**3GPP TSG-RAN2 Meeting #117-eR2-220xxxx**

**Electronic, 21st Feb- 3rd Mar, 2022**

**Source: Email discussion Rapporteur (Huawei, HiSilicon)**

**Title: Summary of [Post116bis-e][510][SDT] MAC running CR review issue list**

**Agenda item:** **8.6.1**

**Document for:** **Discussion and Decision**

# General

This document contains the list of comments made during the review of the MAC CR for SDT in the email discussion [Post115-e][507][SDT] MAC running CR update (Huawei).

For the issue found in the draft CR under Please fill in the form according to the following:

* On the column of index, fill in an index with the company initial letter + discussion number + issue number by increasing order.
  + For example, for the discussion in Post114ePhaseI, for an issue from Huawei, HiSilicon, one can fill in “H (company initial letter) + 0 (discussion number for Post114e)+ 00 (Issue number)”=> H000
  + Please use 3 for Post116bis-e
* On the column of brief description of the issue, as the name suggests, please give a description on the issue
* On the column of suggested change/company comment, please give the proposed change on the draft spec based on the description on the issue. Companies can also give comments on the proposed change in this column by adding a marking of [Company] in this column
* On the column of proposed way forward by rapporteur, please leave it empty at the time of email discussion. At the conclusion of the discussion, email discussion rapporteur would give a way forward according to the inputs from different companies on the issue.

On the section of “Any Other Clause”, if a certain issue is found under a Clause in the spec that has not been listed, please fill the issue in the form under this section.

Please edit the document in draft view (View -> Draft) to view the entire table.

## Contacts

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# Post116bis-e

## 3.2 Definitions

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| # | Brief description of the issue | Suggested change/company comments | Proposed way forward by rapporteur |
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### 5.1.2 Random Access Resource selection

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.1.2a Random Access Resource selection for 2-step RA type

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.1.3 Random Access Preamble transmission

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.1.3a MSGA transmission

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### 5.1.4a MSGB reception and contention resolution for 2-step random access

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.1.5 Contention Resolution

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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## 5.2 Maintenance of Uplink Time Alignment

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L301 | The “RACH procedure” is not used in MAC specification. It should be changed to “Random Access procedure”. | Change “RACH procedure” to “Random Access procedure”. |  |
| L302 | In current MAC specification, which NTA should be used is not specified. There are three places where NTA is mentioned, but the details of NTA handling should be specified in PHY specification.  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:  1> when a *timeAlignmentTimer* expires:  2> if the *timeAlignmentTimer* is associated with the PTAG:  3> flush all HARQ buffers for all Serving Cells;  3> notify RRC to release PUCCH for all Serving Cells, if configured;  3> notify RRC to release SRS for all Serving Cells, if configured;  3> clear any configured downlink assignments and configured uplink grants;  3> clear any PUSCH resource for semi-persistent CSI reporting;  3> consider all running *timeAlignmentTimer*s as expired;  3> maintain NTA (defined in TS 38.211 [8]) of all TAGs.  2> else if the *timeAlignmentTimer* is associated with an STAG, then for all Serving Cells belonging to this TAG:  3> flush all HARQ buffers;  3> notify RRC to release PUCCH, if configured;  3> notify RRC to release SRS, if configured;  3> clear any configured downlink assignments and configured uplink grants;  3> clear any PUSCH resource for semi-persistent CSI reporting;  3> maintain NTA (defined in TS 38.211 [8]) of this TAG. | Remove the following text.  4> if *cg-SDT-TimeAlignmentTimer* is running and the RACH procedure is not triggered for RA-SDT as in clause 5.x:  5> the UE restores the NTA value used before the most recent reception of Random Access Reponse message. |  |
| L303 | There is no agreement on cg-SDT-TAT expiry at successful contention resolution. And we don’t agree that the timer expires in this case. Keeping the timer running does not cause any problem. | Remove the following text.  3> when the Contention Resolution is considered successful for RA-SDT with msg3/msgA including CCCH message as in clause 5.1:  4> considered *cg-SDT-TimeAlignmentTimer* as expired, if running. |  |
| L304 | In the running CR, the UE restarts the cg-SDT-TAT only when the legacy TAT is not running. However, the cg-SDT-TAT is independent of legacy TAT, and the UE should restart the cg-SDT-TAT even if the legacy TAT is running.  2> else if the *timeAlignmentTimer* associated with this TAG is not running:  3> when the Contention Resolution is considered successful for RACH procedure triggered during CG-SDT procedure:  4> restarts the *cg-SDT-TimeAlignmentTimer*. | Make the following behavior independent from the legacy TAT running/not running.  3> when the Contention Resolution is considered successful for RACH procedure triggered during CG-SDT procedure:  4> restarts the *cg-SDT-TimeAlignmentTimer*. |  |
| L305 | We don’t agree that the received TAC is ignored when the legacy TAT is not running. The UE should restart the cg-SDT-TAT at successful contention resolution.  2> else:  3> ignore the received Timing Advance Command. | Make the following behavior independent from the legacy TAT running/not running.  3> when the Contention Resolution is considered successful for RACH procedure triggered during CG-SDT procedure:  4> restarts the *cg-SDT-TimeAlignmentTimer* |  |
| C301 | We think it should be capital for the first letter in the following descriptions:  msgA/msg3/msg4/msgB. | Change the first letter in the following description into capital letter:  msgA/msg3/msg4/msgB |  |
| C302 | We agree with L303 that there is no agreement *cg-SDT-TimeAlignmentTimer* is stopped when the Contention Resolution is considered successful for RA-SDT with msg3/msgA including CCCH message. | Change it to FFS to the following text:  3> when the Contention Resolution is considered successful for RA-SDT with msg3/msgA including CCCH message as in clause 5.1:  4> considered *cg-SDT-TimeAlignmentTimer* as expired, if running. |  |
| C303 | There is no agreement that the MAC entity will restart *cg-SDT-TimeAlignmentTimer* when the Contention Resolution is considered successful.  This is one FFS in RAN2#116bis-e meeting:  FFS and leave it to rapporteur If RAR TAC is received during legacy RA procedure, the CG-SDT-TAT restarts at successful contention resolution | Change it to FFS to the following text.  3> when the Contention Resolution is considered successful for RACH procedure triggered during CG-SDT procedure:  4> restarts the *cg-SDT-TimeAlignmentTimer*. |  |

### 5.3.1 DL Assignment reception

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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#### 5.3.2.1 HARQ Entity

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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5.3.2.2 HARQ process

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L306 | It is not clear what the highlighted text means.  1> if the transmission for the HARQ process is initiated for downlink transmission for CG-SDT procedure and *cg-SDT-TimeAlignmentTimer* is stopped or expired: | Need clarification. |  |
| L307 | In the running CR, it seems that if the legacy TAT is not running, the UE is not allowed to transmit HARQ feedback even if cg-SDT-TAT is running. However, we think the UE should be able to transmit HARQ feedback if cg-SDT-TAT is running regardless of whether the legacy TAT is running or not.  1> if the *timeAlignmentTimer*, associated with the TAG containing the Serving Cell on which the HARQ feedback is to be transmitted, is stopped or expired; or  1> if the transmission for the HARQ process is initiated for downlink transmission for CG-SDT procedure and *cg-SDT-TimeAlignmentTimer* is stopped or expired:  2> not instruct the physical layer to generate acknowledgement(s) of the data in this TB. | Need restructuring (after the highlighted text in L306 becomes clear). |  |

### 5.4.1 UL Grant reception

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L308 | In the running CR, it seems that the UE keeps performing retransmission of initial CG-SDT transmission even if the CGT expires (yellow highlighted text).  In legacy, the UE is allowed to perform retransmission only while the CGT is running. We want to keep this principle, i.e. retransmission is not allowed if CGT is not running.  2> else if the *cg-SDT-RetransmissionTimer* is configured and not running or if CG-SDT is configured while *cg-SDT-RetransmissionTimer* is not configured, for the corresponding HARQ process;  3> if the transmission is for the initial transmission for the CG-SDT with CCCH message (i.e., initial new transmission); or  3> if the *configuredGrantTimer* is not running, the transmission is for the subsequent transmission for the CG-SDT without CCCH message and the initial transmission for the CG-SDT with CCCH message has been acknowledged (i.e., subsequent new transmission):  4> consider the NDI bit to have been toggled;  4> deliver the configured uplink grant and the associated HARQ information to the HARQ entity.  3> else if the previous uplink grant delivered to the HARQ entity for the same HARQ process was a configured uplink grant for initial transmission of CG-SDT with CCCH message or for its retransmssion; and  3> if acknowledgement for the transmission has not been received (i.e., retransmission for initial CG-SDT transmission):  4> consider the NDI bit to have not been toggled;  4> deliver the configured uplink grant and the associated HARQ information to the HARQ entity.  NOTE 1: For the initial transmission for CG-SDT with CCCH message, the acknowledgement can also be indicated to the UE via downlink transmission subsequent to the initial transmission for CG-SDT. | Make changes to allow the UE to perform retransmission only when the CGT is running. |  |
| L309 | The “acknowledgement” in the quoted text (green highlighted) is not clear (also in 5.8.2). In legacy, the acknowledgement usually means HARQ ACK, but it is not the case for CG-SDT. | Use new terminology for acknowledgement, or define acknowledgement clearly. |  |
| C304 | We have confusion on the description of “if CG-SDT is configured while *cg-SDT-RetransmissionTimer* is not configured”. Does *cg-SDT-RetransmissionTimer* can be optionally configured for SDT? | Some clarification is needed for “if CG-SDT is configured while *cg-SDT-RetransmissionTimer* is not configured”. |  |
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#### 5.4.2.1 HARQ Entity

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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#### 5.4.2.2 HARQ process

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.4.4 Scheduling Request

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L310 | The configuration restriction should be specified in RRC, not in MAC. | Remove the following text.  For a logical channel serving a radio bearer configured with SDT, PUCCH resource for SR is not used during SDT. |  |
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### 5.4.5 Buffer Status Reporting

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L311 | The configuration restriction should be specified in RRC, not in MAC. | Remove the following text.  BSR can be used during SDT procedures. |  |
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### 5.4.6 Power Headroom Reporting

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L312 | The configuration restriction should be specified in RRC, not in MAC. | Remove the following text.  PHR can be used during SDT procedures. |  |
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### 5.8.2 Uplink

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L313 | The configuration restriction should be specified in RRC, not in MAC. | Remove the following text.  Only Type 1 can be configured for SDT. CG-SDT can only be configured on initial BWP. |  |
| L314 | In current specification, there is no behavior described on indicating SSB index to lower layer.  1> if at least one SSB configured for CG-SDT with SS-RSRP above *cg-SDT-RSRP-ThresholdSSB* is available:  2> if the initial transmission for CG-SDT has been performed according to clause 5.4.1 and ackownledgement for the initial tranmission for CG-SDT has not been recevied: (i.e., SSB for retransmission of initial transmission of CG-SDT)  3> if the SSB corresponding to the configured UL grant has the same SSB index as the SSB selected for initial transmission for CG-SDT:  4> indicate the SSB index to the lower layer;  4> consider that this configured uplink grant occurs.  2> else if the RSRP of the SSB corrsponding to the configured uplink grant is above the *cg-SDT-RSRP-ThresholdSSB*: (i.e., SSB for initial and subsequent new CG-SDT transmission)  3> indicate the SSB index to the lower layer;  3> consider that this configured uplink grant occurs. | Remove the yellow highlighted text. |  |
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## 5.15 Bandwidth Part (BWP) operation

### 5.15.1 Downlink and Uplink

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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## 5.16 SUL operation

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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## 5.x Small Data Transmission

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L315 | The RRC does not know which one of CG-SDT or RA-SDT is performed in MAC.  2> if at least one SSB configured for CG-SDT with SS-RSRP above *cg-SDT-RSRP-ThresholdSSB* is available:  3> indicate to the upper layers that the conditions for initiating SDT are fulfilled;  3> select CG-SDT on the selected UL carrier according to clause 5.8.2 for SDT.  2> else if RA-SDT is configured on the selected UL carrier:  3> indicate to the upper layers that the conditions for initiating SDT are fulfilled;  3> select RA-SDT on the selected UL carrier according to clause 5.1 for SDT. | Indicate to RRC which type of SDT is performed in MAC. |  |
| C305 | There is still some discussion on the order for carrier selection and RA partition in RIP. So we can add one Editor’s Note to the following part.  1> if the RSRP of the downlink pathloss reference is higher than *sdt-RSRP-Threshold*:  2> if the Serving Cell for SDT is configured with supplementary uplink as specified in TS 38.331 [5]; and  2> if the RSRP of the downlink pathloss reference is less than *sdt-RSRP-ThresholdSSB-SUL*:  3> select the SUL carrier.  2> else:  3> select the NUL carrier. | Add one Editor’s Note that the order for carrier selection and RA partitioning may change according to progress in RIP. |  |
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### 5.x.1 Validation for CG-SDT

