**3GPP TSG RAN WG2#123bis R2-230xxxxx**

**Xiamen, China, 9th - 13th October, 2023**

**Source: ZTE Corporation, Sanechips**

**Title: Summary of 7.13.8 Other**

**Agenda item:** **7.13.8**

**Document for:** **Discussion and Decision**

# Introduction

**[Pre123bis][xxx][R18 SON/MDT] Summary of 7.13.8 Other (ZTE)**

* Summarize the papers in 7.13.8

Comments are welcome no later than Monday 9 October. 2023, 8:00 p.m. China local time

This document provides the summary of the contributions submitted to agenda item 8.13.8 other identifying essential issues need to be discussed in RAN2 with consideration on RAN3 progress. For UE capabilities, it is expected to be discussed based on the report of [Post123][567][R18 SONMDT] Cap of SONMDT  (Huawei) in [9].

In subclause 2, companies’ proposals are categorized into different topics, where for each topic an initial analysis and proposals are made. Based on chairman’s guideline that only critical issues are discussed, in this summary proposals relevant to ffs issues will be prioritized for online discussion. Topics irrelevant to ffs issues are suggested to be discussed only if time allows and there are supports from multiple companies.

# Discussion

## Fast MCG recovery

Relevant proposals:

|  |  |  |
| --- | --- | --- |
| **TDoc** | **Company name** | **Proposals** |
| [3] [R2-2309945](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2309945.zip) | Lenovo | Proposal 1: The UE reports both MCG failure related information and SCG failure related information in the RLF report, for the case that SCG failure during fast MCG recovery (i.e., running of T316), or, SCG fails or is deactivated before the UE sends the MCGFailureInformation.Proposal 2: The UE reports fast MCG recovery failure related information (i.e. both MCG failure related information and SCG failure related information) in the RLF report:* cause of the fast MCG recovery failure, e.g. T316 expiry, SCG failure or SCG deactivation;
* failure type of the SCG failure, e.g. t310-Expiry, randomAccessProblem, or rlc-MaxNumRetx, when the cause of the fast MCG recovery failure is SCG failure.

[Rapp: P1/2 are covered in running CR.]Proposal 3: The UE reports the time between MCG failure and SCG failure in the RLF report for MRO for fast MCG link recovery. |
| [6] [R2-2310369](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310369.zip) | CATT | Proposal 1: Add the scenario “PSCell change /addition ongoing before fast MCG recovery (when UE detects MCG failure)” to align with RAN3 LS.Proposal 2: Add the consecutive failure scenario of “HO command for recovery failure after MCG RLF”.Proposal 3: UE needs to record some additional information to distinguish the cases of SCG failure happened during fast MCG recovery and before UE sending the MCGFailureInformation, such as an indication or the different cause values or different timer usage.Proposal 4: It is beneficial for the network if UE can report the time between MCG failure and SCG failure.Proposal 5: A new failure cause needs to be introduced to identify the case of PSCell change/addition ongoing before fast MCG recovery.Proposal 6: The cell ID in the HO command and the failure cause should be recorded and reported together with the MCG RLF for consecutive failure scenario of HO command for recovery failure after MCG RLF |
| [8] [R2-2310427](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310427.zip) | SHARP | Proposal 1: UE indicates in the RLF-report whether the response message in fast MCG recovery is RRCrelease or RRCreconfiguration.Proposal 2: UE includes the handover target cell identity in the RLF report when RRCReconfiguration is received in response to MCGFailureInformation.Proposal 3: RAN 2 considers the consecutive failure scenario for MRO fast MCG recovery: RRCreconfiguration is received during fast MCG recovery but the handover is failed.Proposal 4: RAN2 discusses whether UE stores SHR for handover triggered by fast MCG recovery.Proposal 5: UE indicates the handover is triggered for fast MCG recovery in SHR, if UE stores SHR for handover triggered by fast MCG recovery.Proposal 6: UE releases SHR-config configured by source cell when fast MCG recovery is performed, if UE does not store SHR for handover triggered by fast MCG recovery. |
| [10] [R2-2310506](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310506.zip)  | Huawei | 1. UE reports following time information for fast MCG link recovery optimization:
* Time between MCG failure (or transmitting MCGFailureInformation) and SCG failure for case a and f1
* Time between MCG failure (or transmitting MCGFailureInformation) and SCG deactivation for case f1
 |
| [12] [R2-2310569](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310569.zip) | ZTE | Proposal 1: UE includes the time between MCG failure and SCG failure in the RLF report for case a and case f1.Proposal 2: Include location information in MCG failure information. |
| [13] [R2-2310594](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310594.zip) | Samsung | Proposal 1: Upon detection of radio link failure, UE logs the following information for fast MCG Recovery Optimization, into RLF Report:* An indicator to indicate if T316 is (not) configured (i.e. if fast MCG Recovery has been configured)
* An indicator to indicate if SCG transmission is (not) suspended
* An indicator to indicate if SCG is not deactivated
* An indicator to indicate if neither PSCell change nor PSCell addition is ongoing (i.e. timer T304 for the NR PSCell is not running in case of NR-DC or timer T307 of the E-UTRA PSCell is not running).

