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Document for: Discussion, Decision

# Introduction

This document provides the summary of all the contributions submitted to 8.13.2.1 agenda item (agenda Handover related SON aspects) of RAN2#114-e meeting. The following categorization has been used in this document.

* **Cat-a-Proposal:** a potential easy agreement, e.g. Proposals where consensus exists, that seem straightforward to agree.
* **Cat-b-Proposal:** need further discussion. These should be tagged with e.g. [FFS] so they are clearly visible, and should indicate what the primary controversy is.
* **Cat-c-Proposal:** a candidate for immediate postpone, e.g. issues that may require other WG discussions or is contentious such that it is unlikely to converge at e-Meeting.
* **Cat-x-Proposal:** a candidate for not treating due to various reasons, e.g., already captured in the specification.

# Summary of AI 8.13.2.1 - Handover related SON aspects

## CHO related aspects

### Scenarios

* In [2], China Telecommunication proposes the following:

**Proposal 1: no need to merge scenarios 1b/1c, and no need to merge scenario 2a/2b.**

* In [6], Nokia proposes the following:

**Proposal 3: It is proposed the RAN2 use more exact wording in the description of MRO scenarios and actions in order to differentiate between CHO recovery and re-establishment procedure.**

* In [7], Oppo proposes the following:

**Proposal 1: RAN2 to agree that the Scenario 1b and 1c should be regarded as two independent scenarios, considering different cell ID, i.e., *reestablishementCellID* or *reconnectionCellID* should be included in the RLF report for the two scenarios.**

**Proposal 2: RAN2 to agree that Scenario 1b and 1c should not be regarded as two independent scenarios, considering same set of IE should be included in the RLF report.**

* In [12], Huawei proposes the following:

**Proposal 1: Merge case 1b and 1c for too late HO.**

**Proposal 2: Case 2b is the CHO to wrong cell not too early CHO according to the definition in stage 2.**

**Proposal 3: Deprioritize case 3c and 3f for MRO of mixed ordinary HO and CHO.**

* In [19], LG proposes the following:

**Proposal 1: For RLF-report for CHO, scenario 1b/1c (too late HO) and scenario 2a/2b (too early HO) are not merged.**

#### Rapporteur´s summary

Related to the merging of scenarios 1b/1c, 3 companies (China Telecommunication, LG) believe that they should not be merged. One company (Huawei) believe that they should be merged. Given the above, Rapporteur suggests the following

1. No need to merge scenarios 1b/1c

Related to the merging of scenarios 2a/2b, 2 companies (China Telecommunication, Oppo, LG) believe that they should not be merged. One company (Oppo) believe that they should be merged. Rapporteur believe that in can be discussed in stage-3 whether the same set of IEs or different should be used to represent the scenarios 2a/2b. Hence, given the above, Rapporteur suggests to agree on the following for the time being:

1. No need to merge scenarios 2a/2b

For the other proposals on this topic, Rapporteur suggests to further discuss it, since there are no sufficient views available in submitted contributions.

RAN2 to discuss the need to Deprioritize case 3c and 3f for MRO of mixed ordinary HO and CHO

RAN2 to discuss the following “Case 2b is the CHO to wrong cell not too early CHO according to the definition in stage 2”

RAN2 to discuss the need to use more exact wording in the description of MRO scenarios and actions in order to differentiate between CHO recovery and re-establishment procedure

### Timers-related info

In [1], CATT proposes the following:

**Proposal 3: The time elapsed since CHO execution until connection failure should be reported implicitly.**

**Proposal 4: The time elapsed between first CHO execution to RLF in target cell after successful CHO recovery can be included in RLF report.**

In [4], Vivo proposes the following:

**Proposal 1 Timer A is not necessary and should not be included in CHO RLF report.**

**Proposal 2 The field description of timeConnFailure *is modified as:* ‘This field is used to indicate the time elapsed since the last HO initialization or the reception of CHO command until connection failure. Actual value = field value \* 100ms. The maximum value 1023 means 102.3s or longer.’ *to indicate the time between the UE receiving the CHO command and RLF.***

**Proposal 3 Timer D can be implicitly derived with timer C and the modified timer timeConnFailure.**

In [8], Lenovo proposes the following:

**Proposal 1: Reuse the existing IE i.e. *TimeConnFailure* to indicate the time elapsed since initial CHO execution until connection failure with updates for field description if necessary.**

**Proposal 2: The UE reports the time between the first CHO execution and the corresponding latest CHO configuration received for the selected target cell received at UE in handover failure case.**

* In [11], ZTE proposes the following:

**Proposal 3-1: For successive CHO failure event, it is proposed to include the following information for the first failure case:**

* **TimeConnFailure, and modify the starting point to CHO execution time for CHO failure.**
* **TimeSinceFailue**

**Proposal 3-2: For successive CHO failure event, it is proposed to include the following information for the second failure case:**

* **TimeConnFailure, and modify the starting point to CHO execution time for CHO failure.**
* **TimeSinceFailue**
* In [12], Huawei proposes the following:

**Proposal 4: To support CHO MRO, the following failure information should be included in the RLF report:**

* ***timeConnFailure* is to indicate the time elapsed since the last HO initialization, including CHO, until first connection failure;**
* **new time IE, e.g., *timeBetwFailures*, to indicate the time elapsed since the first connection failure until the second one;**
* ***timeSinceFailure* is defined to indicate the time elapsed since the last connection failure;**
* **new time IE, e.g., *timeCHOexeFailure*, to indicate the time elapsed since the CHO execution until the first connection failure; =>This has been agreed in RAN3#110-e meeting;**
* In [13], Qualcomm proposes the following:

**Proposal 1: For handling different scenarios, in Fig. 1, we want to amend our previously agreed RAN2 time**

**From:**

**“Time difference between RRCReconfiguration (containing CHO configuration) reception and execution”**

**To:**

**“Time difference between RRCReconfiguration (containing CHO configuration) reception and execution or time difference between RRCReconfiguration (containing HO/CHO configuration) reception and RRCReconfiguration (containing CHO configuration) reception”**

**Proposal 2: Keep the legacy definition for *timeConnFailure* as “Time elapsed since the reception of the last RRCReconfiguration message until HoF/RLF**

**Proposal 3: Time elapsed since CHO execution until connection failure is implicity computed using *timeConnFailure* and RAN2 amended timer definition.**

**Proposal 4: Introduce additional timer as “time elapsed since the second CHO attempt until the connection failure”**

**Proposal 5: In the multiple CHO failure scenario, *timeUntilReconnection* captures the time elapsed since the first CHO failure until UE comes to the CONNECTED state. UE can come to the CONNECTED state either upon successful CHO recovery or legacy RRCReestablishment.**

* + In [14], Ericsson proposes the following:

**Proposal 2: The UE to report in the RLF-Report the time elapsed between CHO configuration reception and RLF in the source.**

**Proposal 3: To represent the “Time elapsed between CHO execution until the first HOF/RLF”, reuse the legacy timeConnFailure and clarify in the specification that it is started at HO execution.**

**Proposal 4:** **To represent the “Time elapsed between the first CHO execution and the corresponding latest CHO configuration received for the selected target cell” and the “Time between the UE receiving the CHO command and RLF in source” introduce a new timer, e.g. timeSinceCHOReconfig.**

**Proposal 5:** **In case the UE is configured with both A3 and A5 event for CHO, the UE to report in the RLF report the time elapsed between the fulfilment of the two triggering conditions for the CHO cell.**

* + In [15], Samsung proposes the following:

**Proposal 1 For CHOF, UE reports time from CHO config until CHO execution**

#### Rapporteur´s summary

For convenience, it is copied below the table with the CHO timers from the email discussion [20]:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **#** | **Timer** | **Start time (for time related measurements)** | **End time (for time related measurements)** | **Comments** |
| A | Timeline relationship between two consecutive RLF reports for cases of successful or unsuccessful CHO after unsuccessful CHO or handover failure | Time of declaring first RLF / HOF | Time of declaring second RLF/HOF |  |
| B | Time between the UE receiving the CHO command and RLF | Time of received CHO configuration | Time of declaring RLF in the source cell. |  |
| C | Time elapsed between the first CHO execution and the corresponding latest CHO configuration received for the selected target cell [6][8][5] | Time of received CHO configuration | Time of CHO execution | [Rapporteur]: Agreed in RAN2#112 |
| D | Time elapsed between CHO execution until the first HOF/RLF | Time of executing the first CHO | Time of first HOF/RLF | [Rapporteur]: Agreed in RAN2#113 |
| E | CHO interruption time | Time of executing the first CHO | Time of HO completion or successful reestablishment |  |
| F | Time elapsed between CHO execution successful until RLF in target | Time of CHO execution successful | Time of RLF in target |  |
| .... |  |  |  |  |

Related to timer C, all companies that have expressed their views (Vivo, Lenovo, QC, Ericsson) believe that a new IE should be introduced for it:

1. To represent Timer C, i.e. the “Time elapsed between the first CHO execution and the corresponding latest CHO configuration received for the selected target cell” introduce a new timer, e.g. timeSinceCHOReconfig.

