**3GPP TSG-RAN WG2 #131 R2-25nnnnn**

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

Agenda Item: 8.10.2.1

Source: Ericsson, ZTE

Title: Remaining RRC Open issues for SONMDT feature

Document for: Discussion, Decision

# Introduction

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

* [Post130][605][SONMDT] Running NR RRC CR (Ericsson)

Scope:

* + - Update the running CR

      Intended outcome:

* + - Updated running CR to be submitted to next meeting

     Deadline:

* + - Long

Companies are invited to provide feedback on open issue list by: **8th August 2025**

# Remaining open issues for specification TS 38.331

### Issues on MRO for CHO with candidate SCG

**Open issue RRC-1:**Avoiding duplicated measurement reports in SHR and SPR

**Issue description:**

In RAN2#129bis meeting, discussion on near failure scenarios for CHO with candidate SCG resulted in below FFS.

* FFS whether it is needed to avoid duplication of information in case of two reports being generated CHO with candidate SCGs, any redundancy (e.g., measurements) are recorded in the reports for PCell (i.e., in SHR, SPR).

And following the discussion in the meeting RAN2#130 we agreed the following.

* We will not add any optimizations to avoid duplicated info in correlated reports
* FFS if we add some correlation indication.

The scenario addressed in this FFS involves sub-optimal execution of both CHO and CPC procedures, where one or more SHR/SPR triggering conditions are met for each conditional cell change procedure, including PCell and PSCell. In such scenario the UE may have to log SHR and SPR at the same time. As noted in the previous meetings agreement, we need to investigate whether correlation of these reports are needed and if so, what solution should be adopted for this issue.

In general, two options to address this FFS were discussed.

* **Option A**. Adding a correlation indication beside the availability indication in RRC\_Complete messages (i.e., when UE indicates the availability of SHR and SPR it indicates the reports are correlated so network can fetch them and package them together for further analysis)
* **Option B**. Adding a correlation indication in the SHR and SPR reports

To accelerate the discussion and possibly down-select among the mentioned options, rapporteur would like to ask the companies to provide their views to the following question.

**Regarding Open issue RRC-1, companies are invited to provide comments on whether correlation indication is needed in case of both reports being generated in a CHO with candidate SCG execution scenario and if the correlation indication is deemed needed, please indicate which option (e.g. option A/B above) you do prefer.**

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| --- | --- | --- |
| **Company** | **Yes/No** | **If yes, Option A/B** |
| LGE | - | We agree with the general idea of correlation behavior for SHR and SPR when they are both generated in a CHO with candidate SCG scenario.  However, we prefer NOT to introduce an explicit correlation indication in the signaling.  Introducing a correlation indication assumes that the UE has full awareness of the duplicate logging contents between SHR and SPR reports. Since the UE is able to generate and manage the CHO+CPAC logging, and thus it is more appropriate for the UE to avoid logging duplicated information, rather than signaling that duplication has occurred.  In the current RRC running CR, the ChoWithCandidateSCGInfo field used for logging CHO+CPAC evaluation results and this field is defined identically for both SHR and SPR. The logged content in both reports is exactly the same.  Thus, we think there is no value in duplicating the same CHO+CPAC logging information across SHR and SPR. Excluding duplicated logging from one of the reports (e.g., the second report) would not lead to any loss of information. Also, it would not cause any potential misinterpretation from the network perspective.  As such, we would like to propose an additional Option C:  ➤ The UE shall avoid duplicated logging of CHO+CPAC information across SHR and SPR if the content is identical.  If it is considered too restrictive to specify this behavior normatively, we suggest that a note can be added in the specification to clarify that the UE may suppress duplicated CHO+CPAC logging between SHR and SPR.  Lastly, we highlight that similar duplication issues occur in other reporting scenarios (i.e. RLF and SCG failure) as well. In section 3 of this document, we propose that this additional scenario be considered as another open issue going forward. |
| ZTE | Yes | Option B, sounds simple.  As for Option C proposed by LGE I think we have already past that stage as in last meeting we agreed “**We will not add any optimizations to avoid duplicated info in correlated reports**”,  also it might result in certain spec complexity by defining conditions in which what is to be done and what is not to be done. |
| CMCC | See Comments | Slightly prefer Option B as it seems simple. |
| Huawei, HiSilicon | Yes | Option B is ok.  We think the correlation indication is useful at network side, because some mobility scenarios would involve both PCell and PScell, and the network needs to know both SHR and SPR for complete analysis on handover performance. |
| Nokia | YES | Option B: reports need to be correlated so that the network is able to use all available information during root cause analysis. Adding flags inside each report is the easier option. The drawback of option A is that the correlation indication is not part of the report, and thus it does not help during the post processing. |
| Samsung | Correlation information is already available, nothing new needs to be added. | For CHO with candidate SCGs, In SHR, UE logs source cell measurements (*sourceCellMeas*) corresponding to the PCell and source PSCell measurements corresponding to the PSCell. In SPR, UE logs source cell measurements of the PSCell and source PCell measurements of the PCell. If SHR and SPR are at the same time, these measurement will be same. We think this information is sufficient for correlation.  Even for PCell change which simultaneously changes PSCell (non CHO with candidate SCGs), the correlation information is available, as the UE logs the same measurements configured by MN in SHR and SPR.  I am not sure if the companies who commented that an additional correlation information is required have considered this point. This may need to be discussed online. |

