**3GPP TSG-RAN WG2 Meeting #131 R2-250xxxx**

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

**Agenda Item: 8.6.1**

**Source: vivo**

**Title: Discussion report on [AT131][xxx][MOB] MAC open issues (vivo)**

**Document for: Discussion and Decision**

# 1 Introduction

This paper aims to capture the discussion report on the below offline discussion:

* [AT131][103][MOB] (Vivo)

      **Scope:** Discuss and conclude MAC-26, MAC-27, MAC-28, MAC-29, MAC-30, MAC-31, and P2 in R2-2505926.

      **Intended outcome:** Discussion summary in R2-2506213.

**Deadline: 1000 – 1100 (8/26 Tuesday, main session room)**

# 2. Discussion

## 2.1 Inter-CU LTM

2.1.2 MAC-26 REAMBLE\_POWER\_RAMPING\_COUNTER with two TAGs

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| **Index** | **Issue description** | **Rapporteur suggestion** |
| MAC-26 | **How to consider the TAG ID when determining whether to set the *REAMBLE\_POWER\_RAMPING\_COUNTER* to 1 for an (C)LTM candidate cell which is configured with two TAGs in RACH-less (C)LTM**[Rapp]: In RACH-less (C)LTM, for an (C)LTM candidate cell which is configured with two TAGs, TAG ID is not considered when determining whether to set the *REAMBLE\_POWER\_RAMPING\_COUNTER* to 1. Rapporteur realized the same issue exists for Rel-18 LTM, which was missing.  | **Issue Type:** Not essential but important**How to address it:** based on companies’ contribution |

Based on the input, there are the following options for MAC-26 open issue that whether to set the *REAMBLE\_POWER\_RAMPING\_COUNTER* to 1 for an (C)LTM candidate cell which is configured with two TAGs in RACH-less (C)LTM:

* Option 1: *REAMBLE\_POWER\_RAMPING\_COUNTER* is set to 1 when TAG changes. (4/8 companies).
	+ 1 company thinks only Rel-19 LTM could apply this principle, while no impact to Rel-18 LTM.
	+ 1 company further considers the missing case of this initial transmission of PDCCH order for new TAG, *REAMBLE\_POWER\_RAMPING\_COUNTER* should also be set to 1 for the retransmission of PDCCH order.
* Option 2: TAG ID is not considered when determining whether to set the *REAM-BLE\_POWER\_RAMPING\_COUNTER* to 1. (4/8 companies)

The following were proposed on this issue:

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| **Option 1: *REAMBLE\_POWER\_RAMPING\_COUNTER* is set to 1 when TAG changes.****R2-2505098 Lekha Wireless Solutions**  Proposal 4: ...If TAG changes from last RA attempt, set counter to 1; else maintain as per existing rules.**R2-2505349 Fujitsu** Proposal 3 (MAC-26): To support RACH towards a CLTM candidate cell configured with two TAGs, REAMBLE\_POWER\_RAMPING\_COUNTER is set to 1 when TAG changes.Proposal 3bis (MAC-26): TAG change will not be considered when determining whether to set the REAMBLE\_POWER\_RAMPING\_COUNTER to 1 for RACH towards an intra-CU LTM candidate cell configured with two TAGs (i.e. no modification to Rel-18 MAC spec).**R2-2505399 vivo** Proposal 2: [MAC-26] The PREAMBLE\_POWER\_RAMPING\_COUNTER should be set to 1 if the PDCCH order indicates preamble re-transmission associated with a TAG different from the TAG within the same (C)LTM candidate cell to which the UE performed the last Random Access Preamble transmission.**R2-2505167 CATT** Proposal 2 (MAC-26): When network triggers PDCCH order to another TRP of the same candidate cell while the early TA acquisition of one TRP is ongoing, it should indicate preamble initial transmission in the PDCCH order.**Option 2: TAG ID is not considered when determining whether to set the *REAM-BLE\_POWER\_RAMPING\_COUNTER* to 1****R2-2505893 Huawei**Proposal: (MAC-26) When the candidate cell is configured with two TAGs, there is no additional MAC impact for the early RACH procedure.**R2-2505945 CMCC**Proposal 7：For RACH-less intra-/inter-CU LTM and Conditional intra-CU LTM with two TAGs, TAG ID is not considered when determining whether to set the REAM-BLE\_POWER\_RAMPING\_COUNTER to 1.**R2-2505517 OPPO** Proposal 4: In case that the candidate cell is configured with 2TAGs, the TAG ID is not considered when performing power ramping during the RACH either for early UL sync or LTM execution.**R2-2506141 ZTE**Proposal 2 (MAC-26) For an (C)LTM candidate cell configured with two TAGs, the TAG ID is not considered when determining whether to set the REAMBLE\_POWER\_RAMPING\_COUNTER to 1. No change to the current spec. |

Based on above, rapporteur has re-structure the below proposal for discussion.

