3GPP TSG-RAN WG2 Meeting #121bis-e R2-2304412

Elbonia, 17 – 26 April 2023

**Agenda item: 7.1.3**

**Source: Nokia, Nokia Shanghai Bell**

**Title: Summary of AI 7.1.3 on other RAN2 aspects for NCR**

**WID/SID: NR\_netcon\_repeater - Release 18**

**Document for: Discussion and Decision**

# 1 Introduction

This document summarizes the proposals submitted to RAN2#121bis for NCR agenda item 7.1.3 (other RAN2 aspects). The document provides follow-up proposals based on these summaries to facilitate discussion during the meeting.

The rapporteur has organized the summaries and proposals topically; however, final proposals are ordered in the document conclusion based on perceived criticality and/or ease of finding an agreement.

# 2 Discussion

## 2.1 Other issues related to wake-up timer

Whether to support a wake-up timer to bring NCR-MT back out of RRC\_IDLE state will be discussed as part of [R2-2303288](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303288.zip) ([Post121][703][NCR] Open issues on NCR RRC) under AI 7.1.3, so proposals directly related to this issue (see 2.10.1.1) are not treated under the summary of AI 7.1.3. However, assuming the wake-up timer is agreed, some companies identified other related issues and submitted proposals based on this.

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| [R2-2302944](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302944.zip) Fujitsu | Proposal 1: RAN2 decides Option 1 as the solution [for how NCR-MT triggers NAS message to initiate RRC establishment after expiry of the wake-up timer] and sends LS to CT1 to inform the decision.[Option 1: At the expiry of the wake-up timer, RRC of NCR-MT sends a notification to NAS of NCR-MT. By receiving the notification, NAS of the NCR-MT transmits a NAS message.] |
| [R2-2303276](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303276.zip) Kyocera | Proposal 3 : RAN2 should agree that the wake-up timer and/or the prohibit timer is introduced in RRC Release, in order to make the UE transition to Connected under the gNB’s control. Exact timer values and NCR-MT behaviour are FFS. |
| [R2-2304115](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304115.zip) Ericsson | Proposal 2: The NCR-MT shall stop the timer when it performs cell reselection in RRC\_IDLE state. |

In R2-2304115 it was proposed that if a UE in RRC\_IDLE that was configured with a wake-up timer reselects to a new cell, it should reset the timer in order to immediately connect to the new cell and get new side control configuration. It was observed that this is consistent with behaviour following reselection in RRC\_INACTIVE. The rapporteur believes RAN2 could agree to the following (assuming wake-up timer is agreed)

**Proposal 1: If “wake-up timer” IE is agreed: The NCR-MT shall stop the wake-up timer when it performs cell reselection in RRC\_IDLE state.**

Following expiry of the wake-up timer, NCR-MT needs to initiate a new RRC connection. However, R2-2302944 observed that there may not be a clear upper layer trigger for connection establishment based on the existing specifications. For example, if the NCR-MT does not support DRB, then the trigger would need to come from higher layers (e.g. NAS), but NAS would have no reason to generate a message on its own after expiry of the wake-up timer. To resolve this, it was proposed that after timer expiry the RRC of the NCR-MT should send a notification to NAS of the NCR-MT so the NAS could transmit a NAS message to trigger connection setup request. Although this may have some specification impact on NAS, it was argued to be favourable than having the timer tracked within NAS (which would have even more spec impact). In either case, it is expected that CT1 would need to be informed if one of these mechanisms was agreed. RAN2 should discuss whether this behaviour needs to be specified, or if “upper layer” triggers could be left to implementation, in general. Any impact on the establishment cause within the RRC setup request message might also need to be considered.

**Proposal 2: If “wake-up timer” IE is agreed: RAN2 should discuss how an NCR-MT not supporting DRB shall initiate connection setup:**

* **Option 1: RRC of NCR-MT sends a notification to NAS of NCR-MT, and NAS of the NCR-MT transmits a NAS message. RAN2 sends LS to CT1 to inform the decision.**
* **Option 2: Leave it to implementation within “upper layers”.**
* **FFS if establishmentCause impacts within RRCSetupRequest.**

In R2-2303276, it was observed that if the NCR-MT supports OAM via PDU, it is possible that the NCR-MT might be prematurely woken from sleep shortly after being put into idle state, resulting in a sort of “ping-pong” scenario between RRC\_IDLE and RRC\_CONNECTED (perhaps this would be the case if the NCR-MT reported KPIs or keep-alive messages over OAM). To mitigate this, it was suggested that the NCR-MT could also be configured with a prohibit timer in RRC release to prohibit the NCR-MT from triggering RRC setup request too early. The rapporteur wonders if it is appropriate to prohibit incoming connections, since it would prevent access to the NCR-MT via OAM. Nonetheless, if time permits, it could be discussed by RAN2 whether this should be considered alongside a wake-up timer.

**Proposal 3: If “wake-up timer” IE is agreed: RAN2 should discuss whether prohibit timer should be introduced in RRCRelease message to prevent NCR-MT from initiating new connections prematurely.**

## 2.2 How NCR-MT initiates new connection after cell (re)selection from acceptable cell to suitable cell

Related to the agreements for cell reselection by NCR-MT in RRC\_INACTIVE from RAN2#121, was the FFS on NCR-MT behaviour when (re)selecting to an acceptable cell or when no cell is found.

* **The NCR-FWD is switched OFF if the NCR-MT in RRC\_INACTIVE state reselects a different cell than the last serving cell on which side control configuration was received.**
* **After cell reselection, the NCR-MT to resume so that it can receive side-control configuration from the new gNB (can be done by network configuration using existing specifications). The case when a NCR-MT selects/reselects to an acceptable cell or when no cell is found and comes back is FFS.**

This issue was discussed during [Post121][703][NCR] offline summarized in R2-2303288, and companies provided further submissions to RAN2#121bis. Proposals that were similar to the issues raised in R2-2303288 (see 2.10.1.6) are not treated under the summary of AI 7.1.3. However, two companies raised a new issue related to how NCR-MT can initiate a new connection after selecting back to a suitable cell.