[Rapp: Understands the first, second and third bullet can be implicitly derived based on current running CR, e.g. suspension happens when SCG fails. Forth bullet implies new scenario, which is straightforward if new scenario can be agreed.]Proposal 2: RAN2 to discuss the UE behavior when a HOF occurs for a ReconfigurationWithSync received in response to MCGFailureInformation from the following options.* If the failed HO is resulted from Fast MCG Recovery, the old RLF Report content is kept,
* Introduce a new indicator in the new RLF Report content, to indicate if the failed HO is resulted from Fast MCG Recovery or
* The Fast MCG Recovery-related info (e.g. elapsed timer) is included into the new RLF Report content.

Proposal 3: Separate cause IEs are used in RLF report for the case where MCG Failure recovery was initiated and unsuccessful and for the case where MCG Failure recovery couldn’t be initiated. |
| [16] [R2-2310708](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310708.zip) | Nokia | Proposal 1: RAN2 to confirm that in case T316 expires, the UE will use the initially generated RLF report and add a new cause value to indicate fast MCG recovery failed, i.e. T316 expired.[Rapp:I understand this is the behavior captured in current running SON CR ]Proposal 2: In case MN instructs the UE to handover as a part of fast MCG recovery and the said handover is successful, then the SHR generated by this UE includes elapsed T316 and an indication that this HO was triggered as part of fast MCG recovery.Proposal 3: In case MN instructs the UE to handover to a new cell as a part of fast MCG recovery and the said handover fails, the UE generates a new RLF report containing the newest measurements, elapsed T316 and new cause value for RLF (e.g ‘fast MCG recovery HO failure’).Proposal 4: In case MN instructs the UE to release the connection as part of fast MCG recovery, UE retains the existing RLF report and adds the elapsed T316 value and a new cause value (e.g., ‘fast MCG recovery release’).  |
| [17] [R2-2310745](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310745.zip) | Ericsson | Proposal 1 UE logs a flag indicating which of the link failures, SCG or MCG failure, happened first in the RLF report.Proposal 2 UE logs the time between the SCG and MCG failures in the RLF report.Proposal 3 Upon MCG recovery failure due to SCG failure all possible SCG failure types (that in legacy may be included in the SCGFailureInformation) can be logged as MCG recovery failure cause in the RLF report. |
| [19] [R2-2311087](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2311087.zip) | Qualcomm | Proposal 3: No need for UE to report Time between MCG failure (or transmitting MCGFailureInformation, only for case a) and SCG failure for case a and f1.  |

### On remaining issues

FFS: UE reports following time information for fast MCG link recovery optimization:

- Time between MCG failure (or transmitting MCGFailureInformation, only for case a) and SCG failure for case a and f1

Above ffs issues have been identified in last meeting, and there are 6 companies have provided proposals on this ffs issue where 5/6 companies (Lenovo/CATT/Huawei/ZTE/Ericsson) support to include this information in RLF report while one company (Qualcomm) objects to include this information with the argument that the usage is not clear. Based on companies proposals, it appears that majorities companies find this information useful for optimizing mobility decisions, considering the discussion have been repeated several meetings, it is suggested to try one last time online to conclude on this topic:

**Discuss online:**

**(5/6) Proposal 1: UE include following time information in RLF report for fast MCG link recovery optimization:**

* **Time between MCG failure (or transmitting MCGFailureInformation, only for case a) and SCG failure for case a and f1**

Below relevant information also proposed:

|  |  |  |
| --- | --- | --- |
| Company | Proposed enhancement in RLF report | Comments |
| Huawei | Time between MCG failure (or transmitting MCGFailureInformation) and SCG deactivation for case f1 | Help NW with the decision on whether to deactivate SCG or not |
| Ericsson | UE logs a flag indicating which of the link failures, SCG or MCG failure, happened first in the RLF report. | The order of failure of MN and SN will requires different optimizing strategies |

Above proposals are relevant to the time information in ffs issue, and targets for the similar scenario, it is would suggest to go for online discussion to conclude discussion on this topic.

