3GPP TSG-RAN WG3 #116 [R3-223889](file:///C:\Users\ezlyamo\AppData\Local\Temp\Temp1_RAN3_116-e_agenda_20220502.zip\Inbox\R3-223711.zip)

9th – 19th May 2022

Online

Agenda Item: 9.1.5.1

Source: Ericsson (moderator)

Title: CB: # Positioning\_03\_St3\_Corrections (round2)

Document for: Approval

# Introduction

**CB: # Positioning\_03\_St3\_Corrections**

**- Agree on needed corrections**

**- Converge on Single CR per Spec**

(E/// - moderator)

Summary of offline disc [R3-223711](file:///C:\Users\ezlyamo\AppData\Local\Temp\Temp1_RAN3_116-e_agenda_20220502.zip\Inbox\R3-223711.zip) rev in R3-223889

# For the Chairman’s Notes

**==============First round==============**

**Discuss online if the changes proposed in R3-223865 (NRPPa) are agreeable.**

List of changes are:

1. 8.2.6.2, 9.1.1.10: *UE TEG ID Information Request* IE is renamed to *UE TEG Information Request* IE.
2. 8.2.7.2: “if supported” is deleted.
3. 8.5.1.2: Procedural text for the Measurement Time Occasion IE is added.
4. 9.1.4.1: the Response Time IE is ignored when the Report Characteristics IE is set to “periodic”
5. 9.2.61: Unused maxnoofPRSresource is deleted.
6. 9.2.66: For LCS to GCS Translation IE, semantics description is clarified for the case where only ZoA is provided (as in e.g. 9.2.67).
7. 9.2.70: Revision of the IE and unit of seconds is added to semantics description, in alignment with the reportingInterval IE in LPP.
8. 9.2.41 : Added the Path Power IE in Additional Path List IE
9. 9.2.22 : Added new codepoints : posSibType1-9, posSibType1-10, posSibType6-4, posSibType6-5 and posSibType6-6 in the Positioning SIB Type IE
10. 9.2.82: Updated the semantics of the Associated TRP ID IE "This IE specifies the TRP ID of the associated TRP from which the beam information parameters are adopted in Local Coordinate System (LCS)."
11. 9.2.83 : Aligned the TRP Beam Antenna Angles IE with LPP Azimuth and Elevation angle and fine angles values.
12. 9.2.83 : Revised the encoding of the Relative Power IE as "coarse power" + optional "fine" values.
13. 8.5.3.2 & 9.1.4.5 : Added the following IEs in the MEASUREMENT UPDATE message:
    1. Number of TRP Rx TEGs IE and Number of TRP RxTx TEGs IE per TRP ID,
    2. Measurement Characteristics Request Indicator IE
14. 8.2.6.3 Added failure text description for the NRPPA POSITIONING INFORMATION FAILURE message when LMF requests the UE TEG Information Request and the NG-RAN fails to report any UE Tx TEG association.
15. General: miscellaneous corrections to the tabular, e.g. indentions in the IE/Group Name column, “Item” level added in lists to align with ASN.1, etc.
16. 9.2.78 : The UE Tx TEG IDs are associatied with the Positioning SRS Resources instead of the SRS Resources

**Editorial change to be captured by the NRPPA rapporteur:**

9.2.5: Range value for optional lists changed from “0” to “0..1”.

Mirror changes for F1AP to be provided in **R3-223866**

**==============Second round==============**

Draft: R3-223889 (NRPPa) and R3-223866 (F1AP) CRs are agreed

# Discussion- Second round

The purpose of this second round is to discuss the following points that have been raised during the online session:

1. Further check the UE Tx TEG IDs alignment with RRC
2. Check comments on P14 from the first round
3. Check the proposed NRPPa and F1AP CRs for agreement.

## UE Tx TEG Association encoding in NRPPa/F1AP

Below, some RAN1 agreement about the UE TEG Tx association reporting. Mostly relevant to RAN2, but also some aspects that may concern RAN3:

|  |
| --- |
| **Agreement**   * For UL-TDOA, supporting the following for the serving gNB to request a UE to report the Tx TEG association information between UE Tx TEG IDs and SRS resources for positioning, subject to UE capability of supporting UE Tx TEG:   + Based on a configured periodicity, a UE may report the UE Tx TEG association for the SRS resources for positioning that have already been transmitted during the configured period     - It is up to RAN2 to decide how to indicate the change of the Tx TEG association during the configured period (e.g., using the timestamps)     - It is up to RAN4 to decide when the Tx TEG association is changed   + The values of the configurable periodicities are up to RAN2   + Note: Tx TEG association information reporting by single request/response mode is assumed already supported with the previous agreement. * Send an LS to RAN2/RAN4 (cc: RAN3)   + to RAN2, including the following RAN1’s agreement related to the reporting of the UE Tx TEG, for RAN2 to work on the signaling   + to RAN4 for checking the agreement and work on how to decide when the Tx TEG association is changed |

