**3GPP TSG-RAN2 Meeting #125 *R2-2401630***

**, Greece, 26th Feb- 1st Mar, 2024**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.321** | **CR** | 1739 | **rev** | **1** | **Current version:** | **18.0.0** |  |
|  | | | | | | | | |
| *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:*** | Corrections to the MAC spec for R18 positioning | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_pos\_enh2 | | | | |  | ***Date:*** | | | 2024-03-06 |
|  |  | | | |  | |  | | |  |
| ***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 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:*** | | Rapp changes for R18 positioning  1/ 5.22.1.3.1b does not exist, so it is removed from section 5.4.4  2/ select of any resource pool for SL-PRS is missing for single PRS transmission  3/ Change : to ; or  4/ redundant ‘transmission’ in SL-PRS transmisison  5/ SL-PRS request MAC CE is mapped to one or zero SR configuration  6/ wrong indentation in section 5.22.1.1  7/ LS from RAN4 in R4-2321464 has concluded that the reference signal for determining the current RSRP for TA validation shall be the SSB of the currently campped cell. This agreement should be reflected in section  8/ Add the correct RRC field name for 12bit/24bit configuration for source ID  9/ Change the correct RRC field name for the time alignment timer for SRS with validity area  ====================UPDATE after RAN2#125=================  During RAN2#125, the following agreements have been reached regarding the discussion of MAC spec and the ones with spec impacts have been highlighted in green below   * Multiple/single SL-PRS transmission can be triggered by the UE’s own higher layer. * Capture in the NOTE of the MAC spec that SL-PRS delay budget is provided by higher layer of the UE. * LS to RAN1/RAN4 for questions related to the MAC. * Ask RAN1 whether a new RRC parameter is needed to configure the minimum time gap between last symbol of SL PRS and the start of the first symbol of the PSFCH reception that is associated with the PSSCH transmission on SL-PRS shared resource pool. * For resource allocation scheme 2, SL-PRS resource ID selection is determined by the UE’s implementation, applicable for initial transmission and retransmission. * R17 RSRP-based TA validation for positioning SRS transmission in RRC\_INACTIVE can be reused for positioning SRS bandwidth aggregation in RRC\_INACTIVE. Check with RAN1 and RAN4 in the LS. * RAN2 understand that different carriers in SRS bandwidth aggregation belong to the same TAG, for both RRC\_CONNECTED and RRC\_INACTIVE. No spec change is needed. Check with RAN1 and RAN4 in the LS. * SL-PRS resource request MAC CE’s priority in LCP is lower than SL-BSR MAC CE but higher than MAC CE for IAB-MT Recommended Beam Indication. * For activation/deactivation of SP positioning SRS with multiple carrier indications, design a new MAC CE for activation/deactivation of SP positioning SRS across multiple carriers. * SL MAC entity cancels the triggered SL-PRS resource request upon upper layer indication of SL MAC reset. * Include the SL-PRS bandwidth in the SL-PRS resource request MAC CE for aperiodic SL-PRS transmission and RRC UAI message for periodic SL-PRS transmission. * Bandwidth, delay budget, and priority are provided to the SL-PRS Tx UE in SLPP signalling. FFS periodicity. * RAN2 will not specify anything in this release for SL-PRS bandwidth indication from LMF to gNB. * The SL-PRS transmission multiplicity (single/multiple transmission) is determined by the UE’s own higher layer by implementation. * The reservation period for multiple SL-PRS transmission when triggered by the peer UE’s SCI is determined by the UE’s own higher layer and delivered to the MAC layer by implementation. * When SL-PRS transmission is triggered by SCI, SL-PRS priority is determined by the UE’s own higher layer and delivered to the MAC layer by implementation. * SL-PRS priority is provided to the MAC by the UE’s own higher layer, according to the priority sent in the SLPP parameter exchange in the sidelink positioning session, when SL-PRS transmission is triggered by its own higher layer. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Changes according to the above. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Editorial changes for MAC spec for R18 positoning. If not approved, the text will not be right from editorial point of view.  For the agreements in RAN2#125, if they are not implemented, the spec will not be aligned with the conclusions of the discussion. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.1, 5.2, 5.4.4, 5.22.1.1, 5.22.1.2.1, 5.22.1.3.4, 5.22.1.5, 5.22.2, 5.22.2.4, 5.26.2, 5.32, 6.1.3.74 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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: R2-2400338 | | | | | | | | |

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

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

**A2X communication**: A communication to support A2X services leveraging PC5 reference points, as defined in TS 23.256 [31]. A2X services are realized by various types of A2X applications, e.g., BRID or DAA.

**Air to Ground network:** An NG-RAN consisting of ground-based gNBs, which provide cell towers that send signals up to an aircraft's antenna(s) of onboard ATG terminal, with typical vertical altitude of around 10,000 m and take-off/landing altitudes down to 3000 m.

**BWP for SRS for positioning Tx frequency hopping**:For SRS for positioning Tx frequency hopping, separate BWP configuration outside BWP configuration for data transmission.

**Dormant BWP**:The dormant BWP is one of downlink BWPs configured by the network via dedicated RRC signaling. In the dormant BWP, the UE stop monitoring PDCCH on/for the SCell, but continues performing CSI measurements, Automatic Gain Control (AGC) and beam management, if configured.

**DRX group**: A group of Serving Cells that is configured by RRC and that have the same DRX Active Time.

**eRedCap UE**: A UE with enhanced reduced capabilities as specified in clause 4.2.22.1 of TS 38.306 [25].

**HARQ information**: HARQ information for DL-SCH, for UL-SCH, or for SL-SCH transmissions consists of New Data Indicator (NDI), Transport Block Size (TBS), Redundancy Version (RV), and HARQ process ID.

**IAB-donor**: gNB that provides network access to UEs via a network of backhaul and access links.

**IAB-node**: RAN node that supports NR access links to UEs and NR backhaul links to parent nodes and child nodes.

**Listen Before Talk**: A procedure according to which transmissions are not performed if the channel is identified as being occupied, see TS 37.213 [18].

**LTM candidate cell**: A candidate cell configured for LTM as defined in TS 38.331 [5].

**Msg3**: Message transmitted on UL-SCH containing a C-RNTI MAC CE or CCCH SDU, submitted from upper layer and associated with the UE Contention Resolution Identity, as part of a Random Access procedure.

**Multi-path**: Mode of operation of a remote UE in RRC\_CONNECTED configured with one direct path on which the UE connects to gNB using NR Uu, and one indirect path on which the UE connects to the same gNB via a relay UE using L2 U2N relay operation or non-3GPP connectivity (N3C).

**Multi-path U2N N3C relay**: AS functionality providing both direct path and indirect path via relay UE with non-3GPP connectivity.

**Multi-PUSCH configured grant**: A configured grant configuration that includes multiple consecutive configured uplink grants within a single periodicity.

**NCR-Fwd**: NCR-node function, which performs amplifying-and-forwarding of UL/DL RF signals between gNB and UE. The behavior of the NCR-Fwd is controlled according to the side control information received by the NCR-MT from a gNB.

**NCR-MT**: NCR-node entity which communicates with a gNB via a control link to receive side control information. The control link is based on NR Uu interface.

**NCR-node**: RAN node comprising NCR-MT and NCR-Fwd.

**Non-terrestrial network**: An NG-RAN consisting of gNBs, which provide non-terrestrial NR access to UEs by means of an NTN payload embarked on an airborne or space-borne NTN vehicle and an NTN Gateway.

**NR backhaul link**: NR link used for backhauling between an IAB-node and an IAB-donor, and between IAB-nodes in case of a multi-hop backhauling.

**NR sidelink communication**: AS functionality enabling at least V2X Communication as defined in TS 23.287 [19] and ProSe communication (including ProSe non-Relay, UE-to-Network Relay and UE-to-UE Relay communication (including ProSe UE-to-UE Relay communication with integrated discovery)) as defined in TS 23.304 [26], between two or more nearby UEs, using NR technology but not traversing any network node.

**NR sidelink discovery**: AS functionality enabling ProSe non-Relay discovery, ProSe UE-to-Network Relay discovery and ProSe UE-to-UE Relay discovery for Proximity based Services as defined in TS 23.304 [26], between two or more nearby UEs, using NR technology but not traversing any network node.

**NR sidelink transmission**: Any NR Sidelink-based transmission, including transmission for NR sidelink discovery, transmission for NR sidelink communication, transmission for Ranging/Sidelink Positioning, and transmission for A2X communication.

**PDCCH occasion**: A time duration (i.e. one or a consecutive number of symbols) during which the MAC entity is configured to monitor the PDCCH.

**Positioning SRS Bandwidth Aggregation**: Transmission of positioning SRS on multiple carriers in RRC\_CONNECTED and RRC\_INACTIVE where the positioning SRS resources are linked in RRC configuration as defined in TS 38.331 [5].

**PRS Processing Window**: A time window during which UE may perform PRS measurement inside the active DL BWP with the same numerology as the active DL BWP without measurement gap.

**Ranging/Sidelink Positioning**:AS functionality enabling ranging-based services and sidelink positioning as specified in TS 23.586 [30].

**RB set**: A RB set refers to a contiguous set of resource blocks (RBs) on which a channel access procedure is performed in shared spectrum as defined in TS 37.213 [18].

**RedCap UE**: A UE with reduced capabilities as specified in clause 4.2.21.1 in TS 38.306 [25].

**Serving Cell**: A PCell, a PSCell, or an SCell in TS 38.331 [5].

**Sidelink transmission information**: Sidelink transmission information included in an SCI for an SL-SCH transmission or SL-PRS transmission with or without SL-SCH transmission on SL-PRS shared resource pool as specified in clause 8.3 and 8.4 of TS 38.212 [9] consists of Sidelink HARQ information including NDI, RV, Sidelink process ID, HARQ feedback enabled/disabled indicator, Sidelink identification information including cast type indicator, Source Layer-1 ID and Destination Layer-1 ID, and Sidelink other information including CSI request, SL-PRS request, SL-PRS resource ID, a priority, a communication range requirement and Zone ID.

**SL-PRS delay budget**: Delay budget before which the SL-PRS is expected to be transmitted by the Tx UE.

**SL-PRS dedicated resource pool**:A sidelink resource pool which can be used for the transmission of SL-PRS and cannot be used for the transmission of PSSCH.

**SL-PRS shared resource pool**:A sidelink resource pool which can be used for the transmission of both SL-PRS and PSSCH.

**SL-PRS transmission information on SL-PRS dedicated resource pool**:SL-PRS transmission information on SL-PRS dedicated resource pool is included in an SCI for an SL-PRS transmission on SL-PRS dedicated resource pool, as specified in TS 38.212 [9], consisting of

- SL-PRS identification information, including cast type indicator, source ID and destination ID;

- SL-PRS transmission other information, including SL-PRS priority, SL-PRS request, SL-PRS resource ID and resource reservation period.

**SRS for positioning Tx frequency hopping**: Transmit frequency hopping of positioning SRS in RRC\_INACTIVE and RRC\_CONNECTED.

**SRS positioning validity area**:An area consisting of a list of cells within which the corresponding positioning SRS configuration is considered as valid.

**Special Cell**: For Dual Connectivity operation the term Special Cell refers to the PCell of the MCG or the PSCell of the SCG depending on if the MAC entity is associated to the MCG or the SCG, respectively. Otherwise the term Special Cell refers to the PCell. A Special Cell supports PUCCH transmission and contention-based Random Access, and is always activated.

**Timing Advance Group**: A group of Serving Cells that is configured by RRC and that, for the cells with a UL configured, using the same timing reference cell and the same Timing Advance value. A Timing Advance Group containing the SpCell of a MAC entity is referred to as Primary Timing Advance Group (PTAG), whereas the term Secondary Timing Advance Group (STAG) refers to other TAGs.

**UE-gNB RTT**: For non-terrestrial networks, the sum of the UE's Timing Advance value (see TS 38.211 [8] clause 4.3.1) and *kmac*.

**V2X sidelink communication**: AS functionality enabling V2X Communication as defined in TS 23.285 [20], between nearby UEs, using E-UTRA technology but not traversing any network node.

