3GPP RAN WG2 Meeting #131 R2-25xxxxx

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

Agenda Item: 8.1.1

Source: Ericsson

Title: Remaining RRC open issues in feature AIML PHY

Document for: Discussion, Decision

# Introduction

The following document includes a list of open issues according to the following email discussion:

* [POST130][026][AI PHY] 38.331 CR (Ericsson)

Intended outcome: agree to CR and open issues list and input

Deadline: long

Companies are invited to provide feedback on open issue list by: **5 August 2025**

Companies providing input to this email discussion are requested to leave contact information below.

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# Remaining open issues for specification TS 38.331

## LCM for UE-sided model for Beam Management use case

###### **Open issue RRC-1: Cause of inapplicability**

**Issue description:** It isFFS how to define the simple cause value of inapplicability related to model availability and how to capture it in the spec.

This issue refers to the RAN2#129bis agreement:

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| Together with inapplicability reporting, UE further indicates a simple cause value of inapplicability FFS how to define this simple cause related to model availability and how we capture it in the spec |

The issue is captured as an editor’s note in the endorsed RRC running CR [R2-2504349], clause 5.3.5.3.

**Proposed resolution:** This open issue was resolved by the RAN2#130 agreement below. The remaining FFS can be addressed directly in the RRC running CR, where companies can provide comments to the text suggestions made by the rapporteur. If it is not possible to conclude from the running CR discussion, this FFS can be discussed in the next RAN2 meeting based on a proposal from the rapporteur.

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| 1 Introduce “release configuration” flag instead of inapplicability cause to indicate UEs preference to release a configuration (e.g. due to model in availability in the local device FFS reason to be specified) |

###### **Open issue RRC-2: Content of *otherConfig* for enabling applicability reports in UAI**

**Issue description:** It is not yet clarified what the content (if any) of the UAI configuration should be, to enable the UE to report applicability in UAI, e.g. applicability updates/changes as agreed for option A. For instance, this configuration could be just a flag or could contain further information.

The issue is captured as an editor’s note in endorsed RRC running CR [R2-2504349], clause 6.3.4.

**Proposed resolution:** This open issue was resolved by the RAN2#130 agreement below. Remaining aspects for the UAI configuration for applicability reporting for option B are treated in open issue RRC-40.

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| 2 Introduce a flag in OtherConfig indicating whether applicability reporting via UAI is enabled or disabled. Assume this applies to Option A and B, FFS if anything different needs to be done for option B (if specified) |

###### **Open issue RRC-3: UE data collection request**

**Issue description:** For UE-side data collection**,** the details of UAI signaling for the UE start/stop request and especially the following aspects are not yet clarified:

* how to refer in UAI to a preferred radio resource candidate configuration from a list of candidate configurations provided by NW
* where/what the NW provides as candidate configurations
* what the content of *otherConfig* for enabling UE data collection requests in UAI should be (e.g. just a flag, the list of candidate UE data collection configurations, etc.).

This issue refers to the RAN2#129bis agreements:

The UE can request measurement configuration for data collection of AI/ML based beam management. The request can contain one or more of the following:

• An indication on start/stop of data collection

• Preferred configuration from a list of candidate configurations provided by NW. Details of signaling are FFS. It is up to network what it configures at the end.

Introduce UAI message for UE request of data collection measurement configuration. And it is up to UE implementation when to send the request.

The issue is captured as an editor’s notes in endorsed RRC running CR [R2-2504349], clause 5.7.4.3, 6.2.2, and 6.3.4.

RAN2#130 agreed:

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| 3 The UE doesn’t need to measure the candidate data collection configuration(s). This will be specified in RAN2 specs.  4 For beam management, candidate data collection configuration includes at least:  - CSI-ResourceConfigId of Set A  - CSI-ResourceConfigId of Set B  - One/two associated IDs (up to whether Set B is equal/subset of Set A or not) according to RAN1 agreements  FFS the details of how this is signalled (e.g. CSIReport config or simplified signaling) |

**Proposed resolution:** This open issue is treated in the email discussion **[POST130][037][AI PHY] UE candidate data collection (Xiaomi/Ericsson)**.

###### **Open issue RRC-4: Activation of a periodic CSI report configuration upon change from inapplicable to applicable**

**Issue description:** RAN2#129 agreed that for periodic CSI reporting, the UE autonomously activates the applicable functionality upon sending the applicability report via *RRCReconfigurationComplete* in Step 4:

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| If option A is configured in Step 3, for periodic CSI reporting, the UE autonomously activate the applicable functionalities upon reporting applicable functionalities via RRCReconfigurationComplete in step 4 (i.e. without need to wait RRCReconfiguration in Step 5). |

Further, RAN2#129bis agreed:

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| 2 Upon receiving one or more full inference configuration(s) via RRCReconfiguration message, UE shall maintain all the full inference configuration(s) no matter the full inference configuration is applicable or inapplicable until the network releases it explicitly. |

Thus, the UE will maintain a periodic CSI report configuration that is inapplicable, but it is unclear whether/how a periodic CSI report is activated upon a change of applicability, from inapplicable to applicable, since there is no legacy procedure to activate such a configuration (other than the initial sending of the RRC configuration).

One way to solve this situation is by network implementation, namely the network can de-configure a periodic CSI report configuration after the UE initially reports it as inapplicable via *RRCReconfigurationComplete*.

**Proposed resolution:** This open issue was resolved by the RAN2#130 agreement:

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| 1. When UE indicates that a periodic CSI-ReportConfig is not applicable, the gNB is expected to release the configuration (i.e., UE autonomous release is not supported). |

###### **Open Issue RRC-5: Reporting behaviour of inapplicable periodic beam prediction configuration**

**Issue description:** It is ambiguous what the UE should report to the NW when its periodic beam prediction configuration becomes inapplicable and whether the model would output anything at all when if, e.g., the input distribution no longer matches what is expected.

