**3GPP TSG RAN meeting #109 RP-25xxxx**

**Beijing, China, September 15-18,**

## Status Report to TSG

**Agenda item:** 9.xxx

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **WI / SI Name** |  | | | | |
| included in this status report | Study Item:  No | Core part:  Yes | Performance part:  Yes | | Testing part:  No |
| **Acronym** | NR\_AIML\_air | | | | |
| **Unique ID** | 1020093 | | | | |
| **TSG Tdoc of latest approved WI/SI description (if any)** | RP-2xxxxx | | | | |
| **Target Completion Date**  **(indicate if changed)** | Study Item:  NA | Core part:  Sept ‘25 | Performance part:  March ‘26 | Testing part:  NA | |
| **Overall Completion level** | Study Item:  NA | Core part:  xx% | Performance Part:  25% | Testing part:  NA | |

Note: Overall completion level percentage numbers should use one of the colors below:

* xx%: Normal progress, no RAN plenary action needed
* xx%: Progress behind schedule, may need RAN plenary intervention. If so, SR should clearly define requested action
* xx%: Progress critically behind, RAN plenary shall intervene. SR should define requested action

**Source:**

|  |  |  |
| --- | --- | --- |
| **Leading WG** | | TSG RAN WG1 |
| **Rapporteur** | **Name** | Juan Montojo (RAN1); Xiaofeng Liu (RAN4); Marco Belleschi (RAN2/RAN3) |
| **Company** | Qualcomm; CAICT; Ericsson |
| **Email** | [juanm@qti.qualcomm.com](mailto:juanm@qti.qualcomm.com); [liuxiaofeng1@caict.ac.cn](mailto:liuxiaofeng1@caict.ac.cn); [marco.belleschi@ericsson.com](mailto:marco.belleschi@ericsson.com) |

## 1 Work plan related evaluation

|  |  |
| --- | --- |
| **Do you want to modify the time budget for this WI/SI compared to what was endorsed at the last RAN meeting?** | No |

*If you answered No: Then please remove the Excel file from the zip file of this status report.*

*If you answered Yes: Then please fill out the attached Excel template to request a modification of the time budgets for your WI /SI. The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI. The basis are the endorsed time budgets of the last RAN meeting. Please highlight all changes of the values.  
 One time unit (TU) corresponds to ~ 2 hours in the meeting.  
 If this status report covers a WI with Core and Performance part, then please have one line for each in the attached Excel table.  
 Note: If no Excel table is attached, then this means no time budget change.*

**Additional explanations/motivations for the time budget changes in the attached Excel table:**

## 2. Detailed progress in RAN WGs since last TSG meeting (for all involved WGs)

NOTE: Agreements and Open issues impacted cross-TSG aspects shall be explicitly highlighted

## 2.1 RAN1

#### 2.1.1 Agreements

#### 2.1.2 Remaining Open issues

## 2.2 RAN2

#### 2.2.1 Agreements

##### 2.2.1.1 RAN2#131

RAN2 endorsed the running CRs reflecting the agreements up to RAN2#130, i.e. the CRs to TS 37.320 (R2-2506078), 37.355 (R2-2505704), 38.300 (R2-2505191), 38.305 (R2-2505212), 38.321 (R2-2505501), 38.331 (R2-2506401)

RAN2#131 discussed **LCM for UE-sided model for Beam Management use case** and focused on the remaining issues mainly from the RRC specification point of view. The following agreements were reached in RAN2.

* Discussion on UE data collection procedures:
  + Multiple preferred configurations within the list of candidate configurations provided by NW can be indicated by the UE via UAI.
  + No prohibit timer is needed for UE indicating its preferred data collection configuration
  + On stop/start indication
    - The UE can send start indication (without a preferred list) to indicate preference to start data collection
    - The UE can send preferred list implying that it would like to start data collection on those configuration
    - The UE can send stop indication for all or a given actual CSI report config ID.
    - Rapporteur will determine best way of signaling. This doesn’t preclude merging 1 and 2
  + Adopt below text in the field description of dataCollectionCandidateConfig:
    - The UE is not expected to perform measurements solely based on the configurations provided by this IE
  + Adopt the following solution: OtherConfig contains a list of candidate configurations as a list of a new IE, where each candidate configuration contains at least an identifier of the candidate configuration, CSI-ResourceConfigId for Set A, CSI-ResourceConfigId for Set B, and related associated IDs, as agreed in RAN2#130. Each candidate configuration is associated with a cell ID. We will also include individual IEs for CSI prediction case
  + Ask RAN1 what IEs are needed for CSI prediction and inform them of our agreements on BM and confirm if anything else is needed.
  + The procedures for UE data collection request for the CSI prediction use case are the same as for the beam management use case.
  + An agreement was sent to RAN1 to notify them about the above agreements in R2-2506470.
* Discussion on UE-side inference configuration, applicability reports and associated IDs:
  + Applicability reports
    - The applicability reporting procedures for CSI prediction are the same as for beam management. RAN2 confirms that option B is not supported for CSI prediction, given no parameters were provided by RAN1.
    - No enhancements are pursued for reporting applicability in RRCReestablishmentComplete
    - The UE can report applicability via RRCResumeComplete for SCG inference configurations received in RRCResume, without specification impact beyond already agreed applicability reporting procedure.
    - Applicability reporting is added in RRCResumeComplete for inference configurations that exist at the UE based on legacy procedures (restored or received in RRCResume).
    - RRCReconfigurationComplete shall include applicability/inapplicability status for:
      1. All inference configurations included in the immediately preceding RRCReconfiguration message, and
      2. Any previously configured inference configurations for which applicability/inapplicability has already been reported and whose applicability status has changed since the last report.
    - Do not introduce a link, explicit or implicit, between a full inference configuration and a set of inference-related parameters. If the applicability of a full inference configuration changes and there is a corresponding set of inference-related parameters whose applicability changes at the same time, the UE shall report the applicability of both
  + Inference configurations
    - RAN2 understand that when network releases inference configurations of poor-performed applicable functionalities, network may also provide either non-AI/ML configuration in CSI-ReportConfig or may provide full inference configuration of other applicable functionalities, if previously not configured to UE. There is no spec impact and feedback from the NW to the UE to adjust the applicability determination procedure is not supported in Rel-19.
    - RAN2 assumes for no NR DC enhancements are considered and will not ask RAN3 work in Rel-19.
    - RAN2 confirms that UE receives RRCReconfiguration message including one set or multiple sets of inference related parameters via OtherConfig for option B.
    - For Option B for BM Case 1/2, one set or multiple sets of inference related parameters can be configured in OtherConfig, where each set in OtherConfig contains the following parameters according to RAN1#121 agreement:
      1. associatedIDforSetA-r19, resourcesForSetA-r19, resourcesForChannelMeasurement, associatedIDforSetB-r19, reportQuantity-r19, reportConfigType, nrofreportedpredictedrs-r19, TimeGap-r19, nroftimeinstance-r19, applicabilityConfigId-r19.
    - For Option B for BM Case 1/2, inference related parameter set is configured per serving cell.
  + Discussion on the associated IDs
    - Both single cell and multi-cell associated ID can be supported based on NW implementation (i.e., the network may allocate an Associated ID to a single cell and/or to multiple cells).
    - Associated IDs shall be unique within a PLMN in that they can only be associated with one same/similar beam deployment. FFS is we should have signalling indicating multi-cell.
    - We will not define areas. The Associated ID is 24 bits.
    - If the network does not provide the associated ID, it is up to UE implementation how to determine the applicability.