The current draft RRC CR from RAN2 in <https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_118-e/Inbox/Drafts/%5BOffline-623%5D%5BPOS%5D%2038331%20positioning%20CR%20(Ericsson)/R2-22xxxxx%20RRC%20Positioning%20CR_v01.docx> details the encoding of the UE Tx TEG association:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| UE-TxTEG-AssociationList-r17 ::= SEQUENCE (SIZE (1.. maxNrOfTEG-ID-r17)) OF UE-TxTEG-Association-r17  UE-TxTEG-Association-r17 ::= SEQUENCE {  ue-TxTEG-ID-r17 INTEGER (0.. maxNrOfTEG-ID-1-r17),  nr-TimeStamp-r17 NR-TimeStamp-r17,  associatedSRS-PosResourceIdList-r17 SEQUENCE (SIZE(1.. maxNrofSRS-PosResources-r16)) OF SRS-PosResourceId-r16,    servCellId-r17 ServCellIndex OPTIONAL  }  NR-TimeStamp-r17 ::= SEQUENCE {  nr-SFN-r17 INTEGER (0..1023),  nr-Slot-r17 CHOICE {  scs15-r17 INTEGER (0..9),  scs30-r17 INTEGER (0..19),  scs60-r17 INTEGER (0..39),  scs120-r17 INTEGER (0..79)  },  ...  }  -- TAG-UEPOSITIONINGASSISTANCEINFO-STOP  -- ASN1STOP   |  | | --- | | *UEPositioningAssistanceInfo* field descriptions | | ***nr-TimeSTamp***  This field specifies the latest time instance at which the association is valid prior to the reporting. | | ***servCellID***  This field indicates the the serving cell information of SRS for positioning resources associated to the UE Tx TEG report. | | ***ueTxTEG-ID***  Identifies the ID of UE Tx TEG. | |

1. First, we can see that RAN2 has corrected the range of values of the ue-TxTEG-ID-r17 to INTEGER(0..7). Thus, NRRPa is aligned with this aspect.
2. Secondly, as also discussed in CB: # Positioning \_05\_ASN1\_CRs, a mandatory ***nr-TimeSTamp*** IE is added to the RRC UE Tx TEG association report. It was pointed out that this RRC timestamp does not include the optional *Measurement Time* IE coded as *Relative Time 1900* IE that we have in NRPPa section 9.2.42.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 9.2.42 Time Stamp This information element contains the time stamp associated with the measurement.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | IE/Group Name | Presence | Range | IE Type and Reference | Semantics Description | | System Frame Number | M |  | INTEGER(0..1023) |  | | CHOICE *Slot Index* | M |  |  |  | | >SCS-15 | M |  | INTEGER(0..9) |  | | >SCS-30 | M |  | INTEGER(0..19) |  | | >SCS-60 | M |  | INTEGER(0..39) |  | | >SCS-120 | M |  | INTEGER(0..79) |  | | Measurement time | O |  | Relative Time 1900  9.2.36 |  | |

1. The association with the positioning SRS resources has been corrected in R3-223865 (P16).
2. The deletion of the set of positioning SRS resources will be captured by the output CR in CB: # Positioning \_05\_ASN1\_CRs.
3. We can also see that RAN2 have added a serving cell information ***servCellID*** for the positioning SRS resources associated with the UE TEG Tx report.

Finally, it should be noted that the above RRC extract is still under discussion and may be subject to change by RAN2 during this meeting. Thus, we should allow for revisiting in the future, including the eventuality of doing NBC changes, if needed.