NOTE 1: A timer is running once it is started, until it is stopped or until it expires; otherwise it is not running. A timer can be started if it is not running or restarted if it is running. A Timer is always started or restarted from its initial value. The duration of a timer is not updated until it is stopped or expires (e.g. due to BWP switching). When the MAC entity applies zero value for a timer, the timer shall be started and immediately expire unless explicitly stated otherwise.

NOTE 2: In this version of the specification, the SRS in the procedural description includes Positioning SRS except for the Positioning SRS for transmission in RRC\_INACTIVE as in clause 5.26. Positioning SRS except for the Positioning SRS for transmission in RRC\_INACTIVE is treated the same as SRS by the UE unless explicitly stated otherwise.

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

# 5 MAC procedures

## 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 to the associated TAG to be uplink time aligned for the TAG;

- *inactivePosSRS-ValidityAreaTAT* 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;

- *srs-ValidityAreaTimeAlignmentTimer* which controls how long the MAC entity considers Positioning SRS transmission in RRC\_INACTIVE in clause 5.26 to be uplink time aligned when SRS positioning validity area is configured.

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 there is ongoing Positioning SRS Transmission in RRC\_INACTIVE as in clause 5.26:

3> if SRS positioning validity area is configured:

4> start or restart the *srs-ValidityAreaTimeAlignmentTimer* associated with the indicated TAG.

3> else:

4> 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> else:

3> 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 configured with two TAGs or in a MSGB for an SpCell configured with two TAGs:

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 the TAG indicated in the received Random Access Response message or MSGB;

3> start or restart the *timeAlignmentTimer* associated with TAG indicated in the received Random Access Response message or MSGB.

2> else if the *timeAlignmentTimer* associated with the TAG indicated in the received Random Access Response message or MSGB 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:

4> stop the *timeAlignmentTimer* associated with this TAG.

2> else:

3> ignore the received Timing Advance Command.

1> when a Timing Advance Command is received in a Random Access Response message for a Serving Cell not configured with two TAGs or in a MSGB for an SpCell not configured with two TAGs:

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> if SRS positioning validity area is configured:

5> start or restart the *inactivePosSRS-ValidityAreaTAT*associated with the indicated TAG.

4> else:

5> 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, for an SpCell configured with two TAGs:

2> apply the Timing Advance Command for the PTAG indicated in the Absolute Timing Advance Command MAC CE;

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

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, for an SpCell not configured with two TAGs:

2> apply the Timing Advance Command for PTAG;

2> if there is ongoing Positioning SRS Transmission in RRC\_INACTIVE as in clause 5.26:

3> if SRS positioning validity area is configured:

4> start or restart the *srs-ValidityAreaTimeAlignmentTimer* associated with the indicated TAG.

3> else:

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

2> if CG-SDT procedure is ongoing:

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

2> else:

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

1> when the MAC entity is configured with *rach-LessHO*:

2> set the NTA value (as defined in TS 38.211 [8]) to the value indicated by *targetNTA* in *rach-LessHO* for PTAG;

2> start 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 the indication is received from upper layer for starting the *inactivePosSRS-ValidityAreaTAT*:

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

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

2> stop the *inactivePosSRS-ValidityAreaTAT*.

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 an LTM Cell Switch Command MAC CE including a Timing Advance Command is received:

2> apply the Timing Advance Command for the PTAG;

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

1> when an LTM Cell Switch Command MAC CE is received and the UE has successfully measured the Timing Advance as in clause 5.18.35:

2> apply the measured Timing Advance for the PTAG;

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

1> when a *timeAlignmentTimer* expires:

2> if the *timeAlignmentTimer* is associated with a PTAG and the SpCell is not configured with two PTAGs; or

2> if the *timeAlignmentTimer* is associated with a PTAG, the SpCell is configured with two PTAGs, and the *timeAlignmentTimer* associated with the other PTAG is not running:

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 a TAG for an SCell, then for all SCells configured with only this TAG; or

2> if the *timeAlignmentTimer* is associated with a TAG for an SCell, and if the SCell is configured with two TAGs and *the timeAlignmentTimer* associated with the other TAG is not running, then for all such SCells:

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.

2> else if the *timeAlignmentTimer* is associated with a TAG for a Serving Cell configured with two TAGs, and if the *timeAlignmentTimer* associated with the other TAG is running, then for all such Serving Cells:

3> clear any configured downlink assignment, if the activated TCI state(s) for all PUCCH resources configured for the configured downlink assignment is associated with the TAG of the expired *timeAlignmentTimer*;

3> clear any configured uplink grant, if the activated TCI state(s) for the configured uplink grant is associated with the TAG of the expired *timeAlignmentTimer*;

3> clear any PUSCH resource for semi-persistent CSI reporting, if the activated TCI state(s) for the PUSCH resource is associated with the TAG of the expired *timeAlignmentTimer*;

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 not configured with two TAGs 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.

When the MAC entity stops uplink transmissions associated to a STAG for an SCell configured with two TAGs 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 STAG 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*(s) associated with all TAG(s) to which this Serving Cell belongs is not running, CG-SDT procedure is not ongoing and SRS transmission in RRC\_INACTIVE as in clause 5.26 is not on-going. Furthermore, when the *timeAlignmentTimer*(s) associated with all PTAG(s) 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 and the *inactivePosSRS-TimeAlignmentTimer* or *srs-ValidityAreaTimeAlignmentTimer* is not running. The MAC entity shall not perform any uplink transmission except the Random Access Preamble and MSGA transmission on a Serving Cell using TCI state(s) associated with a TAG for which the *timeAlignmentTimer* is not running.

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

## 5.4 UL-SCH data transfer

### 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 a BFD-RS set and/or to positioning measurement gap activation/deactivation request. Each logical channel, SCell beam failure recovery, beam failure recovery of a 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 a DSR (clause 5.4.9) or the SCell beam failure recovery or the beam failure recovery of a 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) or Timing Advance reporting (clause 5.4.8).

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, Refined 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; or

1> 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; or

1> if this SR was triggered by Timing Advance reporting (see clause 5.4.8) and all the triggered Timing Advance reports are cancelled; or

1> if this SR was triggered by DSR procedure (see clause 5.4.9) and the DSR that triggered the SR has been 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; and

1> if there is no ongoing LTM cell switch; and

1> if *rach-lessHO* is not configured:

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* or *simultaneousSR-PUSCH-diffPUCCH-Groups* 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* or *simultaneousSR-PUSCH-diffPUCCHgroups*, 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; or

3> if an SL-PRS 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-PRS resource, and either transmission on the SL-PRS 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-PRS 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-PRS 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 and SL-PRS, if available, determined as specified in clause 5.22.1.3.1a for the SL-PRS 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), except for the overlapping uplink grant(s) whose simultaneous transmission is allowed by configuration of *simultaneousPUCCH-PUSCH* or *simultaneousPUCCH-PUSCH-SecondaryPUCCHgroup* or *simultaneousSR-PUSCH-diffPUCCH-Groups*;

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> if *rach-lessHO* is not configured:

6> 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 a 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 a 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 a 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, 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 for transmission.

The MAC entity may stop, if any, ongoing Random Access procedure due to a pending SR for SL-CSI reporting, which has no valid PUCCH resources configured, if:

- the SL grant can accommodate SL-CSI reporting MAC CE for transmission.

The MAC entity may stop, if any, ongoing Random Access procedure due to a pending SR for SL-DRX command indication, which has no valid PUCCH resources configured, if:

- the SL grant can accommodate SL-DRX command indication 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 SL consistent LBT failure recovery, which has no valid PUCCH resources configured, if one of the following conditions is met:

- 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 LBT failure MAC CE that indicates SL consistent LBT failure; or

- all the triggered SL consistent LBT failure recovery are cancelled (see clause 5.31.2).

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.

The MAC entity may stop, if any, ongoing Random Access procedure due to a pending SR for Timing Advance report, 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 Timing Advance Report MAC CE (see clause 5.4.8).

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

- the DSR that triggered the SR has been cancelled (see clause 5.4.9).

The MAC entity may stop, if any, ongoing Random Access procedure due to a pending SR for SL-PRS Resource Request, 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 SL-PRS Resource Request MAC CE (see clause 5.22.1.12).

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

## 5.22 SL-SCH Data transfer and SL-PRS transmission

### 5.22.1 SL-SCH Data and SL-PRS transmission

#### 5.22.1.1 SL Grant reception and SCI transmission

Sidelink grant is received dynamically on the PDCCH, configured semi-persistently by RRC or autonomously selected by the MAC entity. The MAC entity may have a sidelink grant on an active SL BWP to determine a set of PSCCH duration(s) in which transmission of SCI occurs and a set of PSSCH duration(s) in which transmission of SL-SCH associated with the SCI occurs. The MAC entity may have a sidelink grant on the SL-PRS shared resource pool of an active BWP to determine a set of PSCCH durations(s) in which transmission of SCI occurs and a set of SL-PRS transmission occasion(s) and PSSCH duration(s) in which transmission of SL-PRS and SL-SCH associated with the SCI occur. The MAC entity may have a sidelink grant on the SL-PRS dedicated resource pool of an active BWP to determine a set of PSCCH duration(s) in which transmission of SCI occurs and a set of SL-PRS transmission occasion(s) in which transmission of SL-PRS associated to the SCI occurs. A sidelink grant addressed to SL-CS-RNTI with NDI = 1 is considered as a dynamic sidelink grant. A sidelink grant addressed to SL-PRS-CS-RNTI with Activation/Release indication = 1 as in clause 7.3.1.4.3 in TS 38.212 [9] is considered as a dynamic sidelink grant*.*

If the MAC entity has been configured with Sidelink resource allocation mode 1 as indicated in TS 38.331 [5] or if the MAC entity has been configured with Sidelink resource allocation scheme 1 as indicated in TS 38.331 [5] and PDCCH is received for resource allocation on SL-PRS shared resource pool, the MAC entity shall for each PDCCH occasion and for each grant received for this PDCCH occasion:

1> if a sidelink grant has been received on the PDCCH for the MAC entity's SL-RNTI:

2> if the NDI received on the PDCCH has not been toggled compared to the value in the previously received HARQ information for the HARQ Process ID:

3> use the received sidelink grant to determine PSCCH duration(s) and PSSCH duration(s) and SL-PRS transmission occasion(s), if available, for one or more retransmissions of a single MAC PDU for the corresponding Sidelink process according to clause 8.1.2 of TS 38.214 [7] and SL-PRS according to clause 8.1.4 of TS 38.214 [7].

2> else:

3> use the received sidelink grant to determine PSCCH duration(s) and PSSCH duration(s) and SL-PRS transmission occasion(s), if available, for initial transmission and, if available, retransmission(s) of a single MAC PDU and SL-PRS according to clause 8.1.2 of TS 38.214 [7].

NOTE 0: When SL-PRS is transmitted on SL-PRS shared resource pool, the PSSCH duration(s) and SL-PRS transmission occasion(s) are determined only after the LCP procedure in clause 5.22.1.4.1.

1> else if a sidelink grant has been received on the PDCCH for the MAC entity's SL-CS-RNTI:

2> if PDCCH contents indicate retransmission(s) for the identified HARQ process ID that has been set for an activated configured sidelink grant identified by *sl-ConfigIndexCG*:

3> use the received sidelink grant to determine PSCCH duration(s) and PSSCH duration(s) and SL-PRS transmission occasion(s), if available, for one or more retransmissions of a single MAC PDU and SL-PRS according to clause 8.1.2 of TS 38.214 [7].

2> else if PDCCH contents indicate configured grant Type 2 deactivation for a configured sidelink grant:

3> trigger configured sidelink grant confirmation for the configured sidelink grant.

2> else if PDCCH contents indicate configured grant Type 2 activation for a configured sidelink grant:

3> trigger configured sidelink grant confirmation for the configured sidelink grant;

3> store the configured sidelink grant;

3> initialise or re-initialise the configured sidelink grant to determine the set of PSCCH durations and the set of PSSCH durations for transmissions of multiple MAC PDUs according to clause 8.1.2 of TS 38.214 [7] and the set of SL-PRS transmission occasions for transmission of multiple SL-PRS according to clause of 8.2.4 of TS 38.214 [7], if available.