**Rapporteur summary:**

Among different options provided by different companies we some companies prefer option B (e.g., adding correlation indication inside the SHR and SPR). However, the detail of the correlation indication is not described. One drawback of the correlation inside the reports might be that the network does not know the correlation before fetching both reports and if one report is replaced by a new report (e.g., UE logs a new SHR (which is not correlated with the SPR)) the corrletaion indication of in the SPR should be removed. This creates additional complexity in the procedural text that should be taken into account when designing the solution.

During some offline some companies proposed some other solutions like adding PCell C-RNTI (and time since generating SPR, equivalent to timeSinceSHR) in the SPR report and given that SHR logs same information correlation of SHR and SPR becomes feasible.

Overall, given that different companies have different view on the way forward, companies are invited to submit contribution including a text proposal to visualize their preferred solution to the meeting RAN2#131.

1. [Open issue RRC-1] For correlation of SHR and SHR generated for a CHO with Candidate SCG, RAN2 discuss and agree to one of the following options
   1. Correlation indication in RRC\_Complete message (a flag beside availability indication)
   2. Correlation indication inside the SHR and SPR
   3. Logging C-RNTI of PCell and timeSinceSPR in SPR
   4. The duplicated information in correlated SHR and SPR is sufficient. no further information is needed for correlation.

**Open issue RRC-2:**CHO with candidate SCG with execution of complementary CHO configuration

In RAN2#130 a scenario has been discussed that network provides a complementary CHO only configuration beside CHO with candidate SCGs and UE execute the CHO only configuration. Proponents would like to enhance RLF report and/or SHR with additional information indicating this scenario as a sub-optimal configuration to the network. In the end of the discussion the following has been agreed.

* We will look in to if/what to specify for the scenario with CHO with candidate SCG alongside a CHO-only configuration. Proponents should have clear and well-defined proposals next meeting preferably with text proposals.

Based on the above agreement, the rapporteur believes that companies can directly provide their input at the next meeting. However, since the chair’s note states “if” a solution is to be specified for this scenario, the rapporteur would like to address this point by inviting companies to share any concerns or immediate objections they may have regarding the issue being addressed in the next meeting.

