3GPP TSG-RAN WG4 Meeting #116 R4-250xxxx

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

**Agenda item:** 7.17.1

**Source:** Qualcomm Incorporated

**Title:** AI/ML ad-hoc meeting minutes

**Document for:** Approval

# Introduction

The discussion on the AI/ML study is organized in two threads [126] and [127] in RAN4#114-bis. The ad-hoc meeting will discuss some of the topics from the moderator summary in [1].

# Discussion

## Topic #1: CSI reporting requirement and testing framework for CSI prediction

### Sub-topic 1-1

*Performance monitoring*

Several companies proposed to introduce Type 3 performance with SGCS reporting

**Issue 1-1: Performance monitoring**

* Proposals
	+ Option 1: Introduce requirements for Type 3 performance monitoring
	+ Option 2: other performance monitoring framework/requirement
	+ Option 3: do not introduce any monitoring requirements
* Recommended WF

Option 1

Discussion:

Apple: this is just high level about some requirements

Moderator: yes

Agreement:

RAN4 will introduce requirements for Type 3 performance monitoring for CSI prediction

FSS which requirements are to be introduced.

### Sub-topic 1-2

*Requirements for monitoring*

A framework for the monitoring requirements should be discussed and agreed

**Issue 1-2: Requirement baseline**

* Proposals
	+ Option 1: Introduce reporting delay, accuracy and reporting mapping requirements
		- Reporting delay should follow the same framework as for beam management use case
			* Delay to be defined as the period from the time when UE sends RRCReconfigurationComplete message in response to the configuration of monitoring RS resources via RRCReconfiguration, to the time when UE reports the first performance monitoring metric.
	+ Option 2: Others
* Recommended WF
	+ Option 1, discuss if the proposed delay definition can be agreed

Discussion:

Qualcomm: RAN1 already agreed the report mapping. It is already agreed how SGCS is mapped to bits. The proposals on the delay is focused on periodic, we should discuss these details later.

Apple: we should still have the mapping in 38.133 in section 10. Even if RAN1 agreed, we still have something in RAN4 specs. For the accuracy we are not sure.

E///: regarding the mapping table, RAN1 already have a mapping table in 211. Regarding accuracy, I don’t know whether to put the accuracy in 133 or 101-4. This would be a performance discussion

Samsung: RAN1 design has 4 bits for SGCS. We should define the mapping between those bits and what value is meant by each value.

Oppo: for the accuracy, it is not clear how to test. We need to specify some requirements.

Qualcomm: for the accuracy, the only way to have a requirement is to check that the report exceeds a threshold. This is only way to pass the test.

Ericsson: from a network point of view, we are always worried about the accuracy reporting.

Apple: we might be able to test indirectly.

Agreement:

Introduce the following requirements for CSI performance monitoring:

* Reporting delay
	+ FFS how the delay is defined
* Reporting accuracy
	+ FFS on whether accuracy requirement can be defined/checked
* Mapping table – To be checked whether RAN1 captures or RAN4
* If it is not feasible to define reporting accuracy requirement or test it, RAN4 will send an LS to RAN1 to inform RAN1 about this

### Sub-topic 1-3

*CSI Prediction activation delay*

**Issue 1-3: Activation delay for CSI Prediction**

|  |
| --- |
| **Agreement from General Aspect (BM use case) RAN4#115:****Activation delay:*** **For semi-persistent CSI reporting**
* **Activation delay starts at the reception of the MAC-CE/DCI**
* **For aperiodic CSI reporting**
* **Activation delay starts at the reception of the DCI**
 |

* Proposals
	+ Option 1: Introduce activation delay for CSI prediction for both periodic and aperiodic (or semi-persistent) reporting

Activation delay starting time

* + For period CSI reporting, activation delay starts when UE sends RRCReconfigurationComplete message containing applicable functionality report.
	+ For aperiodic CSI reporting, activation delay starts at the reception of the DCI.
	+ For semi-persistent CSI reporting, activation delay starts at the reception of the MAC-CE/DCI.

Activation delay ending time

* + RAN4 to consider first inference report as the end point to define activation delay requirements for periodic/aperiodic/semi-persistent CSI reporting for CSI prediction use cases.
	+ Delay value TBD, to be discussed/agreed in next meeting
	+ Option 2: No need for any explicit activation delay, can be handled as any other RRC reconfiguration
	+ Option 3: others
* Recommended WF
	+ To be discussed

Discussion:

CMCC: we support to define activation delay, for prediction only semi-persistent or aperiodic is supported so no need to consider periodic

Apple: in our understand it would need a requirement if it is something extra compared ot the usual RRC configuration. What is the difference between this and reporting of other measurements or CSI currently?