1> if a dynamic sidelink grant is available for retransmission(s) of a MAC PDU which has been positively acknowledged as specified in clause 5.22.1.3.1a:

2> clear the PSCCH duration(s) and PSSCH duration(s) corresponding to retransmission(s) of the MAC PDU from the sidelink grant.

If the MAC entity has been configured with Sidelink resource allocation scheme 1 as in TS 38.331 [5] and PDCCH is received for resource allocation on SL-PRS dedicated resource pool, the MAC entity shall for each PDCCH occasion:

1> if a sidelink grant has been received on the PDCCH for the MAC entity's SL-PRS-RNTI: (i.e., dynamic grant)

2> use the received sidelink grant to determine the PSCCH duration(s) and the corresponding SL-PRS occasion(s) for the transmission of SL-PRS.

1> else if a sidelink grant has been received on the PDCCH for MAC entity's SL-PRS-CS-RNTI: (i.e., configured sidelink grant type 2)

2> if the PDCCH content indicates the configured grant Type 2 activation for a configured sidelink grant:

3> store the configured sidelink grant;

3> trigger configured grant confirmation for the configured sidelink grant;

3> initialise or re-initialise the configured sidelink grant to determine the set of PSCCH duration(s) and the corresponding SL-PRS occasion for the transmission of SL-PRS.

2> else if the PDCCH content indicates the configured Type 2 deactivation for a configured sidelink grant:

3> trigger configured grant confirmation for the configured sidelink grant.

If the MAC entity has been configured with Sidelink resource allocation mode 2 to transmit or Sidelink resource allocation scheme 2 using pool(s) of resources in one or multiple carriers as indicated in TS 38.331 [5] or TS 36.331 [21] based on full sensing, or partial sensing, or random selection or any combination(s), the MAC entity shall for each Sidelink process:

NOTE 0A: For SL-PRS transmission by Sidelink resource allocation scheme 2 on SL-PRS dedicated resource pool, partial sensing is not supported.

NOTE 1: If the MAC entity is configured with Sidelink resource allocation mode 2 or Sidelink resource allocation scheme 2 to transmit using a pool of resources in one or multiple carriers as indicated in TS 38.331 [5] or TS 36.331 [21], the MAC entity can create a selected sidelink grant on the pool of resources based on random selection, or partial sensing, or full sensing only after releasing configured sidelink grant(s), if any.

NOTE 2: The MAC entity expects that PSFCH is always configured by RRC for at least one pool of resources in *sl-TxPoolSelectedNormal* and for the resource pool in *sl-TxPoolExceptional* in case that at least a logical channel configured with *sl-HARQ-FeedbackEnabled* is set to *enabled*.

NOTE 2A: For the transmission of Sidelink Inter-UE Coordination Request MAC CE, the MAC entity selects the TX pool of resource where the IUC resource set is required. For the transmission of Sidelink Inter-UE Coordination Information MAC CE, the MAC entity selects the TX pool of resource where the IUC resource set is located.

NOTE 2B: For dynamic co-channel coexistence of LTE sidelink and NR sidelink, when the same TB or different TBs are transmitted on the NR SL slots overlapping with the LTE SL subframe, it is up to UE implementation how to avoid transmitting NR PSCCH/PSSCH only in the subsequent NR SL slot overlapping with an LTE SL subframe for NR PSCCH/PSSCH transmissions of 30kHz SCS.

1> if the MAC entity has selected to create a selected sidelink grant corresponding to transmissions of multiple MAC PDUs, and SL data is available in a logical channel; or

1> if the MAC entity has selected to create a selected sidelink grant corresponding to transmission(s) of multiple SL-PRS(s), which have been triggered by the upper layer or by the reception of a SCI from a peer UE:

NOTE: The multiplicity/singularity of SL-PRS transmission and the reservation period for multiple SL-PRS transmission is determined by the UE's own higher layer by implementation within the service layer requirement for the Ranging/Sidelink positioning session.

2> if the MAC entity has not selected a pool of resources allowed for the logical channel or SL-PRS transmission:

3> if single carrier frequency is configured:

4> if SL data is available in the logical channel for NR sidelink discovery:

5> if *sl-BWP-DiscPoolConfig* or *sl-BWP-DiscPoolConfigCommon* is configured according to TS 38.331 [5]:

6> select the *sl-DiscTxPoolSelected* configured in *sl-BWP-DiscPoolConfig* or *sl-BWP-DiscPoolConfigCommon* for the transmission of NR sidelink discovery message.

5> else:

6> select any pool of resources among the configured pools of resources except for SL-PRS dedicated resource pool, if configured.

4> else if SL data is available in the logical channel for BRID for A2X communication:

5> if *sl-A2X-Service* in *sl-TxPoolSelectedNormal* configured in *sl-BWP-PoolConfigA2X* or *sl-BWP-PoolConfigCommonA2X* indicates *brid* or *bridAndDAA* according to TS 38.331 [5]:

6> select the *sl-TxPoolSelectedNormal* configured in *sl-BWP-PoolConfigA2X* or *sl-BWP-PoolConfigCommonA2X* for the transmission of SL data for A2X communication.

5> else:

6> select any pool of resources among the configured pools of resources.

4> else if SL data is available in the logical channel for DAA for A2X communication:

5> if *sl-A2X-Service* in *sl-TxPoolSelectedNormal* configured in *sl-BWP-PoolConfigA2X* or *sl-BWP-PoolConfigCommonA2X* indicates *daa* or *bridAndDAA* according to TS 38.331 [5]:

6> select the *sl-TxPoolSelectedNormal* configured in *sl-BWP-PoolConfigA2X* or *sl-BWP-PoolConfigCommonA2X* for the transmission of SL data for A2X communication.

5> else:

6> select any pool of resources among the configured pools of resources.

NOTE 2C: The MAC entity identifies the logical channel(s) for BRID or DAA based on the QoS information associated to BRID or DAA, i.e. PQI(s), from upper layers.

4> else if *sl-HARQ-FeedbackEnabled* is set to *enabled* for the logical channel:

5> select any pool of resources configured with PSFCH resources among the pools of resources except the pool(s) in *sl-BWP-DiscPoolConfig*, *sl-BWP-DiscPoolConfigCommon*, *sl-BWP-PoolConfigA2X* or *sl-BWP-PoolConfigCommonA2X*, if configured or SL-PRS dedicated resource pool, if configured.

4> else if SL-PRS is pending for transmission:

5> select any resource pool among the resource pool(s) allowing for SL-PRS transmission.

4> else:

5> select any pool of resources among the pools of resources except the pool(s) in *sl-BWP-DiscPoolConfig*, *sl-BWP-DiscPoolConfigCommon*, *sl-BWP-PoolConfigA2X* or *sl-BWP-PoolConfigCommonA2X*, if configured or SL-PRS dedicated resource pool, if configured.

3> else (i.e. multiple carrier frequencies are configured):

4> trigger the TX carrier (re-)selection procedure as specified in clause 5.22.1.11.

2> if Sidelink consistent LBT failure is detected as specified in clause 5.31.2 in all RB sets of the selected resource pool, if single carrier frequency is configured:

3> if *sl-HARQ-FeedbackEnabled* is set to *enabled* for the logical channel:

4> select any pool of resources configured with PSFCH resources among the pools of resources except the pool(s) in *sl-BWP-DiscPoolConfig* or *sl-BWP-DiscPoolConfigCommon*, if configured and the pool(s) in which all RB sets had Sidelink consistent LBT failure detected and not cancelled.

3> else:

4> select any pool of resources among the pools of resources except the pool(s) in *sl-BWP-DiscPoolConfig* or *sl-BWP-DiscPoolConfigCommon*, if configured and the pool(s) in which all RB sets had Sidelink consistent LBT failure detected and not cancelled.

2> perform the TX resource (re-)selection check on the selected pool of resources as specified in clause 5.22.1.2;

NOTE 2D: It is up to UE implementation to select a resource pool that has at least one RB set in which SL consistent LBT failure was not detected.

NOTE 3: The MAC entity continuously performs the TX resource (re-)selection check until the corresponding pool of resources is released by RRC or the MAC entity decides to cancel creating a selected sidelink grant corresponding to transmissions of multiple MAC PDUs.

2> if the TX resource (re-)selection is triggered as the result of the TX resource (re-)selection check:

3> if *sl-lbt-FailureRecoveryConfig* is configured in the SL BWP:

4> indicate to the physical layer RB set information for which Sidelink consistent LBT failure was detected and not cancelled as specified in clause 5.31.2.

3> if the TX carrier (re-)selection procedure was triggered in above and one or more carriers have been (re-)selected in the TX carrier (re-)selection according to clause 5.22.1.11:

4> determine the order of the (re-)selected carriers, according to the decreasing order based on the highest priority of logical channels which are allowed on each (re-)selected carrier, and perform the resource selection procedure as specified in this clause for each Sidelink process on each (re-)selected carrier according to the order.

3> if one or multiple SL DRX(s) is configured in the destination UE(s) receiving SL-SCH data:

4> indicate to the physical layer SL DRX Active time in the destination UE(s) receiving SL-SCH data, as specified in clause 5.28.2.

NOTE 3A: The MAC entity selects a value for the resource reservation interval which is larger than the remaining PDB of SL data available in the logical channel or remaining SL-PRS delay budget. The value of the SL-PRS delay budget is provided by the upper layer of the UE by implementation.

3> randomly select, with equal probability, an integer value in the interval [5, 15] for the resource reservation interval higher than or equal to 100ms or in the interval for the resource reservation interval lower than 100ms and set *SL\_RESOURCE\_RESELECTION\_COUNTER* to the selected value;

3> if the selected resource pool is not SL-PRS dedicated resource pool:

4> select one of the allowed values configured by RRC in *sl-ResourceReservePeriodList* and set the resource reservation interval, *P*rsvp\_TX, with the selected value;

4> select the number of HARQ retransmissions from the allowed numbers, if configured by RRC, in *sl-MaxTxTransNumPSSCH* included in *sl-PSSCH-TxConfigList* and, if configured by RRC, overlapped in *sl-MaxTxTransNumPSSCH* indicated in *sl-CBR-PriorityTxConfigList* for the highest priority of the logical channel(s) and pending SL-PRS transmission(s), if available, allowed on the carrier and the CBR measured by lower layers according to clause 5.1.27 of TS 38.215 [24] if CBR measurement results are available or the corresponding *sl-defaultTxConfigIndex* configured by RRC if CBR measurement results are not available or the corresponding *sl-DefaultCBR-PartialSensing* configured by RRC if partial sensing is selected and CBR measurement results are not available, or the corresponding *sl-DefaultCBR-RandomSelection* configured by RRC if random selection is selected and CBR measurement results are not available in case the *sl-TxPoolExceptional* is not used;

NOTE: The priority of SL-PRS is provided by the UE's own higher layer by implementation within the service layer requirement of the Ranging/Sidelink Positioning session.

NOTE 3Aa: For Multi-consecutive slots transmission as specified in clause 8.1.4 of TS 38.214 [7], during resource (re)selection, leave it to UE implementation, regarding whether to calculate the number of HARQ retransmissions from the allowed numbers based on the number of MCSt transmissions, or the number of slot(s) within Multi-consecutive slots transmission.

