3GPP TSG-RAN WG3 #116 [R3-223711](file:///C%3A%5CUsers%5Cezlyamo%5CAppData%5CLocal%5CTemp%5CTemp1_RAN3_116-e_agenda_20220502.zip%5CInbox%5CR3-223711.zip)

9th – 19th May 2022

Online

Agenda Item: 9.1.5.1

Source: Ericsson (moderator)

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

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%3A%5CUsers%5Cezlyamo%5CAppData%5CLocal%5CTemp%5CTemp1_RAN3_116-e_agenda_20220502.zip%5CInbox%5CR3-223711.zip)

# For the Chairman’s Notes

<TBD>

# Discussion- Second round

<TBD>

# 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 :

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

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| **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 8.5.3.4P7: editorial and not part of Rel-17 workP8: 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-213174P11: 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 InformationThis IE contains the UE Reporting Information.

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| 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 EricssonOthers ok |
| Qualcomm |  |  | This looks all good. Two comments:9.2.70 UE Reporting InformationThe 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 AssociationThis 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. |
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### 4.1.2 Ericsson NRPPA CR

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

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

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| **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 AnglesElevation 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 PowerThis 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, fP7, 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 UpdateP6f: 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 PowerThank you for the tip on overhead reduction. Ok to define the “fine” version as optional as we have for the angles.

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| 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 |

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## 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 :

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

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| **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 |
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### 4.2.2 Ericsson F1AP CR

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

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

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| **Company** | **Agreeable proposals** | **Not agreeable proposals**  | **Comment** |
| Ericsson | all |  |  |
| Nokia |  | P5b, d, e, fP6, P7 | See NRPPa comments |
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## 4.3 CATT NRPPA and F1AP CRs

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

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| 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.
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**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 [if needed]

# 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