We need to determine whether the configuration should cease reporting, or send the input (measurements) to the NW once it becomes inapplicable, or continue sending (inaccurate) predictions.

**Proposed resolution:** This open issue was resolved by the RAN2#130 agreements:

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| 2. The UE continues to perform the inference and reporting until the configuration is released. It is up to network implementation what to do with UE reported beam predicted reporting after UE indicates that a CSI-ReportConfig is not applicable.  3. The UE shall report when CSI-ReportConfig becomes not applicable |

###### **Open issue RRC-6: Handling of inference, applicability reporting and UE data collection preference configurations when UE goes to RRC\_IDLE/INACTIVE state and during RRCReestablishment**

**Issue description:** RAN2 made following agreements in RAN2#129bis meeting:

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| * Upon receiving one or more full inference configuration(s) via RRCReconfiguration message, UE shall maintain all the full inference configuration(s) no matter the full inference configuration is applicable or inapplicable until the network releases it explicitly. |

It is not clear whether UE releases inference configurations when UE goes to RRC\_IDLE/CONNECTED state or upon network configuration via RRCRelease, etc.

Furthermore, handling of applicability configurations and UE data collection preference configuration (*applicabilityReportConfig* and *dataCollectionPreferenceConfig* in RRC running CR) during RRCReestablishment and in transition to RRC\_INACTIVE state needs to be specified.

**Proposed resolution:** This open issue was resolved by the RAN2#130 agreement below. The remaining FFS on whether applicability reporting via RRCReestablishmentComplete and RRCResumeComplete comes for free is addressed in open issue RRC-42.

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| 2 (RRC6) On how to handle RRC configuration in IDLE/INACTIVE/RLF, follow the legacy UE behaviour in TS 38.331 on whether to release or keep the RRC configuration in CSI-MeasConfig (for inference configuration) and OtherConfig (for applicability reporting and UE data collection preference configurations). FFS Whether applicability reporting via RRCReestablishmentComplete and RRCResumeComplete is supported (if it comes for free). |

###### **Open issue RRC-7: Applicability reporting for option B in *RRCReconfigurationComplete***

**Issue description:** It isFFS whether the applicability report for option B (sets of inference related parameters) can be included in *RRCReconfigurationComplete* (or if it can only be included in UAI).

This issue refers to the following RAN2#129bis agreement, based on which the overall design for option B requires further input from RAN1:

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| **Agreements on option B**  1 RAN2 assumes UE receives RRCReconfiguration message including one set or multiple sets of inference related parameters via OtherConfig for option B. This assumption can be confirmed (i.e., whether to reconsider CSI-ReportConfig) after receiving Option B inference related parameters (e.g., in RAN1 RRC parameters list).  Potential aspects to consider if RAN2 revisit:  - To reconsider CSI-ReportConfig for option B, for example, if the list of inference related parameters is fully contained within existing CSI-ReportConfig.  - to take into accounts UE behaviour when confirming the assumption e.g., whether option A and option B result in different UE behavior |

Given the agreement above, it is the Rapporteur’s understanding that the procedures for option B may depend on the RAN1 list of parameters for option B, since based on this list RAN2 will confirm whether the configuration for option B is sent in otherConfig or not. For instance, if the option B configuration is indeed sent in otherConfig, it may be more suitable to send the applicability report in UAI. However, if the parameters for option B are sent within the CSI measurement framework, RRCReconfigurationComplete may be more suitable to send the applicability report.

Thus, if further procedures for option B are discussed, it is suggested to taken into account whether these procedures may depend on the list of inference related parameters from RAN1.

The issue is captured as an editor’s note in the endorsed running CR [R2-2504349], clause 5.3.5.3.

**Proposed resolution:** This open issue was resolved by the RAN2#130 agreement:

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| 1 (RRC 7) RAN2 assumes applicability report for Option B (sets of inference related parameters) can be included in both RRCReconfigurationComplete and UAI (i.e., same as Option A). This can be revisited based on RAN1 conclusions/final signaling design. |

###### **Open issue RRC-8: Coexistence between option A and option B**

**Issue description:** Considering that both Option A and B are to be specified, we need to discuss how the 2 options co-exist, whether there is any interaction between them etc. For instance, it is not clear whether both option A and option B can be configured or not. This can affect signaling design of ApplicabilityReportList.

If further procedures for option B are discussed, it is suggested to take into account whether these procedures may depend on the list of inference related parameters from RAN1.

**Proposed resolution:** This open issue was resolved by the RAN2#130 agreement:

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| 3 (RRC8) RAN2 confirm that option A and option B can be configured in the same RRCReconfiguration message with the unified applicability report procedure. |

###### **Open issue RRC-9: Definition of ‘applicable AI/ML functionality’**

**Issue description:** How to update the definition of ‘applicable AI/ML functionality’ in clause 3.1, e.g. replace 'functionality', and align it with RAN1 specs and with TS 38.300.

The issue is captured as an editor’s note in the running CR, in clause 3.1. The running CR also contains an example initial definition.

**Proposed resolution:** Update the definition as in the proposal below.

1. (RRC-9) Update the definition of ‘applicable AI/ML functionality’ in clause 3.1 as: “Applicable configuration: Configuration according to which an AI/ML functionality is determined to be applicable, as defined in TS 38.300 [2].”

Companies are invited to provide feedback regarding the above open issue and possible proposed resolution:

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| **Company** | **Agree to proposal?** | **Other comments** |
| OPPO | Agree |  |
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###### **Open issue RRC-10: Terminology throughout RRC specs**

**Issue description:** It isFFS how to consistently update the AIML related terminology throughout the document (e.g. whether to adopt the terms 'measurement prediction', 'prediction configuration', etc.).