**Regarding Open issue RRC-2, Companies are invited to share their view on addressing this issue in the next RAN2 meeting.**

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| --- | --- | --- |
| **Company** | **Agree/disagree (to address this issue in the next meeting)** | **comment** |
| ZTE | See comments | It depends on how we interpret the CHO-only configuration for CHO with candidate SCG.  It is unclear whether CHO only intended as a late fix is feasible or usual, i.e., after NW finds out previous CHO with candidate SCGs does not work, NW could have issued a HO or reconfigure the CHO with candidate SCGs themselves. |
| CMCC | Agree | The complementary CHO only configuration has been introduced in RAN2 R18 mobility WI to avoid likely happened failure, in principle, if the CHO with candidate SCGs is supported by the UE, the complementary CHO only configuration also needs to be supported.  Two possible options for when to provide the complementary CHO only configuration:  Option 1: CHO only configuration is provided **together with** CHO with candidate SCGs configuration  Option 2: CHO only configuration is provided **after** CHO with candidate SCGs configuration  For option 1, the condition(s) of CHO only should be more **difficult** to be fulfilled than the CHO condition(s) in CHO with candidate SCGs. With this, **Option 1 only benefits the scenario that CPAC condition(s) is not properly configured and hard to be fulfilled.**  However, **Option 2 could benefit the scenario that any or both the condition(s) of CHO and CPAC are not properly configured**.  So, we think **it makes sense to provide CHO only configuration after CHO with candidate SCGs configuration**.  And **it worth to study the scenario**.  We will submit contribution with a text proposal addressing the issue and potential solution. |
| Huawei, HiSilicon | Agree | Firstly, we think the network can first send CHO with candidate SCGs configuration (T0), and then send CHO only configuration (T1) in case that the previous configuration does not work well.  Secondly, the issue is that:  - between T0 and T1, the UE may not trigger the execution conditions for CHO with candidate SCGs  - from network point of view, the status of handling the execution conditions is helful for network side. In other words, the network would like UE to collect useful information after T1 to help optimiza relevant parameters  Here is an example:  Between T0 and T1, only the CPAC execution condition is fulfilled, and it means the CHO configuration of MCG is suboptimal. After T1, the UE can log this information and let NW know. |
| Nokia | Yes | If CHO only complimentary configuration was executed instead of the preferred CHO with candidate SCG (CwcS), and CHO-only was successful, the network should be informed about this non-optimal behaviour. As it was a successful PCell change but not the preferred one, SHR can be extended with new triggering criteria (CHO-only configuration was used while CHO with candidate SCG was also configured). The information being provided with that SHR will be a new cause value; e.g., *CHO-WithSCG-NotTrigerred;* with *choWithCandidateSCGInfoList* to help the network to detect root cause of the non-optimal handover. |
| Samsung | See comments | While we understand that CHO only configuration is a valid configuration, if something needs to be logged at this point, it should be only essential information which is not available to the network. |
|  |  |  |

The majority of companies agree to address this issue at the next meeting, however it seems there is no convergance on the what information should be logged for the CHO only scenario.

Therefore companies are invited to submit contributions and as requested by the session chair, companies should include a well-defined solution along with a corresponding text proposal.

1. [Open issue RRC-2] For the scenario of CHO with candidate SCG with complementary CHO only configuration, companies are invited to submit contribution with a text proposal addressing the issue and their proposed solution.

### Open issues on SON/MDT for slicing

**Open issue RRC-3:**NSAG logging on slice-based reselection failure

In the meeting RAN2#130 RAN2 discussed logging the NSAG information when the UE fails to find a suitable cell upon cell selection/reselection based on slice priorities. In the end RAN2 agreed to log the highest ranked NSAG information potentially in a report.

* We aim to specify that: If the UE supports slice-based cell reselection does not find any suitable cell in the frequencies corresponding to the highest ranked NSAG, the UE logs the highest ranked NSAG. FFS the need of cell or frequency info.

However, RAN2 didn’t converge on how to associate such information in a SON/MDT report. The main problem with this scenario is that the UE could not find a suitable cell in the frequency at which it searches for suitable cells based on the provided NSAG priorities. Therefore, in order to efficiently investigate this issue rapporteur’s proposal is that companies provide their input on how to fix this issue by providing a text proposal to the next meeting.

1. [Open issue RRC-3] concerning logging highest ranked NSAG info associated with cell, freq etc.) companies are invited to submit their contribution addressing this issue with a text proposal reflecting their solution.

### Open issues on MDT for NTN

**Open issue RRC-4:**Logging MDT in NTN when location is unavailable

Another open issue under discussion is related to logging MDT measurements in NTN network when the location information is not available or not obtained by the UE. Concerning this issue, we have the following agreement and FFS.