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| [R2-2303276](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303276.zip) Kyocera | Proposal 8: RAN2 should discuss whether the NCR-MT can initiate MO data (i.e.., UL packet) by OAM client implementation or not, when the NCR-MT moves from an acceptable cell to a suitable cell.Proposal 9: RAN2 should discuss whether the NCR-MT is allowed to initiate an MO data (e.g., UL OAM traffic) as emergency call in an acceptable cell, when the cell broadcasts the NCR-Supported IE in SIB1. |
| [R2-2303974](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303974.zip) Huawei | Proposal 2: RAN2 to discuss the following options for the NCR-MT’s behavior for the acceptable cell:* Option 1: The NCR-MT enters RRC\_IDLE when reselecting to the acceptable cell, and initializes the RRC setup when it comes back to the suitable cell from the acceptable cell.
* Option 2: The NCR-MT which is originally in RRC\_INACTIVE in the suitable cell still stays in RRC\_INACTIVE when reselecting to the acceptable cell, and resumes the RRC connection when coming back to the suitable cell
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If NCR-MT selects an acceptable cell it may be released to RRC\_IDLE. However, both companies observed that if the NCR-MT reselects back to a suitable cell there would not necessarily be DL/UL traffic to trigger the NCR-MT back to RRC\_CONNECTED to get updated side control. Thus, NCR-MT would need to wait until T3512 expiry to trigger NAS registration update before a new RRC connection could be triggered on the suitable cell.

To deal with this issue, R2-2303974 proposed that NCR-MT should either directly initiate RRC setup upon reselection to a suitable cell from an acceptable cell or it should be specified that NCR-MT stays in RRC\_INACTIVE after reselecting to an acceptable cell. R2-2303276 proposed the possibility that the NCR-MT could initiate an MO data connection (e.g. via UL packet) to trigger the new connection on the suitable cell.

The rapporteur sees similarities between these proposals and the one above (Proposal 2) for initiating a new connection following expiry of the wake-up timer. In general, MO data cannot be the only specified mechanism as DRB was previously agreed to be optional for NCR-MT. Thus, RAN2 should discuss the following:

**Proposal 4: RAN2 should discuss how NCR-MT in RRC\_IDLE can initiate RRC setup request when there is no existing trigger from NAS (e.g. registration request/update).**

**Note: MO data can be considered as an option, but RAN2 should take into account that DRB is optional for NCR-MT.**

**Note: If RAN2 decides a new NAS trigger is necessary (possibly based on indication from RRC of the NCR-MT to NAS of the NCR-MT), then RAN2 shall inform CT1. FFS if establishmentCause impacts within RRCSetupRequest.**

R2-2303276 also proposed that NCR-MT may be able to trigger an MO data (UL traffic) as an emergency call in an acceptable cell if the acceptable cell is broadcasting NCR-support in SIB1. The rapporteur believes this situation is out of the ordinary and the motivation is still not very clear. Maybe it is to maintain some type of OAM connection at the NCR-MT when suitable cell is not available. This could be discussed further if there is time.

**Proposal 5: RAN2 should discuss whether the NCR-MT is allowed to initiate an MO data (e.g., UL OAM traffic) as emergency call in an acceptable cell, when the cell broadcasts the NCR-Supported IE in SIB1.**

## 2.3 Beam monitoring when NCR-MT in RRC\_INACTIVE

Another issue which was raised was if the NCR-MT in RRC\_INACTIVE reselects/determines to use a different beam from the cell on which it is already camped, e.g. due to beam failure.

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| [R2-2302893](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302893.zip) Qualcomm | Proposal 1: The NCR-FWD switches OFF if the NCR-MT in RRC\_INACTIVE mode detects beam failure.Proposal 2: The NCR-MT in RRC\_INACTIVE resumes connection to receive updated side control configuration if it reselects a new beam of the same camped cell. |
| [R2-2303291](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303291.zip) ZTE | Proposal 6: It is up to gNB implementation to perform link monitoring for the backhaul link when NCR-MT is in RRC\_INACTIVE state. |

In R2-2302893, it was observed that in RRC\_CONNECTED state, BFR is known by the network and the gNB can provide updated SCI if necessary; however, for NCR-MT in RRC\_INACTIVE state, the gNB cannot know whether a beam failure occurred and cannot know to provide new side control configuration, if necessary, after this situation. Therefore it was proposed that if the NCR-MT in RRC\_INACTIVE state selects/detects a new beam it should switch OFF the NCR-Fwd and initiate a connection on the gNB so it can acquire new side control configuration. In some sense, this makes NCR-MT in RRC\_INACTIVE experiencing beam degradation in the C-link behave functionally similar to NCR-MT in RRC\_CONNECTED experiencing RLF. The rapporteur believes R2-2302893 assumes there could be some beam monitoring capability at the NCR-MT while in RRC\_INACTIVE state, presumably left to implementation.

On the other hand, R2-2303291 argued that that RAN2 cannot decide whether NCR-MT can perform beam monitoring in RRC\_INACTIVE without involvement from RAN1 and RAN4. However, they indicated that a gNB could by implementation perform beam monitoring on behalf of an NCR-MT in RRC\_INACTIVE, e.g. by taking channel reciprocity into account at least for NCR-Fwd operating in FR2, and wake up the NCR-MT from RRC\_INACTIVE if necessary to provide updated side control configuration.

**Proposal 6: RAN2 should discuss backhaul beam monitoring by NCR-MT in RRC\_INACTIVE:**

* **Option 1: NCR-MT in RRC\_INACTIVE state may perform backhaul beam monitoring. FFS if anything further to be specified or if left to implementation.**
* **Option 2: NCR-MT in RRC\_INACTIVE state may not perform backhaul beam monitoring. gNB may perform link monitoring for the backhaul link by implementation when NCR-MT is in RRC\_INACTIVE state.**

**Note: If Option 1 is agreed, the following proposals can also be considered:**

* **Proposal 6-1: The NCR-FWD switches OFF if the NCR-MT in RRC\_INACTIVE mode detects beam failure.**
* **Proposal 6-2: The NCR-MT in RRC\_INACTIVE resumes connection to receive updated side control configuration if it reselects a new beam of the same camped cell.**

## 2.4 RRC release with redirection for NCR-MT

A couple of companies provided views on RRC release with redirection.

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| [R2-2302928](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302928.zip) Nokia | Proposal 1: RAN2 should discuss NCR-MT support for RRC release with redirection:- Option 1: NCR-MT supports RRC release with redirection.- Option 2: NCR-MT optionally supports RRC release with redirection.- Option 3: NCR-MT does not support RRC release with redirection. |
| [R2-2303276](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303276.zip) Kyocera | Proposal 7: RAN2 should discuss whether the redirection is enhanced to move the NCR-MT from an undesired cell to a desired cell (i.e., instead of handover). |

In R2-2303276 it was suggested that redirection could be enhanced to move the NCR-MT from one undesired cell to a different preferred cell, e.g. based on a recommended list of cells (possibly configured by OAM). The rapporteur notes that this would require new enhancements (e.g. to signal the preferred cells for redirection), which do not seem suitable to try to specify at this point in the work item. Such functionality could possibly be revisited in a future release.