**Discuss online:**

**Proposal 2: RAN2 discuss whether below information is needed in RLF report for fast MCG link recovery optimization:**

* + **Time between MCG failure (or transmitting MCGFailureInformation) and SCG deactivation for case f1**
	+ **a flag indicating which of the link failures, SCG or MCG failure, happened first in the RLF report.**

Furthermore, RAN2 has agreed last meeting to include at least RA problem, reaches maximum RLC retransmission time and SCGT310 expiry as the failure cause leads to SCG failure in RLF report for fast MCG recovery MRO. In this meeting, a relevant proposal from Ericsson proposed to include in RLF report all possible SCG failure cause, which seems to be straightforward, and still it would be suggest to go for online discussion to check with companies’ view. Therefore below proposal is made for online discussion.

**Discuss online:**

**Proposal 3 Upon MCG recovery failure due to SCG failure all possible SCG failure types (that in legacy may be included in the SCGFailureInformation) can be logged as MCG recovery failure cause in the RLF report.**

### Others

For proposals listed in this section they will only be discussed if time allows.

#### RLF relevant fast MCG recovery MRO

There are 4 companies provide proposals or hinted in their proposals to discuss new scenarios for fast MCG recovery which are categorized in below:

|  |  |  |
| --- | --- | --- |
| Scenarios | Supporter | Relevant proposals: |
| Case 1: PSCell change /addition ongoing before fast MCG recovery (when UE detects MCG failure) | CATT | Proposal 5: A new failure cause needs to be introduced to identify the case of PSCell change/addition ongoing before fast MCG recovery. |
| Case 2: RRCRelease is received during fast MCG recovery as a response to MCGFailureInformation | Sharp | Proposal 1: UE indicates in the RLF-report whether the response message in fast MCG recovery is RRCrelease or RRCreconfiguration. |
| Nokia | Proposal 4: In case MN instructs the UE to release the connection as part of fast MCG recovery, UE retains the existing RLF report and adds the elapsed T316 value and a new cause value (e.g., ‘fast MCG recovery release’).[Rapp: It is already allowed in current running CR for UE supporting fast MCG recovery MRO to keep the RLF report stored, and set elapsed T316 when RRCRelease or RRCReconfiguration is received] |
| Case 3: Consecutive failure scenario for MRO fast MCG recovery, i.e., RRCreconfiguration is received during fast MCG recovery but the handover fails. | CATT | Proposal 6: The cell ID in the HO command and the failure cause should be recorded and reported together with the MCG RLF for consecutive failure scenario of HO command for recovery failure after MCG RLF |
| Samsung | Proposal 2: RAN2 to discuss the UE behavior when a HOF occurs for a ReconfigurationWithSync received in response to MCGFailureInformation from the following options.* If the failed HO is resulted from Fast MCG Recovery, the old RLF Report content is kept,
* Introduce a new indicator in the new RLF Report content, to indicate if the failed HO is resulted from Fast MCG Recovery or
* The Fast MCG Recovery-related info (e.g. elapsed timer) is included into the new RLF Report content.
 |
| Sharp | Proposal 2: UE includes the handover target cell identity in the RLF report when RRCReconfiguration is received in response to MCGFailureInformation.[Rapp: Already current UE behavior] |
| Nokia | Proposal 3: In case MN instructs the UE to handover to a new cell as a part of fast MCG recovery and the said handover fails, the UE generates a new RLF report containing the newest measurements, elapsed T316 and new cause value for RLF (e.g ‘fast MCG recovery HO failure’).[Rapp: It is already allowed in current running CR for UE supporting fast MCG recovery MRO to keep the RLF report stored, and set elapsed T316 when RRCRelease or RRCReconfiguration is received] |

For case 1, it is counted as part of the case when fast MCG cannot be initiated due to SCG is not available, which may require introducing new cause to differentiate this use case.