Related to timer D, these are the companies´ views on how to represent it in the specification:

* + D is derived implicitly assuming that the TimeConnFailure is started at reception of the CHO configuration (CATT, Vivo, Qualcomm)
  + The TimeConnFailure is re-used with possible updates to indicate that it is started at HO execution (Lenovo, ZTE, Ericsson, Samsung)
  + A new time IE, e.g., timeCHOexeFailure, is used indicate the time elapsed since the CHO execution until the first connection failure (Huawei)

Given the above, Rapporteur suggests discussing how to derive timer D, i.e. the time elapsed between CHO execution until the first HOF/RLF:

1. RAN2 to select one of the following three options to derive Timer D, i.e. the time elapsed between CHO execution until the first HOF/RLF:
   1. Timer D is derived implicitly from timer C and the timeConnFailure which is started at reception of CHO configuration
   2. The TimeConnFailure is re-used with possible updates to indicate that it is started at CHO execution
   3. A new timer, e.g. timeCHOexeFailure, is introduced

Still related to timer C, one company QC believe that a previous agreement should be revisited. Rapporteur proposes cat-b for it:

RAN2 to discuss the need to revisit a previous agreement on timer C:

From “Time difference between RRCReconfiguration (containing CHO configuration) reception and execution”

To:“Time difference between RRCReconfiguration (containing CHO configuration) reception and execution or time difference between RRCReconfiguration (containing HO/CHO configuration) reception and RRCReconfiguration (containing CHO configuration) reception”

Other timers are mentioned in submitted contributions. Since those timers were discussed in previous email discussions, but not agreed, Rapporteur proposes to further discuss them as cat-b proposals:

RAN2 to discuss the need of the following timers:

* 1. Timer A, i.e. to include the timeline relationship between two consecutive RLF reports for cases of successful or unsuccessful CHO after unsuccessful CHO or handover failure
  2. Timer B, i.e. time between the UE receiving the CHO command and RLF in source
  3. Timer F, i.e. time elapsed between successful CHO execution/recovery until RLF in target
  4. In case the UE is configured with both A3 and A5 event for CHO, the UE to report in the RLF report the time elapsed between the fulfilment of the two triggering conditions for the CHO cell

Two companies (Huawei, ZTE) mentions the timeSinceFailure. Since that has been already agreed in RAN2#113, Rapporteurs proposes to do not discuss that again.

One company (QC) proposes to modify the definition of timeUntilReconnection. Since no other companies has expressed views on this, Rapporteur proposes to postpone the discussion on it, hence cat-c is applied:

1. In the multiple CHO failure scenario, *timeUntilReconnection* captures the time elapsed since the first CHO failure until UE comes to the CONNECTED state. UE can come to the CONNECTED state either upon successful CHO recovery or legacy RRCReestablishment

### Radio measurements-related info and candidate cells indication

* + In [1], CATT proposes the following:

**Proposal 1: RAN2 waits for RAN3’s reply LS before making the final decision on the radio measurements-related parameters for RLF-Report issues.**

**Proposal 2: List of candidate cells IDs or an indicator to indicate a neighbor cell is associated to a CHO candidate target cell can be included in RLF report if RAN3 confirms the source cell cannot keep the UE context.**

* + In [6], Nokia proposes the following:

**Proposal 5: RAN2 to clarify and possibly correct point b) in the above agreement to reflect the correct CHO behaviour.**

where the point b) is the following agreement from RAN2#113bis-e:

*Include in the RLF-report for CHO the following:*

*a. Configured CHO execution condition(s) (A3 and/or A5 event configuration, TTT values)*

*b. Fulfilled CHO execution condition(s), i.e. whether A3 and/or A5 event was fullfilled, for the cell(s) in which CHO execution was triggered.*

*c. Latest radio measurement results of the candidate target cells*

*Inclusion of a) and c) are subject to the RAN3 reply to the RAN2 LS R2-2102149.*

*Try to reuse existing mechanism as much as possible.*

* + In [7], Oppo proposes the following:

**Proposal 3: RAN2 to agree that the agreement made in the last RAN2 meeting that ‘List of candidate cells ID’ to be included in the RLF report for CHO case should exclude the ones already indicated in the existing *measResultNighCells* IE, for the sake of saving the overhead of RLF report.**

* + In [11], ZTE proposes the following:

**Proposal 3-1: For successive CHO failure event, it is proposed to include the following information for the first failure case:**

* **csi-rsRLMConfigBitmap/ssbRLMConfigBitmap**
* In [14], Ericsson proposes the following:

**Proposal 1:** **RAN2 to include within the measResultNeighCells in the RLF-Report an indication on whether a measured neighbour cell was configured as a CHO candidate or not (e.g. add a cho-Candidate flag in MeasResults as shown in the Annex).**

* In [15], Samsung proposes the following:

**Proposal 2 RLF report for CHO includes measurement results of candidate target cells and this does not depend on RAN3 feedback**

**Proposal 5 Do not report results of poor CHO candidates (can consider extending size of existing field measResultNeighCells)**

**Proposal 8 RAN2 is requested to discuss and conclude for which time instances UE should provide available measurement results to facilitate SON for the CHO config and support measurements at least for each failure event**

* In [18], CMCC proposes the following:

**Proposal 1: UE reports following information of fulfilled CHO events/conditions to the network:**

* **The first satisfied event or condition (A3 or A5)**
* **The time difference between the triggering of the two events or conditions**
* **The measurements of the second condition when the first condition is fulfilled**

#### Rapporteur´s summary:

One company (Samsung) believes that the radio measurements of candidate target cells should be included irrespective of the RAN3 LS reply. Rapporteur believes that seems to be a correct observation aligned with the current RLF-report principles in which the measurement results of candidate cells are included.

1. RLF report for CHO includes measurement results of candidate target cells and this does not depend on RAN3 feedback

Related to measurement results of candidate cells, two companies (Ericsson, Samsung, CATT) believes that the existing measResultNeighCells with indication of whether a reported cell is candidate cell or not. Two companies (CATT, Oppo) mentions that the list of “List of candidate cells IDs” should exclude the measurements included already in measResultNeighCells. Hence, Rapporteur proposes the following:

1. RAN2 to discuss how to represent the measurement results of the candidate target cells (subject to RAN3 LS reply):
   1. Reuse the measResultNeighCells in the RLF-Report, and include an indication on whether a measured neighbour cell was configured as a CHO candidate or not
   2. Introduce a separate list of measurements including only the measurements of candidate target cells not included in the measResultNeighCells

There are other possible measurement-related info proposed in various contributions. Rapporteur proposes the following:

RAN2 to discuss the need of the following information in the RLF report:

* 1. For successive CHO failure event, it is proposed to include the following information for the first failure case: csi-rsRLMConfigBitmap/ssbRLMConfigBitmap
  2. The first satisfied event or condition (A3 or A5)
  3. The measurements of the second condition when the first condition is fulfilled

One company (Nokia) believes that one agreement related to the “fulfilled CHO execution conditions” should be clarified:

RAN2 to discuss whether the following agreement should be clarified:

* 1. Include in the RLF-report for CHO the following: “Fulfilled CHO execution condition(s), i.e. whether A3 and/or A5 event was fullfilled, for the cell(s) in which CHO execution was triggered”

### Other info

* In [2], China Telecommunication proposes the following:

**Proposal 3: the network need to confirm whether *attemptCondReconfig-r16* is configured or not to help deducing the optimization direction. Whether an explicit indication is needed in RLF report depends on RAN3’s response to LS R2-2102149.**

* In [6], Nokia proposes the following:

**Proposal 4: Include in the RLF report a simple, explicit indication of HO type.**

Proposal 7: Add a new IE for encoding CHOCellID as the CHO prepared target cell that that UE performs successful CHO recovery to after HOF/RLF.

Proposal 8: Re-use the reestablishmentCellId-r16 IE to encode CellID as the cell the UE re-establishes to in case CHO recovery was unsuccessful.

* In [8], Lenovo proposes the following:

**Proposal 3: The UE can report an explicit CHO failure indicator to the network in the RLF-Report.**

**Proposal 4: The UE can report an** **indication of whether the cell for re-establishment is a CHO candidate target cell or not.**

**Proposal 5: Introduce a new IE to represent the selected CHO cell after the first connection failure no matter handover/the first reestablishment towards this selected CHO cell is successful or not.**

**Proposal 6:** **Reuse the existing IE i.e. *reestablishmentCellId* to indicate the cell in which the UE attempted the second reestablishment after failure of the first reestablishment following an HOF/RLF.**

* In [11], ZTE proposes the following:

**Proposal 2: Include CHO failure as a new failure type in RLF report.**

**Proposal 3-1: For successive CHO failure event, it is proposed to include the following information for the first failure case:**

* **connectionFailureType**
* **failedPCellId to include the failure PCell (RLF) or target PCell identity (HOF/CHOF)**
* **previousPCellId to include the source cell identity if the first failure is a HOF or CHOF**
* **C-RNTI**
* **rlf-cause if the first failure is RLF;**

**Proposal 3-2: For successive CHO failure event, it is proposed to include the following information for the second failure case:**

* **failedPCellId to include the candidate cell identity selected when T311 is running**
* **reestablishmentCellId**
* **noSuitableCellFound**
* In [12], Huawei proposes the following:

**Proposal 4: To support CHO MRO, the following failure information should be included in the RLF report:**

* ***failedPCell* is reused to indicate the cell where the first connection failure is detected in case of CHO;**
* ***reestablishmentCellId* can indicate the cell where the UE performs the successful CHO recovery;**
  + In [14], Ericsson proposes the following:

**Proposal 6:** **RAN2 to assume that reestablishmentCellID is used if the (first or second) reestablishment occurs in a non-CHO candidate cell, while a new “reestablishmentCHOCellID” is used if the (first) reestablishment occurs in a CHO candidate cell.**

* + In [15], Samsung proposes the following:

**Proposal 3 Introduce a single flag indicating whether all CHO conditions were met. Do not introduce a seperage flag indicating whether UE attempted recovery (given large overlap)**

* + In [18], CMCC proposes the following:

**Proposal 2: For scenarios that two connection failures happened, it should be clarified that whether the connection failure means the first failure or the second failure.**

#### Rapporteur´s summary

Related to the IDs to use for the first and second reestablishment attempts, these were the agreements from RAN2#113bis-e:

The following information in the RLF report for CHO are needed:

b. CHOCellId, to indicate the selected CHO cell after the first connection failure and before the reestablishment

c. CellID to indicate the cell in which the UE attempted the second reestablishment after failure of the first reestablishment following an HOF/RLF.