4> select an amount of frequency resources within the range, if configured by RRC, between *sl-MinSubChannelNumPSSCH* and *sl-MaxSubchannelNumPSSCH* included in *sl-PSSCH-TxConfigList* and, if configured by RRC, overlapped between *sl-MinSubChannelNumPSSCH* and *sl-MaxSubchannelNumPSSCH* indicated in *sl-CBR-PriorityTxConfigList* for the highest priority of the logical channel(s) and pending SL-PRS transmission(s), if available, allowed on the carrier and the CBR measured by lower layers according to clause 5.1.27 of TS 38.215 [24] if CBR measurement results are available or the corresponding *sl-defaultTxConfigIndex* configured by RRC if CBR measurement results are not available or the corresponding *sl-DefaultCBR-PartialSensing* configured by RRC if partial sensing is selected and CBR measurement results are not available, or the corresponding *sl-DefaultCBR-RandomSelection* configured by RRC if random selection is selected and CBR measurement results are not available in case the *sl-TxPoolExceptional* is not used;

3> else if the selected resource pool is SL-PRS dedicated resource pool:

4> select one of the allowed values configured by RRC in *sl-PRS-ResourceReservePeriodList* and set the resource reservation interval, , with the selected value;

4> select the number of SL-PRS retransmissions from the allowed numbers, if configured by RRC, in *sl-PRS-MaxNum-Transmissions* included in *sl-CBR-SL-PRS-TxConfigList*.

3> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is not configured by RRC:

4> if transmission based on random selection is configured by upper layers:

5> if the selected resource pool is not SL-PRS dedicated resource pool:

6> randomly select the time and frequency resources for one transmission opportunity from the resource pool which occur within the SL DRX Active time, if configured, as specified in clause 5.28.2 of the destination UE selected for indicating to the physical layer the SL DRX Active time above, and the pool(s) in which all RB sets with Sidelink consistent LBT failure detected and not cancelled are excluded, if configured, according to the amount of selected frequency resources, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier.

NOTE 3Ab: When there are both SL data available in the logical channel(s) and SL-PRS pending for transmission, the resources are selected based on the shorter one of the corresponding remaining PDB and the corresponding remaining SL-PRS delay budget.

5> else if the selected resource pool is SL-PRS dedicated resource pool:

6> randomly select the time and frequency resources for one transmission opportunity from the resource pool as specified in clause 5.28.2, according to the remaining SL-PRS delay budget of the SL-PRS transmission(s).

4> else:

5> if *sl-NRPSSCH-EUTRA-ThresRSRP-List* is configured by the RRC:

6> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier;

7> when SCS of NR SL is (pre-)configured as *μ* = 1:

8> select the time and frequency resources in the first of NR SL slots overlapping with an LTE SL subframe;

8> may additionally select the time and frequency resources in the subsequent NR SL slot overlapping with the LTE SL subframe.

5> else if the selected resource pool is not SL-PRS dedicated resource pool:

6> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7] which occur within the SL DRX Active time, if configured, as specified in clause 5.28.2 of the destination UE selected for indicating to the physical layer the SL DRX Active time above, according to the amount of selected frequency resources, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier.

5> else if the selected resource pool is SL-PRS dedicated resource pool:

6> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by physical layer as clasue 8.2.4 of TS 38.214 [7] as specified in clause 5.28.2, according to the remaining SL-PRS delay budget of the SL-PRS transmission(s).

3> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is configured by RRC and preferred resource set is not received from a UE:

4> if transmission based on random selection is configured by upper layers:

5> if the selected resource pool is not SL-PRS dedicated resource pool:

6> randomly select the time and frequency resources for one transmission opportunity from the resources pool excluding all RB sets had Sidelink consistent LBT failure detected and not cancelled, if configured, according to the amount of selected frequency resources, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier.

5> else if the selected resource pool is SL-PRS dedicated resource pool:

6> randomly select the time and frequency resources for one transmission opportunity from the resource pool which as specified in clause 5.28.2, according to the remaining SL-PRS delay budget of the SL-PRS transmission(s).

4> else:

5> if the selected resource pool is not SL-PRS dedicated resource pool:

6> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier.

5> else if the selected resource pool is SL-PRS dedicated resource pool:

6> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by physical layer as clause 8.2.4 of TS 38.214 [7], according to the remaining SL-PRS delay budget of the SL-PRS transmission.

3> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is configured by RRC and when the UE does not have its own sensing result as specified in clause 8.1.4 of TS 38.214 [7] and if a preferred resource set is received from a UE and if the selected resource pool is not SL-PRS dedicated resource pool:

4> randomly select the time and frequency resources for one transmission opportunity from the resources belonging to the received preferred resource set for SL-SCH data to be transmitted to the UE providing the preferred resource set, according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier.

3> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is configured by RRC and when the UE has its own sensing result as specified in clause 8.1.4 of TS 38.214 [7] and if a preferred resource set is received from a UE and if the selected resource pool is not SL-PRS dedicated resource pool:

4> randomly select the time and frequency resources for one transmission opportunity within the intersection of the received preferred resource set and the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7] for an SL-SCH data to be transmitted to the UE providing the preferred resource set, according to the amount of selected frequency resources, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier.

4> if there are no resources within the intersection that can be selected as the time and frequency resources for the one transmission opportunity according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier.

5> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier.

3> use the randomly selected resource to select a set of periodic resources spaced by the resource reservation interval for transmissions of PSCCH, PSSCH and SL-PRS corresponding to the number of transmission opportunities of MAC PDUs or SL-PRSs determined in TS 38.214 [7].

3> if one or more SL-PRS retransmissions are selected and the selected resource pool is SL-PRS dedicated resource pool:

4> randomly select the time and frequency resources for one or more transmission opportunities from the available resources, according to the selected number of retransmissions and the remaining SL-PRS delay budget and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9];

4> use the randomly selected resource to select a set of periodic resources spaced by the resource reservation interval for transmissions of PSCCH and SL-PRS corresponding to the number of retransmission opportunities of SL-PRS;

4> consider the first set of transmission opportunities as the initial transmission opportunities and the other set(s) of transmission opportunities as the retransmission opportunities;

4> consider the sets of initial transmission opportunities and retransmission opportunities as the selected sidelink grant.

3> else if one or more HARQ retransmissions are selected and the selected resource pool is not SL-PRS dedicated resource pool:

4> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is not configured by RRC:

5> if transmission based on full sensing or partial sensing is configured by upper layers and there are available resources left in the resources indicated by the physical layer according to clause 8.1.4 of TS 38.214 [7] for more transmission opportunities; or

5> if transmission based on random selection is configured by upper layers and there are available resources left in the resource pool for more transmission opportunities:

6> if *sl-NRPSSCH-EUTRA-ThresRSRP-List* is configured by the RRC:

7> randomly select the time and frequency resources for one or more transmission opportunities from the available resources, according to the amount of selected frequency resources, the selected number of HARQ retransmissions and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier by ensuring the minimum time gap between any two selected resources in case that PSFCH is configured for this pool of resources and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9].

8> when SCS of NR SL is (pre-)configured as *μ* = 1:

9> select the time and frequency resources in the second of NR SL slots of NR SL slots overlapping with an LTE SL subframe to which the selected initial transmission resources belongs, or at least select the time and frequency resources in the first of NR SL slots overlapping with an LTE SL subframe.

6> else:

7> randomly select the time and frequency resources for one or more transmission opportunities from the available resources which occur within the SL DRX Active time, if configured, as specified in clause 5.28.2 of the destination UE selected for indicating to the physical layer the SL DRX Active time above, and the pool(s) in which all RB sets with Sidelink consistent LBT failure detected and not cancelled are excluded, if configured, according to the amount of selected frequency resources, the selected number of HARQ retransmissions, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier by ensuring the minimum time gap between any two selected resources in case that PSFCH is configured for this pool of resources and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9].

4> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is configured by RRC and preferred resource set is not received from a UE:

5> if transmission based on full sensing or partial sensing is configured by upper layers and there are available resources left in the resources indicated by the physical layer according to clause 8.1.4 of TS 38.214 [7] for more transmission opportunities; or

5> if transmission based on random selection is configured by upper layers and there are available resources left in the resource pool for more transmission opportunities:

6> randomly select the time and frequency resources for one or more transmission opportunities from the available resources excluding all RB sets had Sidelink consistent LBT failure detected and not cancelled, if configured according to the amount of selected frequency resources, the selected number of HARQ retransmissions, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier by ensuring the minimum time gap between any two selected resources in case that PSFCH is configured for this pool of resources and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9].

4> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is configured by RRC and when the UE has own sensing result as specified in clause 8.1.4 of TS 38.214 [7] and if a preferred resource set is received from a UE:

5> if there are available resources left in the intersection of the received preferred resource set and the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7] for more transmission opportunities:

6> randomly select the time and frequency resources for one or more transmission opportunities from the available resources within the intersection for SL-SCH data to be transmitted to the UE providing the preferred resource set, according to the amount of selected frequency resources, the selected number of HARQ retransmissions, the remaining PDB of SL data available in the logical channel(s) , and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier by ensuring the minimum time gap between any two selected resources in case that PSFCH is configured for this pool of resources and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9].

5> if the number of time and frequency resources that has been maximally selected for one or more transmission opportunities from the available resources within the intersection is smaller than the selected number of HARQ retransmissions and there are available resources left in the resources indicated by the physical layer for more transmission opportunities:

6> randomly select the time and frequency resources for the remaining transmission opportunities except for the selected resources within the intersection from the available resources outside the intersection but left in the resources indicated by the physical layer according to clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources, the selected number of HARQ retransmissions, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier by ensuring the minimum time gap between any two selected resources in case that PSFCH is configured for this pool of resources and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9].

4> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is configured by RRC and when the UE does not have own sensing result as specified in clause 8.1.4 of TS 38.214 [7] and if a preferred resource set is received from a UE; and

4> if there are available resources left in the received preferred resource set for more transmission opportunities:

5> randomly select the time and frequency resources for one or more transmission opportunities from the available resources belonging to the received preferred resource set for SL-SCH data to be transmitted to the UE providing the preferred resource set, according to the amount of selected frequency resources, the selected number of HARQ retransmissions, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier by ensuring the minimum time gap between any two selected resources in case that PSFCH is configured for this pool of resources and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9].

4> use the randomly selected resource to select a set of periodic resources spaced by the resource reservation interval for transmissions of PSCCH, PSSCH, if available and SL-PRS, if available corresponding to the number of retransmission opportunities of the MAC PDUs determined in TS 38.214 [7] or SL-PRS(s);

4> consider the first set of transmission opportunities as the initial transmission opportunities and the other set(s) of transmission opportunities as the retransmission opportunities;

4> consider the sets of initial transmission opportunities and retransmission opportunities as the selected sidelink grant.

3> else:

4> consider the set as the selected sidelink grant.

3> use the selected sidelink grant to determine the set of PSCCH durations and the set of PSSCH durations and the set of SL-PRS transmission occasion(s), if available, according to TS 38.214 [7] if the selected resource pool is not SL-PRS dedicated resource pool or to determine the set of PSCCH durations and SL-PRS transmission occasion(s) if the selected resource pool is SL-PRS dedicated resource pool according to TS 38.214 [7].

2> else if *SL\_RESOURCE\_RESELECTION\_COUNTER* = 0 and when *SL\_RESOURCE\_RESELECTION\_COUNTER* was equal to 1 the MAC entity randomly selected, with equal probability, a value in the interval [0, 1] which is less than or equal to the probability configured by RRC in *sl-ProbResourceKeep*:

3> clear the selected sidelink grant, if available;

3> randomly select, with equal probability, an integer value in the interval [5, 15] for the resource reservation interval higher than or equal to 100ms or in the interval for the resource reservation interval lower than 100ms and set *SL\_RESOURCE\_RESELECTION\_COUNTER* to the selected value;

3> reuse the previously selected sidelink grant for the number of transmissions of the MAC PDUs or SL-PRS(s) determined in TS 38.214 [7] with the resource reservation interval to determine the set of PSCCH durations, the set of PSSCH durations, and the pending SL-PRS transmission(s), if available, according to TS 38.214 [7].