R2-2302928 observed that many use cases for RRC redirection (e.g. load balancing, service-based redirection) are not very applicable for NCR-MT, so redirection may not even be necessary for NCR. Although the motivation is not very clear, it also might be seen as overkill to explicitly specify that NCR-MT does not support redirection (until now it is mandatory to support).

The rapporteur believes RAN2 could probably agree that RRC release with redirection can be supported, even if the motivation is not very clear. Furthermore, it is suspected that companies would agree that NCR-Fwd behaviour after redirection should follow the case of cell reselection, i.e. NCR-Fwd is turned OFF.

**Proposal 7: NCR-MT supports RRC release with redirection. If NCR-MT reselects a new cell due to redirection, NCR-Fwd is OFF.**

## 2.5 Cells preferred/allowed/forbidden/barred for NCR-MT

Three companies submitted proposals related to preferred, allowed, forbidden, barred cells.

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| [R2-2302787](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302787.zip) Intel | Proposal 1: Forbidden cells or cells not in allowed cell list are considered as barred for NCR-MT. |
| [R2-2303276](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303276.zip) Kyocera | Proposal 6 : RAN2 should discuss whether the NCR-MT is allowed to prioritize the desired cell(s) (i.e., the cell(s) of interest), in the cell reselection procedure. |
| [R2-2303387](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303387.zip) Apple | Proposal 3: NCR-Fwd is turned OFF if the “NCR-support” in SIB1 of the last serving cell on which side control configuration was received has been toggled OFF. |

In RAN3#119, it was agreed that the NCR-MT may be configured with a list of allowed/forbidden cells. The first proposal above from R2-2302787 provides direction for how NCR-MT should treat such cells. The rapporteur agrees that the proposal seems like the natural approach. RAN2 should discuss this considering its relationship to the agreement from RAN3.

**Proposal 8: Cells in forbidden cell list (if configured) are considered as barred for NCR-MT. Cells not in allowed cell list (if configured) are considered as barred for NCR-MT.**

Another company indicated in R2-2303276 NCR-MT should be able to prioritize certain desired cells during the cell reselection procedure in order to avoid camping on less preferred cells. The rapporteur believes, however, that this issue is avoided based on the above agreement from RAN3 that the NCR-MT may be configured with a forbidden cell list and the proposal given above to treat forbidden cells as barred. RAN2 can confirm the understanding.

**Proposal 9: NCR-MT prioritization of cells for reselection is based on configured allowed and/or forbidden cell lists.**

R2-2303387 considered the case where NCR in RRC\_INACTIVE is camped on a cell where NCR-support is initially indicated in SIB1 and NCR-support is subsequently toggled OFF. It was proposed that NCR-Fwd should switch OFF in this case, since it means that the network no longer wishes for NCRs to be amplifying-and-forwarding signals. The rapporteur is unsure, however, if this needs to be specified, considering a gNB could release side control configurations for all NCRs (i.e. explicitly indicate that NCR-Fwd should be shut off) prior to toggling NCR-support to OFF. Nonetheless, the proposal can be discussed:

**Proposal 10: RAN2 should discuss if NCR-Fwd is turned OFF when the “NCR-support” in SIB1 of the last serving cell on which side control configuration was received has been toggled OFF.**

## 2.6 Handling of NCR configuration failure

One company observed that if NCR-MT is responsible for compliance checks for the NCR-MT as well as the NCR-Fwd, then in the event of a failed compliance check at the NCR-Fwd the NCR-MT may unnecessarily initiate RRCReestablishment with the NCR-Fwd switched OFF (causing RLF for served UEs) even if the NCR-MT itself had no compliance issues. To resolve this issue, it was proposed to separate the compliance checks at NCR-MT and NCR-Fwd upon reception of RRCReconfiguration with side control (i.e. NCR-MT responsible for compliance check of NCR-MT; NCR-Fwd responsible for compliance check of NCR-Fwd), and allow NCR-MT to report NCR-Fwd compliance failure to the network via OAM without triggering RRC reestablishment or switching OFF NCR-Fwd.

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| [R2-2304004](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304004.zip) Samsung | Proposal 3. RAN2 discuss and agree on the separation of compliance check for MT’s and FWD’s configuration, and MT’s indication of FWD’s configuration failure to the network via at least OAM. |

**Proposal 11: RAN2 should discuss and agree on the separation of compliance check for NCR-MT and NCR-Fwd configuration, and that NCR-MT indicates NCR-FWD’s configuration failure to the network via at least OAM.**

## 2.7 Support for SMTC3

R2-2303944 observed that the SSB measurement timing configuration (SMTC) was extended for Rel-16 IAB to support larger periodicities used for SSB measurements and proposed that NCR could similarly make use of extended SMTC periodicities. The rapporteur believes new SMTCs were introduced in Rel-16 for IAB operating in TDM to prevent the IAB-MT from taking SSB measurements of the DU at the same IAB node. However, considering that NCR is a stationary network device, R2-2303944 argues that this feature could also be used by NCR-MT to reduce overhead and power consumption related to RRM measurements for cell reselection or radio link monitoring (i.e. to support much longer intervals between measurements). In that regard, the rapporteur believes the proposal could be discussed:

**Proposal 12: RAN2 should discuss whether NCR-MT shall support configuration of the same SMTC periodicities as IAB-MTs (i.e. periodicityAndOffset-r16 within SSB-MTC3-r16).**

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| [R2-2303944](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303944.zip) AT&T | Proposal 1: The NCR-MT should support configuration of the same SMTC periodicities as IAB-MTs (i.e. periodicityAndOffset-r16 within SSB-MTC3-r16) when making cell reselection and RRM measurements in RRC\_IDLE and RRC\_INACTIVE. |

## 2.8 NCR-specific PRACH resource occasions

R2-2303276 discussed whether scaling factors and offsets to PRACH occasions—another feature from Rel-16 IAB—might be applicable to NCR. In IAB, new PRACH occasions, which are configured by the donor gNB using RRC-signalled scaling factors and frame/slot offsets, can be configured to mitigate RACH collisions between UEs and IAB nodes. Considering that NCR is a stationary network device that extends coverage to cell edge users, it was proposed that new NCR-specific PRACH resources should also be considered to avoid collisions between the NCR-MT and the UEs it is extending coverage to. R2-2303276 also observed that PRACH partitioning (which is used by Rel-17 RedCap, SDT, Slicing and Coverage Enhancement) could alternatively be considered. The rapporteur believes this decision should be made by RAN1 and wonders if RAN2 should send an LS:

**Proposal 13: RAN2 should discuss if LS should be sent to RAN1 to enquire whether separate PRACH resources specific to NCR-MT should be defined, either based on separate PRACH occasions (like Rel-16 IAB) or based on PRACH partitioning (like Rel-17 RedCap, SDT, Slicing and Coverage Enhancement).**

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| [R2-2303276](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303276.zip) Kyocera | Proposal 10: RAN2 should discuss whether the separate PRACH resource specific to NCR-MT should be defined. |

## 2.9 NCR-specific cell selection thresholds

In R2-2302947, it was proposed that an NCR-specific cell (re)selection threshold should be defined independently of the thresholds used for UEs in order to ensure robustness in the NCR C-link (and also to provide a more robust NCR-Fwd link). This could, for example, create a way to adjust the cell edge differently from UEs. The rapporteur is somewhat sceptical of this approach, since NCR is a network device and the RF characteristics of the device would already be quite different from other UEs. However, if time permits, the proposal can be discussed:

**Proposal 14: Define an NCR-specific q-RxLevMinNCR and specify that Qrxlevmin applied in NCR-MT cell selection criterion S is obtained from q-RxLevMinNCR.**

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| [R2-2302947](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302947.zip) NEC | Proposal 1: RAN2 agree to define an NCR-specific q-RxLevMinNCR and specify that Qrxlevmin applying in NCR-MT cell selection criterion S is obtained from q-RxLevMinNCR. |

## 2.10 Proposals not treated for discussion with AI 7.1.3 summary

This section briefly describes other proposals that were submitted under AI 7.1.3, which are not suggested to be treated in the AI 7.1.3 summary discussion.

### 2.10.1 Proposals related to R2-2303288 (ZTE report of [Post121][703] Open issues on NCR RRC)

Numerous proposals submitted to AI 7.1.3 closely related to the offline discussion [Post121][703][NCR] Open issues on NCR RRC summarized in R2-2303288 (submitted to RAN2#121bis and will also be treated under AI 7.1.3). Since the proposals in R2-2303288 will already be treated, the proposals below will not be discussed as part of the summary of AI 7.1.3.

#### 2.10.1.1 Wake-up timer related

In RAN2#121 and [Post121][703][NCR] Open issues on NCR RRC offline discussion it was discussed whether NCR-MT should support a wake-up timer to periodically bring an NCR-MT in RRC\_IDLE state back to RRC\_CONNECTED state. Upon timer expiry the NCR-MT would initiate the new RRC connection.

Some companies (re)submitted proposals on this subject to RAN2#121bis, although the rapporteur also suspects that other companies may have withheld proposals on this subject if they had already provided their views during the Post121 offline discussion. In any case, whether to define a wake-up timer will already be discussed as part of R2-2303288 Proposal 3.

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| [R2-2302787](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302787.zip) Intel | Proposal 3: It is up to implementation how to transfer NCR-MT in RRC\_IDLE state back to RRC\_CONNECTED state. |
| [R2-2302944](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302944.zip) Fujitsu | Proposal 1: RAN2 decides Option 1 as the solution [for how NCR-MT triggers NAS message to initiate RRC establishment after expiry of the wake-up timer] and sends LS to CT1 to inform the decision.[Option 1: At the expiry of the wake-up timer, RRC of NCR-MT sends a notification to NAS of NCR-MT. By receiving the notification, NAS of the NCR-MT transmits a NAS message.] |
| [R2-2302947](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302947.zip) NEC | Proposal 3: For supporting NCR-Fwd ON when network sends NCR-MT to RRC\_IDLE, RAN2 agree the Modified Option 1 and Proposal 1.[*Modified Option 1: The gNB provides a wake-up timer to the NCR-MT when released to RRC\_IDLE.* * *The NCR-Fwd follows the last side control configuration from the gNB until the timer expires.*
* *The NCR-MT reconnection to the network is restricted when the wake-up timer is running.*
* *The NCR-MT may proactively reconnect to the network upon timer expiry to receive updated side control configuration.*

*Proposal 1: RAN2 agree to define an NCR-specific q-RxLevMinNCR and specify that Qrxlevmin applying in NCR-MT cell selection criterion S is obtained from q-RxLevMinNCR.*]Proposal 4: If Proposal 3 can’t be agreed, RAN2 agree to switch off the NCR-Fwd when network sends NCR-MT to RRC\_IDLE. |
| [R2-2303237](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303237.zip) Lenovo | Proposal 3: A timer is used to wake up NCR-MT from IDLE mode and trigger NCR-MT to establish RRC connection with gNB. |
| [R2-2303238](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303238.zip) Lenovo | Proposal 1: NCR-MT transit from IDLE to CONNECTED mode based on gNB indication e.g. configured timer that in RRC release message or paging. |
| [R2-2303264](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303264.zip) vivo | Proposal 4: Wakeup timer is supported to trigger the NCR-MT to reconnect to the NW.Proposal 5: The wakeup timer should be started when NCR-MT is released to RRC\_IDLE state.Proposal 6: Upon the wakeup timer expiration, the NCR-MT should initiate the RRC connection setup with the gNB. |
| [R2-2303276](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303276.zip) Kyocera | Proposal 3 : RAN2 should agree that the wake-up timer and/or the prohibit timer is introduced in RRC Release, in order to make the UE transition to Connected under the gNB’s control. Exact timer values and NCR-MT behaviour are FFS. |
| [R2-2303291](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303291.zip) ZTE | Proposal 1: To define “wake-up timer” IE in RRCRelease message. |
| [R2-2303387](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303387.zip) Apple | Proposal 5: RAN2 does not support a timer-based scheme to trigger IDLE NCR-MT entering CONNECTED state. OAM-based approach is considered instead. |
| [R2-2303775](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303775.zip) China Telecom | Proposal 2: The gNB provides a wake-up timer to the NCR-MT in RRCRelease message to assist the NCR-MT in IDLE state to reconnect to the gNB. |
| [R2-2303974](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303974.zip) Huawei | Proposal 1: No need to introduce a wake-up timer. |
| [R2-2304015](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304015.zip) Samsung | Proposal 5: Wakeup timer is configured via RRC Release. |
| [R2-2304115](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304115.zip) Ericsson | Proposal 1: A new timer is introduced in the RRCRelease message to indicate to the NCR-MT when it should transition to RRC\_CONNECTED. FFS on whether the same timer needs to be introduced in system information.Proposal 2: The NCR-MT shall stop the timer when it performs cell reselection in RRC\_IDLE state. |

#### 2.10.1.2 NCR-Fwd ON/OFF configuration when NCR-MT released to RRC\_IDLE

Another topic that was discussed in RAN2#121 and [Post121][703][NCR] RRC running CR for NCR (ZTE) offline discussion was the NCR-Fwd’s ON/OFF configuration after NCR-MT is released to RRC\_IDLE. Some companies (re)submitted proposals on this topic, although the rapporteur notes again that other companies may have withheld proposals on this subject if they had already provided their views during the Post121 offline discussion. This will also be discussed under Proposal 4 of R2-2303288, so will not be treated further within the summary of AI 7.1.3.

