**3GPP TSG-RAN WG1 Meeting #110bis-eR1-220xxxx**

**e-Meeting, October 10th – 19th, 2022**

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| *CR-Form-v12.2* | | | | | | | | |
| **DRAFT CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Draft CR on UE TEG framework | | | | | | | | | |
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| ***Source to WG:*** | Moderator (CATT), ZTE | | | | | | | | | |
| ***Source to TSG:*** | TSG RAN WG1 | | | | | | | | | |
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| ***Work item code:*** | NR\_pos\_enh-Core | | | | |  | ***Date:*** | | | 2022-10-18 |
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| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
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| ***Reason for change:*** | | In RAN4#104e meeting, RAN4 discussed UE/TRP TEG framework and provided the following feedback:   |  | | --- | | **Issue #6: Questions on UE Rx/RxTx TEG margins**  RAN4 feedback:   * UE Rx/RxTx TEG margins are provided as LPP signalling parameters out of UE capability signaling. * A single timing error margin value is provided per Rx TEG/RxTx TEG type per measurement instance in a single LPP message, if it has multiple measurement instances. * The timing error margin values for an Rx TEG/RxTx TEG type in different LPP messages can be different. |   Also, the “Draft\_37355-h20” and “Draft\_38331-h20\_v3” provided by RAN2 captures TEG timing error margins.  However, currently the report of UE Tx/Rx/RxTx TEG margin value is not included in RAN1’s spec. TS 38.214 should be updated accordingly. | | | | | | | | |
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| ***Summary of change:*** | | Add description on UE Tx/Rx/RxTx TEG margin value according to RAN4’s agreement and “Draft\_37355-h20” and “Draft\_38331-h20\_v3” provided by RAN2. | | | | | | | | |
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| ***Consequences if not approved:*** | | The framework to UE TEG is not completely captured in RAN1’s specification. TS 38.214 does not include the UE behavior on report of UE Tx/Rx/RxTx TEG margin value. | | | | | | | | |
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| ***Clauses affected:*** | | 5.1.6.5, 6.2.1.4 | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **N** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **N** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **N** | O&M Specifications | | | | TS/TR ... CR ... | | |
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| ***Other comments:*** | | **Isolated impact analysis:**  There is no isolated impact. | | | | | | | | |
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| ***This CR's revision history:*** | |  | | | | | | | | |

#### 5.1.6.5 PRS reception procedure

<Unrelated part omitted>

Timing Error Group(s) (TEG(s)) at UE side are defined:

*-* UE Rx TEG is associated with one or more DL measurements, which have the Rx timing error difference within a certain margin.

*-* UE RxTx TEG is associated with one or more UE Rx-Tx time difference measurements, which have the 'Rx timing errors+Tx timing errors' difference within a certain margin.

The UE may be configured to report, subject to UE capability, via high layer parameter *nr-UE-RxTEG-Request*, the association information of DL RSTD measurement(s) with UE Rx TEG(s) via higher layer parameter *nr-UE-Rx-TEG-ID* when the UE reports the DL RSTD measurement(s). The UE may report up to 4 RSTD measurements associated with different DL PRS resources per UE Rx TEG per *dl-PRS-ID*.

The UE may report a UE Rx TEG ID via higher layer parameter *nr-UE-Rx-TEG-ID* for a RSTD reference time *dl-PRS-ReferenceInfo* and a UE Rx TEG ID for each DL RSTD measurement, where the DL RSTD can be DL RSTD measurement in *NR-DL-TDOA-MeasElement* and/or *NR-DL-TDOA-AdditionalMeasurementElement*.

If the UE reports a UE Rx TEG ID with a DL RSTD measurement, the UE ~~shall~~ may report report a UE Rx TEG timing error margin value, via high layer parameter *nr-UE-RxTEG-TimingErrorMargin*, for all the UE Rx TEGs within one *NR-DL-TDOASignalMeasurementInformation*.

The UE may be configured to measure and report, via high layer parameter *measureSameDL-PRS-ResourceWithDifferentRxTEGs* subject to UE capability, RSTD measurements on a PRS resource associated with a *dl-PRS-ID* using up to 8 different UE Rx TEGs with the same *dl-PRS-ReferenceInfo.* The higher layer parameter *measureSameDL-PRS-ResourceWithDifferentRxTEGs* applies to all DL PRS positioning frequency layers.