Qualcomm: agree with CMCC, not needed for periodic. For semi-persistent and aperiodic, proposals is that it starts from the command to report until it is sent. How is this different from regular prediction. It would be implicitly tested during the test for inference.

CMCC: we think this case is similar is same as for BM prediction, we agreed that we will define activation delay and starting point

Xiaomi: for CSI reporting we just have the normal timeline. We do not have any dedicated requirement for such reporting timelines

Oppo: we need to think about this, compared to the legacy solution there could be extra delays on this.

Nokia: we agree with CMCC and oppo about LCM, we think that activation is a more important aspect. First report could be a special report

MTK: first report could be different than the subsequent ones. For the 1st one, the UE needs to decode the MAC-CE. UE might need several observations to get the prediction. UE might have to wait for the observation window. Whether the model is active/loaded will depend on implementation.

### Sub-topic 1-4

*Reporting delay requirement*

The delay between the CSI-RS and UCI containing the report with the predicted PMI should be agreed

**Issue 1-4: Reporting delay requirement**

* Proposals
	+ Option 1: Use 4ms separation between CSI-RS and predicted PMI report
	+ Option 2: Use 4+Xms separation between CSI-RS and predicted PMI report
		- X to be defined by RAN1
	+ Option 3: wait for RAN1 decision
	+ Option 4: other
* Recommended WF
	+ Option 3

Discussion:

Qualcomm: RAN1 has started discussing this, we should for RAN1 discussion

Apple: this should not be from periodic. This should come from RAN1, nothing RAN4 needs to do.

Agreement:

Option 3

### Sub-topic 1-5

*Scheduling delay*

The delay from when the UE prediction is send until the time the TE applies should be discussed and agreed

**Issue 1-5: Scheduling delay**

* Proposals
	+ Option 1: n+4
	+ Option 2: n+3
	+ Option 3: n+2
	+ Option 4: others
* Recommended WF
	+ Option 1

Discussion:

### Sub-topic 1-6

*Generalization*

Several companies proposed to further study generalization issues and how to ensure that the UE performance does not degrade under different conditions.

**Issue 1-6: Generalization**

* Proposals
	+ Option 1: Introduce tests with different MCSs
		- MCS 13
		- MCS4
		- MCS19
		- MCS20
		- >MCS20
	+ Option 2: Introduce tests for different throughput metrics:
		- 90%
		- 70%
		- 30%
	+ Option 3: different SNR points
	+ Option 4: Combinations of the above
	+ Option 5: further discuss after more evaluation through simulation
* Recommended WF
	+ To be discussed

Discussion:

### Sub-topic 1-7

*Doppler values*

There are proposals to further limit the Doppler values being consider

**Issue 1-7: Doppler values**

* Proposals
	+ Option 1: keep 20Hz and 50Hz
	+ Option 2: keep only 20Hz
	+ Option 3: others
* Recommended WF
	+ Option 1

Discussion:

### Sub-topic 1-8

*Simulation results and next steps*

Several companies provided simulation results based on the agreed assumptions. The results and next steps in the simulation evaluation campaign should be discussed

**Issue 1-8: Simulation results**

* Proposals
	+ Discuss the simulation results and next steps
		- Simulation results
		- Refinement of parameters:
			* Introduce realistic channel estimation
			* Further discuss CSI-RS configuration, codebook configuration, Dopller, SNR, etc
* Recommended WF
	+ To be discussed

Discussion on refinement of simulation parameters to be done mainly offline

Discussion:

Oppo: we have more simulation results, for step 2, there is good alignment among 3 companies. We would more input for step 3, so far no good alignemtn. We should further check the assumptions and more input is needed.

Oppo to lead the offline discussion on the next steps for the simulation campaign.