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| [R2-2302927](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302927.zip) Nokia | Proposal 1: NCR-Fwd should be OFF whenever NCR-MT is in RRC\_IDLE state. |
| [R2-2302947](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302947.zip) NEC | Proposal 3: For supporting NCR-Fwd ON when network sends NCR-MT to RRC\_IDLE, RAN2 agree the Modified Option 1 and Proposal 1.[*Modified Option 1: The gNB provides a wake-up timer to the NCR-MT when released to RRC\_IDLE.* *o The NCR-Fwd follows the last side control configuration from the gNB until the timer expires.* *o The NCR-MT reconnection to the network is restricted when the wake-up timer is running.**o The NCR-MT may proactively reconnect to the network upon timer expiry to receive updated side control configuration.**Proposal 1: RAN2 agree to define an NCR-specific q-RxLevMinNCR and specify that Qrxlevmin applying in NCR-MT cell selection criterion S is obtained from q-RxLevMinNCR.*]Proposal 4: If Proposal 3 can’t be agreed, RAN2 agree to switch off the NCR-Fwd when network sends NCR-MT to RRC\_IDLE. |
| [R2-2303237](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303237.zip) Lenovo | Proposal 1: gNB can control NCR behaviour in IDLE mode by configure side control information in RRC CONNECTED mode or RRC release message.Proposal 2: A valid timer is used to control the validity time duration of side control information for NCR in IDLE mode. |
| [R2-2303276](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303276.zip) Kyocera | Proposal 2: RAN2 should confirm that after NCR-MT enters RRC\_IDLE mode, the NCR-Fwd can be ON or OFF following the last configuration received from the gNB, as with INACTIVE. |
| [R2-2303387](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303387.zip) Apple | Proposal 6: RAN2 can choose of the following options for NCR-Fwd when NCR-MT is released to IDLE state by the gNB: * Option 1: NCR-Fwd is OFF.
* Option 2: NCR-Fwd keep operating based on the last configuration as same as in RRC\_INACTIVE.
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| [R2-2303775](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303775.zip) China Telecom | Proposal 1: In NCR-MT idle state, the broadcast messages can be used to control the NCR-Fwd’s ON/OFF. When the NCR-MT is in idle state and NCR-Fwd is on, the NCR can fall back to the legacy RF repeater. |
| [R2-2304015](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304015.zip) Samsung | Proposal 1: NCR-Fwd can operate in RRC idle according to the configuration received in RRC connected mode, same as in RRC inactive.Proposal 2: If NCR-MT is released to RRC idle with NCR-Fwd operating, the NCR-Fwd configuration is not released.Proposal 4: Donor gNB will not drop the NCR-Fwd configuration by network implementation when NCR is released to RRC idle. No specification impact. |
| [R2-2304114](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304114.zip) Ericcson | Proposal 3: When NCR-MT is released to RRC\_IDLE, the NCR-Fwd can be ON or OFF following the last configuration received from the gNB. |

#### 2.10.1.3 NCR-Fwd ON/OFF configuration after RRC re-establishment

In RAN2#120, the following agreement was reached related to RLF:

* **After RLF is declared by NCR-MT, NCR-MT performs cell selection and trigger RRC re-establishment;**
* **If NCR-MT enters RRC\_IDLE due to no suitable cell is find, NCR-Fwd is OFF;**
* **During RRC re-establishment procedure, NCR-Fwd is OFF.**

Several companies noted that further clarification was needed regarding NCR-Fwd’s behaviour after successful RRC re-establishment and provided various views on the matter. Although there were some possibly new views provided, contrasting the case where the NCR-MT re-establishes on the same or different cell where it received its last side control configuration, the rapporteur believes companies can raise these issues when Proposal 8 is treated from the summary of the offline discussion R2-2303288.

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| [R2-2302927](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302927.zip) Nokia | Proposal 2: RAN2 should discuss NCR-Fwd behaviour after RRC re-establishment:* Option 1: After RRC re-establishment procedure, NCR-MT waits for new side control configuration before switching NCR-Fwd ON (regardless of the cell where re-establishment occurred).
* Option 2: If NCR-MT re-establishes on the same cell where RLF occurred, NCR-Fwd may resume forwarding based on the last received side control configuration immediately after NCR-MT sends RRCReestablishmentComplete. If NCR-MT re-establishes on a different cell, NCR-MT waits for new side control configuration before switching NCR-Fwd ON.
* Option 3: NCR-Fwd may resume forwarding based on the last received side control configuration immediately after NCR-MT sends RRCReestablishmentComplete (regardless of the cell where re-establishment occurred).
 |
| [R2-2303276](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303276.zip) Kyocera | Proposal 4 : RAN2 should discuss whether the NCR-Fwd may resume its operation with the last configuration, when the RRC Reestablishment toward the same cell succeeds.Proposal 5 : RAN2 should discuss whether the NCR-MT discards the last configuration, when the RRC Reestablishment toward a different cell is initiated or completed successfully. |
| [R2-2303291](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303291.zip) ZTE | Proposal 3: NCR-MT discards side control configuration when triggers resume/re-establishment in a cell other than the cell on which the SCI configuration was received. Otherwise, NCR-MT in RRC\_INACTIVE state keeps SCI configuration.Proposal 5: When RRC re-establishment is succeed, NCR-Fwd keeps OFF and waits for new configuration/indication(RRC/MAC/DCI) from the network. |
| [R2-2304004](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304004.zip) Samsung | Proposal 1: NCR-Fwd is turned ON using previous configuration when RRCReestablishment is received. |

#### 2.10.1.4 “Last configuration” when NCR-MT released to RRC\_INACTIVE

Recall again, the following agreement from RAN2#120:

* **When NCR-MT is in RRC\_CONNECTED mode, the NCR-Fwd can be ON or OFF following the side control information received from the gNB.**
* **After NCR-MT enters RRC\_INACTIVE mode, the NCR-Fwd can be ON or OFF following the last configuration received from the gNB.**

It was observed in the [Post121][703][NCR] offline discussion that companies had different views regarding the meaning of “last configuration”. A few companies made proposals on this subject to RAN2#121bis, but the rapporteur notes that there are no substantially different insights compared to the offline discussion. In that regard it is suggested to focus discussion on the Proposal 5 already provided in R2-2303288.