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L316 | The text below is not for MAC specification.  The MAC entity shall:  1> if *cg-SDT-NrOfSS-BlocksToAverage* is not configured; or  1> if *cg-SDT-AbsThreshSS-BlocksConsolidation* is not configured or the highest beam measurement quantity value is below or equal to *cg-SDT-AbsThreshSS-BlockConsolidation*, if *cg-SDT-AbsThreshSS-BlcoksConsolidation* is configured:  2> derive the downlink pathloss reference RSRP for TA validation for initial transmission for CG-SDT as the highest beam measurement quantity value, where each beam measurement quantity is described in TS 38.215 [24].  1> else:  2> derive the downlink pathloss reference RSRP for TA validation for initial transmission for CG-SDT as the linear average of the power values of up to *cg-SDT-NrOfSS-BlocksToAverage* of the highest beam measurement quantity values above *cg-SDT-AbsThreshSS-BlocksConsolidation*, where each beam measurement quantity is described in TS 38.215 [24]*.* | Remove the text related to cg-SDT-NrOfSS-BlocksToAverage and cg-SDT-NrOfSS-BlocksToAverage.  Then, 5.x.1 can be removed, and RSRP change related text can be included in 5.x. |  |
| L317 | In the running CR, the reference RSRP value is obtained when the MAC entity last resets. However, it is not clear when the MAC entity last resets.  We think it is better to specify as “when the configuration for cg-SDT-RSRP-ChangeThreshold is received”, similar to cg-SDT-TAT.  1> when the configuration for *cg-SDT-TimeAlignmentTimer* is received: | Change “reference RSRP value when the MAC entity last resets” to “reference RSRP value when the configuration for cg-SDT-RSRP-ChangeThreshold is received”. |  |
| C306 | That the *cg-SDT-TimeAlignment* is running is also one of the conditions check CG-SDT validation. | Add one condition for checking *cg-SDT-TimeAlignment.*  The MAC entity shall consider the CG-SDT resource to be valid when the following conditions are fulfilled:  1> compared to the downlink pathloss reference RSRP value when the MAC entity last resets, the RSRP has not increased/decreased by more than cg-SDT-RSRP-ChangeThreshold, if configured;  1> when *cg-SDT-TimeAlignment* is running. |  |

### 6.1.5a MAC PDU (MSGB)

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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## Any Other Clause

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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# Post116e

## 3.2 Definitions

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| # | Brief description of the issue | Suggested change/company comments | Proposed way forward by rapporteur |
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### 5.1.2 Random Access Resource selection

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.1.2a Random Access Resource selection for 2-step RA type

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.1.3 Random Access Preamble transmission

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.1.3a MSGA transmission

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.1.4a MSGB reception and contention resolution for 2-step random access

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.1.5 Contention Resolution

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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## 5.2 Maintenance of Uplink Time Alignment

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L200 | For the description of *cg-SDT-TimeAlignmentTimer*,  1) Should be marked with change markup.  2) Editorial comment: "time-aligned" should be changed to "time aligned" | 1) "cg-SDT-TimeAlignmentTimer which controls how long the MAC entity considers the uplink transmission for CG-SDT to be uplink time-aligned." should be marked with change markup  2) Remove hyphen | [Rapp] Corrected |
| L201 | If CG-SDT-TAT specific NTA is not introduced, the start of *cg-SDT-TimeAlignmentTimer* can be merged with the above paragraph. | If the NTA is used for CG-SDT, i.e., not introducing new NTA for CG-SDT, merge into the above paragraph.  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> start or restart the *timeAlignmentTimer* associated with the indicated TAG.  2> start or restart the *cg-SDT-TimeAlignmentTimer*, if configured. | [Rapp] This can be reconsidered after agreement on NTA is formally made. We can come back to this later |
| L202 | Readability is not good. Simply adding a comma can improve readability. | Add comma (yellow highlighted).  The MAC entity shall not perform any uplink transmission on a Serving Cell except the Random Access Preamble and MSGA transmission when the *timeAlignmentTimer* associated with the TAG to which this Serving Cell belongs is not running, and except CG-SDT when the *cg-SDT-TimeAlignmentTimer* is running. | [Rapp] OK |
| C200 | It is still FFS for the following issue:  *Postpone:*  *Proposal 24: Postpone the issue to the next meeting: whether and when to start/restart TAT-SDT if RAR TAC is received during legacy RA procedure.*  *Proposal 25: Postpone the issue to the next meeting: whether and when to start/restart TAT-SDT if RAR TAC is received during RA-SDT procedure.*  *Proposal 26: Postpone the issue to the next meeting: whether to start/restart TAT-SDT if TAC MAC CE is received during subsequent RA-SDT procedure.*  If it is the common understanding to start TAT-SDT if RAR TAC is received during legacy/SDT RA procedure or subsequent RA-SDT procedure, we suggest to add one step, i.e. apply the Timing Advance Command. | Add the step to the following procedures:  <*Omitted*>  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> start or restart the *timeAlignmentTimer* associated with the indicated TAG.  1> when a Timing Advance Command MAC CE is received and *cg-SDT-TimeAlignmentTimer* is configured:  2>apply the Timing Advance Command;  2> start or restart the *cg-SDT-TimeAlignmentTimer*.<*Omitted*>  1> when an Absolute Timing Advance Command is received in response to a MSGA transmission including C-RNTI MAC CE as specified in clause 5.1.4a:  2> apply the Timing Advance Command for PTAG;  2> start or restart the *timeAlignmentTimer* associated with PTAG.  1> when the configuration for *cg-SDT-TimeAlignmentTimer* is received:  2>apply the Timing Advance Command;  2> start or restart the *cg-SDT-TimeAlignmentTimer*. | [Rapp] This is still under discussion in the email discussion. Rapp suggests that we can come back to this when formal agreement is made |
| Z200 | A general comment to *cg-SDT-TimeAlignmentTimer.*  We want to clarify the usage of *cg-SDT-TimeAlignmentTimer* first. From our point of view, the *cg-SDT-TimeAlignmentTimer* is mainly used for the maintenance of CG resource, and it is expected to have a different value other than the legacy TAT. The legacy TAT timer is still the one which will be used to control the UL transmission (i.e. if legacy TAT expired, only RACH is allowed in uplink).  According to current specs, it seems the CG transmission is still allowed in case legacy TAT is not running, which means CS-RNTI based retransmission is not allowed in this case, which is not the expected behaviour, and TAC MAC CE has to be included in the next DL transmission to start the TAT.  In addition, we think a single N\_TA should be maintained on UE side, and the N\_TA will be considered as valid in case the TAT timer is running. It is quite strange that we consider the N \_TA is valid for CG only but not for other UL channel simply because different TAT timer is used in case cg-SDT-TimeAlignmentTimer is running but legacy TAT is not. | To simply the description, we propose to rename the cg-SDT-TimeAlignmentTimer to cg-SDT-ValidityTimer, and decouple the cg-SDT-ValidityTimer with TA maintenance. The UE can maintain the cg-SDT-ValidityTimer and legacy TAT timer independently in INACTIVE mode.  For example:   * When UE receive RRC release with CG-SDT resource, the UE can start cg-SDT-ValidityTimer can keep current TAT timer running. * Either the cg-SDT-ValidityTimer expiration or TAT expiration will disable the CG resource in SDT operation   With the above changes, we can minimize the impact on TA maintenance and simplify our specs a lot.  If the above proposal is not agreed, then we need to discuss when to start legacy TAT in CG-SDT? Shall we start the legacy TA once CG-SDT is initiated or we wait for the DL TAC MAC CE? It is worth noting that CS-RNTI based retransmission and subsequent DG based transmission are not allowed if TAT is not running. | we propose to rename the cg-SDT-TimeAlignmentTimer to cg-SDT-ValidityTimer, and decouple the cg-SDT-ValidityTimer with TA maintenance. The UE can maintain the cg-SDT-ValidityTimer and legacy TAT timer independently in INACTIVE mode.  [Rapp] We understand the issue that ZTE is trying to address. But, there is still no agreement to support the proposed change. The previous agreement for CG TAT is as follows:  3 A new TA timer for TA maintenance specified for configured grant based small data transfer in RRC\_INACTIVE should be introduced. FFS on the procedure, the validity of TA, and how to handle expiration of TA timer. The TA timer is configured together with the CG configuration in the RRCRelease message.  For this, I agree we need to have more discussion, and it is already covered by the email discussion. we can comeback to this later |
| X201 | It seems that no specification text is mentioning which NTA value should be used for the validation of the CG-SDT resource, when multiple TAG is available. | To add editor’s note:  FFS which NTA value should be used for the validation of the CG-SDT resource, when multiple TAG is available before the reception of the RRCRelease message. | [Rapp] I guess there is no CA configured for CG-SDT. Then why we need to think about TAG? |
| O200 | TAC MAC CE can be received during CG-SDT procedure while only SDT-TAT is running. In this case, legacy TAT does not need to be started/restarted. According to the text in CR, this case is not excluded. | Considering that it is still under discussion on how to handle the co-existence issue of SDT-TAT and TAT. We suggest to add a note to exclude this case for now and update the text after further progress is made. | [Rapp] we are not sure why legacy TAT should be started when TAC MAC CE is received during CG-SDT. We have agreed to use CG-SDT-TAT to maintain the TA per pervious agreement below:  3 A new TA timer for TA maintenance specified for configured grant based small data transfer in RRC\_INACTIVE should be introduced. FFS on the procedure, the validity of TA, and how to handle expiration of TA timer. The TA timer is configured together with the CG configuration in the RRCRelease message. |
| O201 | *cg-SDT-TimeAlignmentTimer* is configured is misleading. There is no text related to the release of *cg-SDT-TimeAlignmentTimer,* thus, even *cg-SDT-TimeAlignmentTimer*is configured, it may not be running. If SDT-TAT is not running, CG-SDT resoures have been relesased, it is meaningless to start/restart SDT-TAT. | Two options to make it clearer:  Option1: Rephrase ‘*cg-SDT-TimeAlignmentTimer* is configured’ to ‘*cg-SDT-TimeAlignmentTimer* is running’.  Option2: Add text to release *cg-SDT-TimeAlignmentTimer* configuration. | [Rapp] it is still possible that the UE receives TAC MAC CE after the CG-SDT-TAT expires. So, it is not quite accurate to say TAT is running. We also don’t think CG-TAT should be released when TA expires and there is no agreement on this yet.  We can come back to this later. |
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### 5.3.1 DL Assignment reception

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| C201 | We have not reached agreements on whether UE needs to monitor PDCCH when CG-SDT-timer is running. | Change the following description to FFS.  Editor notes: It is FFS whether the UE needs to monitor PDCCH when the timer is running for any HARQ process configured for configured grant type 1 for CG-SDT and when cg-SDT-Timer is configured. | [Rapp] This is the comment understanding with the email discussion [Post115-e][509][SDT] CG open issues (Xiaomi) in the last meeting. We think this has already been quite clear. Please read Section 3.4 of R2-2110670\_Summary\_of\_[Post115-e][509][SDT]\_CG\_open\_issues\_(Xiaomi). If it has not been a problem before, it should not be a problem for now |
| Z201 | When *cg-SDT-Timer* is configured, the UE monitors PDCCH addressed to C-RNTI when the timer is running for any HARQ process configured for configured grant type 1 for CG-SDT.  [ZTE] We think the above sentence can be moved to the SDT section, and a general sentence can be captured for both downlink and uplink.  Similar comments to 5.4.1 | A general description is preferred for both UL and DL, and the general sentence can be captured in SDT section.  In addition, the usage of cg-SDT-Timer is not crystal clear, this can be revised based on the email discussion on CG-SDT. | Have a general sentence in SDT section for both UL and DL.  [Rapp] The reason why it is put under the section for UL grant is that that timer is maintained per HARQ process. We think it is better to be put in the current place if we relate the timer to HARQ process |
| N200 | Agree with C201 that this seems to be incorrect “When *cg-SDT-Timer* is configured, the UE monitors PDCCH addressed to C-RNTI when the timer is running for any HARQ process configured for configured grant type 1 for CG-SDT. ”  The UE would need to monitor PDCCH for as long as the failure timer expires. *cg-SDT-Timer* is intended for potential retx of the initial tx, but it does not stop the UE from monitoring PDCCH. | Remove the addition. | [Rapp] It has been agreed that this timer is used for PDCCH monitoring in the previous meeting. Please read Section 3.4 of R2-2110670\_Summary\_of\_[Post115-e][509][SDT]\_CG\_open\_issues\_(Xiaomi). If it has not been a problem before, it should not be a problem for now  The PDCCH monitoring behavior that you mentioned is for RA-SDT. |
| O202 | We have not made it clear whether the CG-SDT-timer is a per HARQ process timer. | Remove the addition for now. | [Rapp] see comment above |

#### 5.3.2.1 HARQ Entity

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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5.3.2.2 HARQ process

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z202 | 1> if the transmission for the HARQ process is initiated for CG-SDT and *cg-SDT-TimeAlignmentTimer* is stopped or expired:  [ZTE]  Since this section is for DL transmission, it is not clear how to understand “the HARQ process is initiated for CG-SDT”? | If we assume the legacy TAT will be used to control the UL transmission, then the sentence can be removed. | Remove the concerned sentence  [Rapp] The transmission is DL subsequent transmission in CG-SDT. I am not sure why it is not clear. Perhaps it can be changed to  “if the transmission for the HARQ process is initiated for downlink transmission for CG-SDT procedure and *cg-SDT-TimeAlignmentTimer* is stopped or expired “ |
| N201 | Agree with Z202. This has not been agreed: “1> if the transmission for the HARQ process is initiated for CG-SDT and *cg-SDT-TimeAlignmentTimer* is stopped or expired:”.  Why shouldn’t the UE generate feedback for NW response for initital transmission? Further discussion needed on *cg-SDT-TimeAlignmentTimer* handling as covered in the CG email discussion. | Remove the addition. | See the comment above |