How to provide these information is FFS.

Related the cellID in bullet C from the above agreements, many companies (Huawei, Ericsson, Lenovo, Nokia, ZTE) believe that the reestablishment cell ID can be used. Hence, Rapporteur proposes the following:

1. RAN2 to agree that the reestablishmentCellID is used to represent:
   1. CellID in which the UE attempted the second reestablishment after failure of the first reestablishment following an HOF/RLF

One company (Ericsson) believe that the reestablishmentCellID can also be used to indicate the cellID of the first attempted reestablishment, if such cell is an ordinary cell, i.e. non-CHO candidate.

RAN2 to discuss if the reestablishmentCellID can also be used to represent the cellID of the cell in which the UE attempted the (first) reestablishment if such cell is a non-CHO candidate cell

Related to bullet B, i.e. CHOCellID, some companies have further provided proposals on it. Most of them believe a new IE CHOCellID should be used, one company (ZTE) believe that the existing failedPCellID should be used. Since the need of this new IE was already discussed in RAN2#113bis-e, Rapporteur proposes to stick to that agreement:

1. RAN2 to confirm the agreement from RAN2#113bis-e, i.e.
   1. A new CHOCellID is introduced to represent the CHO candidate cell selected after the first connection failure and before the reestablishment

Some companies (ZTE, Huawei) focus on other possible parameters that could be included. Rapporteur proposes to discuss it:

RAN2 to include in the RLF report the following parameters:

* 1. failedPCell is reused to indicate the cell where the first connection failure is detected in case of CHO
  2. previousPCellId to include the source cell identity if the first failure is a HOF or CHOF
  3. C-RNTI
  4. rlf-cause if the first failure is RLF
  5. noSuitableCellFound

Related to the need of an explicit CHO flag, some companies (Nokia, ZTE, Lenovo) believe that this is needed:

RAN2 to discuss the need of an explicit CHO indication as HO type in the RLF-Report

Rapporteurs proposes to further discuss these proposals:

For scenarios that two connection failures happened, it should be clarified that whether the connection failure means the first failure or the second failure.

Introduce a single flag indicating whether all CHO conditions were met. Do not introduce a seperage flag indicating whether UE attempted recovery (given large overlap)

The network need to confirm whether attemptCondReconfig-r16 is configured or not to help deducing the optimization direction. Whether an explicit indication is needed in RLF report depends on RAN3’s response to LS R2-2102149.

### Signalling model

* In [2], China Telecommunication proposes the following:

**Proposal 2: In case the UE is configured with CHO configuration, it is easier for the network to identify successive failure cases by putting the failure information of multiple failures in one RLF report, i.e. just adding new IEs or new fields in legacy RLF report.**

* In [8], Lenovo proposes the following:

**Proposal 7: Use separate IEs within the existing RLF-report to represent the second failure, and the first failure can be represented by reusing as much as possible existing IEs.**

* In [11], ZTE proposes the following:

**Proposal 1: It is proposed to use different IEs in one RLF report to include failure information of consecutive failure event.**

* In [12], Huawei proposes the following:

**Proposal 5: To support two consecutive failures in CHO, the existing parameters in the R16 RLF report is used to record the first failure related information and new parameters can be introduced for the second one.**

**Proposal 6: Separate IEs/fields within the existing RLF-report are used to represent the second connection failure or success cases for CHO.**

* In [14], Ericsson proposes the following:

**Proposal 7:** **RAN2 to assume that separate IEs within the existing RLF-report are used to represent the second (un)successful reestablishment attempt in a candidate CHO cell (see Annex).**

**Proposal 8:** **RAN2 to assume that CHO-related RLF-report content is applicable for both LTE and NR.**

* In [15], Samsung proposes the following:

**Proposal 6 In case UE experiences multiple report triggers/ events, the UE stores multiple reports that network can retrieve**

**Proposal 7 RAN2 is requested to adopt generic solution approaches as much as possible e.g. re-use or extend existing fields rather than creating new specific fields with similar contents**

* + In [6], Nokia proposes the following:

Proposal 6: In case of dual event CHO execution, include information regarding both events and the timing relationship between them in the RLF report.

#### Rapporteur´s summary

Related to the signalling model to adopt for the multiple failures the UE may experience during CHO, these are the options:

* + Use separate IEs within the existing RLF-report to represent the second failure, and the first failure can be represented by reusing as much as possible existing IEs (Lenovo, Huawei, Nokia, Ericsson, China Telecommunication, ZTE)
  + In case UE experiences multiple report triggers/ events, the UE stores multiple reports that network can retrieve (Samsung)

Given the above, Rapporteur proposes the following:

1. Use separate IEs within the existing RLF-report to represent the second failure, and the first failure can be represented by reusing as much as possible existing IEs.

## DAPS related aspects

### Scenarios

* In [3], China Telecommunication proposes the following:

**Proposal 1: DAPS scenarios 2b/2c can be merged.**

**Proposal 2: DAPS scenarios 3b/3c can be merged.**

* In [7], Oppo proposes the following:

**Proposal 7: RAN to agree that Scenario 2b and 2c for DAPS HO should be merged, since both scenarios result in the same RLF report IE and gNB behaviour.**

**Proposal 8: RAN to agree that Scenario 3b and 3c for DAPS HO should be merged, since both scenarios result in the same RLF report IE and gNB behaviour.**

* In [11], ZTE proposes the following:

**Proposal 4: It is proposed to discuss scenario “RLF in DAPS target cell after DAPS HO successful completion” without differentiation whether the RLF detected is before or after daps-SourceRelease reception.**

* In [12], Huawei proposes the following:

**Proposal 7: Move scenario 1b into the too early DAPS HO.**

**Proposal 8: Merge scenarios 2b/2c and 3b/3c.**

**Proposal 9: Introduce new scenario 3d and merge scenarios 3a and 3d.**

* In [19], LG proposes the following:

**Proposal 2: For RLF-report for DAPS HO, scenario 2b/2c(Too early DAPS) and scenario 3b/3c (DAPS to wrong cell) are not merged.**

#### Rapporteur´s summary

Related to the merging of scenarios 2b/2c, and 3b/3c in [20], these are the views:

* Merge scenarios 2b/2c and 3b/3c (China Telecommunication, Oppo, ZTE, Huawei)
* Not merge 2b/2c and 3b/3c (LG)

Given the above, Rapporteur proposes the following:

1. Scenarios 2b/2c and 3b/3c are merged

One company (Huawei) has further proposals on scenarios that Rapporteur suggests to further discuss.

RAN2 to further discuss the following:

* 1. Move scenario 1b into the too early DAPS HO
  2. Introduce new scenario 3d and merge scenarios 3a and 3d

### Timers-related info

* In [1], CATT proposes the following:

**Proposal 4: The time elapsed between first CHO execution to RLF in target cell after successful CHO recovery can be included in RLF report.**

**Proposal 6: New timers can be introduced for the time elapsed since DAPS HO execution until RLF occurs in source cell before or after fallback.**

* In [3], China Telecommunication proposes the following:

**Proposal 3: the same new timer is needed for both ‘a. Time elapsed since DAPS HO execution until RLF occurs in source cell before fallback’ and ‘b. Time elapsed since DAPS HO execution until RLF occurs in source cell after fallback’.**

**Proposal 4: the legacy timer *timeConnFailure* can be used to record ‘c. The elapsed time between the execution of DAPS and RLF in target cell’.**

* In [7], Oppo proposes the following:

**Proposal 9: RAN2 to agree that two variant IEs of *timeConnFailure*, e.g., *timeConnFailureSource* and *timeConnFailureTarget* might need to be introduced in the RLF report to indicate the time elapsed since the DAPS HO execution until RLF occurs in the source cell and the target cell, respectively.**

* In [12], Huawei proposes the following:

**Proposal 10: To support DAPS HO MRO, the following failure information should be included in the RLF report:**

* ***timeConnFailure* is to indicate the time elapsed since the last HO initialization, including DAPS HO, until first connection failure;**
* **new time IE, e.g., *timeBetwFailures*, to indicate the time elapsed since the first connection failure until the second one;**
* ***timeSinceFailure* is defined to indicate the time elapsed since the last connection failure;**
* **new time IE, e.g., *timeFailureDAPSHO*, to indicate the time elapsed since the first connection failure until the successful RACH with the target DAPS HO cell;**
* In [13], Qualcomm proposes the following:

**Proposal 6: Define the *timeConnFailure* as the “Time elapsed since reception of RRCReconfiguration containing DAPS HO until UE leaves CONNECTED state, i.e., UE doesn’t have an active cell connection.”**

**Proposal 8: Introduce a new timer as “The elapsed time between the first failure in the source (or target) and the second failure in target (or source) while performing the DAPS HO”**

* In [14], Ericsson proposes the following:

**Proposal 9:** **“The elapsed time between the execution of DAPS and HOF or RLF in target cell” is represented by the legacy timeConnFailure**

**Proposal 10:** **“The time elapsed since DAPS HO execution until RLF occurs in source cell before fallback” is represented by a new timer, e.g. timeSourceFailure**

**Proposal 11:** **“The time elapsed since DAPS HO execution until RLF occurs in source cell after fallback” is represented by the legacy timeConnFailure and by an indication included in the RLF-Report on whether a DAPS fallback was performed.**

* In [18], CMCC proposes the following:

**Proposal 3: Redefine the end time of *timeConnFailure* for the failure scenarios that UE still has the connection with source or target, or introduce new timers for those scenarios.**

#### Rapporteur´s summary

Related to the use of timeConnFailure, these are the views:

* timeConnFailure is to indicate the time elapsed since the last HO initialization, including DAPS HO, until first connection failure (Huawei)
* timeConnFailure represents “The elapsed time between the execution of DAPS and HOF or RLF in target cell” (Ericsson, CATT, China Telecommunications)
* timeConnFailure represents “Time elapsed since reception of RRCReconfiguration containing DAPS HO until UE leaves CONNECTED state, i.e., UE doesn’t have an active cell connection.” (Qualcomm)

Further one company (Oppo) believe that a new IE timeConnFailureTarget might need to be introduced in the RLF report to indicate the time elapsed since the DAPS HO execution until RLF occurs in the target cell. Rapporteur proposes to discuss the following.

