**3GPP TSG RAN WG1 #110bis-e R1-2210266**

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

**Agenda item:** 8.5

**Source:** Moderator (CATT)

**Title:** Summary for preparation phase on maintenance of Rel-17 WI on NR positioning enhancements

**Document for:** Discussion and Decision

## Introduction

This document provides a summary of maintenance maintenance issues of Rel-17 WI on NR positioning enhancements for the following email discussion.

[110bis-e-R17-Pos-01] Email discussion to determine maintenance issues to be handled in RAN1#110bis-e by October 12 – Ren (CATT)

* Additional email discussions will be set up once the maintenance issues for RAN1#110bis-e are determined

## Issues on NR positioning enhancements

The issues submitted to RAN1#110bis-e are summarized in the following tables. The initial assessment on each of the maintenance issues is also provided by the Rel-17 FLs, where

* *High priority (H):* high-priority item (essential, pending issues, broken spec components) and proposed editorial changes that either enhance the clarity of the specs or correct mistakes
* *Non-essential (N)*: all other purposes such as spec optimization and low priority issues
* *Editorial (E)*: editorial issues that will be handled as editorial CRs (to be communicated to the editors/chairs)

Interested companies are encouraged to provide these initial views, if any, to the last column of the table views by 23:59 (UTC) on Day1 of RAN1#110bis-e.

**Table 1 - Accuracy improvements by mitigating UE Rx/Tx and/or gNB Rx/Tx timing delays**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue#** | **Description of the issue** | **References** | **FL initial assessment** | **Company inputs and FLs’ responses** |
| 1-1 | The tdocs propose some correction of Tx TEG reporting based on RAN1’s agreement. | R1-2208939[10]  R1-2208940[11] | H |  |
| 1-2 | The tdoc proposes adding the description of TEG margin reporting to TS 38.214 based on RAN4’s LS on TEG frame work | R1-2209211[14] | H |  |
| 1-3 | The tdoc proposes the clarification of the Tx timing error difference in UE Tx TEG definition.  **FL comment:**   * The title in cover page seems not correct. | R1-2210101[26] | H |  |

**Table 2 - Accuracy improvements for UL-AoA positioning solutions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue#** | **Description of the issue** | **References** | **FL initial assessment** | **Company inputs and FLs’ responses** |
| 2-1 | None |  |  |  |
| 2-2 |  |  |  |  |

**Table 3 - Accuracy improvements for DL-AoD positioning solutions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue#** | **Description of the issue** | **References** | **FL initial assessment** | **Company inputs and FLs’ responses** |
| 3-1 | Correction on missing descriptions for timestamp of DL PRS-RSRPP  FL : align RAN1 specs with RAN2 specifications. | R1-2208601  R1-2210211 | H |  |
| 3-2 | Correction to the Rx beam reporting condition for DL-AoD  FL: RSRPP should support use of the same rx beam index | R1-2209837 | H |  |
| 3.3 | Clarification of the limitation of 24 RSRP/RSRPP reports for AOD  FL: OK to discuss but not sure if the spec is broken without it. | R1-2210212 | H |  |

**Table 4 - Information reporting from UE and gNB for multipath/NLOS mitigation**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue#** | **Description of the issue** | **References** | **FL initial assessment** | **Company inputs and FLs’ responses** |
| 4-1 | LOS/NLOS Indicator details | R1-2208603 [4] | N/E |  |
| 4-2 | RSRPP and RSTD measurement alignment | R1-2208732 [7]  R1-2208731 [6] | H |  |
| 4-3 | Alginment on RSRPP parameters | R1-2209458 [15] | E |  |

**Table 5 - Latency improvements for both DL and DL+UL positioning methods**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue#** | **Description of the issue** | **References** | **FL initial assessment** | **Company inputs and FLs’ responses** |
| 5-1 | PRS and UL collision timeline | R1-2208472 [1]  R1-2209705 [20]  R1-2209706 [21]  R1-2209838 [23]  R1-2209839 [24] | H |  |
| 5-2 | SSB priority within the PPW  FL comments: Seems RAN4 business | R1-2209701 [16]  R1-2209702 [17] | N |  |
| 5-3 | Description of DL signals/channels | R1-2208602 [3] | E |  |
| 5-4 | Capturing CBM for FR2  FL comments: It appeared that RAN4 made some agreement in the last meeting. | R1-2209209 [12] | H |  |
| 5-5 | Associating priority state with UE capability  FL comments: The agreement on TP in RAN1#110 tended to align with state description irrespective of UE capability options. | R1-2209210 [13] | N |  |
| 5-6 | PPW higher layer parameters | R1-2209840 [25] | E |  |