## Topic #2: RRM core requirement and testing framework for beam management

### Sub-topic 2-1

*Measurement period for inference*

Some agreements were made for case 1 but case 2 was still TBD. As this requirement will impact the core, it is important that progress is made

**Issue 2-1: Measurement period for inference**

Proposals

* + Option 1: reuse existing measurement period (existing M, N, P) for both case 1 and case 2
		- Agree the baseline requirements, discuss if this should be combined with any other features in future meetings
	+ Option 2: reusing existing measurement period (existing M,N,P) for case 1, introduce a scaling factor T to increase the delay for case 2
		- T defined as a capability or dependent on M, N, P
	+ Option 3: other options
* Recommended WF
	+ Option 1

From a network operation point of view, it seems best to have consistent delays irrespective of which case is used.

If option 2 is preferred, how to define the additional scaling factor should be further discussed

Moderator recommends we do not combine the BM prediction feature with any other feature because there would be no time to finalize the requirements and specification would become unnecessarily complex.

Discussion:

Vivo: we support option 1, for case 1 we should have 1 shot measurement. For case 2, not clear. For combination with other features, we should check.

Qualcomm: we support option 2, but for case 2 we should have multiple samples. We could have it a fixed value.

MKT: UE might have to do both legacy measurenets and AI based prediction. UE can follow what it can do in legacy. The legacy measurement should stay the same.

Vivo: T would depend on how accuracy we can be. Will we have different accuracy requirements for case 1 and case 2?

Nokia: observation period is not clearly defined now

Xiaomi: observation window is better than period

Vivo: will we do sims for case 2 ?

Samsung: we agree with the contents, T is part of core, how are we going to decide that in such short time

Agreement:

observation period for prediction: (observation period is the amount of time during which UE samples the reference signals to make 1 prediction report)

For case 1 reuse M,N,P from legacy measurement requirements

For case 2, use T\*M, N P (M,N,P same as legacy measurement requirement)

 FFS on T value, T can also be 1. T can also be based on capability

This observation period is to be used for the prediction delay requirement

### Sub-topic 2-2

*Prediction report delay*

For the final requirement, a timeline between measurement and the final report should be established

**Issue 2-2: Prediction report delay**

* Proposals
	+ Option 1: Overall timeline to be measurement delay + inference delay + report
	+ Option 2: others
* Recommended WF
	+ Option 1

Inference delay should be further discussed. For now can be introduced a parameter but some numbers will be needed to finalize the requirements

Discussion:

### Sub-topic 2-3

*TCI State Handling*

In the previous meeting several agreements were reached regarding the handling of TCI state switching relative to whether it is known/unknown and the UE Rx beam knowledge. The agreements are listed above.

**Issue 2-3: TCI State Handling**

* Proposals for known TCI state
	+ Detectability and SNR conditions:
		- Option 1:
			* The UE has sent at least 1 L1-RSRP report for the target/predicted TCI state before the TCI state switch command
			* The TCI state remains detectable during the TCI state switching period
			* The SSB associated with the TCI state remain detectable during the TCI switching period
				+ SNR of the TCI state ≥ -3 dB
			* For BM case-1 and case-2, when the target TCI state is predicted (in Set A) and is not QCL-D to any previously measured RS, there is no physical RS transmission for the target. Therefore, the conditions of "detectable RS" and "SNR ≥ -3dB" cannot be applied and should be exempted.​
		- Option 2: others
	+ Time conditions:
		- Option 1: TCI state switch command is received within 1280 ms upon the last transmission of the RS resource for beam reporting or measurement
		- Option 2: TCI state switch command is received within X\*1280 ms upon the last transmission of the RS resources for beam reporting or measurement
			* X can depend on case 1/2 and can be 1
		- Option 3:
			* For BM case 1, TCI state switch command is received within T\_prediction\_valid upon the last transmission of the RS resources for reporting. T\_prediction\_valid is a prediction-validity time related to channel coherence; FFS value/range.
			* For BM case 2, TCI state switch command is received within Tprediction\_time\_period + Tprediction\_valid upon the last transmission of the RS resources for beam reporting .
		- Option 4:
			* option 1 when target TCI state is based on RS from set A that is QCL type-D to a known measured TX beam.
			* Option 2 when target TCI state is based on RS from set A that is not QCL type-D to a known Tx beam and UE reports [TCI state known] capability.
		- Option 5: others
	+ QCL relationship:
		- Option 1: Target TCI state is based on RS from set A beams with QCL relationship configured to a set B beam
		- Option 2: For BM case-1, if the predicted Tx beam in Set A is QCL Type-D to a known measured Tx beam, where TX beam can be both inside or outside set B, the corresponding Rx beam is known.
		- Option 3: If the predicted Tx beam in Set A is not QCL Type-D to a known Tx beam, known TCI state conditions shall be updated as
			* UE reports [TCI state known] in Capability X, and
		- Option 4:
			* For BM-Case 1, when the UE has the capability to know the corresponding Rx beam, RAN4 needs to further discuss:
				+ If the UE supports this capability, for MAC-CE-based TCI state switch delay for known TCI state, whether the UE still needs to perform fine time tracking—i.e., whether TOk can be 0 and under what conditions.
			* For BM-Case 2, regarding the MAC-CE-based TCI state switch delay, when the UE has the capability to know the corresponding Rx beam, RAN4 needs to further discuss:
				+ If the UE supports this capability, should the L1-RSRP measurement and fine time tracking delay always be defined according to the unknown TCI state case?
				+ Potential side condition: The L1-RSRP measurement must wait until the corresponding TCI state takes effect before it can be performed (i.e., the L1-RSRP measurement cannot be executed earlier than the earliest predicted time instance of the target TCI state).
		- Option 5: Known if predicted beam is the RS in target TCI or QCL-ed to the target TCI state
		- Option 6: RS resource for of predicted-L1-RSRP measurement is the RS in target TCI state or QCLed to the target TCI state
* Recommended WF
	+ Detectability and SNR conditions:
		- Option 1
	+ Time conditions:
		- Option 1
	+ QCL relationship:
		- To be discussed