1> if the MAC entity has selected to create a selected sidelink grant corresponding to transmission(s) of a single MAC PDU, and if SL data is available in a logical channel, or an SL-CSI reporting is triggered, or a Sidelink DRX Command indication is triggered or a Sidelink Inter-UE Coordination Information reporting is triggered, or a Sidelink Inter-UE Coordination Request is triggered; or

1> if the MAC entity has selected to create a selected sidelink grant corresponding to transmission of a single SL-PRS, which has been triggered by the upper layer or by the reception of a SCI from a peer UE:

2> if single carrier frequency is configured:

3> if SL data is available in the logical channel for NR sidelink discovery:

4> if *sl-BWP-DiscPoolConfig* or *sl-BWP-DiscPoolConfigCommon* is configured according to TS 38.331 [5]:

5> select the *sl-DiscTxPoolSelected* configured in *sl-BWP-DiscPoolConfig* or *sl-BWP-DiscPoolConfigCommon* for the transmission of NR sidelink discovery message.

4> else:

5> select any pool of resources among the configured pools of resources except for SL-PRS dedicated resource pool, if configured.

3> else if SL data is available in the logical channel for BRID for A2X communication:

4> if *sl-A2X-Service* in *sl-TxPoolSelectedNormal* configured in *sl-BWP-PoolConfigA2X* or *sl-BWP-PoolConfigCommonA2X* indicates *brid* or *bridAndDAA* according to TS 38.331 [5]:

5> select the *sl-TxPoolSelectedNormal* configured in *sl-BWP-PoolConfigA2X* or *sl-BWP-PoolConfigCommonA2X* for the transmission of SL data for A2X communication.

4> else:

5> select any pool of resources among the configured pools of resources.

3> else if SL data is available in the logical channel for DAA for A2X communication:

4> if *sl-A2X-Service* in *sl-TxPoolSelectedNormal* configured in *sl-BWP-PoolConfigA2X* or *sl-BWP-PoolConfigCommonA2X* indicates *daa* or *bridAndDAA* according to TS 38.331 [5]:

5> select the *sl-TxPoolSelectedNormal* configured in *sl-BWP-PoolConfigA2X* or *sl-BWP-PoolConfigCommonA2X* for the transmission of SL data for A2X communication.

4> else:

5> select any pool of resources among the configured pools of resources.

NOTE 3Ac: The MAC entity identifies the logical channel(s) for BRID or DAA based on the QoS information associated to BRID or DAA, i.e. PQI(s), from upper layers.

3> else if SL data for NR sidelink communication is available in the logical channel:

4> if *sl-HARQ-FeedbackEnabled* is set to *enabled* for the logical channel:

5> select any pool of resources configured with PSFCH resources among the pools of resources except the pool(s) in *sl-BWP-DiscPoolConfig*, *sl-BWP-DiscPoolConfigCommon*, *sl-BWP-PoolConfigA2X* or *sl-BWP-PoolConfigCommonA2X*, if configured or SL-PRS dedicated resource pool, if configured.

4> else:

5> select any pool of resources among the pools of resources except the pool(s) in *sl-BWP-DiscPoolConfig*, *sl-BWP-DiscPoolConfigCommon*, *sl-BWP-PoolConfigA2X* or *sl-BWP-PoolConfigCommonA2X*, if configured or SL-PRS dedicated resource pool, if configured.

3> else if SL-PRS is pending for transmission:

4> select any resource pool among the resource pool(s) allowing for SL-PRS transmission.

3> else if an SL-CSI reporting or a Sidelink DRX Command or a Sidelink Inter-UE Coordination Request or a Sidelink Inter-UE Coordination Information is triggered:

4> select any pool of resources among the pools of resources except the pool(s) in *sl-BWP-DiscPoolConfig*, *sl-BWP-DiscPoolConfigCommon*, *sl-BWP-PoolConfigA2X* or *sl-BWP-PoolConfigCommonA2X*, if configured or SL-PRS dedicated resource pool, if configured.

2> else (i.e. multiple carrier frequencies are configured):

3> trigger the TX carrier (re-)selection procedure as specified in clause 5.22.1.11.

2> if Sidelink consistent LBT Failure is detected as specified in clause 5.31.2 in all RB sets of the selected resource pool for the logical channel, if single carrier frequency is configured:

3> clear the selected sidelink grant on the selected pool of resources.

3> if *sl-HARQ-FeedbackEnabled* is set to *enabled* for the logical channel:

4> select any pool of resources configured with PSFCH resources among the pools of resources except the pool(s) in *sl-BWP-DiscPoolConfig* or *sl-BWP-DiscPoolConfigCommon*, if configured and the pool(s) including all RB sets for which Sidelink consistent LBT failures were detected.

3> else:

4> select any pool of resources among the pools of resources except the pool(s) in *sl-BWP-DiscPoolConfig* or *sl-BWP-DiscPoolConfigCommon*, if configured and the pool(s) including all RB sets for which Sidelink consistent LBT failures were detected.

2> perform the TX resource (re-)selection check on the selected pool of resources as specified in clause 5.22.1.2;

2> if the TX resource (re-)selection is triggered as the result of the TX resource (re-)selection check

3> if *sl-lbt-FailureRecoveryConfig* is configured in the SL BWP:

4> indicate to the physical layer RB set information for which Sidelink consistent LBT failure was detected as specified in clause 5.31.2.

3> if the TX carrier (re-)selection procedure was triggered in above and one or more carriers have been (re-)selected in the Tx carrier (re-)selection according to clause 5.22.1.11:

4> determine the order of the (re-)selected carriers, according to the decreasing order based on the highest priority of logical channels which are allowed on each (re-)selected carrier, and perform the resource selection procedure as specified in this clause for each Sidelink process on each (re-)selected carrier according to the order.

3> if one or multiple SL DRX(s) is configured in the destination UE(s) receiving SL-SCH data:

4> indicate to the physical layer SL DRX Active time in the destination UE(s) receiving SL-SCH data, as specified in clause 5.28.2.

3> if the selected resource pool is not SL-PRS dedicated resource pool:

4> select the number of HARQ retransmissions from the allowed numbers, if configured by RRC, in *sl-MaxTxTransNumPSSCH* included in *sl-PSSCH-TxConfigList* and, if configured by RRC, overlapped in *sl-MaxTxTransNumPSSCH* indicated in *sl-CBR-PriorityTxConfigList* for the highest priority of the logical channel(s) and pending SL-PRS transmission(s), if available allowed on the carrier and the CBR measured by lower layers according to clause 5.1.27 of TS 38.215 [24] if CBR measurement results are available or the corresponding *sl-defaultTxConfigIndex* configured by RRC if CBR measurement results are not available or the corresponding *sl-DefaultCBR-PartialSensing* configured by RRC if partial sensing is selected and CBR measurement results are not available, or the corresponding *sl-DefaultCBR-RandomSelection* configured by RRC if random selection is selected and CBR measurement results are not available in case the *sl-TxPoolExceptional* is not used;

NOTE 3Ad: For Multi-consecutive slots transmission as specified in clause 8.1.4 of TS 38.214 [7], during resource (re)selection, leave it to UE implementation, regarding whether to calculate the number of HARQ retransmissions from the allowed numbers based on the number of MCSt transmissions, or the number of slot(s) within Multi-consecutive slots transmission.

4> select an amount of frequency resources within the range, if configured by RRC, between *sl-MinSubChannelNumPSSCH* and *sl-MaxSubChannelNumPSSCH* included in *sl-PSSCH-TxConfigList* and, if configured by RRC, overlapped between *sl-MinSubChannelNumPSSCH* and *sl-MaxSubChannelNumPSSCH* indicated in *sl-CBR-PriorityTxConfigList* for the highest priority of the logical channel(s) and pending SL-PRS transmission(s), if available allowed on the carrier and the CBR measured by lower layers according to clause 5.1.27 of TS 38.215 [24] if CBR measurement results are available or the corresponding *sl-defaultTxConfigIndex* configured by RRC if CBR measurement results are not available or the corresponding *sl-DefaultCBR-PartialSensing* configured by RRC if partial sensing is selected and CBR measurement results are not available, or the corresponding *sl-DefaultCBR-RandomSelection* configured by RRC if random selection is selected and CBR measurement results are not available in case the *sl-TxPoolExceptional* is not used;

3> if the selected resource pool is SL-PRS dedicated resource pool:

4> select the number of SL-PRS retransmissions from the allowed numbers, if configured by RRC, in *sl-PRS-MaxNum-Transmissions* included in *sl-CBR-SL-PRS-TxConfigList*.

3> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is not configured by RRC:

4> if transmission based on random selection is configured by upper layers:

5> if the selected resource pool is not SL-PRS dedicated resource pool:

6> randomly select the time and frequency resources for one transmission opportunity from the resources pool which occur within the SL DRX Active time, if configured, as specified in clause 5.28.2 of the destination UE selected for indicating to the physical layer the SL DRX Active time above, if configured and the pool(s) in which all RB sets had Sidelink consistent LBT failure detected and not cancelled, according to the amount of selected frequency resources, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier, and the latency requirement of the triggered SL-CSI reporting.

5> if the selected resource pool is SL-PRS dedicated resource pool:

6> randomly select the time and frequency resources for one transmission opportunity from the resource pool as specified in clause 5.28.2, according to the remaining SL-PRS delay budget of the SL-PRS transmission.

4> else:

5> if *sl-NRPSSCH-EUTRA-ThresRSRP-List* is configured by the RRC:

6> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting;

7> when SCS of NR SL is (pre-)configured as *μ* = 1:

8> select the time and frequency resources in the first of NR SL slots overlapping with an LTE SL subframe;

8> may additionally select the time and frequency resources in the subsequent NR SL slot overlapping with the LTE SL subframe.

5> else if the selected resource pool is not SL-PRS dedicated resource pool:

6> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7] which occur within the SL DRX Active time, if configured, as specified in clause 5.28.2 of the destination UE selected for indicating to the physical layer the SL DRX Active time above, according to the amount of selected frequency resources, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting.

5> if the selected resource pool is SL-PRS dedicated resource pool:

6> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by physical layer as clasue 8.2.4 of TS 38.214 [7] as specified in clause 5.28.2, according to the remaining SL-PRS delay budget of the SL-PRS transmission.

3> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is configured by RRC and preferred resource set is not received from a UE:

4> if transmission based on random selection is configured by upper layers:

5> if the selected resource pool is not SL-PRS dedicated resource pool:

6> randomly select the time and frequency resources for one transmission opportunity from the resources pool excluding all RB sets had Sidelink consistent LBT failure detected and not cancelled, if configured according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting.

4> else:

5> if the selected resource pool is not SL-PRS dedicated resource pool:

6> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting.

3> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is configured by RRC and when the UE does not have own sensing result as specified in clause 8.1.4 of TS 38.214 [7] and if a preferred resource set is received from a UE and if the selected resource pool is not SL-PRS dedicated resource pool:

4> randomly select the time and frequency resources for one transmission opportunity from the resources belonging to the received preferred resource set for a MAC PDU to be transmitted to the UE providing the preferred resource set, according to the amount of selected frequency resources, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting.

3> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is configured by RRC and when the UE has own sensing result as specified in clause 8.1.4 of TS 38.214 [7] and if a preferred resource set is received from a UE and if the selected resource pool is not SL-PRS dedicated resource pool:

4> randomly select the time and frequency resources for one transmission opportunity within the intersection of the received preferred resource set and the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7] for a MAC PDU to be transmitted to the UE providing the preferred resource set, according to the amount of selected frequency resources, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting;

4> if there are no resources within the intersection that can be selected as the time and frequency resources for the one transmission opportunity according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier.

5> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting.

3> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is configured by RRC and when the UE determines the resources for Sidelink Inter-UE Coordination Information transmission upon explicit request from a UE:

4> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources, the remaining PDB of SL data available in the logical channel(s) allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting and the latency requirement of the Sidelink Inter-UE Coordination Information transmission, and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available.

3> if one or more SL-PRS retransmissions are selected and the selected resource pool is SL-PRS dedicated resource pool:

4> randomly select the time and frequency resources for one or more transmission opportunities from the available resources, according to the selected number of retransmissions and the remaining SL-PRS delay budget and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9];

4> consider the first set of transmission opportunities as the initial transmission opportunities and the other set(s) of transmission opportunities as the retransmission opportunities;

4> consider the sets of initial transmission opportunities and retransmission opportunities as the selected sidelink grant.