For case 2, NW has provocatively released MCG as a response to MCGFailureInformation received and it is already allowed in current running CR for UE supporting fast MCG recovery MRO to keep the RLF report stored and set running of time if T316.The only discussion point is on whether to differentiate it is RRCRelease or RRCReconfiguration received in response to MCGFailureInformation.

For Case 3, According to current running CR, UE will store the latest HOF failure in RLF report without any fast MCG recovery information. While 4 companies propose further enhancements on RLF report for this scenarios. It is suggested to first discuss whether to support this scenario and then companies can further discuss whether to record more information in next round based on current contribution or next meeting.

Based on above analysis and the level of companies support, below proposals are made:

**Discuss if time allows:**

**Proposal 4: RAN2 discuss whether to include fast MCG recovery information in RLF report associated to failed handover, which is based on RRCReconfiguration received in response to MCGFailureInformation.**

**Proposal 5: RAN2 discuss which of below failure cause is needed be included in RLF report in case MCG RLF and T316 has been configured:**

* **new failure cause to indicate PSCell change/addition ongoing before fast MCG recovery**
* **Information to indicate which response ( i.e., RRCRelease or RRCReconfiguration ) UE has received for transmitted MCGFailureInformation**

#### SHR relevant fast MCG recovery MRO

Relevant proposals are made to enhance SHR to allow inclusion fast MCG recovery information:

|  |  |  |
| --- | --- | --- |
| **TDoc** | **Company**  | **Proposals** |
| [17] [R2-2310427](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310427.zip) | Sharp | Proposal 4: RAN2 discusses whether UE stores SHR for handover triggered by fast MCG recovery.Proposal 5: UE indicates the handover is triggered for fast MCG recovery in SHR, if UE stores SHR for handover triggered by fast MCG recovery.Proposal 6: UE releases SHR-config configured by source cell when fast MCG recovery is performed, if UE does not store SHR for handover triggered by fast MCG recovery. |
| [16] [R2-2310708](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310708.zip) | Nokia | Proposal 2: In case MN instructs the UE to handover as a part of fast MCG recovery and the said handover is successful, then the SHR generated by this UE includes elapsed T316 and an indication that this HO was triggered as part of fast MCG recovery. |

Rapporteur understands according to current specs UE will based on received SHR configuration to generate SHR if at least one triggering events is fulfilled. Moreover, current running CR also allows UE to store at least elapse T316 in RLF report, which can be an implicit indication that RLF report generated is relevant to fast MCG recovery. Then existing correlation mechanism between RLF report and SHR could be sufficient for further root cause analysis. Therefore, the requirement as shown in above proposals can be naturally achieved. No proposal will be made.

#### Location information

|  |  |  |
| --- | --- | --- |
| [12] [R2-2310569](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310569.zip) | ZTE | Proposal 4: Include location information in MCG failure information. |

Only one company propose this enhancements, based on guideline, no proposal will be made for online discussion.

## On CPAC MRO

RAN2 has agreed to investigate RAN3 agreed CPAC MRO scenarios for further enhancements to SCGFailureInformation message. Relevant submitted in this meeting is as below:

|  |  |  |
| --- | --- | --- |
| **TDoc** | **Company**  | **Proposals** |
| [1] R2-2309673 | Vivo | Proposal 1:Source PSCell ID and target PSCell ID should be included in SCGFailureInformation to support MRO for CPAC, the existing previousPSCellId and failedPSCellId can be reused.Proposal 2: Radio measurement results of source PSCell, target PSCell and neighbor cells should be included in SCGFailureInformation to support MRO for CPAC, the existing measResultFreqList and measResultSCG-Failure can be reused.Proposal 3: For CPA, MN initiated inter-SN CPC and SN initiated inter-SN CPC, the following time information does not need to be included in SCGFailureInformation:* The time elapsed between the CPAC execution towards the target PSCell and the corresponding latest CPAC configuration received for the target PSCell;
* The time elapsed since the CPAC execution towards the target PSCell until the SCG failure.

Proposal 4: For intra-SN CPC without MN involvement, the following time information needs to be included in SCGFailureInformation:* The time elapsed between the CPAC execution towards the target PSCell and the corresponding latest CPAC configuration received for the target PSCell;
* The time elapsed since the CPAC execution towards the target PSCell until the SCG failure, the existing field timeSCGFailure can be reused.