Discussion:

### Sub-topic 2-4

*Activation delay*

Some companies are proposing to discuss/introduce an activation delay when the UE is configured to report predictions

**Issue 2-4: Activation delay**

* Proposals
	+ Option 1: No need for any additional delay definition, delay of legacy procedures (RRC reconfiguration, etc) can be reused
	+ Option 2: Introduce a separate delay from RRC reconfiguration until UE starts sending prediction reports
		- Requirement definition is FFS, should be agreed in the next meeting
	+ Option 3: others
* Recommended WF
	+ Option 1

If option 2 is to be agreed, concrete proposals on how to define the requirement and what should be studied/considered should be presented

Discussion:

Vivo: for the reporting and activation delay, the only difference is whether the model loading time is included in the RRC reconfig procedure the activation time is not needed

MTK: RAN2 has concluded this, we should go with option 1

Apple: we do not need to have any activation delay, should be included in any inference reporting delay

Nokia: we need to understand what exactly this means, we already agreed to have an activation delay. If this is included in each inference reporting delay, option 1 is fine.

ZTE:we defined an actiavatoin delay for MAC-CE based, for this we are also talking about activation delay.

CMCC: after UE sends the RRC reconfiguration, UE is ready to perform inference. When it is up to when the report is triggered.

Agreement:

* UE has to be ready to start measurements for inference after sending RRC reconfiguration complete
* Inference delay (might include also model loading depending on UE implementation) will be included in the inference reporting delay
* This applies to all reporting schemes

### Sub-topic 2-5

*Simulation results*

**Issue 2-5: How to proceed with defining metrics based on Simulation results**

Discuss the following Options based on summary of simulation results–prepared by vivo

* Proposals
	+ Option 1: Continue aligning on the following aspects
		- Prediction model
			* Companies clarify the model they used (or whether they applied the reference model provided in the simulation assumptions) when submitting results in the next meeting.
		- Dataset
			* Companies should perform simulations based on the reference dataset and submit results in the next meeting.
			* Alternatively, agree on dataset-related parameter settings (e.g., dataset size) in this meeting, and companies should submit results based on the aligned dataset parameters in the next meeting.
	+ Option 2: In the next meeting, decide the value of metric based on the simulation results submitted by companies.
		- The source for the metric value can be determined by directly taking the average of the results from companies and applying certain criteria to exclude results with excessively large deviations
	+ Option 3: other parameters or assumptions to be clarified/modified
* Recommended WF
	+ To be discussed

Discussion:

Vivo: we will try to align the dataset size.

See the ad-hoc minutes on simulation assumptions/results in R4-25xxxxx

Companies are invited to bring further results based on the updated assumptions.

MTK: vivo proposed to have a dataset size larger than 100k but our results are consistent. Maybe we can check the performance with a larger set than 6k but not 100k. companies should provide more info on the size they used.

### Sub-topic 2-6

*Test system basic setup*

The basic test setup has been discussed for several meetings without much progress.