The issue is captured as an editor’s note in the running CR, clause 5.3.5.3.

Furthermore, the applicability reporting procedure should be based on specific fields in the configuration being present, as for legacy procedures.

**Proposed resolution:** It is suggested to address this open issue directly in the RRC running CR, where the companies can provide comments to the updated text provided by the rapporteur.

###### **Open issue RRC-11: How to configure RS configuration for UE sided data collection within CSI-ReportConfig**

**Issue description:** According to RAN1 agreements, a *CSI-ReportConfig* without an actual CSI report can be configured for UE data collection purposes. Since the *reportConfigType* field is mandatory in *CSI-ReportConfig*, further discussion is needed on how to handle this situation.

For example, instructing the UE to ignore the legacy *reportConfigType* could be considered.

**Proposed resolution:** It is suggested to address this open issue directly in the RRC running CR, where companies can provide comments to the updated text provided by the rapporteur.

###### **Open issue RRC-12: Monitoring for AI based beam management**

**Issue description:** RAN1 has made progress related to the monitoring framework, i.e., Type 1 Option 2 UE assisted monitoring wherein UE will report the monitoring metric to gNB. The RRC impact can be analysed upon RAN1 conclusion.

**Proposed resolution:** It is suggested to address this open issue directly in the RRC running CR, where the companies can provide comments to the updated text (i.e. inclusion of the RAN1 parameters for monitoring) provided by the rapporteur. If the companies identify conceptual/more general issues relates to monitoring, it is suggested that they discuss them in contributions.

###### **Open issue RRC-13: CSI prediction LCM framework**

**Issue description:** For the CSI prediction use case, it is very likely the same framework (e.g., applicability report, inference configuration, data collection, monitoring) for AI based beam management can be used, but still it is upon RAN1/RAN2’s confirmation.

From the rapporteur’s perspective it is overall straightforward to adopt the same LCM framework for the CSI prediction use case as for beam management. However, a few details need to be clarified for UE-side data collection, for the CSI prediction use case. From the rapporteur’s point of view, the procedures for UE data collection such as start/stop request, candidate configuration provision, request for preferred candidate configurations, etc. should be the same as for beam management. If this is acceptable, RAN2 needs to discuss what the content of the candidate configurations is, for the CSI prediction use case.

**Proposed resolution:** Adopt the proposal below.Further proposal(s) can be made by the rapporteur after collecting input from the companies in the table below.

1. (RRC-13) The procedures for UE data collection for the CSI prediction use case are the same as for the beam management use case (start/stop request from UE, candidate configuration provision from NW, request for preferred candidate configurations from UE, etc.).

Companies are invited to provide feedback regarding the above open issue and possible proposed resolution:

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| **Company** | **Agree to proposal?** | **If the proposal is agreed, what should be the content of the candidate configurations for CSI prediction? Companies can provide also other comments regarding this open issue.** |
| OPPO | Agree | Resource for set B and associated ID for set B |
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###### **Open Issue RRC-14: Repeated reports of applicability for configurations which consistently perform poorly**

**Issue description:** UEs may repeatedly report a configuration as applicable based on the applicability determination information (UE-side and NW-side) but still perform poorly based on unforeseen factors, e.g., scenarios not captured in the dataset which trained one or more models supporting the AI/ML configuration. There is nothing we have agreed to so far to prevent a UE from repeating the same indication of applicability every time it re-enters RRC CONNECTED.

One solution is to let the UE receive feedback sufficient to adjust its applicability determination.

In the rapporteur’s view, this is an optimization and therefore it is not critical for the conclusion of the WI. As an alternative, the NW can configure performance monitoring for a certain applicable and active configuration, and if it decides that the performance is not good enough, it can de-configure that configuration.

**Proposed resolution:** Adopt the proposal below.

1. (RRC-14) Feedback from the NW to the UE to adjust the applicability determination procedure is not supported in Rel-19.

Companies are invited to provide feedback regarding the above open issue and possible proposed resolution:

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| **Company** | **Agree to proposal?** | **Other comments** |
| OPPO | Agree | This issue seems not essential, it’s also workable to rely on model monitoring procedure to check the real applicability, NW can decide whether to deactivate one prediction configuration based on model monitoring outcome and other implementation factors. |
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###### **Open Issue RRC-15: The time duration for an AI functionality to become available for inference when the UE reports applicability**

**Issue description:** The UE needs to synchronize the time duration for an AI functionality to become available for inference with the network when the UE reports applicability for either a full inference configuration or a set of inference parameters.

Unlike conventional non-AI features, where the algorithm size is fixed, AI algorithms can vary significantly in size depending on their generalization performance and specific use cases. These sizes can range from several kilobytes to tens of megabytes. Additionally, UE implementations may use various types of memory to balance cost and performance, and these different memory types and constraints can affect the access speed of stored models.

The UE should indicate the time duration for the AI functionality to become available when reporting applicability to the network. This time duration refers to how long it takes for the UE to load the AI models into RAM or another accessible memory for inference. By providing this information, the network can better understand the timeframe within which the configured radio resources and AI model can be utilized, enabling more efficient and effective resource management, especially for periodic CSI.

Another option is to let RAN4 address this time duration in terms of requirements.

**Proposed resolution:** It is suggested that companies provide contributions to resolve the issue.

###### **Open issue RRC-16: UE behaviour when the associated ID is not provided by the network**

**Issue description:** The UE behaviour when the associated ID is not provided by the network is not yet clarified.

In the rapporteur’s view, if the associated ID is not provided by the network, the UE should still be able to provide the applicability status (applicable or inapplicable) of the configurations, which is anyway subject to UE implementation.