Further, RAN2 discussed how to reply to the RAN4 LS on AI/ML functionality activation (R2-2505045), and made the following agreements:

* On the time duration for an AI functionality to become available for inference, RAN2 conclude that it is up to UE implementation from RAN2 point of view and no further RAN2 work.
* RRCReconfigurationComplete containing applicability reports has a processing latency requirement of 16 ms with respect to the reception of RRCReconfiguration, from RAN2 point of view.
* RRC processing delay shouldn’t be impacted by the model loading delay
* If the UE is ready for inference by end of RRC processing delay, it reports model applicable. If not, it reports model inapplicable and doesn’t set the release flag. The network is not expected to release inference configuration (this will not be added to stage 3 specification).
* Once the model is applicable, UE reports applicability to network via UAI (applicable to all CSI reporting).
* On the time duration for an AI functionality to become available for inference, RAN2 conclude that it is up to UE implementation from RAN2 point of view and no further RAN2 work.
* RRCReconfigurationComplete containing applicability reports has a processing latency requirement of 16 ms with respect to the reception of RRCReconfiguration, from RAN2 point of view.
* LS to RAN1 - RAN2 has identified a problem. From RAN2 point of view this can be solved by option 2, but needs to check with RAN1. RAN2 also discussed option 1 and couldn’t conclude as it is outside scope of RAN2. Would like too ask RAN1 which one is best.
* Current RAN2 specifications will not be updated to cover this problem for now.
* In RAN4 LS, RAN2 will not mention interpretation but just provide agreement 1 – 6.

RAN2#131 discussed **NW-side data collection** for the beam management use case, and made the following agreements:

* RAN2 confirms that the network data logging is captured in a new clause (e.g. 5.5x) in the RRC specification.
* A hysteresis should be configured and used (alongside threshold and timeToTrigger) for event-triggered logging for NW-side data collection.
* The resource configuration does not have separate resources for Set A and Set B.
* RAN2 to send an LS to RAN1 to inform about the RAN2 agreements on solution for network data logging, including L1 related content for NW-side data collection.
* RAN2 to send an LS to RAN3 to inform about the RAN2 agreements on solution for network data logging
* Keep event-triggered logging
* Logging configuration is introduced as a new list of configurations under CSI-MeasConfig, based on TP1 in R2-2505860,
* Event evaluation for the event-triggered logging will be capturing within the existing A1/A2 events (in sub-clauses 5.5.4.2 and 5.5.4.3)
* For L1-related content for NW-side data collection, it is sufficient to collect the L1-RSRP and/or beam ID as agreed by RAN2.
* Multiplexing of legacy SON/MDT report and AIML logged data is not supported in the same UE information response message. Up to the network to ensure that data is not requested at the same time
* The logging periodicity of a NW-side data collection configuration is configurable.
* No further indication/condition is specified (beyond already agreed ones) for the UE to inform source gNB about data availability before HO in Rel-19.
* The UE stores logged data for BM in a variable specific to L1 CSI related measurements.
* Only periodic CSI resources are used for NW sided data collection. No need for new dynamic MAC CE mechanisms.
* If LoggedDataCollectionAssistanceConfig is configured, then full buffer and low power indications are configured by default (i.e., no additional fields/bits required to configure them). Data threshold is (optionally) configured by including the threshold in the loggedDataCollectionAssistanceConfig.
* Both the data collection configuration and the UAI configuration related to data collection are released when the UE transitions to IDLE/INACTIVE or initiates re-establishment (including RLF).
* If the buffer is not full or the data threshold is configured and the amount of data is below the threshold, UE does not send data availability indication when it sends low power indication.
* The possible values for the buffer threshold are 16KB, 32KB and 48KB. FFS during CR phase in any higher value is needed depending on UE capability discussion
* No additional handling of logged data to be specified (apart from the already agreed release during state transition and RLF, and release upon successful delivery).
* No further discussion is needed on RRC issue 34 in re-19 as we have only one use case.
* The UE will indicate the presence of a gap (i.e. there will be no indication on the length of gap or time instance, etc). Rapporteur will suggest a way to implement that as part of the RRC review.
* To define field names and IE based on the content of the logged data rather than the specific use case
* Data forwarding to OAM or source gNB after HO is not in RAN2 scope and understands that other groups don’t have time to work on it.
* UE discards the logged data upon inter-RAT handover.
* RAN2 confirm that the solution agreed in RAN2#130 is applicable to regular HO and CHO (i.e. 1-bit indication corresponding to each candidate cell configuration in RRCReconfiguration is provided).
* Do not introduce an indication from the UE to NW about unsuitable data collection configurations in Rel-19.

