**3GPP TSG-RAN WG3 Meeting #129 R3-25xxxx**

**Bengaluru, India, 25 – 29 August 2025**

**Agenda item: 20.2**

**Source: Ericsson**

**Title: Summary of AIML for PHY (Positioning) offline discussion before online session**

**Document for: Discussion and Decision**

# 1 Introduction

This contribution provides summary of offline discussion on AI/ML for PHY (Positioning) before the online session.

# 2 For the Chair’s Notes

# 3 Case 3a issues

### 3.1 LoS/NLoS inference indication to LMF

It has been proposed by some companies to indicate over NRPPa that the reported LoS/NLoS indication can also be an inferred result in the *TRP Measurement Result* IE.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 9.2.37 TRP Measurement ResultThis information element contains the measurement result.

| **IE/Group Name** | **Presence** | **Range** | **IE Type and Reference** | **Semantics Description** | **Criticality** | **Assigned Criticality** |
| --- | --- | --- | --- | --- | --- | --- |
| **Measured Result Item** |  | *1 .. <maxnoPosMeas>* |  |  | - |  |
| //skipped irrelevant rows// |
| >LoS/NLoS Information | O |  | 9.2.77 |  | YES | ignore |
| //skipped irrelevant rows// |
| >Inferred measurement | O |  | ENUMERATED(true, …) | This IE is only valid for UL-RTOA, gNB Rx-Tx Time Difference and (FFS) LoS/NLoS Information. | YES | ignore |

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| **Range bound** | **Explanation** |
| maxnoPosMeas | Maximum no. of measured quantities that can be configured and reported with one positioning measurement message. Value is 16384. |
| maxnoaggregatedPosSRS-Resources | Maximum no of aggregated Positioning SRS resources per UL BWP. Value is 3. |

EN: FFS if LoS/NLoS Information can also be indicated as inferred. |

1. Supporting companies: SS, Xiaomi, CEWIT, QC,
2. Non-supporting companies: E///, ZTE, Nokia, Huawei, CATT

**From RAN1 agreements**

* + Note: It is up to RAN3 to decide whether the field of LOS/NLOS indicator should be removed or kept.
	+ For measurement report of AI/ML assisted positioning Case 3a, regarding the report of LOS/NLOS indicator: LOS/NLOS indicator can’t be reported independently from other measurements

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| **Agreement (RAN1#118bis)**From RAN1 perspective, when timing information is reported for Rel-19 AI/ML positioning Case 3a, at least the following are mandatorily or optionally supported in a measurement report from gNB to LMF:* (Mandatory) timing information;
* (Optional) Quality of the timing information;
	+ Existing IE “Timing Measurement Quality” can be reused.
* (Mandatory) Time stamp.
* FFS: LOS/NLOS indicator.
* (Optional) LOS/NLOS indicator with legacy format

Note: The final decision of “mandatory” or “optional” presence of each field is up to RAN3.Note: It is up to RAN3 to decide whether the field of LOS/NLOS indicator should be removed or kept. |

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| **Agreement (RAN1 #117)**For AI/ML assisted positioning Case 3a, at least LOS/NLOS indicator and/or timing information are supported for reporting. * If LOS/NLOS indicator is reported, the indicator can be reported as soft indicator or hard indicator as defined in 38.214.
* If timing information is reported, the timing information at least can be reported via UL RTOA or gNB Rx-Tx time difference as defined in 38.215.
* Note: details of the report are pending further discussion.
 |

**Moderator:** it is questionable what will LMF behaviour be upon knowing that the LoS/NLoS indicator is “inferred”, and since it is a channel attribute rather than timing information, it does not seem right to mention it is inference result. However, some stage 2 clarification could perhaps be captured that the indicated los is associated to an inferred result:

**Proposal 1: clarify in semantics of LoS/NLoS Information in 9.2.37 and possibly in stage 2, that the indicated LoS/NLoS in the TRP measurement result IE is associated to the inferred timing measurement when the Inferred measurement is set to true. Delete LoS/NLoS Information from Inferred measurement and remove FFS.**

**Summary of offline discussion:**

### 3.2 LMF to specifically request for AI/ML inferred measurements from TRPs

a. Pro: All companies except CATT and NEC.

**RAN1 conclusion:** Rel-19 AI/ML measurements are different from legacy measurements.

Moderator: Many companies wish to give control at LMF when to request for inferred measurements, based on positioning QoS, desire for analytics and to distinguish if measurements have been derived using legacy or inference methods (Hw).

**Proposal 2: Introduce a new bit “inferred timing measurement” in the MCRI**

Alternatively, introduce two bits distinguishing inferred UL-RTOA and inferred gNB Rx-Tx TD. However we do not have many bits left in MCRI….

