**3GPP TSG RAN WG2 #121bis-e *draft R2-230xxxx***

**Online, 17 - 26 April, 2023**

**Source:** ZTE Corporation (rapporteur)

**Title:** Report: [AT121bis-e][302][R17 SDT] SDT related correction (ZTE)

**Agenda Item:** 6.4.1

**Document for:** Discussion and decision

# Introduction

* [AT121bis-e][302][R17 SDT] SDT related correction (ZTE)

Scope: Treat the following tdocs related to SDT

* **6.4.x (SDT CP/UP):** R2-2302664, R2-2302665, R2-2302988, R2-2303056, R2-2303594, R2-2303687, R2-2303688, R2-2303699, R2-2304179
* **6.11 (SDT/RACH partitioning)**: R2-2302668
* **6.1.2 (SDT+REDCAP)**: R2-2303136, R2-2302660, R2-2304057

Determine agreeable parts/CRs. For Agreeable parts progress CRs

Intended outcome: Report, Agreed CRs.

Deadline: Company comments (Friday, 21st 10:00 UTC), Final report and CRs (Tuesday 25th 10:00 UTC)

Please use the following deadline

* **Comment deadline:** Friday, 21st 10:00 UTC (for collecting views)
* **Rapporteur proposals:** Monday W2, 0700 UTC (proposed outcome)
* **CR/Report deadline:** Tuesday W2, 10:00 UTC (discussion report, CRs)

1. Contact Information

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# Discussion – Phase-1

## SDT UP corrections

R2-2302664 Clarification on RA Resource Selection During CG-SDT vivo CR Rel-17 38.321 17.4.0 1576 - F NR\_SmallData\_INACTIVE-Core Late

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| Rapporteur comments:  The intention of the CR is to ensure that RA-SDT resource are not used during subsequent data transmission phase for CG-SDT. The general intention seems fine, but perhaps the change could be simplified (e.g: as below?) if companies think that this is not already clear in the specs.  1> if *smallData* is set to *true* for a set of Random Access resources:  2> consider the set of Random Access resources as not available for the Random Access procedure which is not triggered for RA-SDT |

Q 3.1.1: Do you agree with the reason for change in R2-2302664? Do you have any comments on the change proposed?

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| **Company** | **Yes/No** | **Comments (please propose any alternative wording etc if you think a change is needed)** |
| Samsung | No | RA triggered for SDT refers to RA initiated when SDT procedure is initiated. If majority view is to clarify this we are ok with changes suggested by rapporteur. |
| ZTE | - | We think the current spec is fine, but okay to go with majority view if companies think there is confusion. The revised wording from rapporteur seems simpler. |
| Sharp | Yes with comments | We agree with the intention of the change. However, we prefer the changes suggested by rapporteur. |
| LG | No | Same view as Samsung. Rapporteur suggestion is fine, if needed. |
| Huawei, HiSilicon | No | It is already clear in the current specification that only legacy RACH will be used for RACH triggered during ongoing SDT. The change is not needed. |
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[R2-2302988](file:///C:\evutukuri\work\5G\RAN2\docs\R2-2302988.zip) Correction to CG-SDT LCH restriction Huawei, HiSilicon CR Rel-17 38.321 17.4.0 1580 - F NR\_SmallData\_INACTIVE-Core

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| **Rapporteur comments**  The intention is to Clarify that the configuredGrantType1Allowed used for SDT refers to configuredGrantType1Allowed-r17 in CG-SDT-ConfigLCH-Restriction-r17 in RRCRelease.  We can check if this is agreeable. |

Q 3.1.2: Do you agree with the change in R2-2302988?

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| **Company** | **Yes/No** | **Comments (please propose any alternative wording etc if you think a change is needed)** |
| Samsung | See comments | Alternate TP:  2> if, for each RB having data available for transmission, *configuredGrantType1Allowed*, if configured for CG-SDT, is configured with value *true* for the corresponding logical channel; and |
| ZTE |  | No strong view, but we think nothing is broken without the CR. |
| Sharp | Yes | It is fine for us to have such a clarification. |
| LG | No | *configuredGrantType1Allowed* is already specified in 5.4.3.1.1, and it is enough for SDT. Specifying the same parameter again in 5.27.1 makes more confusion. Moreover, RRC field description of *configuredGrantType1Allowed* already clarifies that *configuredGrantType1Allowed-r17* is used for CG-SDT.  But, if something is really needed, Samsung’s suggestion is better. |
| Huawei, HiSilicon | Yes (proponent) | We prefer to clarify as in TS 38.300 it is mentioned that:  “Logical channel restrictions configured by the network while in RRC\_CONNECTED state and/or in *RRCRelease* message for radio bearers enabled for SDT, if any, are applied by the UE during SDT procedure.”. The confusion may emerge in particular for the case where *configuredGrantType1Allowed-r17* is not configured, but *configuredGrantType1Allowed* is configured in RLC bearer configuration. Should the UE use it in this case (in our understanding, it shouldn’t). |
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R2-2303699 Clarifying HD-FDD CG-SDT Ericsson CR Rel-17 38.321 17.4.0 1594 - F NR\_SmallData\_INACTIVE-Core