3> else if one or more HARQ retransmissions are selected and the selected resource pool is not SL-PRS dedicated resource pool:

4> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is not configured by RRC:

5> if transmission based on full sensing or partial sensing is configured by upper layers and there are available resources left in the resources indicated by the physical layer according to clause 8.1.4 of TS 38.214 [7] for more transmission opportunities; or

5> if transmission based on random selection is configured by upper layers and there are available resources left in the resources pool for more transmission opportunities:

6> if *sl-NRPSSCH-EUTRA-ThresRSRP-List* is configured by the RRC:

7> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier, and/or the latency requirement of the triggered SL-CSI by ensuring the minimum time gap between any two selected resources in case that PSFCH is configured for this pool of resources, and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9];

8> when SCS of NR SL is (pre-)configured as *μ* = 1:

9> select the time and frequency resources in the second of NR SL slots of NR SL slots overlapping with an LTE SL subframe to which the selected initial transmission resources belongs, or at least select the time and frequency resources in the first of NR SL slots overlapping with an LTE SL subframe.

6> else:

7> randomly select the time and frequency resources for one or more transmission opportunities from the available resources which occur within the SL DRX Active time, if configured, as specified in clause 5.28.2 of the destination UE selected for indicating to the physical layer the SL DRX Active time above, and the pool(s) in which all RB sets with Sidelink consistent LBT failure detected and not cancelled are excluded, if configured, according to the amount of selected frequency resources, the selected number of HARQ retransmissions and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting, and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, by ensuring the minimum time gap between any two selected resources in case that PSFCH is configured for this pool of resources, and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9];

4> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is configured by RRC and preferred resource set is not received from a UE:

5> if transmission based on sensing is configured by upper layers and there are available resources left in the resources indicated by the physical layer according to clause 8.1.4 of TS 38.214 [7] for more transmission opportunities; or

5> if transmission based on random selection is configured by upper layers and there are available resources left in the resource pool for more transmission opportunities:

6> randomly select the time and frequency resources for one or more transmission opportunities from the available resources excluding all RB sets had Sidelink consistent LBT failure detected and not cancelled, if configured according to the amount of selected frequency resources, the selected number of HARQ retransmissions and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting, and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, by ensuring the minimum time gap between any two selected resources in case that PSFCH is configured for this pool of resources and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9].

4> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is configured by RRC and when the UE has own sensing result as specified in clause 8.1.4 of TS 38.214 [7] and if a preferred resource set is received from a UE:

5> if there are available resources left in the intersection of the received preferred resource set and the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7] for more transmission opportunities:

6> randomly select the time and frequency resources for one or more transmission opportunities from the available resources within the intersection for a MAC PDU to be transmitted to the UE providing the preferred resource set, according to the amount of selected frequency resources, the selected number of HARQ retransmissions and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting, and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, by ensuring the minimum time gap between any two selected resources in case that PSFCH is configured for this pool of resources and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9].

5> if the number of time and frequency resources that has been maximally selected for one or more transmission opportunities from the available resources within the intersection is smaller than the selected number of HARQ retransmissions and there are available resources left in the resources indicated by the physical layer for more transmission opportunities:

6> randomly select the time and frequency resources for the remaining transmission opportunities except for the selected resources within the intersection from the available resources outside the intersection but left in the resources indicated by the physical layer according to clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources, the selected number of HARQ retransmissions and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting, and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, by ensuring the minimum time gap between any two selected resources in case that PSFCH is configured for this pool of resources and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9].

4> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is configured by RRC and when the UE does not have own sensing result as specified in clause 8.1.4 of TS 38.214 [7] and if a preferred resource set is received from a UE; and

4> if there are available resources left in the received preferred resource set for more transmission opportunities:

5> randomly select the time and frequency resources for one or more transmission opportunities from the available resources belonging to the received preferred resource set for a MAC PDU to be transmitted to the UE providing the preferred resource set, according to the amount of selected frequency resources, the selected number of HARQ retransmissions and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting, and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, by ensuring the minimum time gap between any two selected resources in case that PSFCH is configured for this pool of resources and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9].

4> if *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is configured by RRC and when the UE determines the resources for Sidelink Inter-UE Coordination Information transmission upon explicit request from a UE:

5> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources, the remaining PDB of SL data available in the logical channel(s) allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting and the latency requirement of the Sidelink Inter-UE Coordination Information transmission, and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available.

4> consider a transmission opportunity which comes first in time as the initial transmission opportunity and other transmission opportunities as the retransmission opportunities;

4> consider all the transmission opportunities as the selected sidelink grant.

3> else:

4> consider the set as the selected sidelink grant.

3> use the selected sidelink grant to determine PSCCH duration(s) and PSSCH duration(s) and the SL-PRS transmission occasion(s), if available, according to TS 38.214 [7] if the selected resource pool is not SL-PRS dedicated resource pool or to determine the PSCCH duration(s) and SL-PRS transmission occasion(s) if the selected resource pool is SL-PRS dedicated resource pool according to TS 38.214 [7].

NOTE 3Ae: MAC entity, based on UE implementation, decides whether to indicate the number of consecutive slots for Multi-consecutive slots transmission as specified in clause 8.1.4 of TS 38.214 [7] larger than 1.

NOTE 3Af: MAC entity, based on UE implementation, decides the value of the number of consecutive slots for Multi-consecutive slots transmission if it decides the number of consecutive slots for Multi-consecutive slots transmission larger than 1, as long as it meets the CAPC maximum COT duration requirement as specified in TS 37.213 [18].

NOTE 3Ag: When the MAC entity selects the time and frequency resources from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], it is up to the UE implementation whether to randomly select resources for transmission opportunities from the resources indicated by the physical layer or to select resources in consecutive slots by UE implementation from the resources indicated by the physical layer.

NOTE 3Ah: For a resource pool configured with PSFCH resource, UE cannot select consecutive slots for SL transmissions of a single TB for Multi-consecutive slots transmission.

NOTE 3Ai: UE may avoid selection of N consecutive resource(s) before a reserved resource of its own, where the selection of N is up to UE implementation from {0,1,2}. UE may avoid selection of M consecutive resource(s) after a reserved resource of its own, where the selection of M is up to UE implementation (at least including 0).

NOTE 3Aj: If configured, UE may avoid selection of N consecutive resource(s) before a reserved resource of other UE when the L1 SL priority value for the transmission is higher than the L1 SL priority value of the reserved resource, where the selection of N is up to UE implementation from {0,1,2}. UE may avoid selection of M consecutive resource(s) after a reserved resource of other UE when the transmitting symbols of the reserved resource overlap with LBT of its own selected resource, where the selection of M is up to UE implementation from {0,1,2}. It is up to UE implementation how the physical layer reports detected reserved resources to MAC layer.

NOTE 3Ak: If configured, if transmission in slot(s) at least before a reserved resource of other UE is able to share its initiated COT to the reservation, UE may prioritize/select resource(s) in the slot(s) for transmission. It is up to UE implementation how the physical layer reports detected reserved resources to MAC layer.

NOTE 3A1: If *sl-InterUE-CoordinationScheme1* enabling reception/transmission of preferred resource set and non-preferred resource set is configured by RRC and if multiple preferred resource sets are received from the same UE, it is up to UE implementation to use one or multiple of them in its resource (re)selection.

NOTE 3B1: If retransmission resource(s) cannot be selected by ensuring that the resource(s) can be indicated by the time resource assignment of a prior SCI, how to select the time and frequency resources for one or more transmission opportunities from the available resources is left for UE implementation by ensuring the minimum time gap between any two selected ‎resources in case that PSFCH is configured for this pool of ‎resources.

NOTE 3B2: When the UE receives both a single preferred resource set and a single non-preferred resource set from the same peer UE or different peer UEs, when the UE has own sensing results, it is up to the UE implementation to use the preferred resource set in its resource (re)selection for transmissions to the peer UE providing the preferred resource set.

NOTE 3B3: The UE is not required to use any resource from the preferred resource set in its resource (re-)selection if that resource is earlier than (++) after the resource of Inter-UE Coordination Information transmission, where is equal to (+) when only MAC CE is used for inter-UE Coordination Information transmission, or is equal to when MAC CE and SCI format 2-C are both used for Inter-UE Coordination Information transmission. The case when is equal to is assuming that SCI format 2-C is received. and are specified in clause 8.1.4 of TS 38.214 [7].

NOTE 3B4: For Inter-UE Coordination Information triggered by an explicit Inter-UE Coordination Request in Scheme 1, whether or not to transmit the Inter-UE Coordination Information upon the Inter-UE Coordination Request reception is determined by UE implementation subject to Release-16 procedure of UL/SL prioritization, LTE SL/NR SL prioritization, and congestion control.

NOTE 3B5: If configured by RRC, *sl-IUC-Explicit* set to *enabled* and an SL-IUC request is received for the Source Layer-2 ID and Destination Layer-2 ID pair of a unicast, MAC layer indicates to physical layer the resource selection window, resource set type (i.e., preferred resource set), L1 priority, the number of sub-channels to be used for the PSSCH/PSCCH transmission and the resource reservation period for preferred resource set. If configured by RRC, *sl-IUC-Explicit* set to *enabled* and an SL-IUC request is received for the Source Layer-2 ID and Destination Layer-2 ID pair of a unicast, MAC layer indicates to physical layer resource set type (i.e., non-preferred resource set) and the resource selection window for non-preferred resource set.

NOTE 3B6: If either *sl-IUC-Explicit* or *sl-IUC-Condition* is configured as *enabled*,UE considers the reception of preferred and non-preferred resource is enabled.

NOTE 3B7: When *sl-TriggerConditionCoordInfo* is set to value 0, for groupcast or broadcast of Inter-UE Coordination Information triggered by a condition in Scheme 1, which Destination Layer-2 ID (and the corresponding cast-type) a UE selects among Destination Layer-2 IDs that are already used or interested in NR sidelink transmission is up to the UE implementation.

1> if a selected sidelink grant is available for retransmission(s) of a MAC PDU which has been positively acknowledged as specified in clause 5.22.1.3.3, except a positive acknowledgement to Multi-consecutive slots transmission (i.e., multiple TBs case) of the MAC PDU and there is remaining slot(s) for this MAC PDU:

2> clear the PSCCH duration(s) and PSSCH duration(s) corresponding to retransmission(s) of the MAC PDU from the selected sidelink grant.

NOTE 3C: How the MAC entity determines the remaining PDB of SL data is left to UE implementation.

For a selected sidelink grant, the minimum time gap between any two selected resources comprises:

- a time gap between the end of the last symbol of a PSSCH transmission of the first resource and the start of the first symbol of the corresponding PSFCH reception determined by *sl-MinTimeGapPSFCH* and *sl-PSFCH-Period* for the pool of resources; and

- For SL operation with shared spectrum channel access, the time gap between the end of the last symbol of a PSSCH transmission of the first resource and the start of the first symbol of the last corresponding PSFCH reception determined by *sl-MinTimeGapPSFCH* and *sl-PSFCH-Period* for the pool of resources; and

- a time required for PSFCH reception and processing plus sidelink retransmission preparation including multiplexing of necessary physical channels and any TX-RX/RX-TX switching time.

NOTE 4: How to determine the time required for PSFCH reception and processing plus sidelink retransmission preparation is left to UE implementation.

The MAC entity shall for each PSSCH duration not on SL-PRS dedicated resource pool:

1> for each sidelink grant occurring in this PSSCH duration:

2> select a MCS table allowed in the pool of resource which is associated with the sidelink grant;

NOTE 4a: MCS table selection is up to UE implementation if more than one MCS table is configured.

2> if the MAC entity has been configured with Sidelink resource allocation mode 1 or Sidelink resource allocation Scheme 1 for SL-PRS transmission on SL-PRS shared resource pool:

3> select a MCS which is, if configured, within the range that is configured by RRC between *sl-MinMCS-PSSCH* and *sl-MaxMCS-PSSCH* associated with the selected MCS table included in *sl-ConfigDedicatedNR*;

3> set the resource reservation interval to 0ms.