**Proposed resolution:** Adopt the proposal below.

1. (RRC-16) If the network does not provide the associated ID, the UE the reports the applicability (applicable/inapplicable) based on the other provided information in the configuration.

Companies are invited to provide feedback regarding the above open issue and possible proposed resolution:

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| **Company** | **Agree to proposal?** | **Other comments** |
| OPPO | Agree with some clarification | If associated ID is not provided by the network, UE may optionally provide associated ID(s) to NW per configuration. This can help NW to better understand under which condition the configuration is applicable, which can avoid some ambiguity between UE and NW. |
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###### **Open issue RRC-17: Processing timing requirement of applicability/inapplicability report via *RRCReconfigurationComplete***

**Issue description:** According to Section 12 of TS 38.331, there are two processing latency requirements (10ms vs 16ms) between reception of *RRCReconfiguration* andreporting *RRCReconfigurationComplete,* depending on whether it is related to CA/DC operation. For Option A, it was agreed to report initial applicability report in *RRCReconfigurationComplete*. However, it is not clear what is its processing latency requirement because the applicability reporting is a new reporting different from CA/DC configuration.

As Rel-19 is the first release of AI/ML, we expect new / unpredicted challenges for the UE to handle AI/ML operation. Thus, one possibility is using relaxed RRC processing latency requirements (i.e. 16ms).

**Proposed resolution:** Adopt the proposal below.

1. (RRC-17) RRCReconfigurationComplete containing applicability reports has a processing latency requirement of 16 ms with respect to the reception of RRCReconfiguration.

Companies are invited to provide feedback regarding the above open issue and possible proposed resolution:

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| **Company** | **Agree to proposal?** | **Other comments** |
| OPPO | No strong view |  |
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###### **Open issue RRC-40: Configuration for Option B for applicability reporting**

**Issue description:** RAN2 is still to confirm the assumption that option B is configured in otherConfig.

RAN2#129bis agreed that:

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| RAN2 assumes UE receives RRCReconfiguration message including one set or multiple sets of inference related parameters via OtherConfig for option B. This assumption can be confirmed (i.e., whether to reconsider CSI-ReportConfig) after receiving Option B inference related parameters (e.g., in RAN1 RRC parameters list).  Potential aspects to consider if RAN2 revisit:  - To reconsider CSI-ReportConfig for option B, for example, if the list of inference related parameters is fully contained within existing CSI-ReportConfig.  - to take into accounts UE behaviour when confirming the assumption e.g., whether option A and option B result in different UE behavior |

Subsequently, RAN1#121 agreed that:

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| Agreement  For option B of applicability check, RAN 1 assumes that at least the following RRC parameters are to be reused:   * For both BM-Case 1 and BM-Case 2:   + *associatedIDforSetA-r19, resourcesForSetA-r19, resourcesForChannelMeasurement, associatedIDforSetB-r19, reportQuantity-r19, reportConfigType, nrofreportedpredictedrs-r19* * For BM-Case 2:   + *TimeGap-r19, nroftimeinstance-r19,*   Note: this doesn’t imply the associated ID is always present |

**Proposed resolution:** Adopt the proposal below.

1. (RRC-40) RAN2 confirms that UE receives RRCReconfiguration message including one set or multiple sets of inference related parameters via OtherConfig for option B.

Companies are invited to provide feedback regarding the above open issue and possible proposed resolution:

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| **Company** | **Agree to proposal?** | **Other comments** |
| OPPO | Agree | We see no serious problem to confirm this working assumption, and this way forward can also limit the spec impact to RAN2 only. |
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###### **Open issue RRC-41: Value range for associated ID**

**Issue description:** RAN1 left the value range for the associated ID (associatedIDforSetA and associatedIDforSetB) up to RAN2, according to the list of RAN1 parameters in [R2-2505000].

In the rapporteur’s view, the associated ID is simply an integer, namely INTEGER (0..FFS). Thus, RAN2 needs to agree on the maximum value of the associated ID, assuming that both associatedIDforSetA and associatedIDforSetB get values from the same pool of IDs.

**Proposed resolution:** A proposal will be made by the rapporteur after collecting input from the companies in the table below.

Companies are invited to provide the maximum value for the associated ID and explain why they suggest that value:

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| **Company** | **Maximum value for associated ID (integer)** | **Other comments** |
| OPPO | 16 or 24 | This is related to the dataset type possibility, we understand for future proof flexibility, the ID length can be a little bit longer, so lightly suggest to consider 16 and 24. |
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###### **Open issue RRC-42: Whether applicability reporting comes for free in RRCReestablishmentComplete and RRCResumeComplete**

**Issue description:** RAN2 to confirm whether applicability reporting via RRCReestablishmentComplete and RRCResumeComplete comes for free or not.

RAN2#130 agreed:

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| 2 (RRC6) On how to handle RRC configuration in IDLE/INACTIVE/RLF, follow the legacy UE behaviour in TS 38.331 on whether to release or keep the RRC configuration in CSI-MeasConfig (for inference configuration) and OtherConfig (for applicability reporting and UE data collection preference configurations). FFS Whether applicability reporting via RRCReestablishmentComplete and RRCResumeComplete is supported (if it comes for free). |

In the rapporteur’s understanding, “comes for free” means that there is no specification impact, i.e. no need to make modifications to add applicability reports in the Complete message.

Given this assumption, applicability reporting cannot come for free in RRCReestablishmentComplete, since the UE releases the entire configuration.

For RRCResumeComplete, the only case when the applicability reporting comes for free is when the network sends in RRCResume a configuration for the SCG, so the UE can report in RRCResumeComplete the applicability of the inference configurations for the SCG. Namely, the UE replies with RRCResumeComplete including *nr-SCG-response*, which contains RRCReconfigurationComplete, as a response to RRCResume including *mrdc-SecondaryCellGroup* set to *nr-SCG*, which includes RRCReconfiguration.