RAN2 also discussed how to reply to the LS from SA5 on OAM-centric solution for NW-side data collection (R2-2505043), and made the following agreements to be included in the LS reply:

* For network-side data collection for beam prediction, measurement reports include the following:
  + Cell identity: CGI or PCI of the cell to which the measurement results are related.
  + Logged L1 radio measurement results including the beam identifiers associated to CSI-RS resources or SSBs (CSI-RS IDs or SSB IDs) and the corresponding measured L1-RSRPs.
  + The UE will indicate the presence of a gap (i.e. there will be no indication on the length of gap or time instance, etc).
* The required L1 measurements (i.e. L1-RSRP of CSI-RS(s) or SSBs) are defined in TS 38.215 which is referenced in the definition of M1 measurement in TS 37.320.
* RAN2 needs to ask SA5 how to transfer the measurement report with the above content and whether the M1 measurement defined in clause 5.4.1.1 of TS 37.320 can be used to transfer the measurement reports with the above content or not.
* The gNB will configure the UE to log the above content via the NW-side data collection configuration, which is different from legacy immediate MDT configuration.

Further, the topic of user consent for NW-side data collection was brought up. RAN2 agreed to send an LS to SA3 indicating our work on NW-sided gNB and OAM centric data collection and the content of collected data. The LS will indicate that RAN2 discussed the need for user consent and that SA3 should take this into account and decide on the need for user consent for NW-sided data collection.

RAN2#131 discussed **LCM for Positioning use case** and made the following agreements:

* Do not introduce a request for additional PRUs (e.g., a number of PRUs) in the Request Assistance Data message
* "Batch reporting", i.e., reporting of up to 32 location results in a single report as supported for the current NR positioning methods, is also applicable to "NR AI/ML Positioning Case 1".
* Keep NR-DL-AIML-RequestLocationInformation, excluding UE-assisted measurement parameters, and retain only UE-based and common parameters (e.g., nr-AssistanceAvailability).
* For AI/ML positioning Case 1, the LocationInformationType field in CommonIEsRequestLocationInformation shall be set to locationEstimateRequired. Other values, including locationMeasurementsRequired, locationEstimatePreferred, locationMeasurementsPreferred, and locationEstimateAndMeasurementsRequired, are not applicable and shall not be used. No specification impact.
* We do not introduce new error cause for the target device error causes.
* Case 3a and Case 3b can be supported without new impact to LPP
* Introduce list of global cell information (i.e., NCGIs, or PCIs with ARFCN) and TRP ID, as the request associated information to ensure consistency between training and inference.
* The UE asks specific TRPs for PRS transmission with on-demand PRS configuration, i.e., within NR-On-Demand-DL-PRS-Request
* Similar to BM, UE decides the applicable functionalities based on NW-side additional conditions (if provided), UE-side additional conditions (internally known by UE) and model availability in device. If nw side additional conditions are not provided then we follow BM conclusion. No stage 3 impacts.
* Similar to AI PHY, when applicability changes the UE should report this to the LMF and only what changed. For now capture this at least in stage 2. Check offline if and how this would be implemented in stage 3.
* Wait for RAN1 for LPP-21. Take what RAN1 gives us and we implemented. Can compile an LS for next meeting if we have questions.

RAN2#131 discussed Rel.19 **UE capabilities** and made the following agreements:

* If UE supports NW side data collection, it is mandatory for UE to support the minimum AS layer memory size of 64kB for UE supporting AI/ML based beam management, which is shared across all use cases with NW-sided model. The assumption is that this will be shared across all use cases (i.e. Rel-20 as well)
* FFS on whether UE can support other memory sizes and indicate to network via optional capability signaling.
* Include RAN2 feature ‘UE can provide update of applicability reporting via UAI’ as part of RAN1 FGs (e.g., 58-0-1 and/or FG 58-1-2/3/4/5, the details of those feature group depend on RAN1 progress) once implemented.
* Introduce two conditional mandatory capabilities (with signaling) for AI/ML based BM Option A and Option B, if UE supports FG58-0-1 and/or FG58-1-2/3/4/5 (the details of those feature group depend on RAN1 progress).
* Include RAN2 feature ‘providing UE preferred configuration for UE-side data collection’ as part of RAN1 FG58-1-7/FG58-3-4 (once implemented).
* UAI is mandatory for both Option A and B
* Introduce an optional per UE capability ‘loggedDataCollection-r19’ to indicate supporting logged measurements of data collection for NW-side model, which includes the following components:
  1. the minimum 64kB AS layer memory size
  2. periodic logging
  3. Provide full buffer indication, low power indication
* Event-based logging is an optional per UE capability separate from ‘loggedDataCollection-r19’. UE supporting this feature shall also indicate the support of ‘loggedDataCollection-r19’. If UE supports event-based logging it shall support data threshold-based data availability indication.
* RAN2 will not introduce separate CSI resource capability for logged NW-side data collection. Legacy capability will be used for logged NW-side data collection. Check with RAN1 on whether this assumption is ok.
* Data threshold-based data availability indication is an optional per UE capability with signaling. A UE supporting this feature shall also indicate support of the basic logged NW-side data collection.