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| [R2-2303264](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303264.zip) vivo | Proposal 1: If configured, after the NCR-MT is released from RRC\_CONNECTED to RRC\_INACTIVE state, the received periodic/semi-persistent beam indication before the NCR-MT is released in RRC\_INACTIVE state, can be still effective. |
| [R2-2303291](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303291.zip) ZTE | Proposal 2: For NCR-MT in RRC\_INACTIVE state, the periodic beam indication configuration is applied for NCR-Fwd ON/OFF. Aperiodic and semi-persistent beam indication configurations are NOT applied when NCR-MT is in RRC\_INACTIVE state |
| [R2-2303387](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303387.zip) Apple | Proposal 1: When releasing the NCR-MT to RRC\_INACTIVE state, it is up to NW to decide which configuration is suitable for NCR in INACTIVE state. The content of “last configuration” is up to NW implementation. |
| [R2-2303974](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303974.zip) Huawei | Proposal 3: When releasing the NCR-MT to RRC\_INACTIVE state, periodic beam indication, aperiodic beam indication and semi-persistent/semi-static beam configurations are all applicable to the NCR-MT. |

#### 2.10.1.5 Whether/when to discard side control configuration

In RAN2#121, the following agreement was reached when NCR-MT in RRC\_INACTIVE performs cell reselection followed by RRC resume:

* **The NCR-FWD is switched OFF if the NCR-MT in RRC\_INACTIVE state reselects a different cell than the last serving cell on which side control configuration was received.**
* **After cell reselection, the NCR-MT to resume so that it can receive side-control configuration from the new gNB (can be done by network configuration using existing specifications). The case when a NCR-MT selects/reselects to an acceptable cell or when no cell is found and comes back is FFS.**

In [Post121][703][NCR] offline, one issue discussed was whether the NCR-MT in RRC\_INACTIVE should discard its last received side control configuration after reselecting a new cell. In that discussion it was observed that SCI would be tied to the UE context unless otherwise specified, so it is important to agree when/whether the configuration is discarded since it could have impacts on delta configuration. A few companies submitted proposals related to this topic to RAN2#121bis, although many companies had already provided their views during the offline discussion. Although some companies brought new proposals related to NCR-MT in RRC\_IDLE or when NCR-support is toggled OFF, the rapporteur believes it is best for now to focus on the original proposal that was an outcome of the offline discussion (Proposal 6 of R2-2303288).

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| [R2-2302927](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302927.zip) Nokia | Proposal 3: Upon entering RRC\_IDLE, NCR-MT shall discard the side control configuration of the NCR-Fwd.Proposal 4: NCR-MT in RRC\_INACTIVE shall discard the side control configuration of the NCR-Fwd when it initiates RRCResume procedure in a cell different from the released cell. |
| [R2-2303291](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303291.zip) ZTE | Proposal 3: NCR-MT discards side control configuration when triggers resume/re-establishment in a cell other than the cell on which the SCI configuration was received. Otherwise, NCR-MT in RRC\_INACTIVE state keeps SCI configuration. |
| [R2-2303387](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303387.zip) Apple | Proposal 2: NCR release the last configuration when it reselects a different cell.Proposal 4: NCR releases the last configuration when the “NCR-support” in SIB1 of the last serving cell on which side control configuration was received has been toggled OFF. |
| [R2-2303775](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303775.zip) China Telecom | Proposal 3: The NCR-FWD is switched OFF when the NCR-MT in RRC\_IDLE state reselects a different cell. But the configuration in the last cell should not be discarded |
| [R2-2303974](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303974.zip) Huawei | Proposal 4: The NCR-MT in RRC\_INACTIVE does not discard the configuration autonomously, i.e., delta configuration is supported in any cell. |

#### 2.10.1.6 Cell (re)selection from acceptable cell to suitable cell by NCR-MT

Related to the agreements for cell reselection by NCR-MT in RRC\_INACTIVE from RAN2#121, was the FFS on NCR-MT behaviour when (re)selecting to an acceptable cell or when no cell is found.

* **The NCR-FWD is switched OFF if the NCR-MT in RRC\_INACTIVE state reselects a different cell than the last serving cell on which side control configuration was received.**
* **After cell reselection, the NCR-MT to resume so that it can receive side-control configuration from the new gNB (can be done by network configuration using existing specifications). The case when a NCR-MT selects/reselects to an acceptable cell or when no cell is found and comes back is FFS.**

This issue was discussed further during [Post121][703][NCR] offline, where the resulting proposal (Proposal 2 in R2-2303288) is that NCR-Fwd is switched OFF if no suitable cell has been found. Some companies provided further submissions to RAN2#121bis related to this topic.

In R2-2302947 one company proposed that when NCR-MT (re)selects to an acceptable cell the NCR-Fwd should be OFF, while another company proposed in R2-2303264 that if no acceptable cell is available the NCR-Fwd should be OFF. The rapporteur observes that these proposals already hold if NCR-Fwd is OFF if no suitable cell is found by NCR-MT. Hence, the original proposal from the offline discussion is appropriate and nothing new needs to be discussed (i.e. the proposal in R2-2303288 is sufficient):

**The NCR-Fwd is switched OFF if the NCR-MT in RRC\_INACTIVE detects no suitable cell.**

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| [R2-2302947](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302947.zip) NEC | Proposal 3: RAN2 agree to switch off NCR-Fwd when the NCR-MT in RRC\_INACTIVE state (re)selects an acceptable cell. |
| [R2-2303264](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303264.zip) vivo | Proposal 2 : If NCR-MT is in RRC\_INACTIVE state, the current serving cell is too bad and no acceptable cell is available, the NCR-Fwd should be kept off, i.e. no specific enhancement is needed. |
| [R2-2304015](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304015.zip) Samsung | Proposal 7: NCR-Fwd should be OFF if no suitable cell has been found in RRC inactive. |

#### 2.10.1.7 Ping-pong reselection by NCR-MT in RRC\_INACTIVE state

Three companies described ping-pong type scenarios where the NCR-MT reselects from one cell to a new cell then reselects back to the old cell again. In this scenario the radio environment may be poor/unpredictable. Two of the companies proposed that it is better for the NCR-Fwd to stay OFF and wait for the NCR-MT to acquire new side control configuration from the gNB before being switched back ON. One company expressed the view that turning NCR-Fwd back ON (based on the previous configuration) could mitigate service disruption for UEs, although it is noted that this might only provide marginal benefit to UEs. This issue was discussed somewhat during the [Post121][703][NCR] offline discussion. Proposal 7 from R2-2303288 already covers this scenario so there is no need to treat the proposals under the summary for AI 7.1.3.