**Issue 2-6: Test system setup**

* Proposals
	+ Option 1: Single AoA with UE antenna pattern knowledge
	+ Option 2: Single AoA without any UE antenna pattern knowledge
	+ Option 3: Multi AoA based on MPAC
	+ Option 4: Multi AoA based on RRM testing setup
* Recommended WF
	+ Focus the discussion on the multi AoA based on RRM testing setup

Multi AoA based RRM testing setup can also be used to run some tests with single AoA while also having the potential to provide a more realistic environment by using multiple AoAs

Discussion:

Anritsu: we agree that we cannot converge, I think before discussing we propose to discuss more about assumptions to conduct measurements for example, what kind of channel we should apply for case 1 or case 2. How many models we need, etc.

Apple: do we have enough information and confidence to take this multi AoA approach? We shouldn’t completely rule out the single AoA approach.

Nokia: we agree with Anritsu on how many clusters are needed. It’s not possible to use 24 clusters. 64 SSBs can be configured, we might not need many clusters for each SSB. We support multi AoA testing.

R&S: we agree to take this setup as baseline, we can analyze how many clusters can be emulated in such a chamber

QC: the ecosystem does not want a new system, we need a basic setup and see what kind of simplified CDL can be supported. We cannot know how many clusters can be emulated without knowing what the setup is. R&S showed that even with less probes we can emulate a simplified CDL and it has minimum impact on the channel model.

Keysight:we have seen in the past that there are 3 test systems that can do CDL. With a single angle and a two stage approach the test complexity is high. We could go with the enhanced RRM setup and see what channels can be emulated. We should forgo any single AoA solution.

MTK: in the R&S tdoc it is proposed to simplify the CDL in several ways. It seems we need to simulate whether the simplified CDL can be emulated in a chamber.

R&S: we proposed several simplifications in our paper. Companies should take a look.

Anritsu: for the channel model, it is not only the number of clusters, there is a case in which we have a channel model in which the UE is moving. We should also consider whether UE movement. We need ot check if a spatially consistent model can also be emulated.

MTK: we take the e IFF test setup as baseline for a feasibility study to understand the benefits for performance testing. The number of probes could be increased/decreased depending on the study

R&S: in the current sims we only talk about CDL-C.

Keysight: the more channel models we look at, the more probes are needed. If we add another probe or reflector, it’s a brand new system. We should not look at additional probes. We should look into some channel models, should not be open ended. It’s important to set a baseline.

Nokia: do we exclude MPAC setup

Moderator: as of now, yes. No more analysis for it.

QC: we should go to the next step

Agreement:

 Consider multi AoA based RRM testing setup as baseline(enhanced IFF system with 4 probes used for FR2 RRM conformance testing)

 Single AoA tests can also be performed in the multi AoA based RRM test setup

 Further analyze what spatial channel models can be emulated with this test setup

* + Companies are invited to bring analysis on what simplified spatial channel (multiple clusters coming from multiple directions) model can be emulated in this test setup

 Single AoA tests are not precluded

### Sub-topic 2-7

*Test system channel model*

In the previous meetings it was agreed that a CDL-based channel model will be taken as starting point. Further details need to be discussed

**Issue 2-7: Test system setup**

* Proposals
	+ Option 1: “full” CDL model to be emulated in the test
	+ Option 2: simplified CDL should be used
	+ Option 3: others
* Recommended WF
	+ To be discussed

If Option 2 is chosen, simplification methods should be discussed.

Discussion:

Nokia: this is only looking at omni directional channels. We might not need to remove any clusters if we consider each SSB may not interact with many clusters. There are different ways to do simplification is by removing clusters or considering narrow beams.

R&S: option 2 is ok, it’s a starting point

Keysight: option 2 is the only feasible approach. Can we downselect to 2-3 by the end of the meeting? We know how to simplify channel models based on previous tests.

QC: we can propose CDL-C as an option

MTK: this analysis does not consider any BS information or other system level parameters, we are only looking at possible channel models.

Anritsu: is only 1 CDL model enough?

R&S: we should do the simplification also considering the impact on prediction performance

Agreement:

Companies to bring analysis into what simplifications to CDL channels are needed to be able to emulate the channels in the enhanced IFF chamber.