Proposal 5: The following information does not need to be included in SCGFailureInformation:* explicit indication to differentiate CAPC from conventional SCG failure;
* explicit indication of CPAC type (i.e., CPA, MN-initiated inter-SN CPC, SN-initiated inter-SN CPC or SN-initiated intra-SN CPC).
 |
| [2] [R2-2309944](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2309945.zip) | Lenovo | Proposal 1: The UE reports the time elapsed between the SCG failure in source SCG and the latest CPC configuration is received.Proposal 2: The UE reports the time elapsed between the CPAC execution towards the target PSCell and the corresponding latest CPAC configuration is received for the target PSCell.Proposal 3: The UE reports the time elapsed since the CPAC execution towards the target PSCell until the SCG failure.Proposal 4: The UE reports the type of PSCell addition/change (e.g. CPA/CPC or legacy PSCell addition/change) to differentiate CPAC from conventional SCG failure.Proposal 5: The UE reports an indication about whether a measured neighbour cell was configured as a CPAC candidate PSCell or not. |
| [4] [R2-2310282](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310282.zip) | CMCC | Proposal 1: The scenario that PCell handover happens after CPA/CPC configuration and before CPA/CPC execution is considered for CPA/CPC optimization.Proposal 2: To support the MRO for scenario in P1, UE reports one indication that before PCell handover, CPA/CPC configuration has received but not executed, or the time difference between the CPA/CPC configuration and PCell handover.Proposal 3: For CPA/CPC failure cases, UE logs following information and measurements:a) Source PSCell info (cell ID, measurement result)b) Target PScell info (cell ID, measurement result)c) Neighbour Cells info (cell ID, measurement result, CPAC Candidate cells flag)d) Success PSCell change/addition cause value (e.g., t304, t310, t312 cause, etc.)f) The time elapsed between the CPAC execution towards the target cell and the corresponding latest CPAC configuration received for the selected target cellProposal 4: If multiple events are configured for CPA/CPC, UE reports the first triggered CPAC event, and the time duration between the two triggered CPAC events.[Rapp: P4 has agreed] |
| [11] [R2-2310507](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310506.zip)  | Huawei | Proposal 1: For CPAC MRO, the following information can be included in SCGFailureInformation:* The time elapsed between the CPAC execution towards the target PSCell and the corresponding latest CPAC configuration is received for the target PSCell
* The time elapsed since the CPAC execution towards the target PSCell until the SCG failure
 |
| [12] [R2-2310569](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310569.zip) | ZTE | Proposal 3: UE set timeSCGFailure to time elapse from CPAC execution to SCG failure when SCG failure information is generated due to CPAC execution failure.Proposal 4: A common UE capability can be used for both MRO for PSCell change failure and CPAC, which is optional without capability signalling. |
| [15][R2-2310707](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310707.zip) | Nokia | Proposal 1: RAN2 to discuss possible solutions to aid the Target SN to prepare the correct PSCell(s). Proposal 2: The SCGFailureInformation message may be enhanced with an indication regarding the target cells that were previously reported to the network but not part of the received CPC configurations.[Rapp: Understands the discussion shall be initiated by RAN3] |
| [18] [R2-2310756](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310756.zip) | NTTDococmo | Proposal1: Introduce the time elapsed between the CPAC execution towards the target PSCell and the corresponding latest CPAC configuration is received for the target PSCell in the SCGFailureInfo. |
| [19] [R2-2311087](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2311087.zip) | Qualcomm | Proposal 1: No need for UE to report the time elapsed between the CPAC execution towards the target PSCell and the corresponding latest CPAC configuration received for the target PSCell.Proposal 2: For the reporting of the time elapsed since the CPAC execution towards the target PSCell until the SCG failure, reuse existing timeSCGFailure. |

### On remaining issues

FFS: For CPAC MRO, RAN2 discuss which of below time information is included in SCGFailureInformation:

 The time elapsed between the CPAC execution towards the target PSCell and the corresponding latest CPAC configuration is received for the target PSCell

 The time elapsed since the CPAC execution towards the target PSCell until the SCG failure

7 companies provide proposals on above ffs issues, and the supporting situation is as below:

|  |  |  |
| --- | --- | --- |
| **Time info** | **Supporter** | **Objector** |
| The time elapsed between the CPAC execution towards the target PSCell and the corresponding latest CPAC configuration is received for the target PSCell  | Vivo/Lenovo/CMCC/Huawei/NTT Docomo | Qualcomm |
| The time elapsed since the CPAC execution towards the target PSCell until the SCG failure  | Vivo/Lenovo/Huawei/ZTE | Qualcomm |