**Summary of offline discussion:**

### 3.3 Positioning Data Collection Needed IE:

1. **Encoded as top level IE or as withing a TRP list?**
2. **Should a time stamp be added indicating the desired time for report of data collection**
3. **Whether UE location can be part of requested part B information?**
4. **Stage 2 updates and clean up:**
	1. **Add an LCS consent check step at LMF.**
	2. **Indication of time stamp as correlation information**
	3. **“Positioning information” vs “measurement information”**
	4. **Clean up and EN removals**
	5. **Any others?**

**Proposal 3: Discuss the details of Positioning Data Collection Needed IE (top level or per TRP, indication of time stamp) and update stage 2/3**

**Summary of offline discussion:**

### 3.4 POSITIONING DATA COLLECTION REPORT message:

1. **LoS/NLoS Information Semantics, remove restriction on it being depending on presence of timing measurements (QC, CEWIT)**

**Moderator:** RAN1 agreement: LosNLOS is a measurement attribute cannot be sent standalone during training. same as for inference

1. **New codepoints where majority proposes to re-encode the Positioning Data Unavailable IE as ENUMERATED (no data available, user consent not granted, ...).**

QC propose to add other types

- Positioning Data Information Not Supported

- Positioning Data Information Supported But Currently Not Available

- Not Provided Positioning Data Information Not Supported (??)

**Moderator:** these seem unclear and overly complicated.

**Stage 2 updates from R3-255160:**

1. **Add a description of the new Positioning Data Collection Information Transfer procedure under sub-clauses 8.10.3.2 and 8.13.3.2. [QC]**
2. **The sub-clauses 8.10.2.4 and 8.13.2.3 ("Information that may be transferred from the LMF to gNBs") should also include the information transferred via the new POSITIONING DATA COLLECTION REPORT message (i.e., the "ground-truth label" information). [QC] Proposal 2: Introduce a new bit “inferred timing measurement” in the MCRI**

**Proposal 4: Discuss the remaining open points in the Positioning Data Collection Information Transfer procedure (code points) and capture stage 2 descriptions**

**Summary of offline discussion:**

### 3.5 Proactive data solution

Due to SA2 LS, the Proactive (i.e., NGAP solution) is not pursued in Rel-19, agree to work on it in Rel-20.

**Proposal 5: send a LS to RAN plenary that RAN3 will work on NG-RAN triggered data collection for NG-RAN assisted positioning (Case 3a) in Rel-20**

**Summary of offline discussion:**

### 3.6 OAM function

For AI/ML assisted positioning Case 3a, the AI/ML model training function is not located in the OAM, only in the gNB. (not supporting: CT, Hw)

Moderator: OAM is true for Rel-18 use cases, but if we include OAM, it will not be supported in the overall 3GP specs, because SA5 is not included/impacted.

**Proposal 6: Agree the TPs R3-255456 and R3-255503**

[R3-255456](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255456.zip) (TP to TS 38.300) AI/ML Training in OAM for case 3a (Nokia, Ericsson, Xiaomi, Samsung, CATT, ZTE)

[R3-255503](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255503.zip) (TP to BL CR to 38.401) AI/ML assisted Positioning (ZTE Corporation, Ericsson, Xiaomi, Nokia, Samsung, CATT)

**Summary of offline discussion:**

# 4 Case 3b:

### 4.1 New measurements UL-SRS-TDCT and UL-SRS-TDCP

**Proposal 6 1: Replace the Sample-based UL RTOA with UL SRS-TDCT and remove the FFS, and replace the UL SRS-RSRPP with UL SRS-TDCP. Agree R3-255337 and R3-255572**

[R3-255337](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255337.zip) (TP to BL CR TS 38.473) addition of UL SRS time domain channel measurement (Xiaomi, Ericsson, CATT, Nokia, Samsung)

[R3-255572](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255572.zip) (TP to NRPPa BL CR): addition of UL SRS time domain channel measurement (Ericsson, Xiaomi, CATT, CEWIT, Nokia, Samsung)

**Summary of offline discussion:**

### 4.2 Stage 2 update

**Proposal 7: Introduce a NOTE in the TP for BLCR to TS 38.305 to indicate that a gNB may use different Nt', Nt and/or k values, other than the signalled parameters for measurement**

**Summary of offline discussion:**

# 5 Other proposals

1. **Lenovo R3-255407 (TP to BLCR 38.455) Provision of associated ID in Case 1 propose that LMF request for associated TRP ID**
2. **NEC R3-255201 propose to add new cause values for case 3b measurements**

Moderator:

* Case 1 is not part of RAN3 scope
* Existing cause values can be re-used

**Summary of offline discussion:**

# 6 Other issues

Please add any missing issues.