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| [R2-2302927](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302927.zip) Nokia | Proposal 5: How soon the NCR-MT triggers RRCResume following cell reselection can be left to implementation.Proposal 6: In a ping-pong scenario where NCR-MT in RRC\_INACTIVE reselects to a new cell and then reselects back to its old cell before initiating RRCResume on the new cell, the NCR-Fwd may be switched back ON following the last received configuration. |
| [R2-2303264](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303264.zip) vivo | Proposal 3: When the NCR-MT in RRC\_INACTIVE state reselects to a target cell, no matter the target cell is one of the previous serving cells or not, the NCR-Fwd beam/ON-OFF should only follow the side control information newly received from the target cell after RRC connection resumption. |
| [R2-2303291](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303291.zip) ZTE | Proposal 4: NCR-Fwd keeps OFF when NCR-MT re-selects back to last serving cell on which SCI configuration was received. |

### 2.10.2 Proposals moved to summary of AI 7.1.2

The following proposals from R2-2302787 will be treated under the summary of AI 7.1.2, due to similarity to other issues being discussed under that agenda item.

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| [R2-2302787](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302787.zip) Intel | Proposal 4: NCR-MT is configured with two RNTI, C-RNTI and NCR-RNTI, respectively. C-RNTI is used to schedule PDSCH carrying side control information via RRC and MAC CE.Proposal 5: Proposal 5: RAN2 to discuss whether there’s a need to introduce an optional UE capability to indicate whether NCR-MT supports beam index update in Access Link Beam Indication MAC CE. |

### 2.10.3 Other proposals not treated

The rapporteur believes that the following proposals submitted under AI 7.1.3 need not be treated in the discussion for AI 7.1.3 summary for various reasons given below the table.

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| [R2-2303276](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303276.zip) Kyocera | Proposal 1: RAN2 should confirm that only RRC Reconfiguration is used to remove the side control configuration before the gNB releases the NCR-MT to IDLE, in order to make the NCR-Fwd to turn OFF. |
| [R2-2303775](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303775.zip) China Telecom | Proposal 4: NCR needs to support FR2-2 configurations, such as new subcarrier spacings, new transmission bandwidth configuration NRB and so on. |
| [R2-2303944](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2303944.zip) AT&T | Proposal 2: An NCR-MT can optionally indicate support for initial access and cell reselection on a band different from the band used by the NCR-Fwd for the access and backhaul links, including via MR-DC and EN-DC capability indications. |
| [R2-2304004](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304004.zip) Samsung | Proposal 2: If P1 is agreed, adopt TP in Annex A1.*[P1: NCR-Fwd is turned ON using previous configuration when RRCReestablishment is received.]*Proposal 4. If P3 is agreed, adopt the TP in Annex A2.*[P3. RAN2 discuss and agree on the separation of compliance check for MT’s and FWD’s configuration, and MT’s indication of FWD’s configuration failure to the network via at least OAM.]* |
| [R2-2304015](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304015.zip) Samsung | Proposal 3: If proposal 2 is agreed, the NCR-Fwd can be maintained in RRC idle with TP in section 6.1.*[P2: If NCR-MT is released to RRC idle with NCR-Fwd operating, the NCR-Fwd configuration is not released.]*Proposal 6: Adopt the TP in Section 6.2. *[TP for 38.331 for NCR wake-up timer.]*Proposal 8: Adopt the TP in Section 7.1. *[TP for 38.304 for NCR failing to find suitable cell]*Proposal 9: Adopt Stage 2 description on NCR RNTI, access control, idle mode cell selection and establishing DRB as in Section 8. |
| [R2-2304114](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2304114.zip) Ericcson | Proposal 1: NCR-MT can optionally indicate its capability to support SRB2 configuration without DRBProposal 2: For FR2, NCR-MT supports BFD and BFR at least on the control link. |

In the case of R2-2303276, rapporteur believes that this agreement is similar but subtly different to the pre-existing agreement from RAN2#121:

* Whenever side control configuration is removed forwarding will be off. This does not preclude any solutions coming from RAN1.

Specifically, the proposal in R2-2303276, conflicts with Proposal 4 of R2-2303288 (i.e. NCR-Fwd is OFF if released to RRC\_IDLE), which is still being discussed. Even if P4 of R2-2303288 is not agreed, the rapporteur believes that the agreement above from RAN2#121 is sufficient already. Unless RAN1 specifically indicates otherwise, RAN2 may assume the above agreement is sufficient.

R2-2303775 proposed that NCR should also support extended frequency band FR2-2. Rapporteur is quite sceptical that this could be decided now considering the additional specification effort that could be required across RAN1/RAN2/RAN4, and considering RAN1 is out of TUs and RAN2 has limited TUs remaining. FR2-2 could instead be considered for a future release.

The proposal from R2-2303944 appears to conflict with the spirit of an earlier agreement reached in RAN2#120:

* gNB cell that NCR-Fwd is forwarding is the same cell the NCT-MT is connected to

Hence, the rapporteur doubts that RAN2 would agree to this proposal. The rapporteur understands the intent of the proposal is to be able to use FR1 in the NCR-MT C-link during network integration followed by FR2 being used for forwarding by the NCR-Fwd. However, such behaviour likely does not require any specification and could be left to network implementation/configuration (e.g. by configuring the NCR-MT to use FR1 at integration, and reconfiguring it to use FR2 following integration).

Proposals from R2-2304004 and R2-2304015 relate to specific text proposals for TS 38.300, 38.304, and 38.331. Since these TPs depend on other agreements first being reached, the rapporteur believes the TPs can be discussed later.

Finally, for the proposals from R2-2304114, rapporteur observes that the first proposal is relevant to capability issues already being discussed [R2-2302788](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302788.zip) and [R2-2302789](https://www.3gpp.org/ftp/TSG_RAN/WG2_RL2/TSGR2_121bis-e/Docs/R2-2302789.zip) (submitted to RAN2#121bis under 7.1.1) so it is better to raise the issue when those contributions are discussed, while the second proposal was already agreed by RAN1 to be optionally supported (in RAN1#111):

 Rel-15 legacy BFD/BFR/RLM mechanisms are supported optionally

# 3 Conclusion

Based on the summaries in this document, the following proposals should be discussed under AI 7.1.3.

The following proposals seem critical or at least straightforward, and should be prioritized in the discussion:

**Proposal 1:** If “wake-up timer” IE is agreed: The NCR-MT shall stop the wake-up timer when it performs cell reselection in RRC\_IDLE state.