1. RAN2 to discuss what timeConnFailure should represent among the following options
   1. “The elapsed time between the execution of DAPS and HOF or RLF in target cell”
   2. “The time elapsed since the last HO initialization, including DAPS HO, until first connection failure”
   3. “Time elapsed since reception of RRCReconfiguration containing DAPS HO until UE leaves CONNECTED state, i.e., UE doesn’t have an active cell connection.”
   4. A new IE timeConnFailureTarget is introduced in the RLF report to indicate the time elapsed since the DAPS HO execution until RLF occurs in the target cell.

Related to the “The time elapsed since DAPS HO execution until RLF occurs in source cell before fallback”, some companies (Ericsson, CATT, China Telecommunication, Oppo) believe that a new IE should be used. One company (Huawei) believe that timeConnFailure can be reused

1. RAN2 to discuss how to represent the “The time elapsed since DAPS HO execution until RLF occurs in source cell before fallback”, among the following options
   1. A new timeConnSourceFailure IE is introduced
   2. timeConnFailure is reused

Related to the “The time elapsed since DAPS HO execution until RLF occurs in source cell after fallback”, two companies (CATT, China Telecommunication) believe that a new IE should be introduced. One company (Ericsson) believe that the timeConnFailure can be reused together with a “DAPS fallback” indication. Hence, Rapporteur proposes to discuss the following:

1. RAN2 to discuss how to represent the “The time elapsed since DAPS HO execution until RLF occurs in source cell after fallback”, among the following options:
   1. A new timer IE is introduced
   2. timeConnFailure is reused and a “DAPS fallback” indication is introduced

Further, two companies (Huawei, Qualcomm) proposes to introduce a timer to indicate the time elapsed betwen the first connection failure until the second one. Since this was discussed in the past in [20] but not agreed, Rapporteur proposes cat-b.

RAN2 to discuss the need to include in the RLF report the “The elapsed time between first failure in source (or target) and second failure in target (or source) while performing the DAPS HO”.

One company (Huawei) further suggests introducing a new timer. Since that was not discussed in the past, Rapporteur proposes cat-b.

RAN2 to discuss the need to introduce the following timer:

* 1. new time IE, e.g., timeFailureDAPSHO, to indicate the time elapsed since the first connection failure until the successful RACH with the target DAPS HO cell

One company (Huawei) suggests that the “timeSinceFailure” is defined to indicate the time elapsed since the last connection failure”. Since this was not discussed before, Rapporteur suggests discussing it.

RAN2 to discuss what “timeSinceFailure” represents in case of DAPS HO, e.g.

* 1. The time elapsed since the connection failure in the target
  2. The time elapsed since the last connection failure (irrespective of whether that is in source or target)

### Radio measurements-related info

No proposals on this topic.

### Other info

* In [9], Lenovo proposes the following:

**Proposal 1: The state of source link after successful RACH should be included in the RLF-Report.**

**Proposal 3: The existing connection failure type i.e. ‘RLF’ or ‘HOF’ can be reused for SON for DAPS HO since additional indication is added to indicate DAPS failure.**

* In [12], Huawei proposes the following:

**Proposal 10: To support DAPS HO MRO, the following failure information should be included in the RLF report:**

* ***failedPCell* is to indicate the target cell in case of consecutive connection failures;**
* ***reestablishmentCellId* can indicate the successful DAPS HO cell.**
* **failure order indicator, e.g., *consecutivetwofailuresoder*, to indicate whether the failure between the UE and the source cell occurs before the one between the UE and the target cell;**
* **new indicator to indicate whether the RLF in the target cell occurred before or after the *daps-SourceRelease*..**

**Proposal 12: Send a reply LS to RAN3, that RAN2 has agreed for UE to report:**

* **the time elapsed since CHO execution initialization until connection failure to network;**
* **the above new enhanced failure information related to successive failures scenario;**
* **explicit indicator to indicator the handover type, e.g., DAPS HO, CHO.**
* In [13], Qualcomm proposes the following:

**Proposal 7: To determine whether the HoF happened before or after the RLF at the source, introduce an indicator.**

* In [16], Sharp proposes the following:

**Proposal 1: include an explicit DAPS handover type indication in RLF-report in case that DAPS HO is successfully performed but subsequent RLF occurs in target.**

#### Rapporteur´s summary

Different new indicators are proposed by various companies. Some of them were discussed in [20], but not agreed. Hence, Rapporteur proposes to further discuss the need of them:

RAN2 to discuss the need of:

* 1. DAPS handover type indication in RLF-report in case that DAPS HO is successfully performed but subsequent RLF occurs in target
  2. failure order indicator, e.g., consecutivetwofailuresoder, to indicate whether the failure between the UE and the source cell occurs before the one between the UE and the target cell
  3. Indicator to determine whether the HoF happened before or after the RLF at the source
  4. The state of source link after successful RACH should be included in the RLF-Report.

One company (Huawei) seems to propose some different interpretations of failedPCell and reestablishmentCellID. Rapporteur is unsure on whether any change is needed compared with legacy.

1. In case of DAPS HO, the failedPCell and reestablishmentCellID in the RLF-report are reused as in legacy.

### Signalling model

* In [1], CATT proposes the following:

**Proposal 7: DAPS handover failure information could be included in *FailureInformation* message for handover optimization.**

* In [4], Vivo proposes the following:

**Proposal 4 For the case of failed DAPS handover to the target cell but successful fallback to source, no further information is needed in the legacy FailureInformation message.**

**Proposal 5 The DAPS-related HO failure report is delivered in rlf-Report via UEInformationResponse.**

**Proposal 6 RAN2 to consider one of the following enhancements to failureInformation:**

1. **to add a flag denoting the availability of rlf-Report;**
2. **to modify the field description of daps-failure implying the availability of rlf-Report.**

* In [8], Lenovo proposes the following:

**Proposal 2: No further information is needed in the legacy *FailureInformation* message for the case that DAPS HO fails but UE falls back to the source link.**

* In [9], Lenovo proposes the following:

**Proposal 4:** **Re-use the existing rlf-report with extensions to cover all the two successive failures related information.**

* In [11], ZTE proposes the following:

**Proposal 5: It is proposed to use different IEs in one RLF report to include information of two consecutive failures when DAPS is configured.**

* In [12], Huawei proposes the following:

**Proposal 11: To support two consecutive failures in DAPS HO, the UE reuses the existing contents of the legacy RLF report to record the failure in the target cell related information for DAPS HO.**

* In [14], Ericsson proposes the following:

**Proposal 12: The existing FailureInformation message associated to DAPS failure is not enhanced for SON purposes.**

* In [16], Sharp proposes the following:

**Proposal 2: RA information and measurement results are included in the *FailureInformation* in DAPS fallback case.**

* In [18], CMCC proposes the following:

**Proposal 4: For DAPS HO, extent the current RLF-Report to capture the related information of the connection failures in both source cell and target cell.**

#### Rapporteur´s summary

Related to the signalling model, two options are possible:

* DAPS handover failure information could be included in FailureInformation message for handover optimization (CATT, Sharp)
* The existing FailureInformation message associated to DAPS failure is not enhanced for SON purposes (Ericsson, ZTE, Lenovo, Vivo, Huawei, CMCC)

Rapporteur proposes the following:

1. RAN2 to discuss how to represent the DAPS HO Failure:
   1. Re-use the existing rlf-report with extensions to cover all the two successive failures related information.
   2. Enhance the FailureInformation message

One company (Vivo) proposes further details on how to transmit the DAPS HOF information. Rapporteur suggests discussing this after agreeing on the above Cat-a-Proposal 15.

1. The DAPS-related HO failure report is delivered in rlf-Report via UEInformationResponse.
2. RAN2 to consider one of the following enhancements to failureInformation:
   1. to add a flag denoting the availability of rlf-Report;
   2. to modify the field description of daps-failure implying the availability of rlf-Report.