**Issue #: (Company) description of the issues**

**Issue #1:**

# References

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| [R3-255009](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255009.zip) | LS on Rel-19 AI/ML positioning higher layer parameters list Post RAN1#121 (RAN1(Ericsson)) | LS in |
| [R3-255016](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255016.zip) | Logged Data Handling During Handover (RAN2(Nokia)) | LS in |
| [R3-255023](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255023.zip) | Reply LS on AI/ML Positioning Case 3a (SA2(Nokia)) | LS in |
| [R3-255029](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255029.zip) | Reply LS on OAM-centric solution for NW-side data collection (SA5(Huawei)) | LS in |
| [R3-255160](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255160.zip) | Views on the Open Issues for AI/ML Positioning Accuracy Enhancements (Qualcomm Incorporated) | Discussion |
| [R3-255161](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255161.zip) | TP to BL CR for TS 38.305 (Qualcomm Incorporated) | Other  |
| [R3-255184](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255184.zip) | (TP to BL CR for TS38.305) Support of AI Positioning (CATT) | Other |
| [R3-255185](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255185.zip) | (TP to BL CR for TS38.455) Support of AI Positioning for Case 3a (CATT) | Other |
| [R3-255200](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255200.zip) | [TP for BL CR to TS 38.305 & TP for BL CR to TS 38.455] Discussion on AI/ML for positioning Case 3a (NEC) | Other |
| [R3-255201](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255201.zip) | [TP for BL CR to TS 38.455] Discussion on AI/ML for positioning Case 3b (NEC) | Other |
| [R3-255288](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255288.zip) | Remaining Issues for AI/ML based positioning case 3a and TP to NRPPa (CEWiT, IITM, Tejas Networks) | Discussion |
| [R3-255336](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255336.zip) | (TPs for TS 38.305 and TS 38.455) Support of gNB-side model (case 3a) (Xiaomi) | Other |
| [R3-255337](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255337.zip) | (TP to BL CR TS 38.473) addition of UL SRS time domain channel measurement (Xiaomi, Ericsson, CATT, Nokia, Samsung) | other |
| [R3-255338](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255338.zip) | (Draft LS out) Logged data handling during handover (Xiaomi) | LS out To: RAN2 CC:  |
| [R3-255372](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255372.zip) | (TPs for AI/ML BLCR to TS 38.300/305/401/455/473) Remaining open issues for AI/ML-based positioning Case 3a and Case 3b (Huawei) | Other |
| [R3-255373](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255373.zip) | (Draft Reply LS to RAN2) Discussion on R3-255016 (R2-2504950) LS Logged Data Handling During Handover (Huawei) | other |
| [R3-255377](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255377.zip) | Discussion on support of AI/ML assisted positioning (Case 3a) (China Telecom) | Discussion |
| [R3-255378](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255378.zip) | (TP to TS38.305) On support of AIML assisted positioning (China Telecom) | other |
| [R3-255406](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255406.zip) | Discussion on NW side data collection (Lenovo) | discussion |
| [R3-255407](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255407.zip) | (TP to BLCR 38.455) Provision of associated ID in Case 1 (Lenovo) | Other |
| [R3-255456](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255456.zip) | (TP to TS 38.300) AI/ML Training in OAM for case 3a (Nokia, Ericsson, Xiaomi, Samsung, CATT, ZTE) | other |
| [R3-255457](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255457.zip) | (TP to TS 38.305) Addressing remaining aspects in case 3a and case 3b (Nokia) | other |
| [R3-255458](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255458.zip) | Logged Data Handling after a Handover Event (Nokia) | discussion |
| [R3-255459](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255459.zip) | [Draft] Reply LS on Logged Data Handling During Handover (Nokia) | LS out To: RAN2 CC: SA5 |
| [R3-255503](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255503.zip) | (TP to BL CR to 38.401) AI/ML assisted Positioning (ZTE Corporation, Ericsson, Xiaomi, Nokia, Samsung, CATT) | other |
| [R3-255504](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255504.zip) | (TP to BL CR to 38.455) Support of AI/ML assisted Positioning (case 3a) (ZTE Corporation) | Other |
| [R3-255505](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255505.zip) | [Draft LS] Reply LS on logged Data Handling During Handover (ZTE Corporation) | other |
| [R3-255570](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255570.zip) | (TP to NRPPa/TS 38.305 BL CR): Addressing remaining issues of NW-assisted AI/ML positioning with gNB-sided model (Ericsson, Nokia) | other |
| [R3-255571](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255571.zip) | Way forward for Proactive (NGAP-based solution) for AI/ML NG-RAN assisted positioning (Ericsson) | discussion |
| [R3-255572](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255572.zip) | (TP to NRPPa BL CR): addition of UL SRS time domain channel measurement (Ericsson, Xiaomi, CATT, CEWIT, Nokia, Samsung) | other |
| [R3-255583](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255583.zip) | [Draft] Reply LS on AI/ML Positioning Case 3a (Nokia) | LS out To: SA2 CC:  |
| [R3-255669](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255669.zip) | Discussion on AI for positioning case 3a and case 3b (Samsung) | Discussion |
| [R3-255670](file:///C%3A%5CUsers%5Cq12059%5CDocuments%5C3GPP%20RAN3%5CRAN3%20Meetings%5CRAN3_129%20%28Aug%202025%2C%20Bangalore%29%5CDocs%5CR3-255670.zip) | Discussion on Logged Data Handling During Handover (Samsung) | other |