**QUESTION1: The first question for this second-round discussion concerns the new information added by RAN2 in the RRC UE TEG Tx association report. Should RAN3 add a time stamp IE and serving cell info (NR CGI) to the UE TX TEG Association IE in 9.2.78?**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comment |
| Ericsson | Yes | We support aligning with RRC by introducing both the time stamp IE and the serving cell info (NR CGI) to 9.2.78. It is not precluded for the LMF to request only for the UE TEG Tx Association from the gNB (see Note above from RAN1 agreements), so it is not possible to always derive the information from the SRS Configuration IE. |
| CATT | No | According the existing positioning procedure, UE Tx TEG is always associated with SRS resource, so in our understanding, LMF deriving information from SRS Configuration IE seems reasonable. In addition, the positioning procedure of RAN3 is complete without the information, and RAN2 is still under discussion. Therefore, it is proposed for RAN3 to keep unchanged. |
| Nokia | Yes w/comments | The gNB should simply report the UE Tx TEG Association that it receives from the UE over RRC, so the format of the IE in NRPPa should be aligned with RRC.  The ServCellId seems to be INTEGER (0..31), not the same as NR CGI. |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Question2 : If companies answered "YES" to the above question, do they have any comments on the revised coding proposed in 9.2.78 below?**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 9.2.78 UE Tx TEG Association  This information element contains the UE Tx TEG association.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | | **UE Tx TEG Association item** |  | *1..<maxnoUETEGs>* |  |  | | >UE Tx TEG ID | M |  | INTEGER (0..7) |  | | **>Positioning SRS Resource ID List** |  | *0..1* |  |  | | **>>Positioning SRS Resource ID Item** |  | *1..<maxnoSRS-PosResourcePerSet>* |  |  | | >>>Positioning SRS Resource ID | M |  | INTEGER(0..63) |  | | >Time Stamp | M |  | 9.2.42 |  | | >Serving Cell ID | O |  | NR CGI  9.2.9 |  |  |  |  | | --- | --- | | **Range bound** | **Explanation** | | maxnoUETEGs | Maximum no of reported UE Tx TEG association. Value is 8. |  |  |  | | --- | --- | | maxnoSRS-PosResourcePerSet | Maximum no of positioning SRS resources per positioning SRS resource set. Value is 16. | |

|  |  |
| --- | --- |
| Company | Comment |
| Ericsson | Coding OK |
| Nokia | If we are aligning with RRC, then it seems:   * *Positioning SRS Resource ID List* should be mandatory? * *Serving Cell ID* should be INTEGER (0..31)? |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

## Failure handling for UE Tx TEG Association

One point open for discussion relates to the proposal by Ericsson in P14: Adding failure text description for the NRPPA POSITIONING INFORMATION FAILURE message when LMF requests the UE TEG Information Request and the NG-RAN fails to report any UE Tx TEG association.

The proposed procedural text to section 8.2.6.3 of NRPPa is as below:

|  |
| --- |
| If the *UE TEG Information Request* IE is included in the POSITIONING INFORMATION REQUEST message and the NG-RAN node is unable to report any UE Tx TEG association information for the UE, the NG-RAN node shall respond with a POSITIONING INFORMATION FAILURE message with an appropriate cause value. |

The motivation behind this proposal lies behind the following observations:

* The UE Tx TEG association information reporting can be made by single request/response. Hence, it is possible for the LMF to send at any time a POSITIONING INFORMATION REQUEST containing only the *UE TEG Information Request* IE to gNB (i.e., not requesting for SRS configuration).
* One company Samsung had commented that current Positioning Information Request allows the case when only UE TX REG info is requested; and such condition happens when LMF knows exactly at least some periodic SRS for positioning resources have been configured to UE, so there’s case when LMF would expect an update of UE TX REG info only.

After some offline discussion, it was argued that the proposed text to 8.2.6.3 should be rephrased, so that when the LMF sends POSITIONING INFORMATION REQUEST containing both the *Requested SRS Transmission Characteristics* IE and *the UE TEG Information Request* IE, and the gNB provides in the POSITIONING INFORMATION RESPONSE the *SRS Configuration* IE but no UE Tx TEG Association, the procedure should not fail.

A slight reformulation to the original proposal is provided below:

|  |
| --- |
| If only the *UE TEG Information Request* IE is included in the POSITIONING INFORMATION REQUEST message and the NG-RAN node is unable to report any UE Tx TEG association information for the UE, the NG-RAN node shall respond with a POSITIONING INFORMATION FAILURE message with an appropriate cause value. |

**QUESTION3: Do companies support and/or have any comment on the proposed rewording of the procedural text for 8.2.6.3?**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comment |
| Ericsson | Yes | We are open for reformulation of the above sentence. As stated, a one-shot request by LMF of UE Tx TEG association to gNB is supported and can be decoupled from the SRS configuraiton. |
| CATT | ? | We are open for defining a failure procedure.  However, is it necessary to distinguish one case? For example, after receiving the request from LMF, the gNB does not receive the report from UE. In this case, it seems that the gNB should not feedback the failure message, rather to wait for the report from UE and subsequently inform LMF via the POSITIONING INFORMATION UPDATE message. |
| Nokia | Maybe | In our understanding, the failure case is intended to cover the scenario where LMF requests UE Tx TEG Association (only), but the gNB does not configure the UE to report UE Tx TEG Association (for some unknown reason)?  It’s not clear why this would happen (e.g. shouldn’t be because of UE capabilities since LMF knows the UE capabilities when making the request). In any case, perhaps we could have more generalized text that would also cover this scenario:  If the NG-RAN node is unable to provide any of the requested information, the NG-RAN node shall respond with a POSITIONING INFORMATION FAILURE message with an appropriate cause value. |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