2> else if the MAC entity has been configured with Sidelink resource allocation mode 2 or Sidelink resource allocation Scheme 2 for SL-PRS transmission on SL-PRS shared resource pool:

3> select a MCS which is, if configured, within the range, if configured by RRC, between *sl-MinMCS-PSSCH* and *sl-MaxMCS-PSSCH* associated with the selected MCS table included in *sl-PSSCH-TxConfigList* and, if configured by RRC, overlapped between *sl-MinMCS-PSSCH* and *sl-MaxMCS-PSSCH* associated with the selected MCS table indicated in *sl-CBR-PriorityTxConfigList* for the highest priority of the sidelink logical channel(s) in the MAC PDU or pending SL-PRS transmission(s), if available, and the CBR measured by lower layers according to clause 5.1.27 of TS 38.215 [24] if CBR measurement results are available or the corresponding *sl-defaultTxConfigIndex* configured by RRC if CBR measurement results are not available or the corresponding *sl-DefaultCBR-PartialSensing* configured by RRC if partial sensing is selected and CBR measurement results are not available, or the corresponding *sl-DefaultCBR-RandomSelection* configured by RRC if random selection is selected and CBR measurement results are not available in case the *sl-TxPoolExceptional* is not used;

3> if the MAC entity decides not to use the selected sidelink grant for the next PSSCH duration corresponding to an initial transmission opportunity:

4> set the resource reservation interval to 0ms.

3> else:

4> set the resource reservation interval to the selected value.

NOTE 5: MCS selection is up to UE implementation if the MCS or the corresponding range is not configured by RRC.

2> if the configured sidelink grant has been activated and this PSSCH duration corresponds to the first PSSCH transmission opportunity within this *sl-PeriodCG* of the configured sidelink grant:

3> set the HARQ Process ID to the HARQ Process ID associated with this PSSCH duration and, if available, all subsequent PSSCH duration(s) occuring in this *sl-PeriodCG* for the configured sidelink grant;

3> determine that this PSSCH duration is used for initial transmission;

3> flush the HARQ buffer of Sidelink process associated with the HARQ Process ID.

2> deliver the sidelink grant, the selected MCS, and the associated HARQ information to the Sidelink HARQ Entity for this PSSCH duration.

The MAC entity shall for each PSCCH duration on SL-PRS dedicated resource pool:

1> if the MAC entity is not configured with multiple SL-PRS transmissions with Sidelink resource allocation scheme 2; or

1> if the MAC entity is configured with Sidelink resource allocation scheme 1:

2> set the resource reservation period to 0.

1> else if the MAC entity is configured with multiple SL-PRS transmission with Sidelink resource allocation scheme 2:

2> set the resource reservation period to the selected value.

1> if the configured sidelink grant has been activated and this PSSCH duration corresponds to the first PSSCH transmission opportunity within this *sl-PeriodCG* of the configured sidelink grant:

2> set the SL-PRS Process ID to the SL-PRS Process ID associated with this PSSCH duration and, if available, all subsequent SL-PRS transmission occasion(s) occuring in this *sl-PeriodCG* for the configured sidelink grant;

2> determine that this SL-PRS transmission occasion is used for initial transmission.

1> process the sidelink grant according to clause 5.22.1.3.4 with the corresponding SL-PRS transmission information.

For configured sidelink grants not on SL-PRS dedicated resource pool, the HARQ Process ID associated with the first slot of an SL transmission is derived from the following equation:

HARQ Process ID = [floor(CURRENT\_slot / *PeriodicitySL*)] modulo *sl-NrOfHARQ-Processes*  
 + *sl-HARQ-ProcID-offset*

For configured sidelink grant on SL-PRS dedicated resource pool, the SL-PRS Process ID associated with the first slot of an SL transmission is derived from the following equation:

SL-PRS Process ID = [floor(CURRENT\_slot / *PeriodicitySL*)] modulo *[nrOfSL-PRSProc]*

where CURRENT\_slot refers to current logical slot in the associated resource pool, and *PeriodicitySL* is defined in clause 5.8.3.

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

##### 5.22.1.3.1 Sidelink HARQ Entity

The MAC entity is configured by upper layers to transmit using pool(s) of resources on one or more carriers as indicated in clause 5.8.8 of TS 38.331 [5]. For each carrier, the MAC entity includes at most one Sidelink HARQ entity for transmission on SL-SCH, which maintains a number of parallel Sidelink processes.

The maximum number of transmitting Sidelink processes associated with the Sidelink HARQ Entity is 16. A sidelink process may be configured for transmissions of multiple MAC PDUs. For transmissions of multiple MAC PDUs with Sidelink resource allocation mode 2, the maximum number of transmitting Sidelink processes associated with the Sidelink HARQ Entity is 4.

A delivered sidelink grant and its associated Sidelink transmission information are associated with a Sidelink process. Each Sidelink process supports one TB.

For each sidelink grant, the Sidelink HARQ Entity shall:

1> if the MAC entity determines that the sidelink grant is used for initial transmission as specified in clause 5.22.1.1; or

1> if the sidelink grant is a configured sidelink grant and no MAC PDU has been obtained in an *sl-PeriodCG* of the configured sidelink grant; or

1> if the sidelink grant is a dynamic sidelink grant or selected sidelink grant and no MAC PDU has been obtained in the previous sidelink grant when PSCCH duration(s) and 2nd stage SCI on PSSCH of the previous sidelink grant is not in SL DRX Active time as specified in clause 5.28.3 of any destination that has data to be sent:

NOTE 1: Void.

2> (re-)associate a Sidelink process to this grant, and for the associated Sidelink process:

2> if all PSCCH duration(s) and PSSCH duration(s) for initial transmission of a MAC PDU of the dynamic sidelink grant or the configured sidelink grant is not in SL DRX Active time as specified in clause 5.28.3 of the destination that has data to be sent:

3> ignore the sidelink grant.

NOTE 1A: The Sidelink HARQ Entity will associate the selected sidelink grant to the Sidelink process determined by the MAC entity.

2> else:

3> obtain the MAC PDU and SL-PRS, if any, to transmit from the Multiplexing and assembly entity, if any;

3> if a MAC PDU to transmit has been obtained:

4> if a HARQ Process ID has been set for the sidelink grant:

5> (re-)associate the HARQ Process ID corresponding to the sidelink grant to the Sidelink process.

NOTE 1a: There is one-to-one mapping between a HARQ Process ID and a Sidelink process in the MAC entity configured with Sidelink resource allocation mode 1.

4> determines Sidelink transmission information of the TB for the source and destination pair of the MAC PDU as follows:

5> set the Source Layer-1 ID to the 8 LSB of the Source Layer-2 ID of the MAC PDU;

5> set the Destination Layer-1 ID to the 16 LSB of the Destination Layer-2 ID of the MAC PDU;

5> (re-)associate the Sidelink process to a Sidelink process ID;

NOTE 1b: How UE determine Sidelink process ID in SCI is left to UE implementation for NR sidelink.

5> consider the NDI to have been toggled compared to the value of the previous transmission corresponding to the Sidelink identification information and the Sidelink process ID of the MAC PDU and set the NDI to the toggled value;

NOTE 2: The initial value of the NDI set to the very first transmission for the associated Sidelink process is left to UE implementation.

NOTE 3: Void.

5> if the MAC PDU is for NR sidelink discovery:

6> set the cast type indicator to broadcast.

5> else:

6> set the cast type indicator to one of broadcast, groupcast and unicast as indicated by upper layers.

5> if HARQ feedback has been enabled for the MAC PDU according to clause 5.22.1.4.2;

6> set the HARQ feedback enabled/disabled indicator to *enabled*.

5> else:

6> set the HARQ feedback enabled/disabled indicator to *disabled*.

5> set the priority to the value of the highest priority of the logical channel(s), if any, and MAC CE(s), if included, in the MAC PDU and SL-PRS, if any;

NOTE 3A: When determining Sidelink transmission information, the priority of the Sidelink Inter-UE Coordination Information MAC CE is the value configured in RRC parameters *sl-PriorityCoordInfoCondition* when triggered by a condition, or *sl-PriorityCoordInfoExplicit* when triggered by an explicit request. When determining Sidelink transmission information, the priority of the Sidelink Inter-UE Coordination Request MAC CE is the value configured in RRC parameter *sl-PriorityRequest*. When determining Sidelink transmission information, the priority of the Sidelink Inter-UE Coordination Information MAC CE is the value indicated in Priority field in the Sidelink Inter-UE Coordination Request MAC CE provided by the UE when triggered by an explicit request, if *sl-PriorityCoordInfoExplicit-r17* is not configured. When determining Sidelink transmission information for performing sensing and candidate resource selections in PHY, the priority value of the Sidelink Inter-UE Coordination Information MAC CE triggered under a condition is up to UE implementation, if *sl-PriorityCoordInfoCondition-r17* is not configured. When determining Sidelink transmission information for performing sensing and candidate resource selections in PHY, the priority value of Sidelink Inter-UE Coordination Request MAC CE is the same as that of a TB to be transmitted by the UE, if *sl-PriorityRequest-r17* is not configured.

5> if HARQ feedback is enabled for groupcast:

6> if both a group size and a member ID are provided by upper layers and the group size is not greater than the number of candidate PSFCH resources in a slot associated with this sidelink grant:

7> select either positive-negative acknowledgement or negative-only acknowledgement.

NOTE 4: Selection of positive-negative acknowledgement or negative-only acknowledgement is up to UE implementation.

6> else:

7> select negative-only acknowledgement.

NOTE 5: UE operating in SL unlicensed does not use negative-only acknowledgement for groupcast HARQ.

6> if negative-only acknowledgement is selected, UE's location information is available, and *sl-TransRange* has been configured for a logical channel in the MAC PDU, and *sl-ZoneConfig* is configured as specified in TS 38.331 [5]:

7> set the communication range requirement to the value of the longest communication range of the logical channel(s) in the MAC PDU;

7> determine the value of *sl-ZoneLength* corresponding to the communication range requirement and set Zone\_id to the value of Zone\_id calculated using the determined value of *sl-ZoneLength* as specified in TS 38.331 [5].

5> set the Redundancy version to the selected value.

5> if the sidelink grant is associated with request from the higher layer for triggering the SL-PRS transmission of the peer UE identified by the Destination layer-2 ID:

6> set the SL-PRS request to *request*.

5> set the SL-PRS resource ID, if SL-PRS is available, within Sidelink transmission information.

NOTE: The SL-PRS resource ID is determined by the UE's own implementation in the upper layer.

4> deliver the MAC PDU, the SL-PRS, if available, the sidelink grant and the Sidelink transmission information of the TB to the associated Sidelink process;

4> instruct the associated Sidelink process to trigger a new transmission.

3> else:

4> flush the HARQ buffer of the associated Sidelink process.

1> else (i.e. retransmission):

2> if the HARQ Process ID corresponding to the sidelink grant received on PDCCH, the configured sidelink grant or the selected sidelink grant is associated to a Sidelink process of which HARQ buffer is empty; or

2> if the HARQ Process ID corresponding to the sidelink grant received on PDCCH is not associated to any Sidelink process; or

2> if PSCCH duration(s) and PSSCH duration(s) for one or more retransmissions of a MAC PDU of the dynamic sidelink grant or the configured sidelink grant is not in SL DRX Active time as specified in clause 5.28.3 of the destination that has data to be sent:

3> ignore the sidelink grant.

2> else:

3> identify the Sidelink process associated with this grant, and for the associated Sidelink process:

4> deliver the sidelink grant of the MAC PDU and the SL-PRS, if available, to the associated Sidelink process;

4> instruct the associated Sidelink process to trigger a retransmission.