RAN2 finally agreed that the AI/ML for PHY WI is considered complete from RAN2 point of view.

The following post-meeting email discussions were agreed to finalize the CRs for the impacted RAN2 specifications, and to finalize the content of the LSs to be sent:

* [POST131][003][AI PHY] Functionality activation (Apple)

Intended outcome: LS to RAN4 and LS to RAN1

Deadline: Sept. 5th, 10:00 UTC

* [POST131][023][AI PHY] 37.320 (Huawei)

Intended outcome: Agree to final CR

Deadline: Sept. 5th, 10:00 UTC

* [POST131][024][AI PHY] 37.355 (Qualcomm)

Intended outcome: Agree to final CR and then trigger LS to RAN1 on questions related to LPP21

Deadline: Sept. 5th, 10:00 UTC for CR and 2 weeks after for LS

* [POST131][025][AI PHY] 38.300 (Vivo)

Intended outcome: Agree to final CR

Deadline: Sept. 5th, 10:00 UTC

* [POST131][026][AI PHY] 38.305 (CATT)

Intended outcome: Agree to final CR

Deadline: Sept. 5th, 10:00 UTC

* [POST131][027][AI PHY] 38.331 (Ericsson)

Intended outcome: Agree to final CR

Deadline: Sept. 5th, 10:00 UTC

* [POST131][028][AI PHY] 38.321 (Apple)

Intended outcome: Agree to final CR

Deadline: Sept. 5th, 10:00 UTC

* [POST131][036][AI PHY] Reply to SA5/RAN3 (Huawei)

Intended outcome: agree to LS

Deadline: Sept. 5th, 10:00 UTC

* [POST131][037][AI PHY] User Consent LS to SA3 (NTT Docomo)

Intended outcome: agree to LS and cc RAN3 ccSA5

Deadline: Sept. 5th, 10:00 UTC

* [POST131][038][AI PHY] LS to RAN1/RAN3 on nw-sided data collection (ZTE)

Intended outcome: agree to RAN1 and RAN3 LS capturing relevant RAN2 agreements

Deadline: Sept. 5th, 10:00 UTC

* [POST131][043][AI PHY] UE capabilities (Xiaomi)

Intended outcome: align on remaining open issues and agreable proposals

Deadline: Sept. 4th

#### 2.2.2 Remaining Open issues

RAN2 agreed that the WI is completed.   
The remaining FFSs and the corrections to the endorsed running CRs will be addressed during the next RAN2 meetings.

## 2.3 RAN3

#### 2.3.1 Agreements

##### 2.3.1.2 RAN3#129

During RAN3#129 meeting, RAN3 discussed the topic of **AI/ML for Air Interface supporting** **Positioning Accuracy Enhancements** and treated the received LSes [R3-255009](https://www.3gpp.org/ftp/TSG_RAN/WG3_Iu/TSGR3_129/Docs/R3-255009.zip) (RAN1), [R3-255016](https://www.3gpp.org/ftp/TSG_RAN/WG3_Iu/TSGR3_129/Docs/R3-255016.zip) (RAN2), [R3-255023](https://www.3gpp.org/ftp/TSG_RAN/WG3_Iu/TSGR3_129/Docs/R3-255023.zip) (SA2) and [R3-255029](https://www.3gpp.org/ftp/TSG_RAN/WG3_Iu/TSGR3_129/Docs/R3-255029.zip) (SA5).

A work plan was presented in [R3-255569](https://www.3gpp.org/ftp/TSG_RAN/WG3_Iu/TSGR3_129/Docs/R3-255569.zip).

The following BL CRs were endorsed:

* [R3-255095](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_129/Docs/R3-255095.zip) (BL CR to 38.305) Introduction of AI/ML air (CATT, Ericsson, Nokia, Huawei, Xiaomi, ZTE, CMCC, Samsung, CEWiT, Jio Platforms)
* [R3-255096](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_129/Docs/R3-255096.zip) (BL CR to 38.401) Support of AI/ML assisted positioning (ZTE Corporation, Xiaomi, CATT, Ericsson, Huawei, NEC, Nokia, Jio Platforms)
* [R3-255097](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_129/Docs/R3-255097.zip) (BL CR to 38.413) Support of Case 3a (Huawei, ZTE, Lenovo, Nokia, Ericsson, Jio Platforms)
* [R3-255098](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_129/Docs/R3-255098.zip) (BL CR to 38.455) Introduction of AI/ML air (Ericsson, Nokia)
* [R3-255099](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_129/Docs/R3-255099.zip) (BL CR to 38.473) Support of Sample-based measurement (case 3b) (Xiaomi, Ericsson, ZTE, CATT, Samsung, Nokia, Jio Platforms)
* [R3-255100](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_129/Docs/R3-255100.zip) (BL CR to 38.300) Stage 2 for case 3a (Nokia, CATT, Xiaomi, Ericsson, CMCC, Huawei, ZTE, Lenovo, Jio Platforms)

Based on the discussion, RAN3 made the following agreements:

* Case 3a NW-side model:

|  |
| --- |
| * The "LoS/NLoS indicator" can also be a gNB inferred measurement. * In a POSITIONING DATA COLLECTION REPORT message, a LMF can provide the LoS/NLoS label information independently of any timing information label. The current semantics description in IE Positioning Data Information is removed. * It should be possible for an LMF to specifically request for AI/ML inferred measurements from TRPs. * Add the following error causes to the Positioning Data Unavailable IE: ‘Not Supported’, ‘Not Available’ |

The following TPs capturing the offline discussion were agreed:

* [R3-255823](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_129/Docs/R3-255823.zip) (TP to NRPPa BL CR): addition of UL SRS time domain channel measurement (Ericsson, et al.)
* [R3-255813](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_129/Docs/R3-255813.zip) (TP to BL CR TS 38.473) addition of UL SRS time domain channel measurement (Xiaomi, et al.)
* [R3-255934](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_129/Docs/R3-255934.zip) (TP to BL CR for TS38.305) Support of AI Positioning (CATT, et al.)
* [R3-255873](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_129/Docs/R3-255873.zip) (TP to NRPPa BL CR): Support of Case 3a remaining issue (Huawei et al.)
* [R3-255456](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_129/Docs/R3-255456.zip) (TP to TS 38.300) AI/ML Training in OAM for case 3a (Nokia, et al.)
* [R3-255503](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_129/Docs/R3-255503.zip) (TP to BL CR to 38.401) AI/ML assisted Positioning (ZTE Corporation, et al.)

The following LS were approved:

* [R3-255935](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_129/Docs/R3-255935.zip) Reply LS on AI/ML Positioning Case 3a
* [R3-255824](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_129/Docs/R3-255824.zip) Reply LS on Logged Data Handling During Handover

#### 2.3.2 Remaining Open issues

The WI is considered complete from RAN3’s perspective.

## 2.4 RAN4

#### 2.4.1 Agreements

##### 2.4.1.1 RAN4#114bis

**CSI reporting requirement framework for CSI prediction**

**Issue 1-1: Performance monitoring**

Agreement:

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

FSS which requirements are to be introduced.

**Issue 1-2: Requirement baseline for monitoring**

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

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

Agreement:

wait for RAN1 decision

**Issue 1-5: Scheduling delay**

Agreement:

* The delay from when the UE prediction is sent until the time the TE applies is n+4 (slots) for FDD

**Testability and interoperability issues for beam management**

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

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

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

Agreement:

* For aperiodic report, the overall prediction reporting delay at least includes measurement delay +reporting delay
  + The reporting delay includes the inference delay
* For semi-persistent and periodic report, the overall prediction reporting delay at least includes measurement delay +inference delay+time for the first available reporting occasion

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

Agreement:

* On Detectability and SNR conditions:
  + The UE has sent at least 1 L1-RSRP inference report for the target 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
* Time conditions:
  + TCI state switch command is received within 1280 ms upon the last transmission of the RS resource for beam predict reporting or measurement
* Agreement on QCL relationship
  + 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.
  + If the predicted Tx beam in Set A is not QCL Type-D to a known Tx beam, known TCI state conditions shall be based on UE capability.

**Issue 2-4: Activation delay**

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

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

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

**Issue 2-7: Test system channel model**

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

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

Agreement:

* If RSRP prediction is reported, absolute/relative RSRP requirements applies to
  + reported beams where SNR side condition is met
  + The exact RSRP reporting including both absolute and relative will be defined in RAN1
  + The related test can only apply to the top-K, where the value of K is FFS, beams.
    - The legacy beam management test and parameters can be taken as the reference to decide the exact value of K
    - The feasibility of the test will be further discussed and decided.

**Requirements for positioning**

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

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

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

Agreement:

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

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

Agreement:

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

#### 2.4.2 Remaining Open issues

* CSI reporting requirement and testing framework for CSI prediction
  + Requirements baseline
  + PMI report and scheduled PDSCH separation
  + SNR
  + Simulation results and next steps
  + Generalization
  + LCM
* RRM core requirement and testing framework for beam management Beam prediction KPIs
  + Beam ID prediction KPIs
  + Measurement period for inference
  + Rx beam knowledge and TCI state handling
  + Requirements based on relative difference
  + Absolute RSRP accuracy applicability
  + Simulation results
  + Measurement error modelling
  + LCM
  + Test system channel model
  + Test system setup
* RRM core requirement and testing framework for Positioning accuracy enhancement
  + Requirements for case 1
  + Report mapping for sample based timing measurement reporting
  + Case 3b requirements

## 2.5 RAN5

#### 2.5.1 Agreements

#### 2.5.2 Remaining Open issues

#### 2.5.3 Remaining Open issues with cross-WG dependencies

## 2.6 RAN6

#### 2.6.1 Agreements

#### 2.6.2 Remaining Open issues

## 3. Detailed progress in SA/CT WGs since last TSG meeting (for all involved WGs)

NOTE: This section only needs to be filled in for WI/SIs where there is a corresponding relevant WI/SI in SA/CT.

## 3.1 SAx/CTs

#### 3.1.1 Agreements with cross-TSG impacts

#### 3.1.2 Remaining Open issues with cross-TSG impacts

NOTE: This section should also flag any critical dependencies that need TSG attention.

## 4. References

NOTE: This can be e.g. a list of all related Tdocs in the affected WGs since last TSG, references to LSs, produced TRs/TSs, the work/study item description or status reports of previous TSGs.