Similar discussion have been repeated several meeting,while the interests to go for more time information has been increased. For the time since the CPAC execution towards the target PSCell until the SCG failure, it is understood the the time information can be covered by current *timeSCGFailure.* And for another time information,considering the large interests, rapporteur suggests that, as a last try, RAN2 discuss online whether to include more time information in SCGFailureInformation

**Discuss online:**

**Proposal 6: For CPAC MRO, RAN2 discuss which of below time information is included in SCGFailureInformation:**

* **The time elapsed between the CPAC execution towards the target PSCell and the corresponding latest CPAC configuration is received for the target PSCell (5)**
* **The time elapsed since the CPAC execution towards the target PSCell until the SCG failure, reusing existing timeSCGFailure (4)**
* **None (1)**

### Others

For proposals listed in this section they will only be discussed if time allows.

#### On new scenarios

Relevant proposals

Proposal 1: The scenario that PCell handover happens after CPA/CPC configuration and before CPA/CPC execution is considered for CPA/CPC optimization.

Proposal 2: To support the MRO for scenario in P1, UE reports one indication that before PCell handover, CPA/CPC configuration has received but not executed, or the time difference between the CPA/CPC configuration and PCell handover.

Above proposals are proposed by CMCC to consider a new scenario when HO execution while CPAC configuration is configured but not executed. It is understand that above scenario has not been confirmed by RAN3 and it is only proposed by one company, suggest not to discuss online.

#### Additional information in SCGFailureInformation for CPAC MRO

Below summarized proposed information in SCGFailureInformation for CPAC MRO:

|  |  |
| --- | --- |
| **Proposed content** | **Supporting companies** |
| Source PSCell ID and latest measurementsand target PSCell ID Radio measurement results of source PSCell, target PSCell and neighbor cells Rapp: Discussed last meeting, and it is common understanding that it has been covered in current running CR. | Vivo/CMCC |
| Target PSCell ID and latest measurement resultsRapp: Discussed last meeting, and it is common understanding that it has been covered in current running CR. | Vivo/CMCC |
| Neighboring cell measurementsRapp: Discussed last meeting, and it is common understanding that it has been covered in current running CR. | Vivo/CMCC |
|  The type of PSCell addition/change (e.g. CPA/CPC or legacy PSCell addition/change) to differentiate CPAC from conventional SCG failure. | Vivo/Lenovo |
| CPAC Candidate cells flag | CMCC |
| If multiple events are configured for CPA/CPC, UE reports the first triggered CPAC event, and the time duration between the two triggered CPAC events.Rapp:Already agreed last meeting. | CMCC |
| Success PSCell change/addition cause value (e.g., t304, t310, t312 cause, etc.)Rapp: This shall be part of SPR consideration | CMCC |

For above, some of the information have been discussed in last meeting, and for the rest information they are not part of ffs issues, yet are still relevant to identified CPAC MRO scenarios. Although the level of interests is limited but since they have not been actually discussed before, it is suggested to discuss if time allows, if there is no support online there is no need to bring the proposal back again.

**Discuss if time allows:**

**Proposal 7: RAN2 discuss which of below information is needed in SCGFailureInformation for CPAC MRO:**

* **The type of PSCell addition/change (e.g. CPA/CPC or legacy PSCell addition/change) to differentiate CPAC from conventional SCG failure.**
* **CPAC Candidate cells flag**

## Others

Topics that are irrelevant to SON for CPAC and fast MCG recovery are listed here, which is expected to discuss with lowest priority.

### MHI for SCG Activation/Deactivation

Relevant proposals are listed in below table:

|  |  |  |
| --- | --- | --- |
| **TDoc** | **Company name** | **Proposals** |
| [R2-2310370](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310370.zip) | CATT | Proposal 1: RAN2 considers MHI enhancement for SCG deactivation/activation. |
| [R2-2310283](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310283.zip) | CMCC | Proposal: Include in MHI the information of SCG activation/deactivation, e.g., the time of SCG activation, or percentage of time that SCG activation. |

There are two companies (including one operator) proposed to consider enhance MHI to address SCG deactivation/activation impact. RAN2 has never discussed this before, considering there is operator support, it is suggested to discuss if time allows.