## CR revisions

A CR to NRPPa capturing the above changes as well as the previous ones from the first round is dropped in the CB folder “[CR Checking](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_116-e/Inbox/Drafts/CB%20%23%20Positioning_03_St3_Corrections/CRs%20checking)”. Once the NRPPa CR is stabilized, the F1AP mirror can be provided for checking as well (before Wednesday 18/06 start of Online session time)

**QUESTION4: Do companies have any comment on the 17 proposals captured by the NRPPA CR in R3-223888 and the delta form the second round? Are there any issues specific to F1AP that should be raised before working on the mirror?**

|  |  |
| --- | --- |
| Company | Comment |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

# Discussion-First round

In this CB, we have 6 CRs proposed for Rel-17 Positioning correction: 3 CRs for NRPPa and 3 CRs for F1AP.

Since we have to converge to a single CR per spec at the end of this CB, we will discuss below the proposals from each CR and merge the agreeable ones into one document co-signed by all proponents, if acceptable.

## Discussion on the CRs proposed for NRPPa

### 4.1.1 Nokia NRPPA CR

The Nokia CR in [1] proposes to consider the following corrections for NRPPA :

|  |
| --- |
| 1. 8.2.6.2, 9.1.1.10: *UE TEG ID Information Request* IE renamed to *UE TEG Information Request* IE to better align with its purpose and with ASN.1. 2. 8.2.7.2: The UE includes the full list of UE Tx TEG associations, not just what has changed since the last update. Also, “if supported” is deleted since the gNB provides the UE Tx TEG Assocations only if requested by the LMF in the POSITIONING INFORMATION REQUEST message. 3. 8.5.1.2: Procedural text for the Measurement Time Occasion IE is added. The gNB is not mandated to use the number of measurement time occasions requested by the LMF (i.e. “may”). 4. 9.1.1.22 & 9.3.4: Criticality Diagnostics IE added to tabular and ASN.1. 5. 9.1.4.1: It is clarified that the Response Time IE is ignored when the Report Characteristics IE is set to “periodic”, in alignment with LPP. 6. 9.1.4.5 & 9.3.4: The criticality of the TRP Measurement Update List IE is changed to “ignore” in tabular and ASN.1. 7. 9.2.5: Range value for optional lists changed from “0” to “0..1”. 8. 9.2.37 & 9.3.5: The criticality of the Z-AoA IE, Multiple UL-AoA IE, and UL SRS-RSRPP IE is changed to “ignore” in tabular and ASN.1. 9. 9.2.61: Unused maxnoofPRSresource deleted. 10. 9.2.66: For LCS to GCS Translation IE, semantics description is clarified for the case where only ZoA is provided (as in e.g. 9.2.67). 11. 9.2.70: Unit of seconds is added to semantics description, in alignment with the reportingInterval IE in LPP. 12. 9.2.78 & 9.3.5: UE Tx TEG ID should be an integer beginning with value 1 (see ue-TxTEG-ID-r17 in RRC) 13. General: miscellaneous corrections to the tabular, e.g. indentions in the IE/Group Name column, “Item” level added in lists to align with ASN.1, etc. |