## 4.1 RAN1

## 4.2 RAN2

### 4.2.1 RAN2#131

100 contributions (for details see agenda items 8.1.1, 8.1.2, 8.1.3 in [Tdoc list](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_131/Docs/TDoc_List_Meeting_RAN2%23131.xlsx))

## 4.3 RAN3

### 4.3.1 RAN3#129

56 contributions have been submitted (for details see agenda items 20 in [Tdoc list](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_129/Docs/TDoc_List_Meeting_RAN3%23129.xlsx))

## 4.4 RAN4

#### 4.4.1 RAN4#116

// **General aspects**

[**R4-2509244**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509244.zip) **On AI/ML Model LCM and Performance Monitoring Requirement**

*Type: discussion For: Approval  
 Source: NTU*

**Decision: Noted.**

[**R4-2509423**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509423.zip) **On general issues on AI/ML**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

[**R4-2509760**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509760.zip) **Discussion on general aspect for AI**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

[**R4-2509920**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509920.zip) **On General Aspects of AI/ML for NR Air Interface Phase 1**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted.**

[**R4-2510104**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510104.zip) **Discussion on General aspects**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Noted.**

[**R4-2510163**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510163.zip) **Discussion on general aspects for AI/ML for NR air interface**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

[**R4-2510335**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510335.zip) **Discussion on general aspects for AI/ML for NR air interface**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

[**R4-2510804**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510804.zip) **Discussion on general aspects on AI/ML for NR air interface**

*Type: discussion For: Approval  
 Source: OPPO*

**Decision: Noted.**

[**R4-2510871**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510871.zip) **Discussion on general aspects on AIML for NR air interface**

*Type: discussion For: Discussion  
 Source: Huawei,HiSilicon*

**Decision: Noted.**

[**R4-2511150**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511150.zip) **On general issues for AIML**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On general issues for AIML

**Decision: Noted.**

[**R4-2511569**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511569.zip) **Generalization aspects of AI-ML**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**//** **CSI reporting requirement framework for CSI prediction**

[**R4-2509133**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509133.zip) **Feasibility of reduction in PMI report and scheduled PDSCH separation for AI/ML CSI prediction**

*Type: discussion For: Discussion  
 Source: Anritsu Corporation*

**Decision: Noted.**

[**R4-2509411**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509411.zip) **View on CSI reporting requirement and testing framework for CSI prediction**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

[**R4-2509424**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509424.zip) **View on CSI reporting requirements framework for CSI prediction**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

[**R4-2510161**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510161.zip) **Discussion on CSI reporting requirement and testing framework for CSI prediction**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

[**R4-2510336**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510336.zip) **Discussion on CSI reporting requirement and testing framework for CSI prediction**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

[**R4-2510671**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510671.zip) **Discussion on PMI reporting delay**

*Type: other For: Approval  
 Source: ROHDE & SCHWARZ*

**Decision: Noted.**

[**R4-2510805**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510805.zip) **CSI reporting requirement and testing framework for CSI prediction**

*Type: discussion For: Approval  
 Source: OPPO*

**Decision: Noted.**

[**R4-2510835**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510835.zip) **Discussion on CSI prediction**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the AI/ML-based CSI prediction.

**Decision: Noted.**

[**R4-2510872**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510872.zip) **Discussion on CSI reporting requirement and testing framework for CSI prediction**

*Type: discussion For: Discussion  
 Source: Huawei,HiSilicon*

**Decision: Noted.**

[**R4-2511221**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511221.zip) **CSI reporting requirement and testing framework for CSI prediction**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted.**

[**R4-2511568**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511568.zip) **CSI Prediction: Testing framework**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**//** **RRM core requirement for beam management**

[**R4-2509298**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509298.zip) **Discussion on RRM core requirements and testing framework for BM**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

[**R4-2509425**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509425.zip) **RRM core requirements and testing framework Based Beam Management**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

[**R4-2509761**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509761.zip) **Discussion on core part requirement and testing framework for AI beam management**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

[**R4-2509921**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509921.zip) **RRM core requirements for AI/ML Based Beam Management**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted.**

[**R4-2510105**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510105.zip) **Discussion on RRM core requirement and testing framework for beam management**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Noted.**

[**R4-2510159**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510159.zip) **Discussion on RRM core requirement and testing framework for beam management**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

[**R4-2510234**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510234.zip) **Discussion on AI/ML beam management testability**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

[**R4-2510334**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510334.zip) **Draft CR on RRM core requirements for support of AIML for NR Air Interface for beam management**

*Type: draftCR For: Endorsement  
 38.133 v19.1.0 CR- rev Cat: B (Rel-19)  
  
 Source: vivo*

**Decision: Noted.**

[**R4-2510337**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510337.zip) **Discussion on RRM core requirement and testing framework for beam management**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

[**R4-2510374**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510374.zip) **Discussion on RRM core requirements and test framework for beam management**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on RRM core requirements and test framework for beam management

**Decision: Noted.**

[**R4-2510806**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510806.zip) **RRM core requirement and testing framework for beam management**

*Type: discussion For: Approval  
 Source: OPPO*

**Decision: Noted.**

[**R4-2510873**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510873.zip) **Discussion on RRM core requirement for AIML Beam management**

*Type: discussion For: Discussion  
 Source: Huawei,HiSilicon*

**Decision: Noted.**

[**R4-2511018**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511018.zip) **Discussion on the RRM requirements of AI/ML Beam management**

*Type: other For: Approval  
 Source: ZTECorporation,Sanechips*

**Decision: Noted.**

[**R4-2511249**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511249.zip) **Discussion on RRM core requirement and testing framework for beam management**