### 5.4.1 UL Grant reception

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L203 | The text “the transmission has not been confirmed” is a bit strange. | May need to change “the transmission has not been confirmed” to “ACKNOWLEDGEMENT has not been received for the transmission”. | [Rapp]  Corrected |
| C202 | We have not reached agreements on whether UE needs to monitor PDCCH when CG-SDT-timer is running. | Change the following description to FFS.  Editor notes: It is FFS whether the UE needs to monitor PDCCH when the timer is running for any HARQ process configured for configured grant type 1 for CG-SDT and when cg-SDT-Timer is configured. | [Rapp]  See the comments above |
| C203 | Small text revision. | 2> set the HARQ Process ID to the HARQ Process ID associated with this PUSCH duration;  2> if, for the corresponding HARQ process, the *configuredGrantTimer* is not running and both *cg-RetransmissionTimer* and *cg-SDT-Timer* are not configured(i.e. new transmission):  3> consider the NDI bit for the corresponding HARQ process to have been toggled;  3> deliver the configured uplink grant and the associated HARQ information to the HARQ entity. | [Rapp] No Strong view but it is better to separate the description for different times so that it is more readable  the *configuredGrantTimer* is not running and *cg-RetransmissionTimer* is not configured and *cg-SDT-Timer* is not configured |
| X202 | The following RAN2 agreement is not reflected:  The UE is allowed to initiate subsequent UL data transmission only after the reception of confirmation of initial transmission from the gNB | 2> else if the *cg-SDT-Timer* for the corresponding HARQ process is configured and not running, then for the corresponding HARQ process:  3> if the transmission is for the initial transmission for the CG-SDT with CCCH message (i.e., new transmission):  4> consider the NDI bit to have been toggled;  4> deliver the configured uplink grant and the associated HARQ information to the HARQ entity.  3> else if the transmission is for the subsequent transmission for the CG-SDT without CCCH message and the initial transmission for the CG-SDT with CCCH message has been acknowledged (i.e., subsequent new transmission):  4> consider the NDI bit to have been toggled;  4> deliver the configured uplink grant and the associated HARQ information to the HARQ entity.  3> else if the previous uplink grant delivered to the HARQ entity for the same HARQ process was a configured uplink grant for initial transmission of CG-SDT and the transmission has not been confirmed (i.e., retransmission on configured grant):  4> consider the NDI bit to have not been toggled;  4> deliver the configured uplink grant and the associated HARQ information to the HARQ entity. | [Rapp]  Thanks for the comment. Added like below  2> else if the *cg-SDT-Timer* for the corresponding HARQ process is configured and not running, then for the corresponding HARQ process;  3> if the transmission is for the initial transmission for the CG-SDT with CCCH message (i.e., new transmission), or;  3> if the transmission is for the subsequent transmission for the CG-SDT without CCCH message and the initial transmission for the CG-SDT with CCCH message has been acknowledged (i.e., subsequent new transmission):  4> consider the NDI bit to have been toggled;  4> deliver the configured uplink grant and the associated HARQ information to the HARQ entity.  3> else if the previous uplink grant delivered to the HARQ entity for the same HARQ process was a configured uplink grant for initial transmission of CG-SDT and acknowledgement for the transmission has not been received (i.e., retransmission on configured grant):  4> consider the NDI bit to have not been toggled;  4> deliver the configured uplink grant and the associated HARQ information to the HARQ entity. |
| N202 | Similar comment as for section DL assignment reception. Agree with C202. | Remove the addition. | [Rapp]  See the comments above |
| N203 | 3> else if the previous uplink grant delivered to the HARQ entity for the same HARQ process was a configured uplink grant for initial transmission of CG-SDT with CCCH message and the transmission has not been confirmed (i.e., retransmission on configured grant): | “with CCCH message” should be added. | [Rapp] Corrected |
| N204 | Current if/else if seems to be missing the case of CG resource for normal subsequent new transmission. | CG resource for subsequent new transmission not covered. Should put the only case of retx of CG tx with CCCH msg as if bullet, then else are all for new tx when the timer is not running. | [Rapp] Thanks for the comments. Already addressed in X202 |
| O203 | Same comments as O202. |  | [Rapp] see comment above |

#### 5.4.2.1 HARQ Entity

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| N205 | Most changes seem to be not needed if to reuse the CG timer, esp. if companies willing to reconsider to align the behavior with CG timer to start the timer after PUSCH transmission. | Wait for the CG email discussion before adding these. | [Rapp] This is based on the previous agreement   1. The “CG-SDT timer” starts at the first “valid” PDCCH occasion from the end of the CG-SDT PUSCH transmission. The first “valid” PDCCH occasion is defined in RAN1 2. The “CG-SDT timer” can be started/restarted during for initial and subsequent transmissions 3. The UE restarts the “CG-SDT timer” at least:  * upon the PUSCH retransmission indicated by the CS-RNTI PDCCH * after each CG-SDT transmission   7. The “CG-SDT timer” stops at least:   * When the UE receives RRC feedback messages (e.g. RRCResume, RRCSetup, RRCRelease and RRCReject)   We have not agreed whether CGT can be used for PDCCH monitoring. |

#### 5.4.2.2 HARQ process

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.4.4 Scheduling Request

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L204 | Regarding the use of PUCCH resource for SR, it would be sufficient to specify in RRC specification. | Remove “For a logical channel serving a radio bearer configured with SDT, PUCCH resource for SR is not used during SDT”. | [Rapp] This has been added from the very beginning of the running CR discussion. Prefer to keep it. |
| Z203 | The same comment as L204 |  | [Rapp] See the comment above |
| L206 | Agree with others. | Remove the addition. | [Rapp] See the comment above |

### 5.4.5 Buffer Status Reporting

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L205 | Without the BSR description for SDT, it is straightforward that BSR is used for SDT. | Remove “BSR can be used during SDT procedures.” | [Rapp] I think it is not wrong for now to add it since we have discussed on BSR and not to have new enhancement. |
| Z204 | The same comment as L205 |  | [Rapp] See above |
| N207 | Agree with others. The addition is not needed. | Remove the addition. | [Rapp] See above |

### 5.4.6 Power Headroom Reporting

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L206 | Without the PHR description for SDT, it is straightforward that BSR is used for SDT. | Remove “PHR can be used during SDT procedures.” | [Rapp] See above |
| Z205 | The same comment as L206 |  | [Rapp] See above |
| N208 | Agree with others | Remove the addition. | [Rapp] See above |

### 5.8.2 Uplink

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L207 | Regarding the configuration of Type 1 for SDT, it would be sufficient to specify in RRC specification. | Remove “Only Type 1 can be configured for SDT. CG-SDT can only be configured on initial BWP”. | [Rapp] This is a matter of style for the MAC spec and we think it is kept quite well with this sentence added. Please refer to the following sentence right above the change  Type 1 and Type 2 are configured by RRC for a Serving Cell per BWP. Multiple configurations can be active simultaneously in the same BWP. For Type 2, activation and deactivation are independent among the Serving Cells. For the same BWP, the MAC entity can be configured with both Type 1 and Type 2. |
| L208 | We have assumed the same formula is used for CG-SDT. | Remove “not for CG-SDT” | [Rapp] For SDT, there are other conditions in addition to satisfying the formula, e..g, SDT is initiated. We should keep the legacy spec not affected by the newly introduced SDT. |
| L209 | Regarding SSB selection for CG-SDT,  1) The current procedure seems to assume that SSB selection is performed for every CG transmission including initial and retransmission. It has not yet been agreed. Thus, it should be left to Editor’s Note.  2) It would be better that SSB selection is specified in 5.x which will specify SDT related procedures altogether. | 1) Add Editor’s Note that FFS whether SSB selection is performed for initial transmission or both initial and retransmission.  2) Move the procedure text for SSB selection for CG-SDT to S5.x Small Data Transmission | [Rapp] OK to add the note. Editor’s Note: FFS whether SSB selection is performed for retransmission for initial CG-SDT.  Prefer to keep the ssb selection in the current chapter, since it is only for CG-SDT |
| Z206 | We support the comments in L207/L208/L209.  We also prefer to merge the SSB selection text to SDT section |  | [Rapp] please see the comments above |
| N209 | This is more stage 2 statement: “Only Type 1 can be configured for SDT. CG-SDT can only be configured on initial BWP.” | Remove the addition. | [Rapp] please see the comments above |
| N210 | For CG beam validation, only RSRP threshold agreed, other conditions not agreed since TA would be under NW control after NW response.  “1> if at least one SSB with SS-RSRP above *cg-SDT-RSRP-ThresholdSSB* is available; and  1> if the configured grant type 1 resource is valid according to clause 5.8.2.x and according to [FFS\_Ref]:” | We have not agreed the TA validation conditions are performed for subsequent transmissions. | [Rapp] Please see the following agreement in R1, which is what I am talking about here. It is not related to TA validation  **Agreement**   * The following PUSCH occasion validation rule is applied for CG-SDT   + for unpaired spectrum and for SS/PBCH blocks with indexes provided by ssb-PositionsInBurst in SIB1 or by ServingCellConfigCommon     - if a UE is provided tdd-UL-DL-ConfigurationCommon, the valid PO is the PO in UL part in a slot, or at least Ngap symbols after the end of the DL part in a slot or after the end of the SSB in a slot     - if a UE is not provided tdd-UL-DL-ConfigurationCommon, the valid PO does not precede a SS/PBCH block in the PUSCH slot, starts at least *Ngap* symbols after a last SS/PBCH block symbol     - *Ngap* is provided in Table 8.1-2 in TS 38.213   + FFS if any validation rule following the CG-PUSCH in RRC connected state is applicable, and whether and how to handle the overlapping between CG-PUSCH occasions for CG-SDT and any valid PRACH occasion or MsgA PUSCH occasion. |
| N211 | This seems to imply RACH is always triggered whenever CG becomes invalid, but it should be only for the case when there is UL data to be transmitted?  “1> else:  2> initiate Random Access procedure in clause 5.1.” | RA should only be triggered when there is UL data to be sent. | [Rapp] Thanks for your comment. I share your concern but there is no previous agreement on this.  The previous agreement only mentioned that legacy RA is triggered when no SSB above the threshold. Refer to the agreement below  3. During subsequent CG transmission phase (i.e. after the UE has received response from NW) UE can initiate at least legacy RACH procedure (e.g. trigger due to no UL resources). No MAC PDU rebuilding is required. FFS if the RA-SDT RA resources can be used for subsequent data.  a. At least the following conditions are agreed: (1) no qualified SSB when the evaluation is performed; (2) when TA is invalid; (3) when SR is triggered due to lack of UL resource |
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### 5.8.2.x Validation for CG-SDT

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L210 | It would be better that the validation for CG-SDT is specified in 5.x which will specify SDT related procedures altogether. | Move S5.8.2.x to S5.x Small Data Transmission | [Rapp] we can come back to this after CG email discussion. |
| L211 | For the derivation of downlink pathloss reference RSRP, we think how to derive the downlink pathloss reference RSRP can be specified in PHY specification. | Remove “For TA validation for CG-SDT, the downlink pathloss reference RSRP is derived as the linear average of the power values of up to *nrofSS-BlocksToAverage* of the highest beam measurement quantity values above *absThreshSS-BlocksConsolidation*.” | [Rapp] But the previous agreement is made in R2? Prefer to keep it for now |
| L212 | TA validation is performed at the initial transmission. So, we wonder what ‘the last uplink transmission’ for this case. There is no ‘uplink transmission’ in RRC\_INACTIVE before triggering a SDT procedure. Maybe, the RSRP should be compared to the RSRP measured at the time point when RRCRelease message is received. | Remove “UE’s last uplink transmission” and specify the correct reference RSRP. We don’t have a concrete proposal now, but something like below can be considered:  “compared to the stored downlink pathloss reference RSRP value measured when RRCRelease message is received” | [Rapp] This needs further discussion. No agreement is made on this. |
| Z207 | For the CG-SDT validation, we think it depends on whether CG resource can be used in subsequent data transmission in CG SDT. | If CG resource is allowed in subsequent data transmission, then we prefer to have a separate section for CG resource validation (only check whether the CG resource is valid or not, the triggering of RACH will be moved to SDT section, and it is only applicable for SDT initialization), and the CG validation check will be performed for each CG occasion. Otherwise, if CG resource is only allowed in initial CCCH transmission, then we prefer to merge this to SDT section.  In addition, to simplify the operation on UE side, we prefer to do the TA Validation for CG-SDT only in the SDT initialization phase, and do the SSB selection/validation for each CG occasion, if CG transmission is allowed for subsequent transmission. | [Rapp] we can come back to this after CG email discussion. |
| X203 | RAN2 did not agree to use “the stored downlink pathloss reference RSRP value at the UE’s last uplink transmission”. The last uplink transmission could be on any serving cell, which may not be the same cell as the CG-SDT, when the UE receives the RRCRelease message. | Add Editor’s Note:  FFS which pathloss reference RSRP is used for comparison | [Rapp] we have agreed on the following  6. From RAN2 point of view, assume similar to PUR, that we introduce a TA validation mechanism for SDT based on RSRP change, i.e. RSRP-based threshold(s) are configured. Ask RAN1 to confirm. FFS on how to handle CG configuration when TA expires or when is invalid due to RSRP threshold. Details of the TA validation procedure can be further discussed.  How to determine the pathloss reference RSRP is quite clear already. It is by UE choosing a subset of SSBs and |
| N212 | We haven’t agreed the TA validation is needed for subsequent transmissions. If only needed for initial tx, this should be integrated into section 5.x | Enough to capture in 5.x if only for initial tx | [Rapp] How the pathloss is determined seems to be quite clear with the following agreements  22. Highest N SSBs of all SSBs actually transmitted as indicated in SIB1 is used for RSRP based TA validation  RAN1 has also made the following agreement in R1#105.  The SSB subset for RSRP based TA validation is determined at least based on a configured absolute RSRP threshold.  Why we should keep it as ffs instead of implementing the agreements? |
| O204 | For the RSRP change based TA validation, we have not made consensus on how to determine the base RSRP used to be compared with.  1> compared to the stored downlink pathloss reference RSRP value at the UE’s last uplink transmission, the RSRP has not increased/decreased by more than *cg-SDT-RSRP-ChangeThreshold*, if configured. | Add a note to trigger further discussions. | [Rapp] Agree with the comment. Add the following note  Editor’s Note: FFS what is the RSRP at the initial CG-SDT transmission to compare with |
| O205 | * *cg-SDT-RSRP-ChangeThreshold*: RSRP threshold for the increase/decrease of RSRP for time alignment validation;   In current CR, only one RSRP threshold is used for TA validation. In LTE PRU transmission, there are two separate parameters configured, one for increase and one for decrease. Further clarification may be needed on whether two thresholds can be also configured for SDT. | Add a note for further discussions. | [Rapp] This has been discussed in the email discussion for the last meeting. But most of the companies think a single threshold is enough. Please refer to Z011 in 115e |