For other cases of RRCResumeComplete, the applicability reporting does not come for free. Nonetheless, before sending RRCResumeComplete, the UE may already have some inference configurations based on legacy procedures, so including their applicability status in RRCResumeComplete would require minor specification changes (i.e. add applicability report in RRCResumeComplete and the corresponding procedural text), so would come almost for free. To the rapporteur’s understanding, the UE may have inference configurations before sending RRCResumeComplete in the following cases:

* The UE restores MCG (for PCell)
* The UE restores MCG-SCells, if configured in RRCResume
* The UE restores SCG, if configured in RRCResume
* The UE receives a configuration for the MCG in RRCResume.

**Proposed resolution:** Adopt the proposals below.

1. (RRC-42) No enhancements are pursued for reporting applicability in RRCReestablishmentComplete.
2. (RRC-42) The UE can report applicability via RRCResumeComplete for SCG inference configurations received in RRCResume, without specification impact beyond already agreed applicability reporting procedure.
3. (RRC-42) Applicability reporting is added in RRCResumeComplete for inference configurations that exist at the UE based on legacy procedures (restored or received in RRCResume).

Companies are invited to provide feedback regarding the above open issue and possible proposed resolution:

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| **Company** | **Agree to P7?** | **Agree to P8?** | **Agree to P9?** | **Other comments** |
| OPPO | Agree | Agree | Agree |  |
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## NW side data collection

###### **Open issue RRC-18: NW control on retaining logged data at HO**

**Issue description:** Thesignaling details of the network control on how data should be retained at handover are FFS, based on the RAN2#129 bis agreement:

Introduce 1-bit indication on whether to release or retain un-retrieved data in RRCReconfiguration during/before HO. Source gNB decides whether the data should be kept. The indication is provided in RRCReconfiguration (i.e. not in RRC Reconfiguration from target cell). FFS signaling details.

The issue is captured as an editor’s note in the running CR, in clause 5.3.5.3 and 6.2.2.

It the rapporteur’s view, it should be clarified Whether/how the 1-bit indication can be sent during or before HO, taking into account that the source gNB decides whether the data should be kept. From the rapporteur perspective, it is not possible for the source gNB to add the 1-bit indication during HO, in the same RRCReconfiguration that encapsulates the RRCReconfiguration from the target gNB. Thus, the rapporteur sees the following two possible solutions for this issue:

* The source gNB sends the 1-bit indication to the UE before HO.
* The source gNB decides if the 1-bit indication is needed and, if so, sends it to the target gNB, which includes it in the RRCReconfiguration sent to the UE during HO. No RAN3 impact is expected if the transmission of the 1-bit indication is limited to the case in which the target gNB is from the same vendor as the source gNB.

**Proposed resolution:** This open issue was resolved by the RAN2#130 agreement:

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| 1 (RRC-18) 1-bit indication on whether to release or retain un-retrieved data in RRCReconfiguration with synch is introduced. In case of HO, the source sends the 1-bit indication to target cell in HO preparation message. This 1-bit indication is included in HO command by target cell (if the target cell wants to keep the data). We should have single UE behaviour, when it receives the indication it keeps it, otherwise it removes it. Notify RAN3 |

###### **Open issue RRC-19: Reporting assistance information related to logged measurements**

**Issue description:** It is not yet clearwhat the *otherConfig* should contain to enable the UE to report assistance information via UAI, related to logging of radio measurements. For instance, should the low power, buffer full, and buffer threshold reached indications be all configured with a single bit, or should the configurations be separated?

This issue is related to the RAN2#129bis agreement:

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| **Agreements on availability indication**   * Availability indication can be triggered due to:   + Full buffer being reached (if configured)   + Buffer threshold being reached (if configured).   + Low power (if configured) * The UE send a UAI that indicates:   + Data is available   + Reason for trigger (full buffer, threshold)   + Low power indication * The encoding of the data is available/UAI and the cause value is FFS   NOTE: it is up to UE Implementation how buffer threshold reached and low power is determined |

The issue is captured as an editor’s notes in the running CR, in clause 5.3.5.9, 5.7.4.3, 6.2.2, and 6.3.4.

**Proposed resolution:** Suggest to address this open issue directly in the RRC running CR, where the companies can provide comments to the text provided by the rapporteur.

###### **Open issue RRC-20: Further procedures for UE assistance information related to logging**

**Issue description:** It has not yet been discussed whether further procedures for UE reporting assistance information related to logging is need. Such further procedures may be, e.g. prohibit timers, indication that battery state is not low any longer, indication that the memory is not full any longer, etc.

The issue is captured as an editor’s note in the running CR, in clause 5.7.4.2 and 5.7.4.3.

**Proposed resolution:** This issue was resolved by the RAN2#130 agreements:

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| --- |
| 3 UAI related to buffer status or low power state is triggered only once when specific conditions are met (e.g., buffer full/threshold, and low power state). A prohibit timer is not necessary for UAI related to buffer status or low power state  4 No additional signaling from the UE is required when the low power issue is resolved  5 No additional signaling from the UE is required when the buffer full issue is resolved |

###### **Open issue RRC-21: Time related content of logged data**

**Issue description:** It has not yet been clarified whatinformation needs to be included with the logged data, to indicate a time gap between the logged data entries (i.e. a gap that is longer than the logging data periodicity).