## Successful Handover Report

### Scenarios

* In [7], Oppo proposes the following:

**Proposal 4: RAN2 to agree the Scenario 2c should be considered as a handover failure case, rather than a successful handover case.**

**Proposal 5: RAN2 to agree the Scenario 3b should be considered as a handover failure case, rather than a successful handover case.**

* In [11], ZTE proposes the following:

**Proposal 6: Consider scenario 3b and 2c as discussed in [3] in SHO report.**

**Proposal 7: For scenario 3b and 2c as discussed in [3], UE includes the previous HO failure/source RLF failure information as stored in RLF-report in SHO report.**

* In [12], Huawei proposes the following:

**Proposal 17: The following scenario has been covered by scenario 1a for DAPS, so there is no need to progress on it.**

**“ In case of DAPS, if the UE gets an RLF in the source while doing DAPS.”**

**Proposal 18: No failure related information should be included in SHR.**

* In [14], Ericsson proposes the following:

**Proposal 13:** **Scenario 2c in Table 3 in [2] is addressed in the RLF report.**

**Proposal 14:** **Scenario 3b in Table 3 in [2] is addressed in the Successful HO Report.**

#### Rapporteur´s summary

Related to scenarios 2c and 3b, these are the views:

* Scenario 2c should be considered as part of RLF-report (Oppo, Ericsson)
* Scenario 2c should be considered as part of SHR (ZTE)
* Scenario 3b should be considered as part of SHR (Oppo, Ericsson, ZTE, Huawei)

Hence Rapporteur proposes the following:

1. Scenario 3b, i.e. “RLF in source during DAPS HO” is considered in the SHR
2. RAN2 to discuss if scenario 2c, i.e. “Successful CHO recovery while initial failure” is part of RLF-Report or SHR

One company (ZTE) proposes how to represent those scenarios 2c and 3b. Rapporteur proposes to discuss it once the above agreements are reached.

1. For scenario 3b and 2c as discussed in [3], UE includes the previous HO failure/source RLF failure information as stored in RLF-report in SHO report.

### SHR triggering conditions

* In [6], Nokia proposes the following:

**Proposal 1: The UE generates Successful HO report upon T310, T312 and T304 exceed a threshold for CHO case (in addition to regular HO).**

**Proposal 2: The UE logs the Successful HO report if the time between receiving the RRCReconfiguration command with sync and the CHO execution exceed a certain threshold.**

* In [8], Lenovo proposes the following:

**Proposal 8: The following triggering conditions can be also applied for generating an HO Success Report for the case that CHO succeeds or normal HO with CHO configuration(s) succeeds besides DAPS HO success.**

**- The UE logs the HO success report if, while doing HO, T310 value for the source cell exceeds a threshold;**

**- The UE logs the HO success report if, while doing HO, T312 value** **for the source cell exceeds a threshold;**

**- The UE logs the HO success report if, while doing HO, T304 exceeds a threshold;**

**- In case of CHO, if the UE gets an RLF in the source while doing CHO/normal HO;**

**Proposal 9: The following triggering conditions are applied for generating an HO Success Report for the case that CHO succeeds or normal HO with CHO configuration(s) succeeds:**

**- RLF does not happen in target cell but T310 in target cell is started within a period after successful handover;**

**- RLF does not happen in target cell but T312 in target cell is started within a period after successful handover;**

**- RLF does not happen in target cell but the number of consecutive "out-of-sync" indications from target cell is greater than one threshold.**

* In [11], ZTE proposes the following:

**Proposal 8: It is useful to store the successful HO report when CFRA configuration or performance is sub-optimal which includes following scenarios:**

* **The successful RA attempt is not based on CFRA resource**
* **the ratio of CFRA attempt among the total attempts is less than a configured threshold**
* In [12], Huawei proposes the following:

**Proposal 15: There are separate thresholds for T310/T312/T304 for SHR triggering conditions, and the values should be within the existing values.**

**Proposal 16: The UE does not log SHR if not triggering conditions are configured.**

* In [14], Ericsson proposes the following:

**Proposal 15:** **RAN2 to confirm the following triggering conditions for HO Success Report:**

1. **The UE logs the HO success report if, while doing HO, the number of out-of-sync indications exceeds a threshold**
2. **The UE logs the HO success report if the beam(s) configured with CFRA for the RACH to the target, are not the best beams at the time of HO**

* In [17], Sharp proposes the following:

**Proposal 1: UE triggers a successful HO report if T310 value for source cell exceeds a threshold at the time of RA completion in case of DAPS HO.**

#### Rapporteur´s summary

The following triggering conditions were agreed in RAN2#113bis-e:

At least the following triggering conditions are applied for generating an HO Success Report in the case that the HO succeeds:

a. The UE logs the HO success report if, while doing HO, T310 value exceeds a threshold

b. The UE logs the HO success report if, while doing HO, T312 value exceeds a threshold

c. The UE logs the HO success report if, while doing HO, T304 exceeds a threshold

d. In case of DAPS, if the UE gets an RLF in the source while doing DAPS.

One company (Huawei) provides proposals on how to configure the T310/T312/T304 thresholds for SHR reporting.

1. There are separate thresholds for T310/T312/T304 for SHR triggering conditions, and the values should be within the existing values.
2. The UE does not log SHR if not triggering conditions are configured.

Two companies (Nokia, Lenovo) believe that exceeding the thresholds for T310, T312, T304 should be used as SHR triggering conditions also for CHO. This seems to be in line with the above agreements.

1. RAN2 to confirm that the UE generates Successful HO report upon exceed thresholds on T310, T312 and T304 exceed also for CHO case (in addition to regular HO)

A number of companies proposes additional triggering conditions on top of what already agreed in RAN2#113bis-e.

RAN2 to discuss the need of the following additional SHR triggering conditions:

* 1. The UE logs the Successful HO report if the time between receiving the RRCReconfiguration command with sync and the CHO execution exceed a certain threshold
  2. In case of CHO, if the UE gets an RLF in the source while doing CHO/normal HO;
  3. For UE configured with CHO, when RLF does not happen in target cell but T310 in target cell is started within a period after successful handover
  4. For UE configured with CHO, when RLF does not happen in target cell but T312 in target cell is started within a period after successful handover
  5. For UE configured with CHO, when RLF does not happen in target cell but the number of consecutive "out-of-sync" indications from target cell is greater than one threshold
  6. The UE logs the HO success report if, while doing HO, the number of out-of-sync indications exceeds a threshold
  7. The UE logs the HO success report if the beam(s) configured with CFRA for the RACH to the target, are not the best beams at the time of HO
  8. the ratio of CFRA attempt among the total attempts is less than a configured threshold
  9. if T310 value for source cell exceeds a threshold at the time of RA completion in case of DAPS HO

### Timers-related info

In [8], Lenovo proposes the following:

**Proposal 10: At least the following information can be reported in the HO Success Report for the case that CHO succeeds or normal HO following CHO configuration(s) succeeds:**

**- T310 value in target cell;**

**- T312 value in target cell;**

**- The number of consecutive "out-of-sync" indications from target cell.**

In [9], Lenovo proposes the following:

**Proposal 7: At least the following information can be reported in the HO Success Report for the case that DAPS HO succeeds:**

**- T310 value in target cell;**

**- T312 value in target cell;**

**- The number of consecutive "out-of-sync" indications from target cell.**

* In [14], Ericsson proposes the following:

**Proposal 19:** **The UE to include in the HO Success Report the fullfilled triggering condition(s) that triggered the HO Success Report.**

**Proposal 20: In case the UE is configured with both A3 and A5 event for CHO, the UE to report in the HO Success Report the time elapsed between the fulfilment of the two triggering conditions for the CHO cell**

**Proposal 21:** **The UE to include in the HO Success Report for CHO and ordinary HO, the HO interruption time, i.e. time elapsed between last received packet in the DL (last transmitted packet in the UL) in source cell, and first received packet in the DL (transmitted packet in the UL) in the target cell.**

* In [17], Sharp proposes the following:

**Proposal 3: UE includes the time elapsed from the DAPS HO command reception to RLF in source cell in successful HO report for DAPS HO.**

* In [18], CMCC proposes the following:

Proposal 5: Include the RLM related timers and RLC retransmission counter in the Successful Handover Report.

#### Rapporteur´s summary

In RAN2#113bis-e the following FFS were left:

|  |
| --- |
| Proposal 6 RAN2 to further discuss the need of the following time-related measurements as part of the successful HO report:  a. Elapsed time for T310 timer for normal HO  b. Elapsed time for T310 timer for Conditional HO |

Given the above FFS and the submitted proposals on this topic, Rapporteur proposes to first discuss whether explicit values of RLM timers should be included or if instead it should be just included an indicator indicating which triggering conditions for SHR was fulfilled by the UE.

1. RAN2 to discuss how to represent time-related information in the SHR:
   1. The UE reports in SHR explicit values of RLM timers
   2. The UE indicates which triggering conditions for generating the SHR was fulfilled, e.g. T310, T304, T312 indications, etc.

Once the above is agreed, RAN2 should discuss the following information proposed in various contributions.