## 5.15 Bandwidth Part (BWP) operation

### 5.15.1 Downlink and Uplink

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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## 5.16 SUL operation

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L213 | NUL/SUL switching is not done by SDT. | Remove “Small Data Transmission as specified in clause 5.x.” | [Rapp] This is also dependent on the email discussion and already considered under the following editor’s note  Edirot’s Note: FFS whether UL carrier reselection can be performed for subsequent uplink transmission. |

## 5.x Small Data Transmission

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L214 | In RACH partitioning discussion, RAN2 agreed to select carrier by not considering feature combination.  Agreement of RAN2#115-e  *6. As a baseline, the RA procedure design for Rel-17 should adhere to the following general principles:*  *a: Carrier selection (between NUL/SUL) should happen ahead of the initial RACH resource selection (i.e. feature combination is not considered in carrier selection)*. | Remove “2 > if the Serving Cell for SDT is configured with supplementary uplink as specified in TS 38.331 [5];” | [Rapp] This is not related to feature combination at all but related to the condition when to consider “SUL is configured”. Please refer to the following text in RACH  1> if the Serving Cell for the Random Access procedure is configured with supplementary uplink as specified in TS 38.331 [5]; and  1> if the RSRP of the downlink pathloss reference is less than *rsrp-ThresholdSSB-SUL*:  2> select the SUL carrier for performing Random Access procedure;  2> set the *PCMAX* to PCMAX,f,c of the SUL carrier.  1> else:  2> select the NUL carrier for performing Random Access procedure;  2> set the *PCMAX* to PCMAX,f,c of the NUL carrier. |
| L215 | The procedure text in section 5.8.2.x can be merged into the part to check resource validity. | The procedure text in section 5.8.2.x can be merged like below. (the yellow highlighted part needs to be changed)  2> if CG-SDT is configured on the selected UL carrier, and  2> if, compared to the stored downlink pathloss reference RSRP value at the UE’s last uplink transmission, the RSRP has not increased/decreased by more than cg-SDT-RSRP-ChangeThreshold | [Rapp]  Come back to this later |
| C204 | SS-RSRP checking is performed for SDT initialization twice in section 5.X and section 5.8.2.  1> if at least one SSB with SS-RSRP above *cg-SDT-RSRP-ThresholdSSB* is available; and  1> if the configured grant type 1 resource is valid according to clause 5.8.2.x and according to [FFS\_Ref]:  2> if the RSRP of the SSB corrsponding to the configured uplink grant is above the *cg-SDT-RSRP-ThresholdSSB*:  3> indicate the SSB index to the lower layer;  3> consider that this configured uplink grant occurs.  5.X  2> if CG-SDT is configured on the selected UL carrier, and the configured grant type 1 resource is valid according to clause 5.8.2.x; and  2> if at least one of the SSBs with SS-RSRP above *cg-SDT-RSRP-ThresholdSSB* is available:  3> indicate to the upper layer that conditions for initiating SDT are fulfilled;  3> initiate CG-SDT on the selected UL carrier according to clause 5.8.2. | Revise the procedure in 5.8.2 as the following:  5.8.2  1> if at least one SSB with SS-RSRP above *cg-SDT-RSRP-ThresholdSSB* is available; and  1> if the configured grant type 1 resource is valid according to clause 5.8.2.x and according to [FFS\_Ref]:  2> if the RSRP of the SSB corrsponding to the configured uplink grant is above the *cg-SDT-RSRP-ThresholdSSB* for subsequent transmission:  3> indicate the SSB index to the lower layer;  3> consider that this configured uplink grant occurs. | [Rapp] I don’t think it changes anything by adding for subsequent. The procedure in 5.8.2 is only for subsequent |
| Z208 | 2> else if RA-SDT is configured on the selected UL carrier:  3> indicate to the upper layer that conditions for initiating SDT are fulfilled;  3> initiate RA-SDT on the selected UL carrier according to clause 5.1.  [ZTE]  The MAC can not initiate the RACH procedure directly since the RRC message has not be generated, and corresponding DRB has not be resumed. | We propose to have two sub-section, one for SDT validity check and one for SDT initialization.  For the validity check sub-section, the following condition shall be checked:  sdt-DataVolumeThreshold  sdt-RSRP-Threshold  Whether there is available RACH partition or CG resource  If all the conditions are satisfied, then MAC inform RRC the SDT operation is allowed, then RRC will trigger the SDT operation, including resume the DRB, generate the RRC message, and inform MAC to initiate the SDT operation etc..  For the SDT initialization sub-section, once SDT is triggered by upper layer, the MAC will initiate either RACH procedure or CG SDT based on the resource selected in validity check phase. For CG SDT, the MAC can also start the TAT timer, start the PDCCH monitoring, etc. | [Rapp] thanks for the comment. We understand your concern. But I think this can be easily resolved by the following change  2> if CG-SDT is configured on the selected UL carrier, and the configured grant type 1 resource is valid according to clause 5.8.2.x; and  2> if at least one of the SSBs with SS-RSRP above *cg-SDT-RSRP-ThresholdSSB* is available:  3> indicate to the upper layer that conditions for initiating SDT are fulfilled;  3> select CG-SDT on the selected UL carrier according to clause 5.8.2 for SDT.  2> else if RA-SDT is configured on the selected UL carrier:  3> indicate to the upper layer that conditions for initiating SDT are fulfilled;  3> select RA-SDT on the selected UL carrier according to clause 5.1 for SDT.  2> else:  3> indicate to the upper layer that the conditions to initiate SDT are not fulfilled;  Please feel free to tell us what you think |
| N213 | MAC uses generally ”upper layer**s**” and not “upper layer” | Replace ”upper layer” with ”upper layers” | [Rapp] OK |
| N214 | 1> if the data volume of the pending UL data across all RBs configured for SDT is less or equal than *sdt-DataVolumeThreshold*; and  Is not proper english. | Please use “less than or equal to” | [Rapp] OK |
| N215 | 2> if at least one of the SSBs with SS-RSRP above *cg-SDT-RSRP-ThresholdSSB* is available:  This should be restricted to the SSBs for which the CG-SDT resources are configured | Restrict to SSBs for which CG-SDT resources are configured | [Rapp] Good comment.  Although I understand this might be not obviously for R2 people. But R1 indeed allow the possibility not t configure CG for certain SSBs.  Corrected |
| N216 | 3> indicate to the upper layer that conditions for initiating SDT are fulfilled; | Please use “the conditions” | [Rapp] OK |
| N217 | After RACH is successfully completed according to clause 5.1.6 if RA-SDT is selected above, the UE monitors PDCCH addressed to C-RNTI.  It is not proper specification language to refer with “RACH” to RA procedure | Please use “If RA-SDT is selected above and the Random Access procedure is successfully completed (see clause 5.1.6), the UE monitors for PDCCH addressed to C-RNTI.” | [Rapp] OK |
| O206 | According to previous agreement, the RSRP threshold for carrier selection can be configured specific to SDT, and this is optional for network. Therefore, it is possible that network does not provide this configuration. | Suggest to revise the text as follows:  2> if *sdt-RSRP-ThresholdSSB-SUL* is configured:  3> if the RSRP of the downlink pathloss reference is less than *sdt-RSRP-ThresholdSSB-SUL*:  4> select the SUL carrier.  3> else:  4> select the NUL carrier.  2> else:  3> if the RSRP of he downlink pathloss reference is less than *rsrp-ThresholdSSB-SUL:*  4> select the SUL carrier.  3> else:  4> select the NUL carrier. | [Rapp] I cannot see that it can be optional from the following agreement.   1. For SDT, UE performs UL carrier selection (i.e. if SUL is configured in the cell, UL carrier selected based on RSRP threshold). FFS whether the RSRP threshold for carrier selection is specific to SDT)   We can comeback to this after RRC configuration is given. |

### 6.1.5a MAC PDU (MSGB)

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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## Any Other Clause

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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# Post115e

## 3.1 Definitions

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| # | Brief description of the issue | Suggested change/company comments | Proposed way forward by rapporteur |
| Z000 | **Msg3**: Message transmitted on UL-SCH containing a C-RNTI MAC CE or CCCH/DTCH/DCCH SDU(s), submitted from upper layer and associated with the UE Contention Resolution Identity, as part of a Random Access procedure.  Comment: It is already possible that DTCH/DCCH SDU(s) are included in Msg3 (e.g. in connected mode). So, isn’t it a bit misleading to say that the above change is part of SDT? | Remove the change and if seen necessary this can be clarified in a clarification CR for Rel-16 for instance.  [Intel] We share ZTE’s views on this comment. | [Rapp] I think it would be best if this can be clarified with a CR. Actually, even for R15, msg3 can also include DTCH/DCCH if multiplexing procedure allows for this. in RRC\_CONNECTED  The change is removed. A CR can be proposed for R15/16 clarifying the contents of msg3 |
| L100 | Same comment as ZTE | Remove the change. | [Rapp] See the comments above. |
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### 5.1.2 Random Access Resource selection