 Take CDL-C Umi as one example

 Other channel models can be further discussed

### Sub-topic 2-8

*Draft CR*

A draft CR for the introduction of the core requirements for beam prediction was submitted in R4-2510334

**Issue 2-8: draft CR**

* Proposals
	+ Option 1: Discuss the draft CR
* Recommended WF
	+ Discuss the structure of the CR and next steps until formal approval

### Sub-topic 2-9

*Prediction KPIs*

Several agreements regarding the prediction KPIs were reached in the previous meetings, however, there are still some open issues regarding whether the accuracy(in absolute or relative terms) should apply to more or all beams predicted and how to make sure that as many of the predicted beams have a certain level of accuracy such that the network can have confidence in the report.

**Issue 2-9: Metrics/KPIs for beam ID prediction**

Proposals

* + Option 1: N=1 (KPI applies only to top predicted beam
	+ Option 2: absolute RSRP applies to all predicted beams
		- Predicted beams should meet an SNR side condition like >0 dB
	+ Option 3: **consider the following performance metrics if RAN4 decides K>1:**
		- * **For all *n<=N***
				+ $\min\_{i\in Y\_{K}}\left(\hat{y}\_{i}-y\_{n}\right)\leq x\_{n}$
			* **Where** $y\_{n}$**’s are the *N* largest ground truth RSRPs among all the beams,** $\hat{y}\_{i}$**’s are the predicted RSRPs,** $Y\_{K}$ **is the set of the index of the predicted largest *K* beams. We need to have *K*>=N, and preferably the difference is larger than 2 or 3.**
	+ Option 4: N=3
	+ Option 5: others
* Recommended WF
	+ To be discussed

### Sub-topic 2-10

*Relative RSRP accuracy*

Relative RSRP accuracy has been discussed in previous meetings and some agreements were reached, there are proposals to make further changes/refinements to the definition.

**Issue 2-10: Relative RSRP accuracy**

* Proposals
	+ Option 1: **RAN4 to remove the square bracket in the definition of relative RSRP accuracy, i.e.,**
		- **Relative RSRP accuracy for reported beams during inference reporting = (predicted L1-RSRP of beam index i - reported L1-RSRP of beam index n) - (ground truth of L1-RSRP of beam index i - ground truth of L1-RSRP of beam index n), ~~[~~where the beam index n owns the largest reported value~~]~~.**
	+ Option 2:  ***for BM case 1, it is proposed that***
		- * + ***The relative RSRP accuracy for reported beams during inference reporting = (predicted L1-RSRP of beam index i - predicted L1-RSRP of beam index n) - (ground truth of L1-RSRP of beam index i - ground truth of L1-RSRP of beam index n), [where the beam index n owns the largest reported value]***
			* ***for BM case 2, it is proposed that***
				+ ***The relative RSRP accuracy for reported beams during inference reporting = (predicted L1-RSRP of beam index i for time instance m - predicted L1-RSRP of beam index n) - (ground truth of L1-RSRP of beam index i for time instance m - ground truth of L1-RSRP of beam index n), where the beam index n owns the largest reported value among all the predicted beams. 1<=m<=M where M is the number of time instance***
	+ Option 3: **For BM-Case 1, Relative RSRP accuracy for reported beams during inference reporting = (predicted L1-RSRP of beam index i - Reported L1-RSRP of beam index n) - (ground truth of L1-RSRP of beam index i - ground truth of L1-RSRP of beam index n), where the beam index n owns the largest reported value**
	+ **Where, the reported L1-RSRP refers to predicted L1-RSRP**
	+ Option 4: **Relative RSRP accuracy for reported beams during inference reporting = (predicted L1-RSRP of beam index i - predicted L1-RSRP of beam index n) - (ground truth of L1-RSRP of beam index i - ground truth of L1-RSRP of beam index n), [where the beam index n owns the largest reported value].**
	+ Option 5: Relative RSRP accuracy for reported beams during inference reporting = (predicted L1-RSRP of beam index i - reported L1-RSRP of beam index n) - (ground truth of L1-RSRP of beam index i - ground truth of L1-RSRP of beam index n), where the beam index n owns the largest reported value given by absolute RSRP reporting.
		- * Reported L1-RSRP can be predicted,
			* Reported L1-RSRP shall be predicted RSRP
		- Relative RSRP accuracy requirements apply for Case 1, and also for Case 2
	+ Option 6: **RAN4 defines relative RSRP accuracy requirement for Case 1 and uses the agreed baseline with the following changes:**
		- **Relative RSRP accuracy for reported beams during inference reporting = (predicted L1-RSRP of beam index i – ~~reported~~ predicted L1-RSRP of beam index n) - (ground truth of L1-RSRP of beam index i - ground truth of L1-RSRP of beam index n), [where the beam index n owns the largest reported value].**
			* + **~~Reported L1-RSRP can be predicted,~~**
				+ **~~FFS whether reported L1-RSRP can be measured RSRP~~**