RAN2 to discuss the need of the following timers to be included in the SHR:

* 1. Elapsed time for T310 timer for normal HO
  2. For UEs configured with CHO, T310 value in target cell
  3. For UEs configured with CHO, T312 value in target cell
  4. For UEs configured with CHO, The number of consecutive "out-of-sync" indications from target cell.
  5. For UEs performing DAPS HO, T310 value in target cell
  6. For UEs performing DAPS HO, T312 value in target cell
  7. For UEs performing DAPS HO, The number of consecutive "out-of-sync" indications from target cell
  8. In case the UE is configured with both A3 and A5 event for CHO, the UE to report in the HO Success Report the time elapsed between the fulfilment of the two triggering conditions for the CHO cell
  9. Include the RLM related timers and RLC retransmission counter in the Successful Handover Report.
  10. UE includes the time elapsed from the DAPS HO command reception to RLF in source cell in successful HO report for DAPS HO.
  11. The UE to include in the HO Success Report for CHO and ordinary HO, the HO interruption time, i.e. time elapsed between last received packet in the DL (last transmitted packet in the UL) in source cell, and first received packet in the DL (transmitted packet in the UL) in the target cell

### Radio measurements-related info

In [7], Oppo proposes the following:

**Proposal 6: RAN2 to agree that the latest radio measurement results of the candidate target cells, in particular, the unqualified candidate cells should be included in the successful handover report in the case of conditional HO.**

In [12], Huawei proposes the following:

**Proposal 13: The following info is not needed:**

* **best cell(s) should be included in.**
* **The radio quality of source cell when ConditionalReconfiguration is received before conditional handover execution condition is satisfied**
* **Elapsed time for T310 timer for normal HO**
* **Elapsed time for T310 timer for Conditional HO**

**The following info is acceptable for SHR:**

* **Latest radio link quality of neighbour cells before HO command was received for all HO types.**
* **Latest radio link quality of source cell before HO command was received in the case of DAPS.**

**Proposal 14: For FFS#2b, it depends on whether the target cell has got SHR or not before sending HANDOVER SUCCESS to the source cell. If yes, there is no need for the UE to store and report the info, otherwise, it is beneficial for the UE to store and report the info.**

* In [14], Ericsson proposes the following:

**Proposal 17:** **The UE to report in the HO Success Report the following information for all types of HO:**

1. **Latest radio measurement results of neighbouring cells**
2. **Latest radio measurement results of source and target cells**

**Proposal 18: The UE to report in the HO Success Report the following information for CHO**

1. **Configured CHO execution condition(s) (A3 and/or A5 event configuration, TTT values)**
2. **Fulfilled CHO execution condition(s), i.e. whether A3 and/or A5 event was fullfilled, for the cell in which CHO execution was triggered.**

* In [15], Samsung proposes the following:

**Proposal 4 Succesful HO report includes results of best neighbouring cells (alike in case of HO failure)**

* In [18], CMCC proposes the following:

Proposal 6: Include the RRM related information in the Successful Handover Report.

Proposal 7: Include following BFR related informatin in the Successful Handover Report, when none of beams in *candidateBeamRSList* could meet the measurement requirement:

* + **Indication that none of beams in *candidateBeamRSList* could meet the measurement requirement,**
  + **ID and measurements of beams whose measurement higher than the threshod *rsrp-ThresholdSSB* but not within the configured list *candidateBeamRSList***
  + **Measurements of reference signals that within the configured list *candidateBeamRSList***

**Proposal 8: The exact condition needs to be defined to report the BFD related information.**

#### Rapporteur´s summary

In RAN2#113bis-e the following was left as FFS:

|  |
| --- |
| Proposal 4 RAN2 to further discuss the need of the following parameters as part of the successful HO report:  a. Latest radio link quality of neighbour cells before HO command was received for all HO types.  b. Configured CHO execution condition(s), e.g. A3 and/or A5 event configuration, of the candidate target cells. The inclusion of this parameter depends on the RAN3 reply to the RAN2 LS R2-2102149.  c. The radio quality of source cell when ConditionalReconfiguration is received before conditional handover execution condition is satisfied  d. Latest radio link quality of source cell before HO command was received in the case of DAPS. |

Given the above FFS and submitted proposals, Rapporteur proposes to continue the discussion on the need of any radio measurements in the SHR.

1. RAN2 to discuss the need of any of the following radio-related measurements to be included in the SHR
   1. Latest radio link quality of neighbour cells before HO command was received for all HO types
   2. Configured CHO execution condition(s), e.g. A3 and/or A5 event configuration, of the candidate target cells. The inclusion of this parameter depends on the RAN3 reply to the RAN2 LS R2-2102149
   3. The radio quality of source cell when ConditionalReconfiguration is received before conditional handover execution condition is satisfied
   4. Latest radio link quality of source cell before HO command was received in the case of DAPS
   5. Latest radio measurement results of source and target cells
   6. Fulfilled CHO execution condition(s), i.e. whether A3 and/or A5 event was fullfilled, for the cell in which CHO execution was triggered
   7. Indication that none of beams in *candidateBeamRSList* could meet the measurement requirement
   8. ID and measurements of beams whose measurement higher than the threshod *rsrp-ThresholdSSB* but not within the configured list *candidateBeamRSList*
   9. Measurements of reference signals that within the configured list *candidateBeamRSList*

### Other info

* In [9], Lenovo proposes the following:

**Proposal 5: The state of source link can be reported in the successful handover report.’**

* In [11], ZTE proposes the following:

**Proposal 9: in case successful HO is stored when RA configuration is sub-optimal, UE includes the the same amount of RA information as in ra-InformationCommon of RA report in successful HO report**

* In [12], Huawei proposes the following:

**Proposal 21: For location config/reports for SHR, location info for RLF report can be reused.**

* In [17], Sharp proposes the following:’

**Proposal 2: UE includes the source RLF cause or the T310 value of source cell at RA completion in successful HO report for DAPS HO.**

#### Rapporteur´s summary

For the above proposals, Rapporteur proposes to discuss them since in [20] only the location information were agreed as “other info”.

RAN2 to discuss the following information to be included in the SHR

* 1. The state of source link can be reported in the successful handover report.
  2. in case successful HO is stored when RA configuration is sub-optimal, UE includes the the same amount of RA information as in ra-InformationCommon of RA report in successful HO report
  3. For location config/reports for SHR, location info for RLF report can be reused
  4. UE includes the source RLF cause or the T310 value of source cell at RA completion in successful HO report for DAPS HO

### Configuration aspects

* In [5], NEC proposes the following

**Proposal 1. The source gNB configures successful handover report for the UE**

**Proposal 2: RAN2 discuss on the options to configure successful handover report:**

* **Option 1. By system information**
* **Option 2. By handover command**
* **Option 3. By RRC Reconfiguration message not including handover command**
* In [11], ZTE proposes the following:

**Proposal 11: UE logs successful HO report in case prior configuration is received for successful HO report (interested trigger and corresponding configuration), otherwise UE doesn’t store successful HO report.**

#### Rapporteur´s summary

Two companies (ZTE, NEC) propose to configure the UE for the logging of SHR. Rapporteur proposes to discuss it.

UE logs successful HO report in case prior configuration is received for successful HO report (interested trigger and corresponding configuration), otherwise UE doesn’t store successful HO report

Once the above is agreed, Rapporteur suggests discussing further details. Hence cat-c is proposes for the following:

1. RAN2 discuss on the options to configure successful handover report:
   1. Option 1. By system information
   2. Option 2. By handover command
   3. Option 3. By RRC Reconfiguration message not including handover command

### Signalling and procedures

* In [5], NEC proposes the following

**Proposal 3: Upon T304 expiry during a HO, the UE shall discard the stored successful handover report information related to this HO.**

**Proposal 4: The successful handover report availability indicator of DAPS handover can be sent in RRCReconfigurationComplete message in response to the RRCReconfiguration message to release the source.**

* In [11], ZTE proposes the following:

**Proposal 10: It is proposed to have multiple entries for successful HO report where each entry includes information of one successful HO event triggered.**

**Proposal 12: UE includes the availability of successful HO report to NW in each completed message send in RRC procedure, i.e., *RRCReconfigurationComplete, RRCReestablishmentComplete, RRCSetupComplete, RRCResumeComplete* message if it has available successful HO report to be reported.**

**Proposal 13: *UEInformationRequest/UEInformationResponse* message is used for successful HO report request and report.**

**Proposal 14: It is proposed UE always report complete successful HO report via one-shot request from NW, i.e., no need for separate request and partially successful HO report.**

* In [12], Huawei proposes the following:

**Proposal 19: The *varSuccHOReport* is introduced to store the parameters for successful HO report.**

**Proposal 20: The UE records the latest one Successful Handover Report, e.g., *varSuccHOReport*. The availability of a Successful Handover Report is indicated by the *RRCReconfigurationComplete* message, and the Successful Handover Report is fetched via UE Information Request/Response messages.**

* In [14], Ericsson proposes the following:

**Proposal 16: RAN2 to discuss how the UE should handle the case in which both an HO Success Report and an RLF Report would need to be stored for the same HO procedure.**

#### Rapporteur´s summary

Related to the above proposals on signalling and procedure, Rapporteur suggests to first agree on the following principles which are in line with the current RLF report:

1. The *varSuccHOReport* is introduced to store the parameters for successful HO report.
2. The UE includes the availability of successful HO report to NW in each completed message send in RRC procedure, i.e., RRCReconfigurationComplete, RRCReestablishmentComplete, RRCSetupComplete, RRCResumeComplete message if it has available successful HO report to be reported.
3. UEInformationRequest/UEInformationResponse message is used for successful HO report request and report.

Related to how many entries related to SHR shall be stored by the UE, one company (Huawei) believes that only one entry should be stored, while another company (ZTE) proposes have multiple SHR entries. Hence, Rapporteur proposes to discuss the following:

1. RAN2 to discuss the following:
   1. The UE only stores the latest SHR entry
   2. The UE may store multiple SHR entries

The other proposals are suggested as cat-c for the time being, since the above cat-a proposals should be agreed first.

1. RAN2 to discuss how the UE should handle the case in which both an HO Success Report and an RLF Report would need to be stored for the same HO procedure
2. Upon T304 expiry during a HO, the UE shall discard the stored successful handover report information related to this HO.
3. The successful handover report availability indicator of DAPS handover can be sent in RRCReconfigurationComplete message in response to the RRCReconfiguration message to release the source.