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| I100 | Editor’s Note: FFS on the necessity for introducing a new RACH type for RA-SDT for 2-step RACH and 4-step RACH. We may come back to this when common RACH CR has a unified solution for all types of RACHes introduced in R17  We don’t see the need to define a separate (4-step RA-SDT type). We have not agreed on separate RA parameters (e.g. target receive power, backoff) for RA-SDT, so there is no reason to complicate and duplicate the spec for now. | Remove “RA SDT type” and the duplicated text around it from 5.1.x sections. Remove the related editor’s note. If needed to differentiate, the same syntax used in 5.8.2 can be used, e.g. “initiate Random Access procedure for SDT”  For the group A/B determination, a note can be added to clarify that RA-SDT is not initiated for a CCCH logical channel, and current specs can be reused.  For measurement gaps, we don’t think any changes are needed since measurement gaps are not applicable in INACTIVE and the spec already says “the MAC entity **may** take into account the possible occurrence of measurement gaps when …”; so if there are no measurement gaps applicable, the MAC entity won’t take them into account.  [Intel] We share InterDigital’s views on this comment. | [Rapp] OK to remove the RA SDT type under the context of discussion for common RACH  For the group A B determination, we think that this still needs to be discussed on whether RA-SDT is considered as initiated for CCCH logical channel since this affects the UE behavior when determining on the condition group selection, even though I understand that the intention is to reuse the legacy conditions.   * If it is considered as initiated for CCCH, the first condition is not needed at all * If it is not considered as initiated for CCCH, the second condition is not needed   It is better that the group can clarify on this  Remove the changes in this section. Keep the note on the FFS for the interpretation for SDT as initiated for CCCH |
| I101 | Editor’s Note: FFS support of RA-SDT for unlicensed spectrum  Per the WID, “Focus of the WID should be on licensed carriers and the solutions can be reused for NR-U if applicable.” | Remove the editor’s note.  [Intel] We share InterDigital’s views on this comment. | OK to remove the NOTE |
| Z001 | We agree with I100 and I101. As already noted previously, introducing new RACH type for each feature will be cumbersome. Note that in theory, one could argue that each feature (e.g. SDT, RedCap, Slicing etc) would need a RACH resource. Further the feature combination will also require a RACH resource. If we start defining new RACH type based on the feature selected (or the feature combination selected), then there will be an explosion of RACH types within MAC spec. So, this should be avoided.  The existing RACH types should stay as they are (i.e. there is just 2-step and 4-step RA type as already defined in Rel-16) and these RA types can be used by a given feature/feature combination and the RA procedure uses RACH resources based on the selected feature combination. So, this selection mechanism should be properly initialized (along with the necessary RACH variables), but there should be no subsequent need to define feature/feature combination specific RA-type. | Same as I100 and I101 | [Rapp] See the comments above.  Removed all the text related to treatment on the RACH type. |
| Z002 | As noted above, once the RA type for SDT is removed, we can also remove these changes. i.e. the variables such as rsrp-ThresholdSSB are correctly initialized (based on the feature/ feature combination), then these changes also should not be necessary.  The problem with changing these variables like this is that not only new variables are need for SDT, but in theory, we need such variables for each feature, but also we will need such variable for each feature combination. Defining such a large number of variables is neither practical nor future proof. | Undo these changes (with the assumption that the RACH procedure related variables will be initialized based on the selected feature/feature combination) and will be used in the rest of the procedure.  [Intel] Agree that this needs to be discussed in the common RACH section. Therefore we share ZTE’s views on removing these changes here and related ones provided in other sections. | [Rapp] See the comments above to Z001 |
| L101 | Agree with InterDigital and ZTE that defining a new RA-type for SDT is not needed. The specificaation should be future-proof even when a new feature-specific RA is introduced.  In our view, it is enough to rely on legacy RA procedure, with addressing feature-specific RA parameters. The feature-specific RA parameters can be specified in one place, e.g. in a new paragraph or new section. In this way, we can avoid duplicated texts, and maintain the specification clean even with other feature-specific RA.  If a new behavior is needed for RA-SDT, we can say “if the RA procedure is initialized for SDT”. However, we haven’t identified any new behavior for SDT except using RA-SDT specific RA parameters.  This comment applies to all the RA related sections, 5.1.x. | Undo all changes in 5.1 Random Access procedure.  Add a new paragraph or a new section to describe RA-SDT specific RA parameters.  “If RA procedure is initiated for SDT, following parameters are used:”  [Intel] We are OK with LG’s suggestion. | [Rapp] See the comments above. For the paragraph describing SDT specific RA parameters, I think it can be handled by the common RACH CR covering section 5.1.1 and 5.1.2 of MAC spec. |
| N000 | Agree with others. The RA procedure itself is common for all the triggers. We have different triggers in legacy as well for HO, for UL data arrival, for SI etc. We never define them as different types.  Any special handling for each feature can be captured in the procedure and parameter part case by case whenever needed. | Remove the new terms of 4-stepRA-SDT/2-stepRA-SDT and related changes. | [Rapp] See the comments above to Z001 |
| A001 | Agree with others that there is no need to have the term of the 4-stepRA-SDT/2-stepRA-SDT. | Agree with LG’s proposal. | [Rapp] See the comments above to L101 |
| C001 | We agree that there is no need to introduce the terminology for RA type in SDT. |  | [Rapp] See the comments above to Z001 |

### 5.1.2a Random Access Resource selection for 2-step RA type

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z003 | For the above change and other changes related to “RA-SDT” type introduction in this sub-clause, the same comment as Z002/Z001 apply | Same comments as Z002 | [Rapp] See the comments above to Z001 |

### 5.1.3 Random Access Preamble transmission

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z004 | Same comment as Z002/Z001 | Same comments as Z002 | [Rapp] See the comments above to Z001 |
| N001 | RAN1 agreed power control parameters are common for SDT and non-SDT which conflict with RAN2 agreement?   * “For RA-SDT in shared ROs and separate ROs with non-SDT, the power control parameters follow those for non-SDT,   + i.e. preambleReceivedTargetPower and power ramping setting follow those for non-SDT.”   Should add an EN that it is to be revisited | Add EN whether power control parameters are SDT specific is to be revisited based on the RAN1 LS R1-2108533.  [Intel] We are OK with Nokia’s suggestion. | [Rapp] but we think the issue should be addressed in the discussion for parameter initialization.  OK to add the note though. Also paste the agreement in RAN1 below  C:\Users\y00397895\AppData\Roaming\eSpace_Desktop\UserData\y00397895\imagefiles\7167FE0C-DA6E-4568-90A8-019D67574897.png |

### 5.1.3a MSGA transmission

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z005 | Same comment as Z002/Z001 | Same comments as Z002 | [Rapp] See above. |
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### 5.1.4a MSGB reception and contention resolution for 2-step random access

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z006 | Same comments as Z002 for the changes | Same comments as Z002 | [Rapp] See above. |
| N004 | This has not been discussed in RAN2? “Editor’s Note: FFS Whether it is OK for the legacy UE transmitting 2-step RACH to receive msgB intended for the UEs transmitting msgA for SDT when RO is shared between 2-step RA and 2-step RA-SDT.” | Remove the EN | [Rapp] This is a question that we think the group should think about how to address. We prefer to keep it to trigger the thinking on this in the group |

### 5.1.5 Contention Resolution

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z007 | Same comments as Z002 for the changes | Same comments as Z002 | [Rapp] See above. |

## 5.2 Maintenance of Uplink Time Alignment

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z008 | We have the following agreement which needs to be reflected in this sub-clause:  **Agreement**  TAT-SDT is started upon receiving the TAT-SDT configuration from gNB, i.e. RRCrelease message, and can be (re)started upon reception of TA command. | Update the section to restart the SDT-TAT when TA command is received.  [Intel] Our understanding is that current TP already address this agreement as the following TP is added after the clauses that check whether TA is received.  1> when the configuration for *cg-SDT-TimeAlignmentTimer* is received:  2> start or restart the *cg-SDT-TimeAlignmentTimer*. | [Rapp] This comment has been addressed during the last meeting. The issue is not that simple/clear for now. Please refer to the discussion in R2-2107492. The main issue is on the maintainance of the NTA and interplay with normal TAT.  But for now, I think we can capture that CG-TAT can be restarted when it is running   * when CG-TAT expires, there is no need to restart it since CG-SDT is released * MAC CE cannot start CG-TAT since it can only be started by RRCRelease message   Also, it needs to be discussed other methods to deliver the TA command, e.g., via DCI as in legacy  Restart CG-TAT when MAC CE is received and CG-TAT is configured. |
| A002 | Same comment as ZTE/Z008.  The *cg-SDT-TimeAlignmentTimer* should be also started upon receiving the TA Command during the CG-SDT procdure | Indicate that the *cg-SDT-TimeAlignmentTimer* should be also started upon receiving the TA Command during the CG-SDT procdure. | [Rapp] See the comment above |
| X001 | We think that the reception of the “Absolute Timing Advance Command” or “Timing Advance Command” during the legacy RACH should not IMMEDIATELY restart the “*cg-SDT-TimeAlignmentTimer*”. The “*cg-SDT-TimeAlignmentTimer*” should restart only after the contention resolution of the RACH, because before the contention resolution, the RACH TAC from the gNB may not be applicable for the UE.  However, during the CG-SDT procedure, if the UE receives the TAC from the gNB, the The “*cg-SDT-TimeAlignmentTimer*” should restart. | Firstly, we support the Editor’s note of adding the FFS on “the interplay between the legacy TAT and cg-SDT-TAT when legacy RACH is initiated”.  Secondly, we think that the following change can be added:  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 or with the CG-SDT:  2> apply the Timing Advance Command for the indicated TAG;  2> start or restart the *timeAlignmentTimer* associated with the indicated TAG.  2> restart the *cg-SDT-TimeAlignmentTimer*. | [Rapp] See the comment above |
| IN001 | A new editor’s note is added on “how the TAC is delivered to the UE”, however this has not been discussed by RAN2 and current legacy behaviour does not discuss this point in current section | Suggest removing the editor’s note:  “Editor’s Note: FFS how the TAC is delivered to the UE” | [Rapp] No harm to keep it. Companies can think about the issue |

### 5.3.1 DL Assignment reception

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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#### 5.3.2.1 HARQ Entity

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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5.3.2.2 HARQ process

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| C002 | 1> if the *timeAlignmentTimer*, associated with the TAG containing the Serving Cell on which the HARQ feedback is to be transmitted, is stopped or expired, and  1> if the transmission for the HARQ process is initiated for CG-SDT and *cg-SDT-TimeAlignmentTimer* is stopped or expired:  We think either condition above is satisfied, the UE shall  2> not instruct the physical layer to generate acknowledgement(s) of the data in this TB. | 1> if the *timeAlignmentTimer*, associated with the TAG containing the Serving Cell on which the HARQ feedback is to be transmitted, is stopped or expired, ~~and~~ or  1> if the transmission for the HARQ process is initiated for CG-SDT and *cg-SDT-TimeAlignmentTimer* is stopped or expired:  [Intel] We share CATT’s view on this comment. | [Rapp] when the UE is performing CG-SDT, I guess the normal TAT should not be running? Then the condition is always satisfied? |

### 5.4.1 UL Grant reception

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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#### 5.4.2.1 HARQ Entity

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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#### 5.4.2.2 HARQ process

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.4.4 Scheduling Request

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| I102 | For a logical channel serving a radio bearer configured with SDT, no PUCCH resource for SR is configured.  a LCH can be configured with PUCCH resources for SR in Connected mode, even if that LCH is configured for SDT. This does not capture the original intention of the agreement “SR resource is not configured for SDT.” | Reword to:  For a logical channel serving a radio bearer configured with SDT, PUCCH resource for SR is not used in INACTIVE state. | [Rapp] OK for the change if this is the view from the majority. But prefer not to mention about RRC state in MAC spec. Nevertheless, we have the following note on the handing of the RRC configuration in the INACTIVE context.  Editor’s Note: How to handle the connected mode configuration in the RRC\_INACTIVE UE context e.g., logical channel configuration.  Original sentence changed to  For a logical channel serving a radio bearer configured with SDT, PUCCH resource for SR is not used during SDT. |
| Z009 | Agree with I102. | Either remove the new sentence or change as proposed by I102 above. | [Rapp] See above |
| L102 | Agree with I102. | We prefer a more general text.  “The MAC entity is not configured with SR configuration in INACTIVE state.” | [Rapp] Not configured with PUCCH-SR resource is different from not configured with SR configuration |

### 5.4.5 Buffer Status Reporting

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| IN002 | We wonder whether it should be explicitly mentioned that BSR can be used during SDT procedure | Add simple description at the beginning of the section e.g. “BSR can be used during SDT procedures” | [Rapp] This is OK with me  Add the sentence “BSR can be used during SDT procedures” |

### 5.4.6 Power Headroom Reporting

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| IN003 | We wonder whether it should be explicitly mentioned that PHR can be used during SDT procedure | Add simple description at the beginning of the section e.g. “PHR can be used during SDT procedures” | [Rapp] This is OK with me  Add the sentence “PHR can be used during SDT procedures” |
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### 5.8.2 Uplink

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z010 | Currently the above text seems to be written with the view that there may be switching between CG and RA during subsequent transmission. This is being currently discussed in the CG- email discussion.  If there is no such switching, then this update is not needed. Instead, we can simply specify that no UL grant is provided to the HARQ entity when there is no valid CG resource/ or no valid SSB etc and then automatically SR should be triggered. We think we can revist this section once we make the final agreement regarding switching etc. | For now, we suggest to add an FFS that this section can be revisited once the agreements regarding switching between CG and RA SDT are clear.  [Intel] We are ok with ZTE’s suggestion | [Rapp] Actually, the current TP does not consider retransmission with CG and this is captured by the note: FFS how to trigger subsequent transmission with CG  Editor’s Note: FFS how to trigger SSB selection for subsequent uplink transmission.  I would want to emphasize on the importance of the issue above. Currently, we cannot use arrival of UL grant on CG occasion as a trigger for SSB selection. Since only after SSB selection, we would know to transmit on which CG occasion. So this has become a chicken-and-egg problem.  It would be good if we can come up with a mechanism to maintain the selected SSB, e.g., perform SSB selection for every SSB to CG occasion association period.  The current procedure in this section is triggered only once by clause 5.x and there is an editor’s note saying that FFS for CG-SDT fallback to RA-SDT when none of the SSB is above the threshold.  But still, if companies are still concerned about this, the sentence under “else if RA-SDT is configured on the selected Ul carrier” can be removed.  Remove “ 1> else if RA-SDT is configured on the selected UL carrier:  2> initiate Random Access procedure on the selected UL carrier for SDT according to clause 5.1. |
| Z011 | It is not clear why we need a separate threshold for “Increase” and “Decrease”. We only agreed to have one “delta” threshold which should be the same in both directions (i.e. the TA change either in positive or negative direction would have equally disruptive impact on the gNB receiver). | Replace cg-SDT-RSRP-ChangeThresholdIncrease and cg-SDT-RSRP-ChangeThresholdDecrease with something like *cg-SDT-RSRP-ChangeThreshold*  [Intel] We share ZTE’s view that delta is sufficient. This is also aligned to related RAN2 agreements that captured “RSRP change” (instead of increase/decreased). This comment is also applicable to other TPs that included the same reference in other sections. | [Rapp] The reason why we captured it in this way is simply because this is how it is captured in LTE. This is excerpted from LTE 38321    OK to change it to a single threshold if no objection from the other companies. |
| L103 | This section describes the UE behavior when the CG-SDT is triggered. Whether to trigger CG-SDT or RA-SDT, or normal RA is already determined in 5.x. Thus, checking the conditions “1> if at least one SSB with SS-RSRP above cg-SDT-RSRP-ThresholdSSB amongst the associated SSBs is available; and 1>if the configured grant type 1 resource is valid according to clause 5.8.2.x:” is not needed in this section.  Moreover, switching from CG-SDT to RA-SDT or normal RA has not been agreed. Thus, the related texts should be removed. | Proposed changes based on the rapporteur’s update.  When CG-SDT is triggered as in clause 5.x, the MAC entity shall:  1> select an SSB with SS-RSRP above *rsrp-ThresholdSSB*;  1> select the configured grant type 1 configuration for CG-SDT on BWP of the selected UL carrier associated with the selected SSB;  1> select the CG occasioncorresponding to the selected SSB and the selected configured grant type 1 configuration for CG-SDT;  1> indicate the SSB index to the lower layer. | [Rapp] Note that in section 5.x, the condition is only used for initial transmission. While for section 5.8.2, this can also be used for subsqeutn uplink trnasmisaion we have agreed that SSB selection shall also be performed for subsequent uplink transmission on CG.  Prefer to keep it as it is and wait for progress on the issue mentioned in the editor’s note. |
| N005 | Agree with ZTE and LG. |  | [Rapp] See comments above |
| A003 | Agree with Z011  We donot need to have two thresholds “*cg-SDT-RSRP-ChangeThresholdIncrease*” and “*cg-SDT-RSRP-ChangeThresholdDecrease*”, and 1 delta-threshold is sufficient. |  | [Rapp] See comments above |
| C003 | Regarding the step following “indicate the SSB index to the lower layer”, we think this can follow the RA procedure. So we would like to keep it FFS. |  | [Rapp] I am not sure what does it mean by “follow RACH procedure” in RACH procedure, the Mac layer indicates to the lower layer the preamble index and RACH occasion. Then, by the RRC configuration RACH-ConfigCommon, the lower layer performs the mapping from the preamble/RACH occasion to the SSB and get the SSB. |
| X002 | Agree with Z011. |  | [Rapp] See comments above |