**Q1: Companies to provide their reflections on the above proposed corrections, please input here.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Company** | **Agreeable proposals** | **Not agreeable proposals** | **Comment** |
| Ericsson | P1, P3, P4, P5, P9, P10, P11, P13 (R17 items only) | P2, P6, P7, P8, P12 | P2: Ok to delete the "if supported" next to "the LMF shall", but given RAN2's consideration (also mentioned in LS R3-223006 Issue#2) that the UE Tx TEG association report is made when the TEG association has changed (compared to the last update), we think the existing text is clearer and more aligned.  P6: this contradicts the abnormal condition described in 8.5.3.4  P7: editorial and not part of Rel-17 work  P8: It was already discussed that the extension of a choice value should not have criticality “ignore” in a choice-extension container; it should be set to “reject”. See for instance the CRs submitted to RAN plenary #94e RP-213173 & RP-213174  P11: we realize that the IE encoding needs to be revised to align with LPP correct value ranges:  ***periodicalReporting***  This IE indicates that periodic reporting is requested and comprises the following subfields:  -    ***reportingAmount*** indicates the number of periodic location information reports requested. Enumerated values correspond to 1, 2, 4, 8, 16, 32, 64, or infinite/indefinite number of reports. If the *reportingAmount* is '*infinite/indefinite'*, the target device shou-ld continue periodic reporting until an LPP *Abort* message is received. The value '*ra1*' shall not be used by a sender.  -             ***reportingInterval***indicates the interval between location information reports and the response time requirement for the first location information report. Enumerated values ri0-25, ri0-5, ri1, ri2, ri4, ri8, ri16, ri32, ri64 correspond to reporting intervals of 1, 2, 4, 8, 10, 16, 20, 32, and 64 seconds, respectively. Measurement reports containing no measurements or no location estimate are required when a *reportingInterval* expires before a target device is able to obtain new measurements or obtain a new location estimate. The value '*noPeriodicalReporting*' shall not be used by a sender.  So something like this below: 9.2.70 UE Reporting Information This IE contains the UE Reporting Information.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | IE/Group Name | Presence | Range | IE type and reference | Semantics description | | Reporting Amount | M |  | ENUMERATED (0, 1, 2, 4, 8, 16, 32, 64) | Value 0 represents an infinite number of periodic reporting | | Reporting Interval | M |  | ENUMERATED (none, 1, 2, 4, 8, 10, 16, 20, 32, and 64) | Unit: seconds |   P12: Not sure. The RAN1 agreement from the Excel table R1-22025759 clearly states that the value range is 0..7. There is now a misalignment between RRC *ue-TxTEG-ID-r17* and LPP *nr-UE-Tx-TEG-ID-r17*. We should check first if this misalignment in RRC was done intentionally by RAN2 or not (typo), before correcting NRPPa. |
| HW |  |  | P8&p11: agree with Ericsson  Others ok |
| Qualcomm |  |  | This looks all good. Two comments:  9.2.70 UE Reporting Information  The ENUMERATED values have a modified mapping to seconds (see LPP):  "Enumerated values ri0-25, ri0-5, ri1, ri2, ri4, ri8, ri16, ri32, ri64 correspond to reporting intervals of 1, 2, 4, 8, 10, 16, 20, 32, and 64 seconds, respectively."  9.2.78 UE Tx TEG Association  This is not in agreement with RAN1 and latest RRC. Should probably be checked during next week whether this is stable enough in RRC. We understand this is the UE report, which is forwarded to the LMF, and therefore, can only include the parameter reported by the UE. |
| Nokia | All except… | P8 | Regarding Ericsson comments:  P2: In our understanding, the UE reports the full UE Tx TEG Assocation and not just the delta from last report. But this can be double-checked against latest RAN2 decisions.  P6: The criticality (abstract syntax error) has nothing to do with abnormal condition (no abstract syntax error but gNB does recognize any of the measurements requested to be updated).  P7: Fair enough.  Agree with Qualcomm’s comment about structure of UE Tx TEG Association IE (align with RRC) |
| CATT | P1, P2, P3, P4, P5, P7, P9, P10, P11, P13 | P6, P8, P12 | For P6, P8, P11, P12, agree with Ericsson. |
| Samsung |  |  | We share view with Nokia. |
| **Moderator’s conclusion**  Based on the discussion, the following proposals can be agreed:  8.2.6.2, 9.1.1.10: *UE TEG ID Information Request* IE is renamed to *UE TEG Information Request* IE.  8.2.7.2: “if supported” is deleted.  8.5.1.2: Procedural text for the Measurement Time Occasion IE is added.  9.1.4.1: the Response Time IE is ignored when the Report Characteristics IE is set to “periodic”  9.2.61: Unused maxnoofPRSresource deleted.  9.2.66: For LCS to GCS Translation IE, semantics description is clarified for the case where only ZoA is provided (as in e.g. 9.2.67).  9.2.70: Revision of the IE and init of seconds is added to semantics description, in alignment with the reportingInterval IE in LPP.  General: miscellaneous corrections to the tabular, e.g. indentions in the IE/Group Name column, “Item” level added in lists to align with ASN.1, etc.  Editorial change to be captured by the rapporteur:  9.2.5: Range value for optional lists changed from “0” to “0..1”. | | | |