## Others

### NR-U

In [10], Lenovo proposes the following:

**Proposal 1: The measured RSSI and channel occupancy in the unlicensed spectrum can be included in the RLF report.**

**Proposal 2: Network needs to distinguish handover failure due to improper mobility paramter or improper LBT configuration.**

### Fast MCG link recovery

In [13], Qualcomm proposes the following:

**Proposal 9: Include fast MCG link recovery-related information in the RLF report.**

#### Rapporteur´s summary

Since the above topics are not in the agenda for this meeting, Rapporteur proposes cat-c for the following proposals:

1. The measured RSSI and channel occupancy in the unlicensed spectrum can be included in the RLF report.
2. Network needs to distinguish handover failure due to improper mobility paramter or improper LBT configuration.
3. Include fast MCG link recovery-related information in the RLF report.

# Conclusion

Based on the discussion in the previous sections, the following Cat-A proposals were identified:

[Cat-a-Proposal 1 No need to merge scenarios 1b/1c](#_Toc71996537)

[Cat-a-Proposal 2 No need to merge scenarios 2a/2b](#_Toc71996538)

[Cat-a-Proposal 3 To represent Timer C, i.e. the “Time elapsed between the first CHO execution and the corresponding latest CHO configuration received for the selected target cell” introduce a new timer, e.g. timeSinceCHOReconfig.](#_Toc71996539)

[Cat-a-Proposal 4 RAN2 to select one of the following three options to derive Timer D, i.e. the time elapsed between CHO execution until the first HOF/RLF:](#_Toc71996540)

[a. Timer D is derived implicitly from timer C and the timeConnFailure which is started at reception of CHO configuration](#_Toc71996541)

[b. The TimeConnFailure is re-used with possible updates to indicate that it is started at CHO execution](#_Toc71996542)

[c. A new timer, e.g. timeCHOexeFailure, is introduced](#_Toc71996543)

[Cat-a-Proposal 5 RLF report for CHO includes measurement results of candidate target cells and this does not depend on RAN3 feedback](#_Toc71996544)

[Cat-a-Proposal 6 RAN2 to discuss how to represent the measurement results of the candidate target cells (subject to RAN3 LS reply):](#_Toc71996545)

[a. Reuse the measResultNeighCells in the RLF-Report, and include an indication on whether a measured neighbour cell was configured as a CHO candidate or not](#_Toc71996546)

[b. Introduce a separate list of measurements including only the measurements of candidate target cells not included in the measResultNeighCells](#_Toc71996547)

[Cat-a-Proposal 7 RAN2 to agree that the reestablishmentCellID is used to represent:](#_Toc71996548)

[a. CellID in which the UE attempted the second reestablishment after failure of the first reestablishment following an HOF/RLF](#_Toc71996549)

[Cat-a-Proposal 8 RAN2 to confirm the agreement from RAN2#113bis-e, i.e.](#_Toc71996550)

[a. A new CHOCellID is introduced to represent the CHO candidate cell selected after the first connection failure and before the reestablishment](#_Toc71996551)

[Cat-a-Proposal 9 Use separate IEs within the existing RLF-report to represent the second failure, and the first failure can be represented by reusing as much as possible existing IEs.](#_Toc71996552)

[Cat-a-Proposal 10 Scenarios 2b/2c and 3b/3c are merged](#_Toc71996553)

[Cat-a-Proposal 11 RAN2 to discuss what timeConnFailure should represent among the following options](#_Toc71996554)

[a. “The elapsed time between the execution of DAPS and HOF or RLF in target cell”](#_Toc71996555)

[b. “The time elapsed since the last HO initialization, including DAPS HO, until first connection failure”](#_Toc71996556)

[c. “Time elapsed since reception of RRCReconfiguration containing DAPS HO until UE leaves CONNECTED state, i.e., UE doesn’t have an active cell connection.”](#_Toc71996557)

[d. A new IE timeConnFailureTarget is introduced in the RLF report to indicate the time elapsed since the DAPS HO execution until RLF occurs in the target cell.](#_Toc71996558)

[Cat-a-Proposal 12 RAN2 to discuss how to represent the “The time elapsed since DAPS HO execution until RLF occurs in source cell before fallback”, among the following options](#_Toc71996559)

[a. A new timeConnSourceFailure IE is introduced](#_Toc71996560)

[b. timeConnFailure is reused](#_Toc71996561)

[Cat-a-Proposal 13 RAN2 to discuss how to represent the “The time elapsed since DAPS HO execution until RLF occurs in source cell after fallback”, among the following options:](#_Toc71996562)

[a. A new timer IE is introduced](#_Toc71996563)

[b. timeConnFailure is reused and a “DAPS fallback” indication is introduced](#_Toc71996564)

[Cat-a-Proposal 14 In case of DAPS HO, the failedPCell and reestablishmentCellID in the RLF-report are reused as in legacy.](#_Toc71996565)

[Cat-a-Proposal 15 RAN2 to discuss how to represent the DAPS HO Failure:](#_Toc71996566)

[a. Re-use the existing rlf-report with extensions to cover all the two successive failures related information.](#_Toc71996567)

[b. Enhance the FailureInformation message](#_Toc71996568)

[Cat-a-Proposal 16 Scenario 3b, i.e. “RLF in source during DAPS HO” is considered in the SHR](#_Toc71996569)

[Cat-a-Proposal 17 RAN2 to discuss if scenario 2c, i.e. “Successful CHO recovery while initial failure” is part of RLF-Report or SHR](#_Toc71996570)

[Cat-a-Proposal 18 There are separate thresholds for T310/T312/T304 for SHR triggering conditions, and the values should be within the existing values.](#_Toc71996571)

[Cat-a-Proposal 19 The UE does not log SHR if not triggering conditions are configured.](#_Toc71996572)

[Cat-a-Proposal 20 RAN2 to confirm that the UE generates Successful HO report upon exceed thresholds on T310, T312 and T304 exceed also for CHO case (in addition to regular HO)](#_Toc71996573)

[Cat-a-Proposal 21 RAN2 to discuss how to represent time-related information in the SHR:](#_Toc71996574)

[a. The UE reports in SHR explicit values of RLM timers](#_Toc71996575)

[b. The UE indicates which triggering conditions for generating the SHR was fulfilled, e.g. T310, T304, T312 indications, etc.](#_Toc71996576)

[Cat-a-Proposal 22 RAN2 to discuss the need of any of the following radio-related measurements to be included in the SHR](#_Toc71996577)

[a. Latest radio link quality of neighbour cells before HO command was received for all HO types](#_Toc71996578)

[b. Configured CHO execution condition(s), e.g. A3 and/or A5 event configuration, of the candidate target cells. The inclusion of this parameter depends on the RAN3 reply to the RAN2 LS R2-2102149](#_Toc71996579)

[c. The radio quality of source cell when ConditionalReconfiguration is received before conditional handover execution condition is satisfied](#_Toc71996580)

[d. Latest radio link quality of source cell before HO command was received in the case of DAPS](#_Toc71996581)

[e. Latest radio measurement results of source and target cells](#_Toc71996582)

[f. Fulfilled CHO execution condition(s), i.e. whether A3 and/or A5 event was fullfilled, for the cell in which CHO execution was triggered](#_Toc71996583)

[g. Indication that none of beams in *candidateBeamRSList* could meet the measurement requirement](#_Toc71996584)

[h. ID and measurements of beams whose measurement higher than the threshod *rsrp-ThresholdSSB* but not within the configured list *candidateBeamRSList*](#_Toc71996585)

[i. Measurements of reference signals that within the configured list *candidateBeamRSList*](#_Toc71996586)

[Cat-a-Proposal 23 The *varSuccHOReport* is introduced to store the parameters for successful HO report.](#_Toc71996587)

[Cat-a-Proposal 24 The UE includes the availability of successful HO report to NW in each completed message send in RRC procedure, i.e., RRCReconfigurationComplete, RRCReestablishmentComplete, RRCSetupComplete, RRCResumeComplete message if it has available successful HO report to be reported.](#_Toc71996588)

[Cat-a-Proposal 25 UEInformationRequest/UEInformationResponse message is used for successful HO report request and report.](#_Toc71996589)

[Cat-a-Proposal 26 RAN2 to discuss the following:](#_Toc71996590)

[a. The UE only stores the latest SHR entry](#_Toc71996591)

[b. The UE may store multiple SHR entries](#_Toc71996592)

Based on the discussion in the previous sections, the following Cat-B proposals were identified:

[Cat-b-Proposal 1 RAN2 to discuss the need to Deprioritize case 3c and 3f for MRO of mixed ordinary HO and CHO](#_Toc71996626)

[Cat-b-Proposal 2 RAN2 to discuss the following “Case 2b is the CHO to wrong cell not too early CHO according to the definition in stage 2”](#_Toc71996627)

[Cat-b-Proposal 3 RAN2 to discuss the need to use more exact wording in the description of MRO scenarios and actions in order to differentiate between CHO recovery and re-establishment procedure](#_Toc71996628)

[Cat-b-Proposal 4 RAN2 to discuss the need to revisit a previous agreement on timer C:](#_Toc71996629)

[Cat-b-Proposal 5 RAN2 to discuss the need of the following timers:](#_Toc71996630)

[a. Timer A, i.e. to include the timeline relationship between two consecutive RLF reports for cases of successful or unsuccessful CHO after unsuccessful CHO or handover failure](#_Toc71996631)

[b. Timer B, i.e. time between the UE receiving the CHO command and RLF in source](#_Toc71996632)

[c. Timer F, i.e. time elapsed between successful CHO execution/recovery until RLF in target](#_Toc71996633)

[d. In case the UE is configured with both A3 and A5 event for CHO, the UE to report in the RLF report the time elapsed between the fulfilment of the two triggering conditions for the CHO cell](#_Toc71996634)

[Cat-b-Proposal 6 RAN2 to discuss the need of the following information in the RLF report:](#_Toc71996635)