**Discuss if time allows:**

**Proposal 8: RAN2 discuss whether to considers MHI enhancement for SCG deactivation/activation.**

### **irregular (TOO LATE handover) cell change**

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| [14] [R2-2310706](file://D://3GPP%20Sync%5C%5CRAN2%5C%5CTSGR2_123bis%5C%5CDocs%5C%5CR2-2310706.zip) | Nokia | **Proposal 1: RAN2 agrees that an irregular (TOO LATE handover) cell change loses the trigger point to start the timer for the RLF variable “*TimeConnFailure*”.****Proposal 2: RAN2 discusses the solution options to get the important RLF information needed for MRO also in cases where the preceding cell change was irregular and problematic.**  |

This scenario has not been discussed before and there are only company support, no proposal will be made for on line discussion per current guideline.

# Conclusion

Based on analysis in section 2, following proposals are made for further discussion, and some proposals are only discussed under certain conditions.

## Fast MCG recovery

**Discuss online:**

 **Proposal 1: UE includes following time information in RLF report for fast MCG link recovery optimization:**

* **Time between MCG failure (or transmitting MCGFailureInformation, only for case a) and SCG failure for case a and f1 (5/6)**

**Proposal 2: RAN2 discuss whether below information is needed in RLF report for fast MCG link recovery optimization:**

* + **Time between MCG failure (or transmitting MCGFailureInformation) and SCG deactivation for case f1**
	+ **a flag indicating which of the link failures, SCG or MCG failure, happened first in the RLF report.**

P2 is only discussed if P1 is agreed, otherwise it can be skipped.

**Proposal 3 Upon MCG recovery failure due to SCG failure all possible SCG failure types (that in legacy may be included in the SCGFailureInformation) can be logged as MCG recovery failure cause in the RLF report.**

**Discuss if time allows:**

**Proposal 4: RAN2 discuss whether to include fast MCG recovery information in RLF report associated to failed handover, which is based on RRCReconfiguration received in response to MCGFailureInformation.**

**Proposal 5: RAN2 discuss which of below failure cause is needed be included in RLF report in case MCG RLF and T316 has been configured:**

* **new failure cause to indicate PSCell change/addition ongoing before fast MCG recovery**
* **Information to indicate which response ( i.e., RRCRelease or RRCReconfiguration ) UE has received for transmitted MCGFailureInformation**

## CPAC MRO

**Discuss online:**

**Proposal 6: For CPAC MRO, RAN2 discuss which of below time information is included in SCGFailureInformation:**

* **The time elapsed between the CPAC execution towards the target PSCell and the corresponding latest CPAC configuration is received for the target PSCell (5)**
* **The time elapsed since the CPAC execution towards the target PSCell until the SCG failure, reusing existing timeSCGFailure (4)**
* **None (1)**

**Discuss if time allows:**

**Proposal 7: RAN2 discuss which of below information is needed in SCGFailureInformation for CPAC MRO:**

* **The type of PSCell addition/change (e.g. CPA/CPC or legacy PSCell addition/change) to differentiate CPAC from conventional SCG failure.**
* **CPAC Candidate cells flag**