### 4.1.2 Ericsson NRPPA CR

The Ericsson CR in [5] proposes to consider the following corrections for NRPPA :

|  |
| --- |
| 1. Add the *Path Power* IE in *Additional Path List* IE 9.2.41 2. Add new codepoints : posSibType1-9, posSibType1-10, posSibType6-4, posSibType6-5 and posSibType6-6 in the *Positioning SIB Type* IE 9.2.22 3. Update the semantics of the *Associated TRP ID* IE in 9.2.82: "This IE specifies the TRP ID of the associated TRP from which the beam information parameters are adopted in Local Coordinate System (LCS)." 4. Align the *TRP Beam Antenna Angles* IE with LPP Azimuth and Elevation angle and fine angles values. 5. Revise completely the encoding of the *Relative Power* IE in 9.2.83. **This change is NBC.** 6. Add the following IEs in the MEASUREMENT UPDATE message:    1. *Number of TRP Rx TEGs* IE *and Number of TRP RxTx TEGs* IE per TRP ID,    2. *Response Time* IE,    3. *Measurement Characteristics Request Indicator* IE    4. *Desired number of reported additional path* IE, coded INTEGER(1..8) per TRP ID    5. *Desired number of UL AoA values per additional path* IE, coded INTEGER(1..8) per TRP ID    6. Revise the procedure text of the MEASUREMENT UPDATE message for the sake of genericity 7. Add failure text description for the NRPPA POSITIONING INFORMATION FAILURE message when NG-RAN fails to report the UE Tx TEG association when requested. 8. Add the AoA/AoZ uncertainty ranges in the *Angle Measurement Quality* IE in the *Measurement Quality* IE in 9.2.43 |

**Q2: Companies to provide their reflections on the above proposed corrections, please input here.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Company** | **Agreeable proposals** | **Not agreeable proposals** | **Comment** |
| Ericsson | all |  |  |
| HW |  | P6, P8 | P6: The information in the Update message should be subset of the Measurement Request message.  P8: Seems duplicated with the existing quality. No strong view. |
| Qualcomm |  | P7, P8 | P7: The main purpose of the POSITION INFORMATION REQUEST is to obtain SRS. The procedure should not fail just because no UE Tx TEG is provided. Indeed, a UE can provide TEG info only after it has transmitted SRS, and in the case of aperiodic/semi-persistent SRS, the POSITIONING INFORMATION RESPONSE can not include any UE Tx TEG information anyhow (since nothing will be transmitted by the UE before SRS is activated).  P8: Not clear where this is coming from. "Quality" is already specified.  9.2.83 TRP Beam Antenna Angles  Elevation is defined as [0;180] degrees. Therefore, 181 values are needed to cover the full range in 1-degree steps, and 1801 in 0.1 degree steps. (azimuth is defined as [0;360[ (i.e., up to 359.9… degrees))  9.2.X TRP Beam Relative Power  This looks inefficient. Could be defined as "coarse" + optional "fine" (like the angles)  (but strictly speaking, defining only "fine" is less ASN.1 overhead and with the same functionality). |
| Nokia |  | P6b, d, e, f  P7, P8 | P6b: Response Time is only applicable to OnDemand, so no need to update.  P6d, e: These are not supported in the Request so should not be included in Update  P6f: The text is too generic (“overwrite previously received information…”). The update cannot be used to change the list of TRPs. In fact, there is no need to be generic: 6a and 6c can simply be stored. |
| CATT | P1, P2, P3, P4, P5, P6 | P7, P8 | For P7, P8, agree with Qualcomm. |
| Ericsson2 |  |  | To Qualcomm on P7: The purpose of the Positioning Information Exchange procedure is to obtain positioning information for the UE, not limited to SRS. When LMF sends the *UE TEG ID Information Request* IE and the gNB cannot signal back the association, then the procedure fails.  On 9.2.X TRP Beam Relative Power  Thank you for the tip on overhead reduction. Ok to define the “fine” version as optional as we have for the angles.   |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  |  |  |  | | --- | --- | --- | --- | --- | | TRP Beam Power | M |  | INTEGER (0..30) | The power values span from -30 to 0dB | | TRP Beam Power “fine" | O |  | INTEGER (0..9) | Relative Power with 0.1dB resolution. The power spans from -0.9 to 0dB | | |
| Samsung | P1-5, P7 | P6, P8 | For P6, agree with Nokia.  For P7, we have sympathy for Ericsson since current Positioning Information Request allows the case when only UE TX REG info is requested; and such condition happens when LMF knows exactly at least some periodic SRS for positioning resources have been configured to UE, so there’s case when LMF would expect an update of UE TX REG info only.  For P8, we share view with QC and fine with the modification for TRP Beam Relative Power as raised by Ericsson2. |
| **Moderator’s conclusion**  Based on the discussion, the following proposals can be agreed:  Add the Path Power IE in Additional Path List IE 9.2.41  Add new codepoints : posSibType1-9, posSibType1-10, posSibType6-4, posSibType6-5 and posSibType6-6 in the Positioning SIB Type IE 9.2.22  Update the semantics of the Associated TRP ID IE in 9.2.82: "This IE specifies the TRP ID of the associated TRP from which the beam information parameters are adopted in Local Coordinate System (LCS)."  Align the TRP Beam Antenna Angles IE with LPP Azimuth and Elevation angle and fine angles values.  Revise the encoding of the Relative Power IE in 9.2.83 as "coarse" + optional "fine" values.  Add the following IEs in the MEASUREMENT UPDATE message:   * Number of TRP Rx TEGs IE and Number of TRP RxTx TEGs IE per TRP ID, * Measurement Characteristics Request Indicator IE   Add failure text description for the NRPPA POSITIONING INFORMATION FAILURE message when LMF requests the UE TEG Information Request and the NG-RAN fails to report any UE Tx TEG association. | | | |