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| **Rapporteur comments**  Intention is to capture a pointer to RAN4 spec for the HD-FDD UE operation for CG-SDT.  **RAN4 note says:**  ------------------------ 5.1B.2.6 Maximum interruption in paging reception The requirements in clause 4.2B.2.6 shall apply for RedCap UEs.  For RedCap UE in HD-FDD mode, if a paging occasion overlaps with CG-SDT transmission then the UE shall monitor the paging during the paging occasion. In this case the UE is allowed to drop the CG-SDT transmission.  ------------------------  and then there is the other note in RAN1 spec as below:  ------------------------------  TS 38.213 clause 17.2  A HD-UE does not expect to receive both a Type-0/0A/1/2-PDCCH CSS set configuration for PDCCH reception in a set of symbols and dedicated higher layer parameters configuring transmission in the set of symbols.  So, firstly it is a bit unclear if RAN4 and RAN1 notes are aligned? RAN1 spec seems to require some configuration level exclusion of the above scenario whilst RAN4 spec allows it but requires the UE to skip the CG occasion.  **RAN2 status**  However, during SDT, the UE doesn't monitor normal paging... it only monitors paging for SI change notification (for ETWS/CMAS). This is only done **in any paging occasion** once per modification period. So, I am not sure if the above notes in RAN1 and RAN4 specs are really correct and if they are needed at all. i.e. why would the UE be allowed to skip the CG occasion if it can monitor it on other occasions (as long as it can do this once per modification period)??  Check what companies think of the above? |

Q 3.1.3: Do you agree with the change in R2-2303699?

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| **Company** | **Yes/No** | **Comments (please explain your understanding of the RAN1/RAN4 requirements i.e. are they aligned with RAN2 specs per above)** |
| Samsung | See comments | Same view as Rapporteur |
| ZTE | No | We agree with rapporteur that the notes in RAN1/4 seem to be mis-aligned with RAN2. We think we should ask RAN1/RAN4 to update their specs and align with our specs instead (e.g. remove the above notes). |
| Sharp | No | Same view as Rapporteur |
| LG | No | Agree with Rapporteur. Moreover, it is weird to specify “paging occasion” in MAC specification. |
| Huawei, HiSilicon |  | We think this topic should be handled in RAN4 first, then w can check whether/what change is needed in RAN2. |
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R2-2304179 Correction to RA-SDT initiation Google Inc. CR Rel-17 38.321 17.4.0 1610 - F NR\_SmallData\_INACTIVE-Core

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| **Rapporteur comments**  The change (to include a UE capability check, which we don’t normally include before other such “if” conditions) seems not essential perhaps? We can check company views. |

Q 3.1.4: Do you think the change in R2-2304179 is essential?

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| **Company** | **Yes/No** | **Comments** |
| Samsung | No | Agree with Rapporteur. |
| ZTE | No | Not essential and not the normal way to do this |
| Sharp | No | Same view as Rapporteur |
| LG | No | If the UE does not support RA-SDT, the UE would not check the RA-SDT condition by UE implementation. |
| Huawei, HiSilicon | No | We agree with the rapporteur. If we do it for this case, we would need to potentially apply the same change in many places, but that is really not needed and that is not what we normally do in the MAC specification. |
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## SDT CP corrections

R2-2302665 Correction on UAI Reporting During SDT vivo CR Rel-17 38.331 17.4.0 3957 - F NR\_SmallData\_INACTIVE-Core Late

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| Figure 5.7.4.1-1: UE Assistance Information while SDT procedure is not ongoing    Figure 5.7.4.1-2: UE Assistance Information while SDT procedure is ongoing**Rapporteur comments**  The change seems not essential. Check company views. |

Q 3.2.1: Do you think the change in R2-2302665 is essential?