*Type: other For: Approval  
 Source: Samsung*

**Decision: Noted.**

[**R4-2511570**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511570.zip) **RRM Core Requirements for AI-ML based Beam Management**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

[**R4-2511597**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511597.zip) **Discussion on test setup for AI/ML based beam management**

*Type: discussion For: Discussion  
 Source: Rohde & Schwarz*

**Decision: Noted.**

**//** **RRM core requirement for Positioning accuracy enhancement**

[**R4-2509299**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509299.zip) **Discussion on RRM core requirements and testing framework for positioning**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

[**R4-2509426**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509426.zip) **RRM core requirement and testing framework for Positioning accuracy enhancement**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

[**R4-2510164**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510164.zip) **Discussion on RRM requirements for positioning accuracy enhancement**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

[**R4-2510338**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510338.zip) **Discussion on RRM core requirement and testing framework for Positioning accuracy enhancement**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

[**R4-2510758**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510758.zip) **On core requirements for AI/ML based positioning**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This paper discusses issues related to the core requirements for AI/ML based positioning use case #1.

**Decision: Noted.**

[**R4-2510807**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510807.zip) **RRM core requirement and testing framework for Positioning accuracy enhancement**

*Type: discussion For: Approval  
 Source: OPPO*

**Decision: Noted.**

[**R4-2510874**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510874.zip) **Discussion on RRM core requirement for AIML Positioning**

*Type: discussion For: Discussion  
 Source: Huawei,HiSilicon*

**Decision: Noted.**

[**R4-2511019**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511019.zip) **Discussion on the RRM requirements aspects of AI/ML positioning**

*Type: other For: Approval  
 Source: ZTECorporation,Sanechips*

**Decision: Noted.**

[**R4-2511222**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511222.zip) **RRM core requirements and testing framework for AI/ML positioning accuracy enhancement**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted.**

**// RRM performance requirements for beam management and positioning accuracy**

[**R4-2509134**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509134.zip) **FR2 test setup for AI/ML beam management evaluation**

*Type: other For: Approval  
 Source: Anritsu Corporation*

**Decision: Noted.**

[**R4-2509242**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509242.zip) **Beam Prediction Performance Metrics for Monitoring and Accuracy Requirement**

*Type: discussion For: Approval  
 Source: NTU*

**Decision: Noted.**

[**R4-2509300**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509300.zip) **Discussion on RRM performance requirements for BM and positioning**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

[**R4-2509427**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509427.zip) **RRM performance requirements for beam management and positioning accuracy**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

[**R4-2509762**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509762.zip) **Discussion on performance requirement for AI beam management**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

[**R4-2509932**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509932.zip) **RRM performance requirements for beam management and positioning accuracy**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted.**

[**R4-2510160**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510160.zip) **Discussion on RRM performance requirements for beam management**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

[**R4-2510339**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510339.zip) **Discussion on RRM performance requirements for beam management and positioning accuracy**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

[**R4-2510759**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510759.zip) **On performance requirements for AI/ML based positioning**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This paper discusses issues related to performance requirements for AI/ML based positioning use cases.

**Decision: Noted.**

[**R4-2510760**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510760.zip) **draftCR to 38.133 on report mapping for UL SRS-TDCT and UL SRS-TDCP measurements (Rel. 19)**

*Type: draftCR For: Endorsement  
 38.133 v19.1.0 CR- rev Cat: B (Rel-19)  
 Source: Ericsson*

**Abstract:**

This draftCR introduces report mapping for new measurements introduced by RAN1 for AI/ML based positioning.

**Decision: Endorsed.**

[**R4-2510808**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510808.zip) **RRM performance requirements for beam management**

*Type: discussion For: Approval  
 Source: OPPO*

**Decision: Noted.**

[**R4-2510875**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510875.zip) **Discussion on RRM performance requirements for beam management and positioning accuracy**

*Type: discussion For: Discussion  
 Source: Huawei,HiSilicon*

**Decision: Noted.**

[**R4-2511574**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511574.zip) **AI-ML BM: Simulation Results**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Revised to** [**R4-2511794**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511794.zip) **(from** [**R4-2511574**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511574.zip)**).**

[**R4-2511794**](file:///D:\Users\yangtang\Documents\work\RAN4\WG%20meetings\116\Docs\R4-2511794.zip) **AI-ML BM: Simulation Results**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**//** **Demodulation and/or CSI reporting requirements for CSI prediction**

[**R4-2509412**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509412.zip) **Discussion and simulation results for AI based CSI prediction**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

[**R4-2509428**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509428.zip) **Discussion on demodulation for CSI prediction**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

[**R4-2509655**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509655.zip) **Discussion on CSI reporting requirements for CSI prediction**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

[**R4-2510162**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510162.zip) **Discussion on demodulation for CSI prediction**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

[**R4-2510340**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510340.zip) **Discussion on Demodulation and CSI reporting requirements for CSI prediction**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

[**R4-2510809**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510809.zip) **Demodulation and CSI reporting requirements for CSI prediction**

*Type: discussion For: Approval  
 Source: OPPO*

**Decision: Noted.**

[**R4-2510836**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510836.zip) **PMI reporting requirements with CSI prediction**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the AI/ML-based CSI prediction.