The UE may be provided with association information of DL PRS resource(s) with Tx TEGs via higher layer parameter *dl-prs-trp-Tx-TEG-ID* for a *dl-PRS-ID*.

The UE may be configured to report, via high layer parameter *nr-UE-RxTxTEG-Request*, subject to UE capability, the association information of UE Rx-Tx time difference measurement(s) with UE RxTx TEG(s) via higher layer parameter *nr-UE-RxTx-TEG-ID*. The UE may report up to 4 UE Rx-Tx time difference measurements associated with different DL PRS resources per UE RxTx TEG per *dl-PRS-ID*.

If the UE reports a UE RxTx TEG ID with a UE Rx-Tx time difference measurement, the UE ~~shall~~ may report report a UE RxTx TEG timing error margin value, via high layer parameter *nr-UE-RxTxTEG-TimingErrorMargin*, for all the UE RxTx TEGs within one *NR-Multi-RTT-SignalMeasurementInformation*.

The UE may be configured to report, via high layer parameter *nr-UE-RxTxTEG-Request*, subject to UE capability, the association information of UE Rx-Tx time difference measurement(s) with the UE Rx TEG(s) and UE Tx TEG(s) via the higher layer parameters of *nr-UE-Rx-TEG-ID*, and *nr-UE-Tx-TEG-Index*. The UE may report up to 4 UE Rx-Tx time difference measurements associated with different DL PRS resources per UE Rx TEG per *dl-PRS-ID*.

If the UE reports a UE Rx TEG ID with a UE Rx-Tx time difference measurement, the UE ~~shall~~ may report report a UE Rx TEG timing error margin value, via high layer parameter *nr-UE-RxTEG-TimingErrorMargin*, for all the UE Rx TEGs within one *NR-Multi-RTT-SignalMeasurementInformation*.

If the UE reports a UE Tx TEG ID with a UE Rx-Tx time difference measurement, the UE ~~shall~~ may report report a UE Tx TEG timing error margin value, via high layer parameter *nr-UE-TxTEG-TimingErrorMargin*, for all the UE Tx TEGs within one *NR-Multi-RTT-SignalMeasurementInformation*.

The UE may be configured to measure and report, via high layer parameter *measureSameDL-PRS-ResourceWithDifferentRxTEGs* subject to UE capability, UE Rx-Tx time difference measurements on a PRS resource associated with a *dl-PRS-ID* using up to 8 different UE Rx TEGs. The high layer parameter *measureSameDL-PRS-ResourceWithDifferentRxTEGs* applies to all DL PRS positioning frequency layers.

The UE may be configured to measure and report, via high layer parameter *measureSameDL-PRS-ResourceWithDifferentRxTxTEGs* subject to UE capability, UE Rx-Tx time difference measurements with the same UE Tx TEG using up to 8 different UE RxTx TEGs*.* The high layer parameter *measureSameDL-PRS-ResourceWithDifferentRxTxTEGs* applies to all DL PRS positioning frequency layers.

<Unrelated part omitted>

#### 6.2.1.4 UE sounding procedure for positioning purposes

<Unrelated part omitted>

Timing Error Group (TEG) at UE side is defined:

- UE Tx TEG is associated with the transmissions of one or more UL SRS resources for the positioning purpose, which have the Tx timing error difference within a certain margin.

The UE may be configured to report, subject to UE capability, association information of the already transmitted SRS resource(s) configured by the higher layer parameter *SRS-PosResource* with UE Tx TEG(s) via higher layer parameter *nr-SRS-TxTEG-Set* or *ue-TxTEG-AssociationList*.

The UE may ~~be configured to~~ report, via high layer parameter *ue-TxTEG-TimingErrorMarginValue*, the UE Tx TEG timing error margin value of all the UE Tx TEGs within one *UEPositioningAssistanceInfo*.

If the UE reports a UE Tx TEG ID with a UE Rx-Tx time difference measurement, as defined in clause 5.1.6.5, the UE shall report the association information of the already transmitted SRS resources configured by the higher layer parameter *SRS-PosResource* with the UE Tx TEG ID.

If the UE is configured with SRS resources configured by the higher layer parameter *SRS-PosResource* in multiple CCs, the UE should report the *carrierFreq or servCellId* of the SRS resources when it reports the UE Tx TEG associations.

If the UE reports a UE RxTx TEG ID with a UE Rx-Tx time difference measurement, the UE may report a Tx TEG ID.

<Unrelated part omitted>