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| **Company** | **Yes/No** | **Comments** |
| Samsung | - | Not essential. |
| ZTE | No | We think the stage-3 procedure is clear and there is no need to update the figure. |
| Sharp | No | Not essential. |
| LG | No | The CR is correct, but not essential. Do we capture all the possible scenarios in the figure? |
| Huawei, HiSilicon | No | Agree with the rapporteur. This change is not essential and we agreed previously that the figures do not have to capture each use case separately. The specifications text is clear. |
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R2-2303056 Correction on the restriction to periodicityExt NEC Corporation CR Rel-17 38.331 17.4.0 3981 - F NR\_SmallData\_INACTIVE-Core

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| **Rapporteur comments**  The intention is to exclude periodicityExt for CG-SDT. However, my understanding is that periodicityExt can also be used as long as the actual configuration of the periodicity is within allowed periodicities captured in RAN1 table. Is there a confusion regarding this? For instance, should we capture something like below?  In case of SDT, the network configures only the periodicity values included in Table 19.1-1 TS 38.213 [13], clause 19.1.  Check company views. |

Q 3.2.2: Do you agree with the change in R2-2303056? Please explain in comments if you think some clarification is needed.

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| **Company** | **Yes/No** | **Comments (if you think some clarification is needed – e.g. as explained above in the rapporteur comments or something else, please explain in comments).** |
| Samsung | No | Not an essential change. |
| ZTE | No | We think periodicityExt can also be used. |
| Sharp | No | Our understanding is periodicityExt can also be used. |
| LG | No | The *periodicityExt* was introduced in R16 IIOT, and we think it is not configured for SDT. |
| Huawei, HiSilicon | No | As the rapporteur commented, there is no need to forbid usage of periodicityExt. We are also not sure that a clarification is needed. The network is implemented according to all specifications with an impact to a specific feature, so the network will make sure to only configure the values applicable to SDT, even without this change. |
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R2-2303594 Control plane corrections for SDT Huawei, HiSilicon CR Rel-17 38.331 17.4.0 4017 - F NR\_SmallData\_INACTIVE-Core

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| First change:  3> restore the *RLC-BearerConfig* (except *configuredGrantType1Allowed* and *allowedCG-List*)associated with the RLC bearers of *masterCellGroup* and *pdcp-Config* from the UE Inactive AS context;  Second change:  The IE *ResumeCause* is used to indicate the resume cause in *RRCResumeRequest*, *RRCResumeRequest1* and *UEAssistanceInformation*.  **Rapporteur comments**  First change seems not needed since we already clarified at the last meeting that we have separate CG resource set for connected mode and for SDT, and have separate configuredGrantType1Allowed indication for SDT (see the field descriptions in R2-2302171). Is there still some confusion?  Second change seems fine. We can check if companies think this is essential. |

Q 3.2.3a: Do you think the first change in R2-2303594 is needed?

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| **Company** | **Yes/No** | **Comments** |
| Samsung | - | Not needed. |
| ZTE | No |  |
| Sharp | No |  |
| LG | No | Agree with Rapporteur. It is already clear. |
| Huawei, HiSilicon | Yes (proponent) | We think the first change is important. Currently, TS 38.300 says the following:  “Logical channel restrictions configured by the network while in RRC\_CONNECTED state and/or in *RRCRelease* message for radio bearers enabled for SDT, if any, are applied by the UE during SDT procedure.”  So even though we have separate CG resources, the UE uses LCH restrictions from both configurations. E.g. maxPUSCH-Duration from LCH configuration will be used, but only configuredGrantType1Allowed and allowedCG-List from CG-SDT config can be used, and not the ones from LCH configuration. As mentioned above, the confusion may emerge in particular for the case where *configuredGrantType1Allowed-r17* is not configured, but *configuredGrantType1Allowed* is configured in RLC bearer configuration. Should the UE use it in this case? (in our understanding, it shouldn’t).  We think this is a simple change which can help avoiding the confusion, but we are OK with another approach, e.g. capturing something is field descriptions. |
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Q 3.2.3a: Do you think the second change in R2-2303594 is needed?

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| **Company** | **Yes/No** | **Comments** |
| Samsung | Yes |  |
| ZTE | Yes |  |
| Sharp | Yes |  |
| LG | Yes |  |
| Huawei, HiSilicon | Yes (proponent) |  |
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R2-2303687 Clarification on RRCReject handling with UL data Nokia, Nokia Shanghai Bell CR Rel-17 38.300 17.4.0 0658 - F NR\_SmallData\_INACTIVE-Core

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| **Rapporteur comments**  The proposal is to specify that when UE receives RRCReject during the SDT procedure, the UE shall not perform SDT procedure for a subsequent RRC resume procedure  We had a similar discussion in the past (see R2-2203732 – see Q11 - especially option 3 which also intends to exclude the possibility to perform another SDT after RRCReject). But at this time, companies were unwilling to deviate from how this is done in EDT (no one supported this option 3). So, it is unclear why we need to deviate from this agreed EDT like behaviour. Check if companies would have changed their minds. |

Q 3.2.4: Do you think the change in R2-2303687 is needed?