* If configured with additional geographical information, FFS if the UE logs the MDT data or not when it cannot obtain its location.

In general, there can be two solutions as described in the following.

* **Option A.** UE stops logging if it cannot obtain the location
* **Option B.** UE continues logging if it is registered within a PLMN included in the PLMN identity list or is registered within a registered PLMN at the time of receiving MDT configuration (this option follows legacy behavior).

In order to have more efficient progress, rapporteur would like to invite companies to provide their view in the following table.

**Regarding Open issue RRC-4 (logging MDT in NTN when location is not available), companies are invited to provide their preference and comment on option A or option B.**

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| --- | --- | --- |
| **Company** | **Option A/B** | **comment** |
| LGE | Option B |  |
| ZTE | Option B | No strong view, but in our opinion, this feature is only working as a late add-on optimization, which should not break the legacy behavior. |
| CMCC | No strong view |  |
| Huawei, HiSilicon | Option B |  |
| Nokia | Modified Option B | A modified Option B is preferred. Option B is described as following legacy behaviour, but it is not clear if this means the legacy MDT area scope configuration is followed or if the logging is done without taking any area scope into consideration. We assume that Option B requires NW to configure the UE also with legacy MDT area scope configuration and that the UE which is capable of getting location information in IDLE/INACTIVE, but currently not possible to get the location information, will continue logging using legacy MDT area scope configuration. |
| Samsung | No strong view |  |

**Rapporteur summary:**

Concerning logging MDT measuremnt in the NTN network when the UE is not able to obtain its location information, companies provided their view and majority suggest to follow option B which means UE follows legacy behaviour. One company proposed to use a modified Option B i..e, considering thelegacy areaScope as part of Option B. however rapporteur would like to note that configuring the legacy area scope together with the geographical area scope is an FFS in RAN3 and given the impact in RAN3 specification (over NG interface) we need to wait for RAN3 progress on this FFS captured below.

**FFS on whether to add the geographical area scope inside or outside the existing area scope IE.**

In light of above and given that irrespective of whether the legacy area scope can be configured together with the geographical areascope or not, in RAN2, and based on the provided input, we can agree that UE follows the legacy behaviour as loging MDT in tresterial networks. Therefore , the following is proposed.

1. [Open issue RRC-4] If the UE is unable to obtain its location, the UE follows legacy procedure as in logged MDT in terrestrial network.

**Open issue RRC-5:**Granularity of distanceFromReference1, distanceFromReference2

In the meeting RAN2#130, and in response to the received LS from RAN3 [R3-252382] on optimizing location based CHO in moving scenario, it has been agreed that UE logs the distance from the UE to moving reference location of serving cell, and measured distance from UE to moving reference location of candidate cell in RLF report when RLF/HOF happens due to a location based CHO configuration.

* We go with option 2 (distance), unless we find critical issues with granularity.

However, the granularity of such distance information being logged by the UE is not discussed. In a solution during the running CR review phase, it is proposed to use the same granularity as eventD2. The proposed solution is described in the following

1. Since the distance thresholds for event D2 are in steps of 50m, distanceFromReference1and distanceFromReference2 also can be in steps of 50m.
2. it is proposed that if value is greater than 65535, 65535 can be reported.
3. The measured distance by the UE needn’t be a multiple of 50 always. For e.g., the value may be 10040m. In such cases, UE may round down to the nearest lower value of step and include in the report (If the UE rounds to the next higher value of step, it can give wrong information to the network. For e.g. if the network has configured a threshold of 10050 meters and the UE sends 201, network would interpret as the threshold is met while actually the distance is closer to the threshold, but not met.)

Based on the above analysis the following field description for the ***distanceFromReference1, distanceFromReference2*** is proposed.

***distanceFromReference1, distanceFromReference2***

This field indicates the measured distances between UE and the moving reference locations of the serving cell and of the associated neighbour cell if the conditional handover is based on *condEventD2*. Reported in steps of 50m, rounded down to the nearest step value. The maximum value 65535 means 65535 or larger.