## Discussion on the CRs proposed for F1AP

### 4.2.1 Nokia F1AP CR

The Nokia CR in [2] proposes to consider the following corrections for F1AP :

|  |
| --- |
| 1. 8.13.9.2, 9.2.12.13: UE TEG ID Information Request IE renamed to UE TEG Information Request IE to better align with its purpose and with ASN.1. 2. 8.13.16.2: The UE includes the full list of UE Tx TEG associations, not just what has changed since the last update. Also, “if supported” is deleted since the gNB-DU provides the UE Tx TEG Assocations only if requested by the gNB-CU in the POSITIONING INFORMATION REQUEST message. 3. 8.13.3.2: Procedural text for the Measurement Time Occasion IE is added. The gNB-DU is not mandated to use the number of measurement time occasions requested by the gNB-CU (i.e. “may”). 4. 9.2.12.28 & 9.4.4: Criticality Diagnostics IE added to tabular and ASN.1. 5. 9.2.12.3: It is clarified that the Response Time IE is ignored when the Positioning Report Characteristics IE is set to “Periodic”, in alignment with LPP. 6. 9.2.12.9 & 9.4.4: The criticality of the TRP Measurement Update List IE is changed to “ignore” in tabular and ASN.1. 7. 9.3.1.166 & 9.4.5: The criticality of the Zenith Angle of Arrival information IE, Multiple UL-AoA IE, and UL SRS-RSRPP IE is changed to “ignore” in tabular and ASN.1. 8. 9.3.1.235: Unused maxnoofPRSresource deleted. 9. 9.3.1.238: For LCS to GCS Translation IE, semantics description is clarified for the case where only ZoA is provided (as in e.g. 9.3.1.239). 10. 9.3.1.255: Unit of seconds is added to semantics description, in alignment with the reportingInterval IE in LPP. 11. 9.3.1.251 & 9.4.5: UE Tx TEG ID should be an integer beginning with value 1 (see ue-TxTEG-ID-r17 in RRC) 12. 9.2.12.3 & 9.4.5: The “Multiple UL AoA” and “UL SRS-RSRPP” codepoints are added to the Postioning Measurement Type IE. 13. General: miscellaneous corrections to the tabular, e.g. indentions in the IE/Group Name column, “Item” level added in lists to align with ASN.1, etc. |

**Q3: Companies to provide their reflections on the above proposed corrections, please input here.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Company** | **Agreeable proposals** | **Not agreeable proposals** | **Comment** |
| Ericsson | P1, P3, P4, P5, P8, P9, P10, P12, P13 (R17 items only) | P2, P6, P7, P11 | See comments for Q1 |
| **Moderator’s conclusion**  Based on the discussion, F1AP will be revised according to the acceptable NRPPa changes. | | | |

### 4.2.2 Ericsson F1AP CR

The Ericsson CR in [6] proposes to consider the following corrections for F1AP :

|  |
| --- |
| 1. Add the *Path Power* IE in *Additional Path List* IE 9.3.1.169 2. Update the semantics of the *Associated TRP ID* IE in 9.3.1.256: "This IE specifies the TRP ID of the associated TRP from which the beam information parameters are adopted in Local Coordinate System (LCS)." 3. Add Azimuth and Elevation fine angles in 9.3.1.257, 4. Revise completely the encoding of the *Relative Power* IE in 9.3.1.257. **This change is NBC.** 5. Add the following IEs in the POSITIONING MEASUREMENT UPDATE message :    1. *Number of TRP Rx TEGs* IE *and Number of TRP RxTx TEGs* IE per TRP ID,    2. *Response Time* IE,    3. *Measurement Characteristics Request Indicator* IE    4. *Desired number of reported additional path* IE, coded INTEGER(1..8) per TRP ID    5. *Desired number of UL AoA values per additional path* IE, coded INTEGER(1..8) per TRP ID    6. Revise the procedure text of the POSITIONING MEASUREMENT UPDATE message for the sake of genericity 6. Add failure description for the F1AP POSITIONING INFORMATION FAILURE message when gNB-DU fails to report the UE Tx TEG association when requested. 7. Add the AoA/AoZ uncertainty ranges in the *Angle Measurement Quality* IE in the *TRP Measurement Quality* IE in 9.3.1.172 |