**Proposal 4:** RAN2 should discuss how NCR-MT in RRC\_IDLE can initiate RRC setup request when there is no existing trigger from NAS (e.g. registration request/update).

NOTE: MO data can be considered as an option, but RAN2 should take into account that DRB is optional for NCR-MT.

NOTE: If RAN2 decides a new NAS trigger is necessary (possibly based on indication from RRC of the NCR-MT to NAS of the NCR-MT), then RAN2 shall inform CT1. FFS if establishmentCause impacts within RRCSetupRequest.

**Proposal 2:** If “wake-up timer” IE is agreed: RAN2 should discuss how an NCR-MT not supporting DRB shall initiate connection setup:

* Option 1: RRC of NCR-MT sends a notification to NAS of NCR-MT, and NAS of the NCR-MT transmits a NAS message. RAN2 sends LS to CT1 to inform the decision.
* Option 2: Leave it to implementation within “upper layers”.
* FFS if establishmentCause impacts within RRCSetupRequest.

**Proposal 6:** RAN2 should discuss backhaul beam monitoring by NCR-MT in RRC\_INACTIVE:

* Option 1: NCR-MT in RRC\_INACTIVE state may perform backhaul beam monitoring. FFS if anything further to be specified or if left to implementation.
* Option 2: NCR-MT in RRC\_INACTIVE state may not perform backhaul beam monitoring. gNB may perform link monitoring for the backhaul link by implementation when NCR-MT is in RRC\_INACTIVE state.

NOTE: If Option 1 is agreed, the following proposals can also be considered:

* **Proposal 6-1:** The NCR-FWD switches OFF if the NCR-MT in RRC\_INACTIVE mode detects beam failure.
* **Proposal 6-2:** The NCR-MT in RRC\_INACTIVE resumes connection to receive updated side control configuration if it reselects a new beam of the same camped cell.

**Proposal 8:** Cells in forbidden cell list (if configured) are considered as barred for NCR-MT. Cells not in allowed cell list (if configured) are considered as barred for NCR-MT.

**Proposal 7:** NCR-MT supports RRC release with redirection. If NCR-MT reselects a new cell due to redirection, NCR-Fwd is OFF.

*If there is time*, the following proposals can also be discussed.

**Proposal 9:** NCR-MT prioritization of cells for reselection is based on configured allowed and/or forbidden cell lists.

**Proposal 10:** RAN2 should discuss if NCR-Fwd is turned OFF when the “NCR-support” in SIB1 of the last serving cell on which side control configuration was received has been toggled OFF.

**Proposal 11:** RAN2 should discuss and agree on the separation of compliance check for NCR-MT and NCR-Fwd configuration, and that NCR-MT indicates NCR-FWD’s configuration failure to the network via at least OAM.

**Proposal 12:** RAN2 should discuss whether NCR-MT shall support configuration of the same SMTC periodicities as IAB-MTs (i.e. periodicityAndOffset-r16 within SSB-MTC3-r16) when making cell reselection and RRM measurements in RRC\_IDLE and RRC\_INACTIVE.

**Proposal 13:** RAN2 should discuss if LS should be sent to RAN1 to enquire whether separate PRACH resources specific to NCR-MT should be defined, either based on separate PRACH occasions (like Rel-16 IAB) or based on PRACH partitioning (like Rel-17 RedCap, SDT, Slicing and Coverage Enhancement).

**Proposal 3:** If “wake-up timer” IE is agreed: RAN2 should discuss whether prohibit timer should be introduced in RRCRelease message to prevent NCR-MT from initiating new connections prematurely.

**Proposal 5:** RAN2 should discuss whether the NCR-MT is allowed to initiate an MO data (e.g., UL OAM traffic) as emergency call in an acceptable cell, when the cell broadcasts the NCR-Supported IE in SIB1.

**Proposal 14:** Define an NCR-specific q-RxLevMinNCR and specify that Qrxlevmin applied in NCR-MT cell selection criterion S is obtained from q-RxLevMinNCR.

# 4 Contribution list

R2-2302787 Discussion on NCR remaining open issues Intel Corporation discussion Rel-18 NR\_netcon\_repeater

R2-2302893 Beam reselection by RRC\_INACTIVE NCR Qualcomm Inc. discussion Rel-18 NR\_netcon\_repeater

R2-2302927 Further issues related to NCR ON/OFF behaviour and side control configuration Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_netcon\_repeater

R2-2302928 RRC release with redirection for NCR Nokia, Nokia Shanghai Bell discussion Rel-18 NR\_netcon\_repeater

R2-2302944 Discussion on releasing NCR-MT to RRC\_IDLE Fujitsu discussion Rel-18 NR\_netcon\_repeater

R2-2302947 Further discussion on remaining open issues when NCR-MT is in RRC Inactive and RRC idle NEC discussion Rel-18 NR\_netcon\_repeater

R2-2303237 Remaining issues for side control information Lenovo discussion Rel-18

R2-2303238 Discussion on RRC states for NCR-MT Lenovo discussion Rel-18

R2-2303264 Remaining Issues of Side Control Information Signaling vivo discussion Rel-18

R2-2303276 Remaining issues on NCR Kyocera discussion Rel-18

R2-2303291 Discussion on NCR remaining issues ZTE Corporation, Sanechips discussion Rel-18 NR\_netcon\_repeater

R2-2303387 Discussion on remaining issues for NCR-MT in IDLE/INACTIVE Apple discussion Rel-18

R2-2303775 Discussion on remaining issues for NCR China Telecom discussione

R2-2303944 Cell selection for NR network-controlled repeaters AT&T discussion

R2-2303974 Discussion on CP issues for NCR Huawei, HiSilicon discussion Rel-18 NR\_netcon\_repeater

R2-2304004 Handling of NCR failure and reestablishment Samsung R&D Institute UK discussion

R2-2304015 Further considerations on NCR procedures and Stage 2 corrections Samsung R&D Institute UK discussion Rel-18 NR\_netcon\_repeater

R2-2304114 Remaining issues for NCR Ericsson discussion Rel-18 NR\_netcon\_repeater

R2-2304115 Transitioning from IDLE to CONNECTED Ericsson discussion Rel-18 NR\_netcon\_repeater

# 5 References

R2-2302788 Summary of [Post121][702][NCR] capabilities running CR for NCR (Intel) Intel Corporation discussion Rel-18 NR\_netcon\_repeater

R2-2302789 Draft 306 CR of Network controlled repeater UE capability Intel Corporation draftCR Rel-18 38.306 17.4.0 B NR\_netcon\_repeater

R2-2303288 Report of [Post121][703][NCR] Open issues on NCR RRC ZTE Corporation report Rel-18 NR\_netcon\_repeater