**RAN4 ensures the following in AI-ML BM case 1,**

* + - * **The core requirement of relative accuracy of predicted L1-RSRP applies to all top-K predicted beams.**
			* **Performance test of relative accuracy of predicted L1-RSRP uses prediction and reporting of two beams, i.e., K = 2.**
	+ Option 7: **For relative predicted RSRP accuracy, define unified definition for both BM-case 1 and BM-case 2:**
		- * $Relative RSRP Accuracy\_{i,t}=\left(Predicted RSRP\_{i,t}-Predicted RSRP\_{max}\right)-\left(True RSRP\_{i,t}-True RSRP\_{max}\right)$
			* **Where** $Predicted RSRP\_{max}$ **is the largest RSRP across all time instance and beams in the report。**$Predicted RSRP\_{i,t}$ **is RSRP of beam index i at time t。**$True RSRP\_{max}$ **is the true RSRP corresponding to the beam/time of** $Predicted RSRP\_{max}$**。Where** $Predicted RSRP\_{i,t}-Predicted RSRP\_{max}$ **is predicted differential RSRP in the report.**
	+ Option 8:others
* Recommended WF
	+ Option 1

## Topic #3: RRM core requirement and testing framework for Positioning accuracy enhancement

### Sub-topic 3-1

*Requirements for case 1*

Several companies proposed to introduce a reporting delay requirements for case 1

**Issue 3-1: Reporting Delay Requirements for case 1**

Proposals

* + Option 1: Introduce a reporting delay requirement defined as the delay from the NW triggered location request until the UE sends the location report
		- Take the existing requirement as baseline
		- Further discuss if this delay should be extended due additional time needed for processing
	+ Option 2: others
* Recommended WF
	+ Option 1

Discussion:

ZTE: we already discussed this issue, we have the reporting delay defined so we should go with option 1 and keep the reporting delay.

Agreement:

Take the framework of the existing reporting delay requirements

* Reporting delay includes measurement delay, inference delay and the time needed until the UE send the report
* Check until next meeting on the number of samples needed for the measurements

### Sub-topic 3-2

*Sample Based Report Mapping*

There are two proposals for the sample based mapping which are very similar. It should be decided which one is used

**Issue 3-2: Sample Based Report Mapping**

Proposals

* + Option 1: Adopt the report mapping in R4-2509299 (CATT)
	+ Option 2: Adopt the report mapping in R4-2509932 (Nokia)
	+ Option 3: Others
* Recommended WF
	+ Option 2

Option 2 seems more general and uses inequalities

Discussion:

E///: this is already captured in our CRs, the tables are not needed

CATT: the defined singaling aligns with the contents of the E/// CR, we are fine not to pursue this

### Sub-topic 3-3

*Report mapping for UL SRS-TDCP measurement*

**Issue 3-3: Report mapping for UL SRS-TDCP measurement**

* Proposals
	+ Option 1: Agree the mapping for UL SRS-TDCP as proposed in R4-2510759
	+ Option 2: others
* Recommended WF
	+ Option 1

Discussion:

Agreement:

 Adopt the mapping for UL SRS-TDCP as proposed in R4-2510759

### Sub-topic 3-4

*Draft CR for UL SRS-TDCT and UL SRS-TDCP*

**Issue 3-4: Report mapping for UL SRS-TDCT and UL SRS-TDCP measurements**

Proposals

* + Option 1: Endorse CR in R4-2510760, to be later merge with the rest of positioning requirements
	+ Option 2: Further modify the draft CR
* Recommended WF
	+ To be discussed

The draft could be technically endorsed, would be later merged with other drafts for other positioning requirements

Agreement:

Technically endorse CR in R4-2510760, to be later merge with the rest of positioning requirements

# References

[1] R4-2504684, “Topic summary for [114bis][126] NR\_AIML\_air\_part1”, Moderator(Qualcomm Incorporated), RAN4#114-bis