### 5.8.2.x Validation for CG-SDT

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z012 | Same comment as Z011 |  | [Rapp] See comments above |
| X003 | We do not agree the RSRP used for CG validation is “downlink pathloss reference” | Remove “downlink pathloss reference” | [Rapp] Not sure why it is not downlink pathloss reference. If not what else it can be? |

## 5.15 Bandwidth Part (BWP) operation

### 5.15.1 Downlink and Uplink

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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## 5.16 SUL operation

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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## 5.x Small Data Transmission

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| I103 | It seems like the conditions for initiating an SDT is split between RRC and MAC specs. Just reading this part of the MAC spec, it gives the impression that the UE is allowed to initiate an SDT procedure, even if there is non-SDT data (i.e. SDT PDU can contain data from SDT DRBs and non-SDT DRBs). However. This condition is captured in RRC spec, as:C 5.3.13.1b Conditions for resuming RRC Connection for SDT A UE in RRC\_INACTIVE initiates the resume procedure for SDT when all of the following conditions are fulfilled:  1> the upper layers request resumption of RRC connection; and  1> the UE supports SDT; and  1> *SIB1* includes *sdt-ConfigCommon*; and  1> all the pending data in UL is mapped to the radio bearers configured for SDT; and  1> lower layers indicate that conditions for initiating SDT as specified in TS 38.321 [3] are fulfilled.  This creates an issue in the scenario where there is pending data form non-SDT DRB, as there can be conflicting instructions within the UE:   * MAC initiates a RA/CG-SDT on the selected UL carrier, according to this part in section 5.x, even though there is not CCCH message from upper layers. * RRC does not initiate a resume procedure for SDT, according to section 5.3.13.1b of the RRC spec | Either:   * Move this condition from the RRC to TS 38.321 section 5.x; Or * Add the following in to section 5.x:   The MAC entity shall:  1> if the data volume of the pending UL data accorss all logical channels configured for SDT according to the data volume calculation procedure in TSs 38.322 [3] and 38.323 [4] (The size of the RLC headers and MAC subheaders are not considered in the data volume computation.) is less or equal than *sdt-DataVolumeThreshold*; and  1> if the RSRP of the downlink pathloss reference is higher than *sdt-RSRP-Threshold*:  2> if the Serving Cell for SDT is configured with supplementary uplink as specified in TS 38.331 [5]; and  2> if the RSRP of the downlink pathloss reference is less than *sdt-RSRP-ThresholdSSB-SUL*:  3> select the SUL carrier.  2> else:  3> select the NUL carrier.  Editor’s NOTE: FFS the procedure when *sdt-RSRP-ThresholdSSB-SUL* is not configured  Editor’s Note: FFS whether the RSRP threshold for UL carrier selection is common for both CG and RA-SDT.  2> if CG-SDT is configured on the selected UL carrier, and the configured grant type 1 resource is valid according to clause 5.8.2.x; and  2> if at least one of the SSBs with SS-RSRP above *cg-SDT-RSRP-ThresholdSSB* is available:  3> indicate to the upper layer that conditions for initiating SDT are fulfilled;  3> initiate CG-SDT on the selected UL carrier according to clause 5.8.2 when the upper layers initiate an RRC resume procedure for SDT.  2> else if RA-SDT is configured on the selected UL carrier:  3> indicate to the upper layer that conditions for initiating SDT are fulfilled;  3> initiate RA-SDT on the selected UL carrier according to clause 5.1 when the upper layers initiate an RRC resume procedure for SDT.  3> else:  4> indicate to the upper layer that the conditions to initiate SDT are not fulfilled;  1> else:  2> indicate to the upper layer that the conditions to initiate SDT are not fulfilled.  3> else:  4> indicate to the upper layer that the conditions to initiate SDT are not fulfilled; | [Rapp] I am not sure why companies e this impression in the current spec that SDT can be triggered within the MAC spec. My thinking on this would be that the RRC layer says that if the the conditions in 5.3.13.1b are satisfied, trigger the lower layer to perform SDT. Then, in the MAC spec, the procedure follows as currently specified.  If some clarifications are indeed needed, a better option would be to add the condition “if SDT is triggered by the upper layer” to the beginning rather than the currently suggested location.  Revise the beginning of procedure as “The MAC entity shall, if triggered by the upper layer for SDT transmission:” |
| I104 | 3> else:  4> indicate to the upper layer that the conditions to initiate SDT are not fulfilled;  Small typo with numbering/adjustment | It should be 2>, 3> | [Rapp]Corrected |
| I105 | 1. if the data volume of the pending UL data accorss all logical channels configured for SDT | Small typo “accorss” should be “across” | [Rapp]Corrected |
| Z013 | Agree with I103.  i.e. MAC should not initiate the procedure without the RRC triggering it. For now the change proposed by I103 seems to work. We may have to clean-up this section once we have the final agreements on switching between CG and RA-SDT | Agree with I103. | [Rapp]See the comments above |
| L104 | Agree with I103, I104, I105, with small modifications. | The MAC entity shall:  …  2> if CG-SDT is configured on the selected UL carrier, and the configured grant type 1 resource is valid according to clause 5.8.2.x; and  2> if at least one of the SSBs with SS-RSRP above *cg-SDT-RSRP-ThresholdSSB* is available:  3> indicate to the upper layer that conditions for initiating CG-SDT are fulfilled;  3> initiate CG-SDT on the selected UL carrier according to clause 5.8.2 when requested by the upper layersso.  2> else if RA-SDT is configured on the selected UL carrier:  3> indicate to the upper layer that conditions for initiating RA-SDT are fulfilled;  3> initiate RA-SDT on the selected UL carrier according to clause 5.1 when requested by the upper layerso.  2> else:  3> indicate to the upper layer that the conditions to initiate SDT are not fulfilled; | [Rapp]See the comments above |
| N006 | Agree with others the interaction between RRC and MAC should be made clear. |  | [Rapp]See the comments above |
| A004 | Agree to make it clear that the MAC SDT procedure (section 5.x) is triggered by RRC. |  | [Rapp]See the comments above |
| C004 | In RAN2#113bis, it was agreed that:   1. . RSRP threshold to select between SDT and non-SDT procedure is same for both CG-SDT and RA-SDT   We can keep one RSRP threshold.  And the whole procedure is depicted below as suggested in R2-2107486: | Delete the parameter *cg-SDT-RSRP-ThresholdSSB* and use *sdt-RSRP-Threshold* instead and the following check on the condition is deleted.  2> if at least one of the SSBs with SS-RSRP above *cg-SDT-RSRP-ThresholdSSB* is available: | [Rapp] These two thresholds are different, one for SDT vs non-SDT selection, another is for CG SSB selection |
| X004 | We think that the CCCH message should be counted for the data volume calculation. | Add: FFS whether the CCCH message is considered for data volume calculation | [Rapp] OK to add this NOTE |
| X005 | We do not agree the RSRP used for CG validation is “downlink pathloss reference” | Remove “downlink pathloss reference” | [Rapp] See the comments above. |
| IN004 | We also agree that the the interaction between RRC and MAC should be clear and aligned to the legacy operations address today in the corresponding specification.  Our preference is that the checks that determine whether SDT procedure can be initiated are done in RRC. Following legacy operation, we also prefer that the selection of carrier is done in RRC. Therefore, MAC could focus on the conditions for the selection to initiate SDT via CG or RA. | Our suggestion is that RRC checks the following conditions (instead of MAC): *sdt-DataVolumeThreshold, sdt-RSRP-Threshold* and *sdt-RSRP-ThresholdSSB-SUL*. | [Rapp] If there is no specific issue found in the implementation of agreement in the current, I would like to keep the current spec unless reverted by further discussion. |

### 6.1.5a MAC PDU (MSGB)

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z014 | Just wondering how to handle this Editor’s Note. Either we can delete the DTCH addition or we need some agreement on this. |  | [Rapp] Ran2 should discuss whether it is allowed for the gNB to include downlink data/signaling in msgB or only allow transmission of subsequent downlink aftetr successful contention resolution. If we only allow transmission of downlink after contention resolution, the change on DTCH can be removed. |

## 7 Variables and constants

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L105 | Same comment as L101. It is better not to define a new RA type for SDT. | Undo the addition of “2-step RA SDT type”. | [Rapp] Removed |

## Any Other Clause

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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# Post114e

## 3.2 Definitions

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| # | Brief description of the issue | Suggested change/company comments | Proposed way forward by rapporteur |
| Z000 | CG-SDT Configured Grant type 1-based Small Data Transmission  Since SDT is also defined separately, we could avoid using the full expansion and use the SDT abbreviation here already. | CG-SDT Configured Grant type 1-based ~~Small Data Transmission~~ SDT | [Rapp] Corrected |
| Z001 | Same as Z000 for RA-SDT | RA-SDT Random Access-based ~~Small Data Transmission~~ SDT | [Rapp] Corrected |
| N000 | CG-SDT Configured Grant type 1-based Small Data Transmission  Enough to say “Configured Grant-based SDT” without “type 1” since what CG type is supported is clear from the procedure and configuration and stage 2.  Agree with ZTE001. | CG-SDT Configured Grant ~~type 1~~-based ~~Small Data Transmission~~ SDT | [Rapp] Corrected |