**Decision: Noted.**

[**R4-2510876**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510876.zip) **Discussion on demodulation andor CSI reporting requirements for CSI prediction**

*Type: discussion For: Discussion  
 Source: Huawei,HiSilicon*

**Decision: Noted.**

[**R4-2510994**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2510994.zip) **On Demodulation and CSI Reporting Requirements for CSI Prediction**

*Type: discussion For: Discussion  
 Source: Nokia*

**Decision: Noted.**

[**R4-2511573**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511573.zip) **CSI Prediction: Simulation results**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**// Moderator summary and conclusions**

[**R4-2509098**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509098.zip) **Topic summary for [116][131] NR\_AIML\_air\_part1**

*Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

Topic summary Main session

**Decision: Noted.**

**Minutes and agreements in the online session and ad hoc**

Please refer to the hyperlink below for the detailed minutes of online session:

[R4-2509098](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2509098.zip)

[**R4-2511795**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511795.zip) **Summary of CSI prediction simulation results**

*Type: other For: information  
 Source: OPPO*

**Decision: Revised to R4-2511889 (from R4-2511795).**

[**R4-2511889**](http://10.10.10.10/ftp/RAN/RAN4/Inbox/R4-2511889.zip) **Summary of CSI prediction simulation results**

*Type: other For: information  
 Source: OPPO*

**Decision: Noted.**

[**R4-2511865**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511865.zip) **Summary of beam management simulation results**

*Type: other For: information  
 Source: vivo*

**Decision: Noted.**

[**R4-2511796**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511796.zip) **WF on updated simulation assumption for AI based CSI prediction**

*Type: other For: Approval  
 Source:* OPPO, CAICT, vivo, Nokia, Ericsson, Qualcomm, CMCC, CTC, Huawei, Hisilicon, Mediatek, CATT, Samsung, ZTE Corporation, Apple

**Decision: Approved.**

[**R4-2511797**](file:////Users/yangtang/Documents/work/RAN4/WG%20meetings/116/Docs/R4-2511797.zip) **WF on updated simulation assumption for AI based beam management**

*Type: other For: Approval  
 Source:* vivo, NTU, Nokia, Ericsson, Qualcomm, Xiaomi, Huawei, Hisilicon, Mediatek, OPPO, APPLE, Rohde & Schwarz, CATT, Samsung, Intel, ZTE Corporation, Sanechips, CAICT

**Decision: Approved.**

[**R4-2511890**](http://10.10.10.10/ftp/RAN/RAN4/Inbox/R4-2511890.zip) **WF on AI/ML for air interface [116][131]**

*Type: other For: Approval  
 Source: Qualcomm*

**Decision: Approved.**

[**R4-2511891**](http://10.10.10.10/ftp/RAN/RAN4/Inbox/R4-2511891.zip) **AH minutes for AI/ML for air interface [116][131]**

*Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

This contribution provides the summary of topics and recommended summary.

**Decision: Noted.**

[**R4-2511892**](http://10.10.10.10/ftp/RAN/RAN4/Inbox/R4-2511892.zip) **AH minutes for BM simulation assumption in AI/ML for air interface [116][131]**

*Type: other For: Information  
 Source: vivo, Qualcomm*

**Abstract:**

This contribution provides the summary of topics and recommended summary.

**Decision: Noted.**

16.02.2024 minor adaptations for RAN #103

10.11.2023 minor adaptations for RAN #102

02.08.2023 minor adaptations for RAN #101

26.04.2023 minor adaptations for RAN #100

01.02.2023 minor adaptations for RAN #99

27.10.2022 minor adaptations for RAN #98e

01.08.2022 minor adaptations for RAN #97e

21.05.2022 minor adaptations for RAN #96

10.01.2022 minor adaptations for RAN #95e

04.10.2021 minor adaptations for RAN #94e

08.08.2021 minor adaptations for RAN #93e

17.05.2021 minor adaptations for RAN #92e

28.01.2021 minor adaptations for RAN #91e

09.11.2020 minor adaptations for RAN #90e

31.08.2020 minor adaptations for RAN #89e

20.04.2020 minor adaptations for RAN #88e

18.02.2020 minor adaptations for RAN #87e

14.11.2019 minor adaptations for RAN #86

18.08.2019 minor adaptations for RAN #85

12.05.2019 minor adaptations for RAN #84

27.02.2019 minor adaptations for RAN #83

21.11.2018 completion levels with colours added (for RAN #82)

v04.81 31.07.2018 simplification of template and addition of cross-TSG aspects (for RAN #81)

v04.80 21.05.2018 minor adaptations for RAN #80

v04.79 26.02.2018 minor adaptations for RAN #79

v04.78 18.11.2017 minor adaptations for RAN #78

v04.77 06.08.2017 minor adaptations for RAN #77

v04.76 15.05.2017 minor adaptations for RAN #76

v04.75 31.01.2017 minor adaptations for RAN #75

v04.74 28.10.2016 minor adaptations for RAN #74

v04.73 01.09.2016 adaptations for RAN #73 (time units in extra Excel table, RAN6 reporting included)

v04.72 26.05.2016 adaptations for RAN #72 (introduction of NR & GERAN TUs)

v04.71 10.02.2016 minor adaptations for RAN #71

v04.70 30.10.2015 minor adaptations for RAN #70

v04.69 12.08.2015 minor adaptations for RAN #69

v04.68 21.05.2015 minor adaptations for RAN #68

v04.67 01.02.2015 minor adaptations for RAN #67

v04.66 16.11.2014 minor adaptations for RAN #66

v04.65 16.08.2014 minor adaptations for RAN #65

v04.64 22.05.2014 minor adaptations for RAN #64

v04.63 24.01.2014 restructuring for RAN #63 to cover Core & Perf. in one doc file

v03.62 11.11.2013 section 1.2.3 adapted for RAN #62

v03 11.08.2013 section 1.2.3 added on time budget

v02 07.05.2010 history added, some spelling corrections

v01 13.11.2009 First version of the template