This issue refers to the RAN2#129bis agreement:

1. For temporal domain, the network is made aware whether there is a gap between two consecutive samples. FFS amount of gap and whether this is implicit or explicit

RAN2#130 agreement:

|  |
| --- |
| Data is collected on per data logging configuration basis and UE indicates data logging configuration ID. An indication of the “gap” is needed. “Gap” is time interval larger than the configured logging periodicity. FFS if timestamp and relative time stamp for each group is needed per “group”. |

The issue is captured as an editor’s note in the running CR, in clause 5.7.10.3 and 6.2.2.

**Proposed resolution:** It is suggested that companies provide contributions to the following meeting to resolve the issue.

###### **Open issue RRC-22: RAN1 involvement for logged data for NW-side and UE-side data collection**

**Issue description:** Procedures for performing the L1 measurement results are captured in RAN1 specification, i.e. TS 38.214. Rapporteur assumes that the same should be applied for the case of radio measurements logging for the NW-side data collection and UE-side data collection. Hence RAN1 involvement is expected to capture procedures related to the radio measurements logging, e.g. in the UE variable *VarCSI-LogMeasReport* for the case of NW-side data collection.

From the rapporteur’s perspective, an LS should be sent to RAN1.

The issue is captured as an editor’s note in the running CR, in clause 5.7.10.3.

**Proposed resolution:** This issue was resolved by the RAN2#130 agreement below. Further related issues are addressed in the email discussion **[POST130][031][AI PHY] NW side data collection (Ericsson/ZTE)**.

|  |
| --- |
| As a starting point, the data logging is captured in RRC specs. |

###### **Open issue RRC-23: Cell ID stored with logged data for NW-side data collection**

**Issue description:** It has not been clarified what type of cell ID the UE needs to log along with the logged data, in order to unambiguously identify the cell in which the UE performed the data logging, e.g. CGI, PCI-ARFCN etc.

The issue is captured as an editor’s note in the running CR, in clause 6.2.2.

**Proposed resolution:** This open issue was resolved by the RAN2#130 agreement:

|  |
| --- |
| The UE should report the CGI of the serving cell whenever feasible. If CGI is unavailable, the UE shall log PCI-ARFCN as a fallback. |

###### **Open issue RRC-24: Where to include the logging configuration from NW to UE**

**Issue description:** It isFFS whether the logging configuration is included in the CSI framework (whether in *CSI-ReportConfig* or directly under *CSI-MeasConfig*) or at L3.

This issue was discussed in RAN2#129bis and the following outcome was captured:

|  |
| --- |
| * Next meeting proponents should work together and bring complete proposals to show specification impact and consider future use cases. |

The issue is captured as an editor’s note in the running CR, in clause 6.3.2.

Configuration details of events for event-based logging configuration, e.g. whether we reuse configuration in reportConfig, can be included.

**Proposed resolution:** This open issue is addressed in the email discussion **[POST130][031][AI PHY] NW side data collection (Ericsson/ZTE)**.

###### **Open issue RRC-25: Dynamic activation/deactivation of data collection configurations for logging**

**Issue description:** RAN2#127 made the following agreement regarding NW-side data collection:

|  |
| --- |
| 1 As the baseline approach, the UE receives the measurement configuration for AI/ML-enabled features/FGs for data collection and logging of measurements. The network can explicitly configure the UE whether the corresponding data collection and logging (if supported) should be immediately started. FFS if multiple configurations can be provided to the UE. FFS if dynamic activation/deactivation is support. |

The second FFS on dynamic activation/deactivation has not yet been addressed, as also pointed out in the stage-2 running CR draft.

**Proposed resolution:** It is suggested that companies provide contributions to the following meeting to resolve the issue.

###### **Open issue RRC-26: Multiplexing legacy logged data and AIML logged data in new SRB**

**Issue description:** RAN2#129bis agreed that

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| --- |
| 2. New SRB can be configured for NW-side data collection (with lower priority) |

Given the agreement on the new SRB for the transmission of the *UEInformationResponse*, Rapporteur’s understanding is that the new SRB may be used also for the transmission of the legacy SON/MDT reports (e.g. logged MDT measurements, RLF-Report, RA-reports, successful HO reports, etc.), whenever the *UEInformationResponse* carries both a legacy SON/MDT report and AIML logged data. However, this would impact how legacy SON/MDT reporting is performed which can only be at the moment on SRB1 or SRB2.

From the specification perspective, this affects primarily RRC clause 5.7.10.3 and it would impact also other specifications, e.g. TS 37.320.

Another simpler option is to not allow multiplexing of legacy logged data and AIML logged data in the UEInformationResponse, i.e. only AIML logged data can be sent in the new SRB.

**Proposed resolution:** Adopt the proposal below.

1. (RRC-26) Multiplexing of legacy SON/MDT report and AIML logged data in the new SRB is not supported.

Companies are invited to provide feedback regarding the above open issue and possible proposed resolution:

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree to proposal?** | **Other comments** |
| OPPO | Agree | Seems not essential, multiplexing of legacy SON/MDT report and AIML logged data in the new SRB may also cause data transmission priority issue, i.e. which type of report can be reported first if collision happens, considering this is the last meeting, we should focus on essential issues first. |
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###### **Open issue RRC-27: How to set logging periodicity**

**Issue description:** Regardless of the chosen logging framework, further discussion is needed on how to set the logging periodicity for each logging RS.

To provide flexibility in the logging timing, two options could be considered for logging periodicity:

(i) aligning with the RS transmission periodicity, or

(ii) introducing an optional logging interval setting.

From the rapporteur’s perspective, introducing a configurable logging interval offers more flexibility to not log redundant data, especially if the RSs are very frequent in time, e.g. the same RSs could be used also for other purposes.

**Proposed resolution:** Adopt the proposal below.

1. (RRC-27) The logging periodicity of a NW-side data collection configuration is configurable.