### 5.1.1 Random Access procedure initialization

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z002 | *prach-ConfigurationIndex*  These are also applicable to Msg1 in 4-step RA-SDT type if the PRACH occasions are shared between 4-step RA type and 4-step RA-SDT type. These are also applicable to the Random Access Preamble for MSGA in 2-step RA-SDT type if the PRACH occasions are shared between 4-step RA type and 2-step RA-SDT type  General Comment: Do we really need to define new 4-step-RA-SDT type? With the above sentence, it seems we need to define “*4-step RA-SDT type*” and “2-step RA-SDT type”. However, since the RA type itself is not changed due to introduction of SDT. We could refer to existing RA types with and without SDT. Please see the suggested rewording.  On the other hand if we do define a new RA type, perhaps this needs to be defined (e.g. in stage-2) etc. Also there will be other changes needed in MAC spec in other sections too in this case since we use checks such as “if *RA\_TYPE* is set to *2-stepRA*” etc elsewhere and we need to now redefine all these with new RA types etc. It would be preferable to avoid a new RA type if possible to avoid such changes. | - *prach-ConfigurationIndex*: the available set of PRACH occasions for the transmission of the Random Access Preamble for Msg1. These are also applicable to Msg1 for RA-SDT if the PRACH occasions are shared between Random Access procedures with and without SDT for 4-step RA type.  These are also applicable to the MSGA PRACH if the PRACH occasions are shared between 2-step and 4-step RA types. These are also applicable to MSGA PRACH for RA-SDT if the PRACH occasions are shared between 4-step RA type and 2-step RA type with SDT. | [Rapp] Thanks for the comments @ ZTE.  On the new RACH type, the main reasons that why it is introduced are that   * In section 5.1.1a for initialization of parameters, I suspect certain parameters would be different from the legacy types of RACHs, e.g., preambleTransMax, etc. (but of course this is subject to further discussion) If such differences do exist, introducing a new RACH type to the UE variable RA\_TYPE fits better with the current framework * For RACH resource selection, the procedure will for sure be different between SDT and nonSDT. For example, preamble group selection, RACH occasion selection (as the current running CR puts it), etc. The solution in R16 2-stepRACH was to introduce a new chapter, i.e., Clause 5.1.2a. But I think for SDT, we can use the existing chapters and then, use the new RACH type to differentiate the procedures for the SDT RACH and non-SDT RACH for 2-step RACH and 4-step RACH * In the previous meeting, we have agreed to allow for fallback from SDT to non-SDT. Introducing a new RACH type is compatible with the procedures in the above two sections   I think we can keep the RACH type as it is for now and we can come back to this later to further examine its necessity.  I have put an editor note here to mark it as FFS. |
| Z003 | *msgA-PRACH-ConfigurationIndex*  Similar comment as Z002 (please see the corresponding suggestion). Further, it is not clear why these occasions should be shared with MSG1 in 4-step RA type with SDT as defined in the new definition. In case of shared occasions between 2-step and 4-step, these should be signalled via prach-CongurationIndex-SDT. | - *msgA-PRACH-ConfigurationIndex*: the available set of PRACH occasions for the transmission of the Random Access Preamble for MSGA in 2-step RA type. These are also applicable to MSGA PRACH for RA-SDT if the PRACH occasions are shared between Random Access procedures with and without SDT for 2-step RA type. | [Rapp] For the previous agreement, I think it does not really forbid RACH occasion sharing between 2-step RACH and 4-step RACH with SDT.   |  | | --- | | RAN2#112e  10: As a baseline, the RACH resource i.e. (RO+preamble combination) is different between SDT and non-SDT  - If ROs for SDT and non SDT are different, preamble partitioning between SDT and non SDT is not needed.  - If ROs for SDT and non SDT are same, preamble partitioning is needed  FFS if common configuration should be allowed |   I have put an editor note here to mark it as FFS. |
| Z004 | *prach-ConfigurationIndex-SDT and msgA-PRACH-ConfigurationIndex-SDT*  Similar comment as Z002 | - *prach-ConfigurationIndex-SDT*:the available set of PRACH occasions for the transmission of the Random Aceess Preamble for Msg1 in 4-step RA type with SDT;  - *msgA-PRACH-ConfigurationIndex-SDT*: the available set of PRACH occasions for the transmission of the Random Access Preamble for MSGA in 2-step RA type with SDT;  - *sdt-MSGA-RSRP-Threshold*: an RSRP threshold for selection between 2-step RA type with SDT and 4-step RA type with SDT when both 2-step and 4-step RA type Random Access Resources for SDT are configured in the UL BWP; | [Rapp] Ref to the previous comments |
| Z005 | Similar comments as Z002 apply also to the definitions of groupB-Configured-SDT and *groupB-ConfiguredTwoStepRA-SDT* |  | [Rapp] Ref to the previous comments |
| Z006 | 1> if the Serving Cell for the Random Access procedure is configured with supplementary uplink as specified in TS 38.331 [5]:  2> if the Random Access procedure was initiated for Small Data Transmission as specified in clause 5.x:  3> set the *PCMAX* to PCMAX,f,c of the selected UL carrier.  2> else if the RSRP of the downlink pathloss reference is less than *rsrp-ThresholdSSB-SUL*:  3> select the SUL carrier for performing Random Access procedure;  3> set the *PCMAX* to PCMAX,f,c of the SUL carrier.  2> else:  3> select the NUL carrier for performing Random Access procedure;  3> set the *PCMAX* to PCMAX,f,c of the NUL carrier.  Comment: It seems we could simplify the changes a bit by existing condition about signalled carrier… Please see the proposed alternative. Both can work though, so no strong view. | 1> if the carrier to use for the Random Access procedure is explicitly signalled or determined as specified in subclause 5.x for SDT:  2> select the signalled or determined carrier for performing Random Access procedure;  2> set the *PCMAX* to PCMAX,f,c of the selected carrier.  1> else if the carrier to use for the Random Access procedure is not explicitly signalled; and  1> if the Serving Cell for the Random Access procedure is configured with supplementary uplink as specified in TS 38.331 [5]; and  1> if the RSRP of the downlink pathloss reference is less than *rsrp-ThresholdSSB-SUL*:  2> select the SUL carrier for performing Random Access procedure;  2> set the *PCMAX* to PCMAX,f,c of the SUL carrier.  1> else:  2> select the NUL carrier for performing Random Access procedure;  2> set the *PCMAX* to PCMAX,f,c of the NUL carrier. | [Rapp]  I have adopted the proposed solution, which is quite concise, but may lack some readability on the other side.  One issue that remains to be resolved is that for subsequent CG-SDT transmission, whether UL carrier selection needs to be performed again. The way the current spec is specified is to assume that (a) the UL carrier selection is only performed for initial CG transmission; (b) the RSRP threshold is the same between RA\_SDT and CG\_SDT. These issues need to be further addressed. However, if we finally agree that for subsequent CG-transmission, UL carrier selection needs to be done again and the threshold can be different between CG and RACH, it is better to move the carrier selection for SDT from subclause 5.x to RA and CG.  From this aspect, it is better to keep the previous chunk of procedure as it is as suggested by ZTE  I have also added the following Editor’s Note per discussion above.  Editor’s Note: FFS whether UL carrier selection is performed for both initial and subsequent UL for CG-SDT and whether the RSRP threshold is common for both CG and RA-SDT. |
| Z100 | General comment to section 5.1.1:  A number of changes to this section will likely overlap with similar changes coming from other WIs that require RACH partitioning. We need to understand how we could integrate these changes. For instance, the statements such as “These are also applicable to Msg1 for RA-SDT if the PRACH occasions are shared between Random Access procedures with and without SDT for 4-step RA type” etc which exist in this section may not be exclusive to this WI. i.e. these preambles or ROs may also be shared by other features requiring the RACH partitioning and such statement above may need to be updated to cover all such cases. We hence need a general discussion on how to combine these features. Perhaps we could even have to think about a common MAC CR for overlapping WIs in this case. Something we need to discuss further at the next meeting. |  | [Rapp]  Agree with the observation from ZTE that this needs to be considered in conjunction with the other WIs that may proposed to introduce RACH changes in this release. And we also need to consider for forward compatibility in the future releases which may further increase the cases for RACH. The current way to capture the procedure does not quite seem to be forward-compatible. |
| N001 | The additions to *prach-ConfigurationIndex*and*msgA-PRACH-ConfigurationIndex* do not seem to be needed. | Remove the addition to *prach-ConfigurationIndex* and *msgA-PRACH-ConfigurationIndex* description. It should be made clear in RRC field description if anything needed. | [Rapp]  This is to align with the similar description with the RACH resource sharing in 2-step RACH. If this is not technically wrong, I think we can keep it as it is. |
| N002 | In the Editor’s NOTE, we do not see why this is up to RAN1 to decide: “Editor’s NOTE: FFS whether there can be separate configurations for related to the configuration of Random Access Preambles group B for RA-SDT , which is up to RAN1 to decide.” | Remove “which is up to RAN1 to decide” or remove the Editor’s NOTE. | [Rapp]  I can remove the note but keep in mind during R16 for the discussion in 2-step RACH, it is RAN1 that makes the decision to use mask index for RACH occasion sharing. It still might not be RAN2’s call to do that.  Remove up to RAN1 to decide |
| N003 | We should not define terms 2/4-step SDT-RA type which makes the spec very confusing and is essentially not true since still we perform the same actions as with 2-step and 4-step RA. It should be noted that Stage-2 would not define such types and to keep the specs consistent, such terms shall not be defined.  This is also inconsistent to what is said in 5.x:  ”Small Data Transmission can be performed either by Random Access procedure with 2-step RA type or 4-step RA type (i.e., RA-SDT)”  Can just use, e.g., “2/4-step RA type for SDT” | Use ” 4-step RA type for SDT” and “2-step RA type for SDT” instead of defining new RA types which is not true. | [Rapp]  Please see the replies to Z002.  IMHO, without the RA type, the spec will look more confusing. Not clear to me what will be the difference between another RA type and RA type for SDT |

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

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.1.2 Random Access Resource selection

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z007 | 1> else if an SSB is selected above:  2> if the selected RA type is set to *4-stepRA-SDT*:  3> determine the next available PRACH occasion from the PRACH occasions corresponding to the selected SSB (the MAC entity shall select a PRACH occasion randomly with equal probability amongst the consecutive PRACH occasions according to clause 8.1 of TS 38.213 [6], corresponding to the selected SSB).  2> else:  3> determine the next available PRACH occasion from the PRACH occasions corresponding to the selected SSB permitted by the restrictions given by the *ra-ssb-OccasionMaskIndex* if configured or indicated by PDCCH (the MAC entity shall select a PRACH occasion randomly with equal probability amongst the consecutive PRACH occasions according to clause 8.1 of TS 38.213 [6], corresponding to the selected SSB; the MAC entity may take into account the possible occurrence of measurement gaps when determining the next available PRACH occasion corresponding to the selected SSB).  Comment: It is unclear why the highlighted part is needed. Isn’t the existing text sufficient? | Delete the newly added text | [Rapp] The reason is that   * For RA for SDT, we don’t need to consider the measurement gap, since it is in RRC\_INACTIVE * We don’t need to consider ra-ssb-OccasionMaskIndex either, since it cannot be CFRA   We can add some conditions to the previous text to rule out the above cases for SDT, but I think a cleaner solution would be add a new sentence to dedicatedly address the case of RA-SDT |
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### 5.1.2a Random Access Resource selection for 2-step RA type

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z008 | 1> if the selected RA type is set to *2-stepRA-SDT*:  2> determine the next available PRACH occasion from the PRACH occasions corresponding to the selected SSB (the MAC entity shall select a PRACH occasion randomly with equal probability amongst the consecutive PRACH occasions according to clause 8.1 of TS 38.213 [6], corresponding to the selected SSB).  1> else:  Same comment as Z007 |  | [Rapp] Ref to the above comment |
| Z101 | NOTE1: Based on the agreement in RAN2#113bis-e: “Switching from SDT to non-SDT is supported”.  The agreement “switching from SDT to non-SDT is supported” doesn’t mean we will support fallback from SDT RACH resource to non-SDT RACH resource within one RACH procedure or PRACH retransmission attempt. The switching can be triggered e.g. by either a DCCH message or new CCCH procedure (FFS) and may also be triggered by network (e.g. by sending RRCResume etc). So, we are not sure if we need changes in this section and this note can be deleted. |  | [Rapp]  I can remove this editor note and put it under issue list  We have agreed on the following for the fallback  11 UE switches from SDT to non-SDT in following cases:  - Case 1 (27/0): UE receive indication from network to switch to non-SDT procedure.  - Network can send RRCResume. FFS whether network can send indication in RAR/fallbackRAR/DCI to switch to non-SDT procedure.  - FFS Case 2 (18/9): Initial UL transmission (in msgA/Msg3/CG resources) fails configured number of times  In section 5.1.4, we have  Editor’s Note: FFS RACH procedure trigger for SR for small data  In sectin 5.1.4a, we have  Editor’s Note: FFS fallback from 2-stepRA-SDT to 4-stepRA-SDT and non-SDT  In section 5.1.5, we have  Editor’s Note: FFS fallback from 2-stepRA-SDT to 4-stepRA-SDT  So, these editor notes correspond to the case when the fallback happen for RACH re-transmission as you have mentioned. If fallback within one RACH procedure is not supported, these section will not be affected. |
| N004 | Agree with ZTE101. Not sure what is the intention of the Editors note on the supported fallbacks. We do not see this impact MAC as it should be rather a RRC procedure upon reception of the resume RRC msg from the NW: “NOTE1: Based on the agreement in RAN2#113bis-e: “Switching from SDT to non-SDT is supported”.” | Remove the NOTE. | [Rapp]  Please see the reply above |

### 5.1.3 Random Access Preamble transmission

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.1.3a MSGA transmission

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L000 | We don't understand why "or for Scheduling Request in Small Data Transmission in clause 5.x" is included. | [LG] Remove the sentence | [Rapp] Thanks for the comments @LGE  In the previous RAN2 meeting, we have agreed on the following for the SR for subsequent UL based on DG  6 SR resource is not configured for SDT. When the BSR is triggered by SDT data, the UE will trigger RA because SR resource is not available, same as legacy  While different from the legacy RACH procedure in RRC\_IDLE/INACTIVE, for SR in RRC\_INACTIVE, the UE may not need to carry CCCH message and should include a RNTI, similar to the connected mode scenario.  The reason why I made this change previously was I thought it is quite straightforward. I can remove this and put it under editor note |
| Z009 | We agree with L000 comment |  | [Rapp] See comments above. |
| N005 | Agree with L000 |  |  |

### 5.1.4a MSGB reception and contention resolution for 2-step random access

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.1.5 Contention Resolution

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.1.6 Completion of the Random Access procedure

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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## 5.2 Maintenance of Uplink Time Alignment