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| **Company** | **Yes/No** | **Comments** |
| Samsung | No | Agree with Rapporteur. |
| ZTE | No | The proposed option would result in some more extensive changes to stage-3 too (since the UE has the SDT configuration, it is not clear how it can be guaranteed that the UE will not initiate SDT the next time for instance). As noted by the rapporteur the option 3 in R2-2203732 would allow the implementation of this by removing the SDT configuration, but such configuration change at the UE based on an non-integrity protected message (RRCReject) is not allowed in general.  So, we think the EDT based approach as currently specified is fine and we can stick with this. |
| Sharp | No | Same view as Rapporteur |
| LG | No |  |
| Huawei, HiSilicon | No strong view | Perhaps we do not have to forbid the UE from always using SDT procedure, but we would be ok to have a note similar to the one as discussed previously (even though we were not favouring it back then), i.e.:  “UE shall avoid a consecutive SDT procedures with a different payload but same security key” |
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R2-2303688 Clarification on unknown, unforeseen and erroneous protocol data Nokia, Nokia Shanghai Bell CR Rel-17 38.321 17.4.0 1593 - F NR\_SmallData\_INACTIVE-Core

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| **Rapporteur comments**  The proposal is to specify the UE behaviour for the case where data over non-SDT RBs is sent by network during SDT.  Is this change essential? |

Q 3.2.5: Do you think the change in R2-2303688 is essential?

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| **Company** | **Yes/No** | **Comments** |
| Samsung | - | Change seems correct |
| ZTE | No | We don’t think this is essential |
| Sharp | Yes |  |
| LG | No | We think the first paragraph of 5.13 covers this case.  *When a MAC entity receives a MAC PDU for the MAC entity's C-RNTI or CS-RNTI, or by the configured downlink assignment, containing a Reserved LCID or eLCID value, or an LCID or eLCID value the MAC Entity does not support, the MAC entity shall at least:*  *1> discard the received subPDU and any remaining subPDUs in the MAC PDU.*  Moreover, if the SDT UE receives an LCID or eLCID of non-SDT RBs, we think the whole MAC PDU shall be discarded instead of discarding only corresponding MAC subPDUs. |
| Huawei, HiSilicon | No | We are wondering why MAC would receive such PDUs? Doesn’t it mean such PDUs are coming from the network and that such network is implemented incorrectly. We normally do not address wrong network implementation cases. |
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## RACH partitioning correction

R2-2302668 Clarification on the Selected Set of RA Resources vivo CR Rel-17 38.321 17.4.0 1577 - F NR\_SmallData\_INACTIVE-Core, NR\_cov\_enh-Core, NR\_redcap-Core, NR\_slice-Core Late

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| 1> perform initialization of variables specific to Random Access type as specified in clause 5.1.1a by using the selected set of Random Access resources;  1> if *RA\_TYPE* is set to *2-stepRA*:  2> perform the Random Access Resource selection procedure for 2-step RA type (see clause 5.1.2a) by using the selected set of Random Access resources.  1> else:  2> perform the Random Access Resource selection procedure (see clause 5.1.2) by using the selected set of Random Access resources.  **Rapporteur comments**  The intention is to clarify which RACH partition is used to initialise the variables for RACH and perform RACH.  Since the RACH partition selection happens ahead for this section, this should be already clear? Is this really essential? |

Q 3.3.1: Do you think the change in R2-2302668 is essential?

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| **Company** | **Yes/No** | **Comments** |
| Samsung | No | Not essential |
| ZTE | No |  |
| Sharp | No |  |
| LG | No | Isn’t it obvious that the UE performs RA procedure on the selected RA resource? |
| Huawei, HiSilicon | No | This is not needed. The following is already captured in 5.1.1 of MAC specs:  “When a Random Access procedure is initiated, UE selects a set of Random Access resources as specified in clause 5.1.1b and initialises the following parameters for the Random Access procedure according to the values configured by RRC for the selected set of Random Access resources:” |
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## SDT+REDCAP CRs

R2-2302660 Correction on SDT with separate initial BWP vivo, Huawei, HiSilicon, Guangdong Genius draftCR Rel-17 38.321 17.4.0 F NR\_redcap-Core, NR\_SmallData\_INACTIVE-Core R2-2301962

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| **Rapporteur comments:**  Seems that the intention is to clarify which BWP is used for SDT procedure. It is not clear that this is essential since the BWP operation (and hence the BWP on which CG/RA-SDT happens) should be clear in MAC spec anyway. Check if companies think this is needed. |

Q 3.4.1: Do you think the change in R2-2302660 is essential?