## Others

**Discuss if time allows (lowest priority):**

**Proposal 8: RAN2 discuss whether to considers MHI enhancement for SCG deactivation/activation.**

# Reference

1. R2-2309673 Remaining issues on MRO for CPAC vivo discussion Rel-18 NR\_ENDC\_SON\_MDT\_enh-Core
2. R2-2309944 SON enhancements for CPAC Lenovo discussion Rel-18
3. R2-2309945 MRO for fast MCG link recovery Lenovo discussion Rel-18
4. R2-2310282 SON MDT enhancement for MR-DC CPAC CMCC discussion Rel-18 NR\_ENDC\_SON\_MDT\_enh2-Core
5. R2-2310283 MHI Enhancement for SCG Activation/Deactivation CMCC discussion Rel-18 NR\_ENDC\_SON\_MDT\_enh2-Core
6. R2-2310369 Discussion on Fast MCG recovery MRO Enhancement CATT discussion Rel-18 NR\_ENDC\_SON\_MDT\_enh2-Core
7. R2-2310370 Discussion on MHI Enhancement for SCG Deactivation/Activation CATT discussion Rel-18 NR\_ENDC\_SON\_MDT\_enh2-Core
8. R2-2310427 Discussion on fast MCG recovery MRO SHARP Corporation discussion
9. R2-2310499 Report of [Post123][567][R18 SONMDT] Cap of SONMDT  (Huawei) Huawei, HiSilicon discussion Rel-18 NR\_ENDC\_SON\_MDT\_enh2-Core
10. R2-2310506 Discussion on leftover issues for fast MCG recovery Huawei, HiSilicon discussion Rel-18 NR\_ENDC\_SON\_MDT\_enh2-Core
11. R2-2310507 Discussion on leftover issues for CPAC MRO Huawei, HiSilicon discussion Rel-18 NR\_ENDC\_SON\_MDT\_enh2-Core
12. R2-2310569 Consideration on fast MCG recovery and CPAC MRO ZTE Corporation, Sanechips discussion Rel-18 NR\_ENDC\_SON\_MDT\_enh2-Core
13. R2-2310594 Fast MCG Link Recovery Optimization Samsung discussion
14. R2-2310706 Improvement of handling of timeConnFailure Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_ENDC\_SON\_MDT\_enh2-Core
15. R2-2310707 MRO for CPAC Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_ENDC\_SON\_MDT\_enh2-Core
16. R2-2310708 MRO for fast MCG recovery Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_ENDC\_SON\_MDT\_enh2-Core
17. R2-2310745 Discussion on Fast MCG recovery and SCG failure optimization Ericsson discussion NR\_ENDC\_SON\_MDT\_enh2-Core
18. R2-2310756 Discussion on CPAC failure report NTT DOCOMO, INC. discussion
19. R2-2311087 Discussion on open issues on CPAC MRO and fast MCG recovery failures Qualcomm Incorporated discussion Rel-18

# Annex: RAN2 Agreements

* **Agreements on fast MCG recovery**

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| ***RAN2#120 Agreements***1 For fast MCG recovery MRO, prioritize NR-DC scenario. if time allows, study whether the same solution can be extended for others DC scenarios. 2 Consider at least below scenarios for fast MCG recovery MRO:a. T316 expiry b. SCG failure/deactivation during fast MCG recovery (i.e., running of T316). The “upon fast MCG recovery case” is FFS.3 RLF report is enhanced to support fast MCG recovery MRO.4 Fast MCG recovery failure cause shall be included for fast MCG recovery optimization. FFS details***RAN2#122 agreements*** 1 RAN2 confirms scenario of near failure fast MCG recovery.2 RAN2 confirms scenario f1, i.e., SCG fails or is deactivated before the UE sends the MCGFailureInformation. FFS RAN2 impact.***RAN2#123 agreements*** 1 UE reports the elapsed T316 between the transmission of MCGFailureInformation and receiving RRC reconfiguration or RRC release message.2 No T316 related triggering threshold is introduced.3 Reuse existing RLF report to capture fast MCG recovery related information.1 RAN2 confirms the “SCG deactivation during fast MCG recovery” is not a valid scenario, therefore would not be considered in fast MCG MRO.2 UE logs the new information for fast MCG link recovery optimziation, only when AS security has been activated.FFS: UE reports following time information for fast MCG link recovery optimization:- Time between MCG failure (or transmitting MCGFailureInformation, only for case a) and SCG failure for case a and f1 |

* **Agreements on CPAC MRO**

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| ***RAN2#120 agreements*** => Deprioritize NE-DC / EN-DC scenarios for SCG failure information report.1 RAN2 confirms the CPA/CPC scenarios agreed by RAN3 and discuss corresponding UE impacts.2 SCGFailureInformation is enhanced to support CPAC MRO (i.e, no need to introduce new reports/message).FFS: For CPAC MRO, information to differentiate CAPC from conventional SCG failure is needed (ffs by implicit or explicit indication).***RAN2#123 agreements*** 3 For CPAC MRO, UE logs the below information in SCGFailureInformation: the type of the first triggered CPAC event if multiple events are configured the time duration between the two triggered CPAC events if multiple events are configured4 For CPAC MRO, RAN2 discuss which of below measurement information is included in SCGFailureInformation (should further check whether something is already existed): Latest radio measurements of neighbour cell(s) if available, reusing existing fields. Source PSCell info (cell ID, measurement result) if available, reusing existing fields. Target PScell info (cell ID, measurement result) if available, reusing existing fields.FFS: For CPAC MRO, RAN2 discuss which of below time information is included in SCGFailureInformation: The time elapsed between the CPAC execution towards the target PSCell and the corresponding latest CPAC configuration is received for the target PSCell  The time elapsed since the CPAC execution towards the target PSCell until the SCG failure  |