Companies are invited to provide feedback regarding the above open issue and possible proposed resolution:

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree to proposal?** | **Other comments** |
| OPPO | Agree |  |
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###### **Open issue RRC-28: Handling of configuration to report data availability and low power state during RRCReestablishment, transition to RRC\_INACTIVE etc**

**Issue description:** Handling of configuration for UE assistance information, to report data availability and low power state(LoggedDataCollectionAssistanceConfig in RRC running CR) during RRCReestablishment and in transition to RRC\_INACTIVE state needs to be specified.

In the rapporteur’s view, handling the UAI configuration for reporting data availability and low power state should follow the way that the logging configurations are handled, which depends on the solution that RAN2 will adopt based on the email discussion **[POST130][031][AI PHY] NW side data collection (Ericsson/ZTE)**.

**Proposed resolution:** Adopt the proposal below.

1. (RRC-27) Handling the configuration for UE assistance information to report data availability and low power state upon IDLE/INACTIVE/RLF follows the UE behaviour for handling the logging configurations.

Companies are invited to provide feedback regarding the above open issue and possible proposed resolution:

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree to proposal?** | **Other comments** |
| OPPO | Agree |  |
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###### **Open issue RRC-29: Whether data availability indication should be sent when the UE has data below the threshold and low power state is sent, and what cause should be included then**

Whether data availability indication should be sent when the UE has data and low power state is sent and what cause should be included then. The UE may have some data when indicating low power state. Even though this data volume may be lower than full buffer/threshold, it is still useful to let the network know about that so that the data can be fetched.

**Proposed resolution:** It is suggested that companies provide contributions to resolve the issue.

###### **Open issue RRC-30: Semi-persistent resources for data collection**

**Issue description:** RAN2 excluded usage of aperiodic CSI resource for data collection, but it is still unclear whether semi-persistent resources are needed for this.

**Proposed resolution:** It is suggested that companies provide contributions to resolve this issue.

###### **Open issue RRC-31: The release of logged AIML data in UE’s buffer**

**Issue description:** RAN2 needs to discuss and capture in the spec when the logged data for AIML in UE buffer will be released. In addition to the retain/release of logged data during HO covered in Open issue RRC-7, the following can be also considered:

- Power off or deregistration

- 48 hrs after the release of logged measurement configuration

- Explicit indication from the serving gNB.

**Proposed resolution:** It is suggested that companies provide contributions to resolve this issue.

###### **Open issue RRC-32: UE behavior during the period that L3 measurement triggered data logging event is fulfilled**

**Issue description:** In RAN2 Athens meeting, RAN2 confirmed to support L3 measurement event triggered data logging method. But it’s still unclear what is the UE behavior during the period that L3 measurement triggered data logging event is fulfilled.

A MDT-like solution can be considered as the baseline, i.e. UE performs data logging periodically during the period that L3 measurement triggered data logging event is fulfilled. If L3 measurement triggered data logging event is not fulfilled, UE just stops data logging.

This issue can be discussed once the L1 data collection configuration framework is settled.

**Proposed resolution:** This open issue is covered by the email discussion **[POST130][031][AI PHY] NW side data collection (Ericsson/ZTE)**.

###### **Open issue RRC-33: Whether separate user consent for gNB centric training is needed**

**Issue description:** It can be discussed whether a separate user consent is required for gNB-centric training, as it may differ from the conventional MDT user consent.

To address the potential impact on gNB and OAM regarding data collection, it may be necessary to send an LS to RAN3 and SA5, including agreements related to logging.

From the rapporteur’s perspective, this issue is outside the scope of RAN2 and it is unclear why separate user consent is needed, given that the gNB can already obtain the same data with legacy reporting (without logging), for the beam management use case considered in Rel-19.

**Proposed resolution:** Adopt the proposal below.

1. (RRC-33) RAN2 does not discuss user consent related aspects for NW-side data collection in Rel-19.

Companies are invited to provide feedback regarding the above open issue and possible proposed resolution:

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| **Company** | **Agree to proposal?** | **Other comments** |
| OPPO | Disagree | Although gNB can already obtain the same data with legacy reporting, no logging behaviour is introduced in legacy, which is totally different compared to AI use cases (data logging seems critical for AI usage), so it’s still valid to have some discussion, of course, RAN3 and SA3 involvement can be helpful for this issue. |
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###### **Open issue RRC-34: Whether enhancements for NW-side data collection are per use case or common for all AI-related use cases**

**Issue description:** It can be discussed whether the enhancements for NW-side data collection are per use case or common for all AI-related use cases, e.g., AS layer memory, logged data availability, low-power state indication.

**Proposed resolution:** It is suggested that companies provide contributions to resolve the issue.

###### **Open issue RRC-35: Release/retain un-retrieved data upon inter-RAT handover**

**Issue description:** RAN2 agreed to introduce 1-bit indication on whether to release or retain un-retrieved data in RRCReconfiguration during/before HO. It needs to be discussed whether this is applicable for inter-RAT handover also. Since it is agreed that UE releases the logged L1 measurements for AI/ML while moving to RRC\_IDLE/RRC\_INACTIVE and RLF, if this agreement is applied for inter-RAT HO, there will be changes in LTE for releasing AI/ML measurements in LTE RLF, moving to LTE idle etc. Moreover, it is not possible to retrieve the data by eNB.

A solution is to always discard logged L1 measurements during inter-RAT handover without considering the indication.

**Proposed resolution:** This open issue was resolved by the RAN#130 agreement below, since the UE discards the logged data if it does not receive the 1-bit indication in HO command.

|  |
| --- |
| 1 (RRC-18) 1-bit indication on whether to release or retain un-retrieved data in RRCReconfiguration with synch is introduced. In case of HO, the source sends the 1-bit indication to target cell in HO preparation message. This 1-bit indication is included in HO command by target cell (if the target cell wants to keep the data). We should have single UE behaviour, when it receives the indication it keeps it, otherwise it removes it. Notify RAN3 |

###### **Open issue RRC-36: How data is forwarded to OAM or source gNB after HO**

**Issue description:** RAN2 agreed that target gNB can fetch data collected in the source gNB after HO. We need to decide how this data is forwarded to OAM or source gNB, e.g. via inter-node RRC message or in some other way. RAN3 involvement may be needed.