**Table 6 - RRC\_ INACTIVE positioning**

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| --- | --- | --- | --- | --- |
| **Issue#** | **Description of the issue** | **References** | **FL initial assessment** | **Company inputs and FLs’ responses** |
| 6-1 | Switchingt time for option 2 | R1-2208731 [6] | H |  |
| 6-2 | SRS-UL collision timeline | R1-2209703 [18]  R1-2209704 [19] | H |  |

**Table 7 - On-demand DL PRS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue#** | **Description of the issue** | **References** | **FL initial assessment** | **Company inputs and FLs’ responses** |
| 7-1 | None |  |  |  |
| 7-2 |  |  |  |  |

## Conclusion

Based on the email discussion, the list of issues recommended to be handled in RAN1#110bis-e is provided in the following table.

**Table 8 - FL recommendation**

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| --- | --- | --- |
| **Issue#** | **FL Final assessment** | **Comments** |
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*Note: The following tdocs are related to FR2-2, and will be discussed in the email thread [110bis-e-R17-Pos-02]:*

* R1-2208604, Correction on SCS for NR DL PRS vivo
* R1-2208734 Correction on DL PRS subcarrier spacings for FR2-2 Nokia, Nokia Shanghai Bell

# References

1. R1-2208472 Maintenance of Rel-17 NR positioning Huawei, HiSilicon
2. R1-2208601 Correction on missing of DL PRS-RSRPP vivo
3. R1-2208602 Correction on description alignment of ‘DL signals and channels‘ vivo
4. R1-2208603 Correction on description of LoS/NLoS indicator vivo
5. R1-2208604 Correction on SCS for NR DL PRS vivo
6. R1-2208731 Maintenance of NR Positioning Enhancements Nokia, Nokia Shanghai Bell
7. R1-2208732 Correction on PRS RSTD and PRS RSRPP reporting Nokia, Nokia Shanghai Bell
8. R1-2208733 Correction on SRS for positioning switching time Nokia, Nokia Shanghai Bell
9. R1-2208734 Correction on DL PRS subcarrier spacings for FR2-2 Nokia, Nokia Shanghai Bell
10. R1-2208939 Correction on UE Tx TEG association information reporting CATT
11. R1-2208940 Discussion on UE Tx TEG association information reporting CATT
12. R1-2209209 Draft CR on collision in PPW for inter-band case ZTE
13. R1-2209210 Draft CR on priority issue in PPW ZTE
14. R1-2209211 Draft CR on UE TEG framework ZTE
15. R1-2209458 Alignment CR on positioning for 38.214 ZTE
16. R1-2209701 Discussion on SSB priority on PRS Samsung
17. R1-2209702 Draft CR for SSB priority on PRS Samsung
18. R1-2209703 Discussion on SRS collisition timeline check in inactive state Samsung
19. R1-2209704 Draft CR for SRS collisition timeline check in inactive state Samsung
20. R1-2209705 Discussion on PRS collision handling for UL signals in PPW Samsung
21. R1-2209706 Draft CR for PRS collision handling for UL signals in PPW Samsung
22. R1-2209837 Correction to the Rx beam reporting condition for DL-AoD Huawei, HiSilicon
23. R1-2209838 Correction to the collision timeline for PRS and UL - 38.214 Huawei, HiSilicon
24. R1-2209839 Correction to the collision timeline for PRS and UL - 38.213 Huawei, HiSilicon
25. R1-2209840 Correction to the PRS processing window Huawei, HiSilicon
26. R1-2210101 Draft CR to 38.214 on definition of UE Tx TEG Ericsson
27. R1-2210211 Adding DL PRS-RSRPP to the applicable measurements Huawei, HiSilicon
28. R1-2210212 Correction to the applied positioning method for RSRP and RSRPP reporting Huawei, HiSilicon
29. R1-2210213 Correction to numerology and CP for positioning in RRC\_INACTIVE state Huawei, HiSilicon