While rapporteur thinks the proposed solution is a good way forward, prior to capturing this solution, rapporteur would like to understand if other companies agree to the proposed solution. Therefore, rapporteur would like to ask the companies whether they disagree to this solution and if so why.

**Regarding Open issue RRC-5 (granularity of distances in NTN), companies are invited to provide their view if they disagree to the proposed solution on the granularity of the distanceFromReference1, distanceFromReference2.**

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| --- | --- | --- |
| **Company** | **Do you disagree?** | **Comment if disagree** |
| LGE | Agree with rapp’s proposal |  |
| ZTE | Agree with rapp’s proposal |  |
| CMCC | Agree with rapp’s proposal |  |
| Huawei, HiSilicon | Agree with rapp's proposal |  |
| Nokia | Agree with comment | This is a question for clarification. The procedure text says “*set distanceFromReference1 to the measured distance between UE and the serving cell moving reference location*”. This means the reported distance is the actual measured distance value and not a discreet quantized value. But, the field is defined as a discreet quantized value in the range 0 to 65535 in increments of 50 m. Either we should align the ASN.1 to match the procedure text by choosing a practical value range for an NTN cell size so that actual measurement distance can be reported or we should clarify the procedure text that the reported distance is an approximate quantized discreet value. |
| Samsung | Agree with the proposal | Since the distance thresholds for the conditional event are provided in multiples of 50m, we think the exact distance is not much useful. Network anyways can only adjust parameters in units of 50m. |

**Rapporteur summary:**

Concerning the granularity of the (*distanceFromReference1, distanceFromReference2*) all the companies who provided the input agree with the suggested way forward however there might some details in the procedural text (e.g., aligning the text with the 50m granularity) that can be resolved during the running CR review phase. Thefore the following is proposed.

1. [Open issue RRC-5] Granularity of *distanceFromReference1, distanceFromReference2* isin steps of 50m, the actual distance will be rounded down to the nearest step value. The maximum value is 65535, meaning 65535 or any larger distance.

# Other identified open issues

Companies are invited to describe any other identified open issues not currently included within this document

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| **Company** | **Other identified open issues? (please describe)** |
| LGE | Avoiding duplicated CHO+CPAC logging between RLF report and SCG failure information:  In scenarios where both SCG and MCG RLF occur in close succession, the UE may generate both SCG failure information and an RLF report:  1) SCG RLF occurs → UE logs SCG failure information  2) UE sends the information to the source MN  3) Source MN receives this as the first log sample  4) Later, MCG RLF occurs → UE logs the RLF report  5) After RRC re-establishment, a new PCell (possibly under a new MN) receives the RLF report and forwards it to the source MN  6) The source MN receives this data again, treating it as a second log sample. Due to the time gap between the two log deliveries, the network may not recognize them as duplicates, leading to erroneous parameter updates.  Since the current specification defines the same ChoWithCandidateSCGInfo structure for both messages, there is a risk that identical CHO and CPAC evaluation results are logged and reported twice.  This duplicated reporting can lead to the network misinterpreting the same data as two separate mobility samples, potentially impacting optimization decisions.  To address this issue, we propose to consider whether the UE should avoid duplicate logging in this case. |
| ZTE | MHI.  As in our previous paper’s observation  Observation 1 It might be beneficial for network to be aware of how efficient the configured SCGs are, e.g., NW is then able to optimize future DC configurations to balance the UE battery usage and data traffic efficiency.  Observation 2 Without data traffic characteristic, the activation/deactivation information becomes irrelevant.  We think current MHI is not complete without traffic information. |
| Nokia | **1) CPAC dual event not logged**  In the current specifications, detailed regarding CHO dual event execution (first triggered event and time between events) are logged as per RAN2 agreements (RAN2#129 Enhance RLF report for CHO with candidate SCGs to include the information for each CHO, i.e., first fulfilled event and time duration between two events fulfilled, if any).  This information is currently logged via choConfig IE in RLF report. However, the similar information regarding CPAC dual events is currently not logged anywhere.  As the RLF may be due to the any of the execution conditions (CHO or CPAC) not being fulfilled, we think the current agreements and specifications are not complete and deprive the network from obtaining all relevant information that may aid it in determining corrective actions.  We propose that CPAC dual event information is also logged in RLF report in a new IE, e.g. cpacConfig.  **2) Mismatch of LTM candidate solutions**  Based on LS from RAN2, RAN3 agreed to implement network-based solution for LTM candidates for connection failure cases. In parallel, RAN2 implemented UE based solution for marking LTM candidates for near failure cases, via SHR (without a formal agreement/discussion). We do not believe this is a good approach, i.e. two different solutions for the same feature based on scenario (failure or near failure). We think that the same solution should be specified for both failure and near failure scenarios. |
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Among the other open issue lists that companies provided, only one critical open issue is identitifed by the rappoerteur, which is related to the logging LTM candidate cells flag in the measurement of the neighbour cells in SHR. In rapporteurs understanding RAN3 agreements seems unclear whether the RAN3 based solution is only limited to the RLF scenario or it can be used also for the SHR scenairo. In some companies understanding network is not aware of the SHR generation at the UE (different from RLF) and hence logging LTM candidate cells for a LTM procedure that led to SHR might not be feasible based on RAN3 solution. However to have an unequivocal way forward, rapporteur propose the following.