**Proposed resolution:** It is suggested that companies provide contributions to resolve the issue.

###### **Open issue RRC-37: Source gNB aware of whether the UE has data available during HO**

**Issue description:** How can the source gNB be aware of whether the UE has data available during HO, e.g. should the UE inform source gNB about data availability before HO is executed?

In the rapporteur’s view, the source gNB already has means to find out whether the UE has data available before HO is executed. For instance, the source gNB may set the buffer threshold to be very low, so that the UE can send the data availability indication as soon as it has some logged data in the buffer. Another option is that the source gNB sends a UEInformationRequest to probe if the UE has logged data. Introducing a new condition/indication for the UE to inform source gNB about data availability before HO is executed seems to be an optimization.

**Proposed resolution:** Adopt the proposal below.

1. (RRC-37) 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.

Companies are invited to provide feedback regarding the above open issue and possible proposed resolution:

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree to proposal?** | **Other comments** |
| OPPO | Agree |  |
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###### **Open issue RRC-38: Minimum AS layer memory size supported by the UE**

**Issue description:** The following agreement was made in RAN2#127, to specify a minimum AS layer memory size across all use cases, similar to logged MDT. And the specific value of the memory size is FFS, but it has not been addressed yet.

|  |
| --- |
| UE stores the logged training data at AS layer with a minimum AS layer memory size supported by the UE. FFS on the memory size. This is across all use cases |

This issue can be part of the capability discussions.

**Proposed resolution:** It is suggested to address this open issue in the capability discussions.

###### **Open issue RRC-39: The naming of IEs related to NW-side data collection**

**Issue description:** The naming of IEs related to NW-side data collection can be revisited. We will have more CSI-based and other use cases, each with different measurement logs and we should minimize the risk of having to replicate the NW-side DC procedures and ASN.1 for every new use case.

One solution direction is to make the naming of procedures and ASN.1 related to NW-side DC generic and enclose use case specific IEs / data logs within so that our framework can support future use cases.

An alternative is to name the IEs based on the use case, which would help to write the procedural text in a simpler way, while being clear.

This issue refers to the following field/IE and variable names:

* The name of the variable to store logged data. This can be use case specific (i.e. *VarCSI-LogMeasReport* as proposed by the rapporteur in the draft RRC running CR) and a new variable would be added in the future for e.g. the AIML mobility use case, or it can be changed to have a more generic name and include lists of logged data for different use cases. Note that defining a variable per use case still allows the UE to use a shared memory size for all use cases.
* The name of the field to request logged data from the UE and the name of the field where the UE provides the report with logged measurements can be specific per use case (as proposed by the rapporteur in the draft RRC running CR, i.e*. csi-LogMeasReportReq* in *UEInformationRequest* and *csi-LogMeasReport* in *UEInformationResponse*, respectively) or can be more generic. The rapporteur sees the benefit in having use case specific names, since this way the NW can select which logged data to retrieve from the UE and the UE can select that logged data to report it.
* The name of the field to indicate to the NW that the UE has logged data during handover can be use case specific (i.e. *csi-LogMeasAvailable* in *RRCReconfigurationComplete*, as proposed by the rapporteur in the draft RRC running CR) or can be more generic. As in the point above, in the rapporteur’s view it is beneficial to have use case specific naming, so that the NW can distinguish which kind of logged data the UE has.

**Proposed resolution:** Adopt the proposals below.

1. The UE stores logged data in a use case specific variable.
2. The name of the fields/IEs to request logged data from the UE and to report logged data or the availability of logged data to the NW are use case specific.

Companies are invited to provide feedback regarding the above open issue and possible proposed resolution:

|  |  |  |  |
| --- | --- | --- | --- |
| **Company** | **Agree to P15?** | **Agree to P16?** | **Other comments** |
| OPPO | Agree | Agree |  |
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###### **Open issue RRC-43: Value range for buffer threshold**

**Issue description:** The value range for the buffer threshold needs to be specified.

RAN2#130 agreement:

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| --- |
| 2 Buffer threshold to trigger data availability indication should be set based on specific size, e.g., KB instead of percentage |

**Proposed resolution:** A proposal will be made by the rapporteur after collecting input from the companies in the table below. The proposal may be conditioned by the capability discussion for the memory size.

Companies are invited to provide possible value ranges for the buffer threshold:

|  |  |  |
| --- | --- | --- |
| **Company** | **Value range for buffer threshold** | **Other comments** |
| OPPO | See comments | {1KB, 2KB, 4KB, 8KB, 16KB, 32KB} |
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# Other identified open issues

Companies are invited to describe any other identified open issues not currently included within this document and critical for the completion of the WI.

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| **Company** | **Other identified open issues? (please describe)** |
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# Conclusions

The following observations are made based on the list of open issues above:

**Observation 1 The following open issues were resolved by RAN2#130 agreements: ...**

**Observation 2 The following open issues are treated in the email discussion [POST130][037][AI PHY] UE candidate data collection (Xiaomi/Ericsson): ...**

**Observation 3 The following open issues are treated in the email discussion [POST130][031][AI PHY] NW side data collection (Ericsson/ZTE): ...**

**Observation 4 The following open issues are treated in the RRC running CR: ...**

The following proposals are made based on the list of open issues above:

[Proposals for easy agreement]

...

[Proposals for discussion]

...