[a. For successive CHO failure event, it is proposed to include the following information for the first failure case: csi-rsRLMConfigBitmap/ssbRLMConfigBitmap](#_Toc71996636)

[b. The first satisfied event or condition (A3 or A5)](#_Toc71996637)

[c. The measurements of the second condition when the first condition is fulfilled](#_Toc71996638)

[Cat-b-Proposal 7 RAN2 to discuss whether the following agreement should be clarified:](#_Toc71996639)

[a. Include in the RLF-report for CHO the following: “Fulfilled CHO execution condition(s), i.e. whether A3 and/or A5 event was fullfilled, for the cell(s) in which CHO execution was triggered”](#_Toc71996640)

[Cat-b-Proposal 8 RAN2 to discuss if the reestablishmentCellID can also be used to represent the cellID of the cell in which the UE attempted the (first) reestablishment if such cell is a non-CHO candidate cell](#_Toc71996641)

[Cat-b-Proposal 9 RAN2 to include in the RLF report the following parameters:](#_Toc71996642)

[a. failedPCell is reused to indicate the cell where the first connection failure is detected in case of CHO](#_Toc71996643)

[b. previousPCellId to include the source cell identity if the first failure is a HOF or CHOF](#_Toc71996644)

[c. C-RNTI](#_Toc71996645)

[d. rlf-cause if the first failure is RLF](#_Toc71996646)

[e. noSuitableCellFound](#_Toc71996647)

[Cat-b-Proposal 10 RAN2 to discuss the need of an explicit CHO indication as HO type in the RLF-Report](#_Toc71996648)

[Cat-b-Proposal 11 For scenarios that two connection failures happened, it should be clarified that whether the connection failure means the first failure or the second failure.](#_Toc71996649)

[Cat-b-Proposal 12 Introduce a single flag indicating whether all CHO conditions were met. Do not introduce a seperage flag indicating whether UE attempted recovery (given large overlap)](#_Toc71996650)

[Cat-b-Proposal 13 The network need to confirm whether attemptCondReconfig-r16 is configured or not to help deducing the optimization direction. Whether an explicit indication is needed in RLF report depends on RAN3’s response to LS R2-2102149.](#_Toc71996651)

[Cat-b-Proposal 14 RAN2 to further discuss the following:](#_Toc71996652)

[a. Move scenario 1b into the too early DAPS HO](#_Toc71996653)

[b. Introduce new scenario 3d and merge scenarios 3a and 3d](#_Toc71996654)

[Cat-b-Proposal 15 RAN2 to discuss the need to include in the RLF report the “The elapsed time between first failure in source (or target) and second failure in target (or source) while performing the DAPS HO”.](#_Toc71996655)

[Cat-b-Proposal 16 RAN2 to discuss the need to introduce the following timer:](#_Toc71996656)

[a. new time IE, e.g., timeFailureDAPSHO, to indicate the time elapsed since the first connection failure until the successful RACH with the target DAPS HO cell](#_Toc71996657)

[Cat-b-Proposal 17 RAN2 to discuss what “timeSinceFailure” represents in case of DAPS HO, e.g.](#_Toc71996658)

[a. The time elapsed since the connection failure in the target](#_Toc71996659)

[b. The time elapsed since the last connection failure (irrespective of whether that is in source or target)](#_Toc71996660)

[Cat-b-Proposal 18 RAN2 to discuss the need of:](#_Toc71996661)

[a. DAPS handover type indication in RLF-report in case that DAPS HO is successfully performed but subsequent RLF occurs in target](#_Toc71996662)

[b. failure order indicator, e.g., consecutivetwofailuresoder, to indicate whether the failure between the UE and the source cell occurs before the one between the UE and the target cell](#_Toc71996663)

[c. Indicator to determine whether the HoF happened before or after the RLF at the source](#_Toc71996664)

[d. The state of source link after successful RACH should be included in the RLF-Report.](#_Toc71996665)

[Cat-b-Proposal 19 RAN2 to discuss the need of the following additional SHR triggering conditions:](#_Toc71996666)

[a. The UE logs the Successful HO report if the time between receiving the RRCReconfiguration command with sync and the CHO execution exceed a certain threshold](#_Toc71996667)

[b. In case of CHO, if the UE gets an RLF in the source while doing CHO/normal HO;](#_Toc71996668)

[c. For UE configured with CHO, when RLF does not happen in target cell but T310 in target cell is started within a period after successful handover](#_Toc71996669)

[d. For UE configured with CHO, when RLF does not happen in target cell but T312 in target cell is started within a period after successful handover](#_Toc71996670)

[e. For UE configured with CHO, when RLF does not happen in target cell but the number of consecutive "out-of-sync" indications from target cell is greater than one threshold](#_Toc71996671)

[f. The UE logs the HO success report if, while doing HO, the number of out-of-sync indications exceeds a threshold](#_Toc71996672)

[g. The UE logs the HO success report if the beam(s) configured with CFRA for the RACH to the target, are not the best beams at the time of HO](#_Toc71996673)

[h. the ratio of CFRA attempt among the total attempts is less than a configured threshold](#_Toc71996674)

[i. if T310 value for source cell exceeds a threshold at the time of RA completion in case of DAPS HO](#_Toc71996675)

[Cat-b-Proposal 20 RAN2 to discuss the need of the following timers to be included in the SHR:](#_Toc71996676)

[a. Elapsed time for T310 timer for normal HO](#_Toc71996677)

[b. For UEs configured with CHO, T310 value in target cell](#_Toc71996678)

[c. For UEs configured with CHO, T312 value in target cell](#_Toc71996679)

[d. For UEs configured with CHO, The number of consecutive "out-of-sync" indications from target cell.](#_Toc71996680)

[e. For UEs performing DAPS HO, T310 value in target cell](#_Toc71996681)

[f. For UEs performing DAPS HO, T312 value in target cell](#_Toc71996682)

[g. For UEs performing DAPS HO, The number of consecutive "out-of-sync" indications from target cell](#_Toc71996683)

[h. In case the UE is configured with both A3 and A5 event for CHO, the UE to report in the HO Success Report the time elapsed between the fulfilment of the two triggering conditions for the CHO cell](#_Toc71996684)

[i. Include the RLM related timers and RLC retransmission counter in the Successful Handover Report.](#_Toc71996685)

[j. UE includes the time elapsed from the DAPS HO command reception to RLF in source cell in successful HO report for DAPS HO.](#_Toc71996686)

[k. The UE to include in the HO Success Report for CHO and ordinary HO, the HO interruption time, i.e. time elapsed between last received packet in the DL (last transmitted packet in the UL) in source cell, and first received packet in the DL (transmitted packet in the UL) in the target cell](#_Toc71996687)

[Cat-b-Proposal 21 RAN2 to discuss the following information to be included in the SHR](#_Toc71996688)

[a. The state of source link can be reported in the successful handover report.](#_Toc71996689)

[b. in case successful HO is stored when RA configuration is sub-optimal, UE includes the the same amount of RA information as in ra-InformationCommon of RA report in successful HO report](#_Toc71996690)

[c. For location config/reports for SHR, location info for RLF report can be reused](#_Toc71996691)

[d. UE includes the source RLF cause or the T310 value of source cell at RA completion in successful HO report for DAPS HO](#_Toc71996692)

[Cat-b-Proposal 22 UE logs successful HO report in case prior configuration is received for successful HO report (interested trigger and corresponding configuration), otherwise UE doesn’t store successful HO report](#_Toc71996693)

Based on the discussion in the previous sections, the following Cat-C proposals were identified:

[Cat-c-Proposal 1 In the multiple CHO failure scenario, *timeUntilReconnection* captures the time elapsed since the first CHO failure until UE comes to the CONNECTED state. UE can come to the CONNECTED state either upon successful CHO recovery or legacy RRCReestablishment](#_Toc71996397)

[Cat-c-Proposal 2 The DAPS-related HO failure report is delivered in rlf-Report via UEInformationResponse.](#_Toc71996398)

[Cat-c-Proposal 3 RAN2 to consider one of the following enhancements to failureInformation:](#_Toc71996399)

[a. to add a flag denoting the availability of rlf-Report;](#_Toc71996400)

[b. to modify the field description of daps-failure implying the availability of rlf-Report.](#_Toc71996401)

[Cat-c-Proposal 4 For scenario 3b and 2c as discussed in [3], UE includes the previous HO failure/source RLF failure information as stored in RLF-report in SHO report.](#_Toc71996402)

[Cat-c-Proposal 5 RAN2 discuss on the options to configure successful handover report:](#_Toc71996403)

[a. Option 1. By system information](#_Toc71996404)

[b. Option 2. By handover command](#_Toc71996405)

[c. Option 3. By RRC Reconfiguration message not including handover command](#_Toc71996406)

[Cat-c-Proposal 6 RAN2 to discuss how the UE should handle the case in which both an HO Success Report and an RLF Report would need to be stored for the same HO procedure](#_Toc71996407)

[Cat-c-Proposal 7 Upon T304 expiry during a HO, the UE shall discard the stored successful handover report information related to this HO.](#_Toc71996408)

[Cat-c-Proposal 8 The successful handover report availability indicator of DAPS handover can be sent in RRCReconfigurationComplete message in response to the RRCReconfiguration message to release the source.](#_Toc71996409)

[Cat-c-Proposal 9 The measured RSSI and channel occupancy in the unlicensed spectrum can be included in the RLF report.](#_Toc71996410)

[Cat-c-Proposal 10 Network needs to distinguish handover failure due to improper mobility paramter or improper LBT configuration.](#_Toc71996411)

[Cat-c-Proposal 11 Include fast MCG link recovery-related information in the RLF report.](#_Toc71996412)

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