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| **Company** | **Yes/No** | **Comments** |
| Samsung | - | Ok to clarify |
| ZTE | No |  |
| Sharp | Yes |  |
| LGE | No | CG-SDT resource is configured on initial BWP, so it is clear that CG-SDT is performed on the initial BWP. We think the suggested change is not essential.  However, if BWP operation in SDT procedure really needs to be clarified, it should be specified in clause 5.15 (BWP). |
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R2-2303136 Corrections on SDT using NCD-SSB for RedCap Huawei, HiSilicon CR Rel-17 38.321 17.4.0 1584 - F NR\_redcap-Core

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| **Rapporteur comments:** Intention is to clarify that NCD-SSB can be used for SS-RSRP measurements during SDT. Can check if companies think this is essential. |

Q 3.4.2: Do you think the change in R2-2303136 is essential?

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| **Company** | **Yes/No** | **Comments** |
| Samsung | No | Current notes (Note 3 and 4) are sufficient |
| ZTE |  | We are okay with the proposed note to clarify this. |
| Sharp | No | Not essential |
| LGE | No | When the SSB (CD or NCD) is associated with RedCap-specific initial BWP, it is obvious that the RSRP measurement is performed using the SSB associated with the separated initial BWP. |
| Huawei, HiSilicon | Yes | From the legacy NOTE, a RedCap UE can only perform SS-RSRP measurement based on the CD-SSB in RRC\_IDLE or RRC\_INACTIVE mode.  However in RAN2#121 meeting, it is agreed that CG/RA-SDT can also be performed if the RedCap specific initial DL BWP includes NCD-SSB. According to this agreement and related CRs, the RedCap UE can also perform SS-RSRP based on NCD-SSB during the RA-SDT procedure (even for the msg1 transmission of RA-SDT).  This is the new behaviour which is different from legacy UE.  So the current NOTE needs to be updated accordingly to clarify/allow the SS-RSRP measurement using NCD-SSB during SDT. Without allowing this, the whole ‘RA-SDT using NCD-SSB’ feature may not work well. |
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R2-2304057 CR for Miscellaneous Corrections for initial BWP LG Electronics. CR Rel-17 38.321 17.4.0 1608 - F NR\_redcap-Core

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| **Rapporteur comments:** The intention seems to be to clarify the BWP used for CG-SDT. The change looks a bit strange since it seems to suggest CG-SDT can also be configured in DL BWP. Is this change needed? |

Q 3.4.3: Do you think the change in R2-2304057 is essential? (please comment on the wording if you think some change is needed).

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| **Company** | **Yes/No** | **Comments** |
| Samsung | No |  |
| ZTE | No |  |
| Sharp | No |  |
| LGE | Yes | Only here, BWP terminology is not aligned with RRC terminology and we think it should be fixed.  Regarding DL BWP, both UL BWP and DL BWP are configured for CG-SDT. If companies think DL BWP is not needed, we are OK to only specify UL BWP.  SDT-MAC-PHY-CG-Config-r17 ::= SEQUENCE {  -- CG-SDT specific configuration  cg-SDT-ConfigLCH-RestrictionToAddModList-r17 SEQUENCE (SIZE(1..maxLC-ID)) OF CG-SDT-ConfigLCH-Restriction-r17 OPTIONAL, -- Need N  cg-SDT-ConfigLCH-RestrictionToReleaseList-r17 SEQUENCE (SIZE(1..maxLC-ID)) OF LogicalChannelIdentity OPTIONAL, -- Need N  cg-SDT-ConfigInitialBWP-NUL-r17 SetupRelease {BWP-UplinkDedicatedSDT-r17} OPTIONAL, -- Need M  cg-SDT-ConfigInitialBWP-SUL-r17 SetupRelease {BWP-UplinkDedicatedSDT-r17} OPTIONAL, -- Need M  cg-SDT-ConfigInitialBWP-DL-r17 BWP-DownlinkDedicatedSDT-r17 OPTIONAL, -- Need M  cg-SDT-TimeAlignmentTimer-r17 TimeAlignmentTimer OPTIONAL, -- Need M  cg-SDT-RSRP-ThresholdSSB-r17 RSRP-Range OPTIONAL, -- Need M  cg-SDT-TA-ValidationConfig-r17 SetupRelease { CG-SDT-TA-ValidationConfig-r17 } OPTIONAL, -- Need M  cg-SDT-CS-RNTI-r17 RNTI-Value OPTIONAL, -- Need M  ...  } |
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