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

5.22.1.3.4 Processing of sidelink grant on SL-PRS dedicated resource pool

For each sidelink grant, the MAC entity shall:

1> if the MAC entity determines that the sidelink grant is used for initial transmission as specified in clause 5.22.1.1; or

1> if the sidelink grant is a configured sidelink grant and no MAC PDU has been obtained in an *sl-PeriodCG* of the configured sidelink grant:

2> associate a Sidelink process to this sidelink grant;

2> set the Destination ID to the Destination layer-2 ID corresponding to the SL-PRS transmission;

2> if the length of the Source ID is configured to as 12 bit:

3> set the Source ID to the 12 LSB of the Source layer-2 ID corresponding to the SL-PRS transmission;

2> else if length of the Source ID is configured to as 24 bit:

3> set the Source ID to the Source layer-2 ID corresponding to the SL-PRS transmission;

2> set the cast type indicator to one of broadcast, groupcast and unicast as indiated by the upper layer;

2> set the SL-PRS priority as the value indicated by upper layer;

2> set the SL-PRS resource ID;

NOTE: The SL-PRS resource ID is determined by the UE's own upper layer by implementation.

2> if the higher layer triggers SL-PRS transmission to the peer UE identified by the Destination layer-2 ID:

3> set the SL-PRS request to *request*;

2> deliver the SL-PRS transmission information to the Sidelink process;

2> instruct the associated Sidelink process to trigger a new transmission as defined in 5.22.1.3.5.

1> else (i.e., retransmission):

2> identify the Sidelink process associated with this grant;

2> if *sl-PRS-MaxNumTransmissions* is configured and the number of transmissions of the SL-PRS has not reached *sl-PRS-MaxNumTransmissions*:

3> deliver the same SL-PRS transmission information as the initial transmission to the Sidelink process;

3> instruct the associated Sidelink process to trigger a retransmission as defined in 5.22.1.3.5.

NOTE: For configured sidelink grant, the Sidelink process for retransmission is identified by the SL-PRS Process ID as specified in clause 5.22.1.3.1.

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

#### 5.22.1.5 Scheduling Request

In addition to clause 5.4.4, the Scheduling Request (SR) is also used for requesting SL-SCH resources for new transmission when triggered by the Sidelink BSR (clause 5.22.1.6) or the SL-CSI reporting (clause 5.22.1.7) or SL-DRX Command indication or SL consistent LBT failure recovery (see clause 5.31.2) or SL-PRS Resource Request (clause 6.1.3.74). If configured, the MAC entity performs the SR procedure as specified in this clause unless otherwise specified in clause 5.4.4. For a sidelink logical channel or for SL-CSI reporting or for SL-DRX Command indication or for SL consistent LBT failure recovery or for SL-PRS Resource Request, at most one PUCCH resource for SR is configured per UL BWP.

The SR configuration of the logical channel that triggered the Sidelink BSR (clause 5.22.1.6) is also considered as corresponding SR configuration for the triggered SR (clause 5.4.4). The value of the priority of the triggered SR corresponds to the value of priority of the logical channel that triggered the SR.

Each sidelink logical channel and SL consistent LBT failure recovery may be mapped to zero or one SR configuration, which is configured by RRC. If the SL-CSI reporting procedure is enabled by RRC, the SL-CSI reporting is mapped to one SR configuration for all PC5-RRC connections. The SR configuration of the SL-CSI reporting triggered according to 5.22.1.7 is considered as corresponding SR configuration for the triggered SR (clause 5.4.4). The value of the priority of the triggered SR triggered by SL-CSI reporting corresponds to the value of the priority of the Sidelink CSI Reporting MAC CE. The SR configuration of the SL-CSI reporting is considered as corresponding SR configuration for the triggered SR of SL-DRX Command indication triggered according to 5.28.3. The value of the priority of the triggered SR triggered by SL-DRX Command indication corresponds to the value of the priority of the Sidelink DRX Command MAC CE. The SR configuration of the SL consistent LBT failure recovery triggered according to 5.31.2 is considered as corresponding SR configuration for the triggered SR (clause 5.4.4). The value of the priority of the triggered SR triggered by SL consistent LBT failure recovery corresponds to the value of the priority of the SL LBT failure MAC CE. SL-PRS resource request may be mapped to zero or one SR configuration, which is configured by RRC. The value of the priority of the triggered SR triggered by SL-PRS resource request corresponds to the value of the priority of the SL-PRS triggering the SL-PRS Resource Request MAC CE.

All pending SR(s) triggered according to the Sidelink BSR procedure (clause 5.22.1.6) 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 an SL-BSR MAC CE which contains buffer status up to (and including) the last event that triggered a Sidelink BSR (see clause 5.22.1.4) prior to the MAC PDU assembly.

All pending SR(s) triggered according to the Sidelink consistent LBT failure recovery (clause 5.31.2) shall be cancelled and each respective *sr-ProhibitTimer* shall be stopped when the MAC PDU is transmitted and this PDU includes an SL LBT failure MAC CE that indicates Sidelink consistent LBT failure or when all the triggered Sidelink consistent LBT failure(s) for an SL BWP is cancelled.

All pending SR(s) triggered according to the Sidelink BSR procedure (clause 5.22.1.6) shall be cancelled and each respective *sr-ProhibitTimer* shall be stopped when the SL grant(s) can accommodate all pending data available for transmission in sidelink.

If there is pending SR triggered by Sidelink consistent LBT failure recovery which has no corresponding SR configuration, MAC entity initiate a Random Access procedure (see clause 5.1) on the Serving Cell and cancel the pending SR.

The pending SR triggered according to the SL-CSI reporting for a destination shall be cancelled and each respective *sr-ProhibitTimer* shall be stopped when the SL grant(s) can accommodate the Sidelink CSI Reporting MAC CE when the SL-CSI reporting that has been triggered but not cancelled or when the triggered SL-CSI reporting is cancelled due to latency non-fulfilment as specified in 5.22.1.7. The pending SR triggered according to the SL-DRX Command indication for a destination shall be cancelled and each respective *sr-ProhibitTimer* shall be stopped when the SL grant(s) can accommodate the Sidelink DRX Command MAC CE when the SL-DRX Command indication that has been triggered but not cancelled. All pending SR(s) triggered by either Sidelink BSR or Sidelink CSI report or Sidelink DRX Command indication shall be cancelled, when RRC configures Sidelink resource allocation mode 2.

All pending SR(s) triggered according to the SL-PRS Resource Request procedure (clause 5.22.1.12) 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 an SL-PRS Resource Request MAC CE which contains status of the pending SL-PRS transmission(s) up to (and including) the last event that triggered a SL-PRS Resource Request (see clause 5.22.1.12) prior to the MAC PDU assembly.

All pending SR(s) triggered according to the SL-PRS Resource Request procedure (clause 5.22.1.12) shall be cancelled and each respective *sr-ProhibitTimer* shall be stopped when the SL grant(s) can accommodate the all the pending SL-PRS transmission(s).

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

### 5.22.2 SL-SCH Data and SL-PRS reception

#### 5.22.2.4 SL-PRS reception on SL-PRS dedicated resource pool

For each SL-PRS transmission occasion on SL-PRS dedicated resource pool, the MAC entity shall:

1> if this SL-PRS transmission is associated to unicast:

2> if the destination ID in the corresponding SCI is equal to the UE's source ID; and if the field *sl-SRC-ID-LenDedicatedSL-PRS-RP* is configured with the value of *12bit*:

3> if source ID in the corresponding SCI is equal to the 12 LSB of the UE's destination layer-2 ID:

4> instruct the physical layer to perform SL-PRS reception on the SL-PRS transmission occasion.

2> else if the destination ID in the corresponding SCI is equal to the UE's source ID, and if the field *sl-SRC-ID-LenDedicatedSL-PRS-RP*  is configured with the value of *24bit*:

3> if source ID in the corresponding SCI is equal to the UE's destination layer-2 ID:

4> instruct the physical layer to perform SL-PRS reception on the SL-PRS transmission occasion.

1> else if this SL-PRS transmission is associated to broadcast or groupcast:

2> if the destination ID in the corresponding SCI is equal to the UE's destination layer-2 ID

3> instruct the physical layer to perform SL-PRS reception on the SL-PRS transmission occasion.

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

## 5.26 Positioning SRS transmission in RRC\_INACTIVE

### 5.26.1 General

Periodic and semi-persistent Positioning SRS with or without positioning SRS bandwidth aggregation can be configured for Positioning SRS transmission in RRC\_INACTIVE.

SRS for positioning Tx frequency hopping as in clause 5.32 can also be configured for Positioning SRS transmission in RRC\_INACTIVE.

The MAC entity shall,

1> if the TA of the configured Positioning SRS is valid according to clause 5.26.2, and the conditions for positioning SRS transmission in clause 7.3.1 of TS 38.213 [6] and clause 6.2.1.4 of TS 38.214 [7] are satisfied:

2> if the UE is configured with UTW and the *UplinkTimeWindowTimer* is running according to clause 5.32; or

2> if the UE is not configured with UTW:

3> instruct to the lower layer according to TS 38.214 [7] to transmit Positioning Periodic SRS or Semi-Persistent SRS that is activated according to clause 5.18.17.

### 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 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 the RSRP of the downlink pathloss reference with the current RSRP value of the downlink pathloss reference.

2> if the UE is configured with SRS with validity area and the upper layer indicates the MAC to update the stored RSRP:

3> update the RSRP of the downlink pathloss reference with the current RSRP value of the downlink pathloss reference of the camped cell as specified in TS 38.331 [5].

The MAC entity shall consider the TA to be valid when the following conditions are fulfilled:

1> compared to the stored downlink pathloss reference RSRP value, the current RSRP value of the downlink pathloss reference of the camped cell as specified in TS 38.331 [5] has not increased/decreased by more than *inactivePosSRS-RSRP-ChangeThreshold*, if configured; and

1> *inactivePosSRS-TimeAlignmentTimer* is running or *inactivePosSRS-ValidityAreaTAT* is running when positioning validity area is configured.

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

## 5.32 SRS for positioning Tx frequency hopping

SRS for positioning Tx frequency hopping can be supported for UE in RRC\_CONNECTED and RRC\_INACTIVE. The UE can be configured with UTW during which the UE is allowed to transmit SRS for positioning Tx frequency hopping.

RRC configures the following parameters for the UTW for SRS for positioning Tx frequency hopping:

- *utw-SlotPeriodicity*: Periodicity of the UTW in slot;

- *utw-SlotOffset*: Offset of the beginning of the UTW with respect to the beginning of the UTW periodicityin time domain in slot;

- *uplinkTimeWindowTimer*: Time duration when the UE performs SRS transmission for positioning Tx frequency hopping.

When UTW is configured, the MAC entity shall start the *uplinkTimeWindowTimer* in the first symbol of the slot for which the following condition is satisfied

CURRENT\_slot modulo (*utw-SlotPeriodicity*) = *utw-SlotOffset*

where CURRENT\_slot = (SFN × *numberOfSlotsPerFrame*) + slot number in the frame and *numberOfSlotsPerFrame* refers to the number of consecutive slots per frame as specified in TS 38.211 [8].

When UTW is configured and the UE is in RRC\_CONNECTED, the MAC entity shall instruct the lower layer to transmit SRS for positioning Tx frequency hopping when the *uplinkTimeWindowTimer* is running.

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

#### 6.1.3.74 SL-PRS Resource Request MAC CE

The SL-PRS Resource Request MAC CE is identified by a MAC subheader with eLCID as specified in Table 6.2.1-1b. It has the following fields:

- Destination index: The Destination Index field identifies the destination. The length of this field is 5 bits. The value is set to one index corresponding to SL destination identity associated to same destination reported in *sl-PosTxResourceReqList* if present. The value is indexed sequentially from 0 in the same ascending order of SL destination identity in *sl-PosTxResourceReqList* as specified in TS 38.331 [5]. When multiple lists are reported, the value is indexed sequentially across all the lists in the same order as presented in *SidelinkUEInformaitonNR* message;

- Priority: Priority of pending SL-PRS transmission. The length of this field is 3 bits;

- SL-PRS Bandwidth: Requested minimum bandwidth of pending SL-PRS transmission. The length of this field is 6 bits. Encoding of this field is the same as *sl-PRS-Bandwidth* in IE *SL-PRS-TxInfo* as specified in TS 38.331 [5];

- R: Reserved bit, set to 0.



Figure 6.1.3.74-1: SL-PRS Resource Request MAC control element

===========================END OF CHANGE===========================================