1. [Open issue RRC-6] RAN2 agree that RAN3 based solution in logging LTM candidate cells can be applicable/used in both RLF and SHR scenarios. RAN2 remove logging LTM candidate flag from SHR procedure.

Rest of the open issues proposed by the companies, from rapporteur understanding are not essential for the closure of the WI and should be treated with low priority only if time allows. Hence they are listed at the end of the Open issue list (highlighted with gray colour) to be treated only if time allows.

Note that we assume even if we do not manage to address such issues during meeting RAN2#131, the WI can still be considered closed.

# Conclusions

The following proposals are made based on the input provided in this email discussion. Green highlighted are easily agreeable proposals. Yellow are the proposals which requires discusison and contribution. Gray are the open issues to be treated only if time allows.

1. [Open issue RRC-1] For correlation of SHR and SHR generated for a CHO with Candidate SCG, RAN2 discuss and agree to one of the following options, Companies supporting each option provide a text proposal illustrating the implementation.
   1. Correlation indication in RRC\_Complete message (a flag beside availability indication)
   2. Correlation indication inside the SHR and SPR
   3. Logging C-RNTI of PCell and timeSinceSPR in SPR
   4. The duplicated information in correlated SHR and SPR is sufficient. no further information is needed for correlation.
2. [Open issue RRC-2] For the scenario of CHO with candidate SCG with complementary CHO only configuration, companies are invited to submit contribution with a text proposal addressing the issue and their proposed solution.
3. [Open issue RRC-3] concerning logging highest ranked NSAG info associated with cell, freq etc.) companies are invited to submit their contribution addressing this issue with a text proposal reflecting their solution.
4. [Open issue RRC-4] If the UE is unable to obtain its location, the UE follows legacy procedure as in logged MDT in terrestrial network.
5. [Open issue RRC-5] Granularity of *distanceFromReference1, distanceFromReference2* isin steps of 50m, the actual distance will be rounded down to the nearest step value. The maximum value is 65535, meaning 65535 or any larger distance.
6. [Open issue RRC-6] RAN2 agree that RAN3 based solution in logging LTM candidate cells can be applicable/used in both RLF and SHR scenarios. RAN2 remove logging LTM candidate cell flag from SHR procedure.

Open issues with low priority (i.e., treated only if time allows)

1. [Open issue RRC-7] If time allows RAN2 discuss duplicated CHO with Candidate SCG information (ChoWithCandidateSCGInfo) in the RLF and SCGFailureInformation.
2. [Open issue RRC-8] If time allows RAN2 discuss logging traffic information in MHI.
3. [Open issue RRC-9] If time allows RAN2 discuss logging CAPC execution conditions in RLF-report e.g., in a cpacConfig IE (similar to choConfig IE).