**Q3: Companies to provide their reflections on the above proposed corrections, please input here.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Company** | **Agreeable proposals** | **Not agreeable proposals** | **Comment** |
| Ericsson | all |  |  |
| Nokia |  | P5b, d, e, f  P6, P7 | See NRPPa comments |
| **Moderator’s conclusion**  Based on the discussion, F1AP will be revised according to the acceptable NRPPa changes. | | | |

## 4.3 CATT NRPPA and F1AP CRs

The CATT CRs in [3-4] proposes to consider the following corrections for NRPPA and F1AP, respectively:

|  |
| --- |
| 1. Remove the PRS Measurement Info List IE from the MEASUREMENT ACTIVATION message. 2. Change the texts "Preconfigured measurement gap" to “preconfigured parameters” in the Measurement Activation procedure. 3. Introduce Measurement Deactivation procedure into NRPPa. |

**Since the proposals in the above CRs relate to the discussion on Positioning pre-configured PRS processing window, which is discussed in another CB** (**CB: # Positioning\_02\_PPW\_Procedures), moderator thinks it is best to take these proposals from CATT in [3-4] in the dedicated CB. Moderator will raise this aspect offline.**

# Conclusion, Recommendations

**Moderator’s conclusion on Nokia NRPPA CR**

Based on the discussion, the following proposals can be agreed:

8.2.6.2, 9.1.1.10: *UE TEG ID Information Request* IE is renamed to *UE TEG Information Request* IE.

8.2.7.2: “if supported” is deleted.

8.5.1.2: Procedural text for the Measurement Time Occasion IE is added.

9.1.4.1: the Response Time IE is ignored when the Report Characteristics IE is set to “periodic”

9.2.61: Unused maxnoofPRSresource deleted.

9.2.66: For LCS to GCS Translation IE, semantics description is clarified for the case where only ZoA is provided (as in e.g. 9.2.67).

9.2.70: Revision of the IE and init of seconds is added to semantics description, in alignment with the reportingInterval IE in LPP.

General: miscellaneous corrections to the tabular, e.g. indentions in the IE/Group Name column, “Item” level added in lists to align with ASN.1, etc.

Editorial change to be captured by the rapporteur:

9.2.5: Range value for optional lists changed from “0” to “0..1”.

**Moderator’s conclusion on Ericsson NRPPA CR**

Based on the discussion, the following proposals can be agreed:

Add the Path Power IE in Additional Path List IE 9.2.41

Add new codepoints : posSibType1-9, posSibType1-10, posSibType6-4, posSibType6-5 and posSibType6-6 in the Positioning SIB Type IE 9.2.22

Update the semantics of the Associated TRP ID IE in 9.2.82: "This IE specifies the TRP ID of the associated TRP from which the beam information parameters are adopted in Local Coordinate System (LCS)."

Align the TRP Beam Antenna Angles IE with LPP Azimuth and Elevation angle and fine angles values.

Revise the encoding of the Relative Power IE in 9.2.83 as "coarse" + optional "fine" values.

Add the following IEs in the MEASUREMENT UPDATE message:

* Number of TRP Rx TEGs IE and Number of TRP RxTx TEGs IE per TRP ID,
* Measurement Characteristics Request Indicator IE

Add failure text description for the NRPPA POSITIONING INFORMATION FAILURE message when LMF requests the UE TEG Information Request and the NG-RAN fails to report any UE Tx TEG association.

Based on the discussion, F1AP will be revised according to the acceptable NRPPa changes.

# References

1. R3-223123, Miscellaneous NRPPa corrections for NR Positioning Enhancements (Nokia, Nokia Shanghai Bell), CR0056r, TS 38.455 v17.0.0, Rel-17, Cat. F
2. R3-223124, Miscellaneous F1AP corrections for NR Positioning Enhancements (Nokia, Nokia Shanghai Bell), CR0870r, TS 38.473 v17.0.0, Rel-17, Cat. F
3. R3-223274, CR to 38.455 for Correction of Positioning Procedure (CATT), CR0059r, TS 38.455 v17.0.0, Rel-17, Cat. F
4. R3-223275, CR to 38.473 for Correction of Positioning Procedure (CATT), CR0895r, TS 38.473 v17.0.0, Rel-17, Cat. F
5. R3-223357, Positioning corrections (NRPPA) (Ericsson), CR0063r, TS 38.455 v17.0.0, Rel-17, Cat. F
6. R3-223358, Positioning corrections (F1AP) (Ericsson), CR0905r, TS 38.473 v17.0.0, Rel-17, Cat. F