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z010 | 1> when the *cg-SDT-TimeAlignmentTimer* expires:  2> notify RRC to release configured grant type 1 configuration(s) for Small Data Transmission.  The notification should only be that the CG-TAT has expired or not running etc. In RRC the actions can be taken based on this indication (e.g. release the CG resources at the next RRC Resume or release it if there is an ongoing SDT etc)… | 1> when the *cg-SDT-TimeAlignmentTimer* expires:  2> notify RRC that the *cg-SDT-TimeAlignmentTimer* has expired. | [Rapp] Thanks for the comments.  I am not quite sure why the RRC layer should release the source at the next RRC resume, since both the network and the UE are maintaining this timer and the network does not need another RRC resume to notify the network (Different from cell reselection in RRC\_INACTIVE and RSRP change beyond a certain threshold?)  Also, the legacy spec for PUCCH and SRS has directly indicated to the RRC layer to release the resource instead of indicating the expiry of the TAT.  1> when a *timeAlignmentTimer* expires:  2> if the *timeAlignmentTimer* is associated with the PTAG:  3> flush all HARQ buffers for all Serving Cells;  3> notify RRC to release PUCCH for all Serving Cells, if configured;  3> notify RRC to release SRS for all Serving Cells, if configured;  3> clear any configured downlink assignments and configured uplink grants;  3> clear any PUSCH resource for semi-persistent CSI reporting;  3> consider all running *timeAlignmentTimer*s as expired;  3> maintain NTA (defined in TS 38.211 [8]) of all TAGs. |
| X001 | When the UE initiate the RACH procedure, the UE would receive the TAC from the Msg2. It is not clear how/whether the TAC from the Msg2 impacts the validation of the CG resource for SDT. | RAN2 should discuss whether the cg-SDT-TimeAlignmentTimer can be affected by any TAC. | [Rapp] Thanks for your comments @Xiaomi  Agree with Xiaomi’s comment. I have added the following editor’s note  Editor’s Note: FFS the interplay between the legacy TAT and cg-SDT-TAT when legacy RACH is initiated |

### 5.3.1 DL Assignment reception

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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#### 5.3.2.1 HARQ Entity

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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5.3.2.2 HARQ process

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z102 | 1> if the *timeAlignmentTimer*, associated with the TAG containing the Serving Cell on which the HARQ feedback is to be transmitted, is stopped or expired, and;  1> if the transmission for the HARQ process is initiated for CG-SDTand *cg-SDT-TimeAlignmentTimer* is stopped or expired:  Comment: The interaction between the regular TAT and the cg-SDT-TimeAlignmentTimer is a bit unclear from the above.  i.e.:  - Is the UE considered to be time aligned only if both TAT and the cg-SDT-TimeAlignmentTimer are both running? The “and” in the above seems to suggest this but this is probably not the common understanding.  - Also, if the above is true then we also need to understand the interaction between TAC and the cg-SDT-TimeAlignmentTimer.  Further, the following agreement is not yet implemented:  5. TAT-SDT is started upon receiving the TAT-SDT configuration from gNB, i.e. RRCrelease message, and can be (re)started upon reception of TA command.  Assuming that the CG-SDT-TAT can be restarted upon TA command, there seems to be no need for checking both regular TAT and CG-SDT-TAT for CG-SDT transmissions?? |  | [Rapp]  This is also related to the comment above in X001, which has been addressed by the editor’s note.  From my side, it seems that the legacy TAT is only applicable when legacy RACH is initiated during the RACH procedure and where the UE variable NTA should be kept independently. TAT can control whether PUSCH and PUCCH can be sent during RACH. When contention resolution is successful, the UE should stop the TAT, similar to the way we treat RACH for on-demand SI request. At this time, the NTA obtained by RACH can be applied to the NTA for CG-SDT.  On the previous agreement on TAC, my previous thinking was that it should be further determined how this is conveyed to the UE, e.g., whether by DCI or MAC CE.  I have put the following FFS for the TA command:  Editor’s Note: FFS how the TA command is conveyed to the UE for cg-SDT-TAT |

### 5.4.1 UL Grant reception

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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#### 5.4.2.1 HARQ Entity

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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#### 5.4.2.2 HARQ process

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.4.4 Scheduling Request

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z011 | For a logical channel serving a radio bearer configured with SDT, no PUCCH resource for SR is configured.  Comment: The above sentence is not needed and seems not correct in any case. Note that the RB will be the same in connected mode too (and in connected mode, the RB may be configured with SR resources). | Delete the sentence “For a logical channel serving a radio bearer configured with SDT, no PUCCH resource for SR is configured.” | [Rapp]  This was based on the previous agreement, that no SR-PUCCH resource is configured for SR  6 SR resource is not configured for SDT. When the BSR is triggered by SDT data, the UE will trigger RA because SR resource is not available, same as legacy  On how to treat the relationship between the connected mode configuration and the UE configuration in INACTIVE for SDT, the following note has been captured.  Editor’s Note: How to handle the connected mode configuration in the RRC\_INACTIVE UE context e.g., logical channel configuration.  I think we need to further clarify that for SDT, the connected mode configuration is only kept in the UE context but not applied to the UE. INACTIVE mode UE for SDT can have a separate set of configurations. |
| N006 | Agree with Z011 |  | [Rapp]  See the reply above |

### 5.8.2 Uplink

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z012 | When CG-SDT is triggered, the MAC entity shall:  1> if at least one of the SSBs with SS-RSRP above *cg-SDT-RSRP-ThresholdSSB* is available:  2> select an SSB with SS-RSRP above *cg-SDT-RSRP-ThresholdSSB*;  2> select the configured grant type 1 configuration on BWP of the selected UL carrier associated with the selected SSB;  2> select the CG occasion corresponding to the selected SSB and the selected configured grant type 1 configuration.  1> else if RA-SDT is configured:  2> initiate Random Access procedure on the selected UL carrier for Small Data Transmission according to clause 5.1;  1> else:  2> initiate Random Access procedure in clause 5.1 for CCCH logical channel (i.e., not for Small Data Transmission).  Comment: Firstly, switching between CG-SDT and RA-SDT has not yet been agreed. We only agreed that if none of the SSBs are above the threshold for initial CG transmission, then UE is not allowed to select any SSB. Instead, UE will select RA-SDT directly before transmitting the first initial message. However, since the initial UL message has not yet been sent, this doesn’t constitute a switching from CG-SDT to RA-SDT. For the subsequent CG transmissions, we need further discussion on how to handle the transmissions/retransmissions. So, for this change, we will likely need separate description for the initial CG-SDT transmission and the subsequent data transmission with CG resource during CG SDT.  For the initial SDT type selection, I guess we can have a separate section (e.g. 5.x) instead of the section for CG transmission.  For the subsequent data transmission with CG, I guess the SSB quality check can be captured in section 5.4.1 UL Grant reception (e.g. only deliver the UL grant to HARQ process in case the RSRP of the SSB associated to the UL grant is qualified). The understanding is that if there is no UL grant then RACH will be triggered (but this is normal RACH, not RA-SDT). |  | [Rapp]  In the last meeting RAN2#114e, we have agreed on the following:   1. For initial CG transmission, UE does not select any SSB if none of the SSBs’ RSRP is above the RSRP threshold. FFS if re-evaluation for every CG transmission is necessary   If you remember during the online discussion, there was an FFS for when none of the SSBs’ RSRP is above the threshold, what shall the UE do. Then, a comment from Huawei and Nokia proposed that this FFS should be removed because it is clear that if none of the SSB’s RSRP is above the threshold, the UE has no option but to do RACH.  The only remaining issue is: when the UE is configured with RA-SDT, whether the UE is allowed to do RA-SDT  Note that the MAC PDU still has not been built yet, hence there is no issue of MAC PDU rebuilding here.  I can put the following Editor’s Note here, but the current text can be kept as it is, unless people disagree to fallback to RA-SDT after discussion.  Editor’s Note: FFS whether CG-SDT can fallback to RA-SDT if none of the SSB’s RSRP is above the threshold for initial CG transmission.  Please note that this is only for initial transmission, for subsequent uplink this is still FFS per the agreement above.  On the organization of clauses, this is a bit complex but my understanding is that it is not quite proper to put the things related to SSB selection for CG and CG resource selection to section 5.4.1. Section 5.4.1 is used by multiple procedures as a common procedure and it is only related to processing UL grant, i.e., process the UL grant and deliver HARQ information and UL grant to HARQ entities.  For the subsequent UL transmission, as long as the CG configuration for SDT is initialized, by initial CG transmission, for subsequent transmission, when CG occasions come, the UE can process the CG occasion and deliver the UL grant to UL grant reception section 5.4.1 (if the SSB selection is not performed for subsequent uplink).  From my perspective, the current formulation is fine. |
| N007 | Why put the CG-SDT/RA-SDT selection in this section? Should be in section 5.X as part of CG validation. | Move the RSRP validation for CG-SDT and the CG/RA-SDT selection to section 5.X | [Rapp]  Please see my comments above |

## 5.14 Handling of measurement gaps

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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## 5.15 Bandwidth Part (BWP) operation

### 5.15.1 Downlink and Uplink

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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## 5.16 SUL operation

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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## 5.x Small Data Transmission

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L001 | The selection of BWP configured for SDT should be considered on SDT procedure. This is because a separate BWP for SDT can be configured, and we think it is also possible to configure multiple separate BWPs for SDT. | [LG] BWP switching from initial BWP to separate BWP for SDT should be considered when SDT procedure is initiated. BWP switching amongst separate BWPs configured for SDT is also considered. | [Rapp] Thanks for your comments @LGE  I have put the following editor note for the issues raised by LGE. We can discuss on this in the future meetings, since the agreements we have now may not be enough for the correction here.  Editor’s Note: FFS BWP switching when multiple BWPs are configured for CG-SDT |
| Z014 | General comment:  Replace all occurrences of Small Data Transmission with SDT (except in the subclause heading). | Replace all occurrences of Small Data Transmission with SDT. | [Rapp] Corrected |
| N010 | 4> initiate Random Access procedure in clause 5.1 for CCCH logical channel (i.e., not for Small Data Transmission);   This cannot be done without RRC intervention as the RRC procedure shall also change, we need only an indication to RRC that SDT cannot be initiated. | Should indicate to RRC layer other than just initiating non-SDT procedure by MAC when SDT verification fails which is not possible given the RRC procedure needs to change as well. | [Rapp]  Thanks for the comment.  I agree that based on the result of the email discussion, only an indication to the RRC of the non-SDT selection, is needed. After that the RRC will trigger legacy RACH like normally.  Corrected the sentence to “indicate to the upper layer that the conditions to initiate SDT cannot be fulfilled” |
| N011 | For Small Data Transmission procedure, the MAC entity considers the suspended radios bearers configured with Small Data Transmission for data volume calculation.  If RRC resumes the SDT bearers already, they are not suspended anymore. Furthermore, rather RRC shall do the data volume calculation before requesting MAC anything. | Remove the sentence. | [Rapp]  I understand there is no pervious explicit agreement on this, but I think this is already implied the current MAC/RRC modeling, otherwise how can the UE do the SDT/non-SDT selection. If people still want to spend time to confirm on this, I am fine with it.  Removed |

## 5.x.1 Validation for Small Data Transmission using CG

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L002 | The expression "the time alignment value for SDT using CG type 1 to be valid " is not familiar. | [LG] The Text could be changed to  " The MAC entity shall consider CG-SDT resource is valid when the following conditions are fulfilled:" | [Rapp] Corrected |
| L003 | TA timer should also be considered for validation for CG-SDT. | [LG] Add "1> cg-SDT-TimeAlignmentTimer is configured and running;" | [Rapp] Thanks for the comment. The condition cg-SDT-TAT is running is already implicit included here, since in Section 5.x.1, we have the condition “ if CG-SDT is configured on the selected UL carrier”. If cg-SDT-TAT is not running, there would be no CG-SDT resource configured |
| Z016 | For L003, please also see our comment above in Z102. To us it seems more discussion is needed to understand how the normal TA and the CG-SDT-TAT interact. |  | [Rapp] We can have more discussion on the interplay of CG-TAT and legacy TAT as discussed. |
| N012 | Why do we need a separate sub-section for this? | Could just be listed as conditions in section 5.x | [Rapp]  Do we need to perform validation for every CG transmission? if yes, we need to keep this section separate; if no, as you said, we can put it under section 5.x.  This is already reflected by the following editor’s Note, in case you have not read it  Editor’s NOTE: FFS whether RSRP change would affect the TA valididation for DG. FFS whether the TA validation is only for initial CG-SDT transmission  Keep it as it is |

### 6.1.5a MAC PDU (MSGB)

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z017 | - a MAC subheader and MAC SDU for CCCH or DCCH or DTCH;  Comment: Why was the DTCH added here. i.e. which agreement is this based on? Our understanding is that we did not agree any changes to MSGB format. | Remove the DTCH | [Rapp] This is from the WID that subsequent DL transmission is supported for all types of SDT.  No new RRC state should be introduced in this WID. Transmission of smalldata in UL, subsequent transmission of smalldata in DL and the state transition decisions should be under network control.  This would also include msgB for SDT based on 2-step RACH and implies a change to the msgB format. |
| N013 | Agree with Z017 |  | [Rapp]  Please see the comments above |

## Any Other Clause

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| N014 | Lots of Editor’s notes not based on any meeting FFS is added | Remove all the Editor’s notes that are not based on any discussions so far. | [Rapp]  One important thing of doing this practice of running CR is that it can help us discover the remaining issues in time. This helps promote the progress of the topic.  If there is any editor’s note people do not find suitable, you can point it out directly, just like thing s have been done above. |