**Proposal 1: PDCCH order will indicate preamble initial transmission when TAG ID has changed, in this case REAM-BLE\_POWER\_RAMPING\_COUNTER is set to 1.**

**Proposal 2: RAN2 discuss whether to set the REAMBLE\_POWER\_RAMPING\_COUNTER to 1 for an (C)LTM candidate cell which is configured with two TAGs in RACH-less (C)LTM,** **if the PDCCH order indicates preamble re-transmission associated with a TAG different from the TAG within the same (C)LTM candidate cell to which the UE performed the last Random Access Preamble transmission.**

**e.g.**

- T1: PDCCH order for cell1 TAG1

- T2: PDCCH order for cell1 TAG2 – initial tx // this one is missing at UE.

- T3: PDCCH order for cell2 TAG2 – retx

**Discussion on P1**

**Discussion on P2**

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| **Offline agreement:** |

2.2 L1 event triggered measurement reporting

2.2.1 MAC-27 Behaviour upon Beam Failure on SpCell

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| **Index** | **Issue description** | **Rapporteur suggestion** |
| MAC-27 | **Whether/how to cancel the triggered Event Triggered L1 MR, and whether/how to reset TTT upon beam failure**[Rapp]: New added based on Anil’s comments.Sine the event triggered MR procedure is triggered based on the current beam, the procedure may be cancelled upon the beam failure on the SpCell. The TTT also may be stopped.i.e. the following may be needed. Upon beam failure on the SpCell:1>cancel, if any, triggered Event Triggered L1 Measurement Report;1>reset TTT for event triggered L1 measurement report triggering condition evaluation;Since it is not discussed an FFS may be added and this issue can be added in open issue list. | **Issue Type:** Not essential**How to address it:** can be discussed based on companies’ contribution |

Based on the input, there are the following options for MAC-27 open issue that whether/how to cancel the triggered Event Triggered L1 MR, and whether/how to reset TTT upon beam failure:

* Option 1: No impact on event triggered L1 MR upon beam failure on SpCell (3/5 companies)
* Option 2: Having impacts on event triggered L1 MR upon beam failure on SpCell, including cancel the triggering MR and reset the TTT (2/5 companies)

The following were proposed on this issue:

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| **Option 1: No impact on L1 MR procedure** **R2-2505135 Xiaomi** Proposal 1: (MAC-27) Specification changes are not needed for event triggered L1 MR upon beam failure on SpCell.**R2-2505482 Apple** Proposal 3: There is no impact on event triggered L1 MR procedure when beam failure is detected.**R2-2506140 ZTE Corporation, Sanechips** Proposal 4: (MAC-27) Upon beam failure on the SpCell, the UE shall not cancel the triggered L1 MR procedure and not reset TTT. No change to the current spec.**Option 2: L1 MR is impacted** **R2-2505787 Ofinno** Proposal 5: On detecting beam failure on SpCell, cancel the triggered L1 MR and reset TTT.Proposal 6: Upon detecting beam failure on SpCell, the UE stops performing L1 measurement evaluation.**R2-2506149 Samsung**  Proposal 2: RAN2 to discuss the behavior of any trigged L1 MR during beam failure and recovery on the SpCell: a. Cancel the triggered L1 MR. b. Send the triggered L1 MR. Proposal 3: RAN2 to discuss the behavior of TTT for L1 MR during beam failure and recovery on the SpCell: a. UE resets TTT for L1 MR. b. TTT is continued if the condition is satisfied with the new beam. |

Based on above, rapporteur has re-structure the below proposal for discussion.

**Proposal 3a: (MAC-27)** **No impact on event triggered L1 MR procedure when beam failure is detected.**

**Proposal 3b: (MAC-27)** **Upon the beam failure on SpCell, cancel the triggered L1 MR, reset TTT, and stop evaluating the L1 measurement.**

**Discussion on P3**

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| **Offline agreement:** |

2.2.1 P2 in R2-2505926

Lenovo thinks it is not clear the meaning of the Type 4 beam, they proposed in R2-2505926 that about the Type 4 beam type, the current definition captured in MAC CR is:

***“…it is set to 11 to indicate the RS(s) not satisfying the event for the entire TTT, if configured by network by allowReportAnyBeam specified in TS 38.331 [5], i.e. the RS(s) with Type set to neither 00, 01, nor 11”***

Not satisfying the even for "entire" TTT can possibly mean two things:

1. The RS has entered reporting range, but TTT is still running
2. RS has not even entered the reporting range and therefore the "***not satisfying the event for the entire TTT***" can be said to be true (below “Trigger Condition” in Figure 1)

And propose:

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| **Lenovo Proposal 2: Type 4 beams are the RS for which TTT has been started but it is still running at the time of reporting.** |

**Discussion:**

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| **Offline agreement:** |

2.3 Conditional intra-CU LTM

2.3.2 MAC-28 Condition on RACH-less CLTM fallback to RACH-based CLTM

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| **Index** | **Issue description** | **Rapporteur suggestion** |
| MAC-28 | **During CLTM is ongoing, after the first transmission, if TAT timer expires while RACH-less LTM is ongoing, if UE based TA is valid, whether/how to fallback.**[Rapp]: New added based on Lenovo’s comments. | **Issue Type:** Not essential **How to address it:** based on companies’ contribution |

Based on the input, there are the following options for MAC-28 open issue that for the case after the first transmission, if TAT timer expires while RACH-less LTM is ongoing, if UE based TA is valid:

* Option 1: UE always fall back to RACH-based CLTM (3/5 companies)
* Option 2: UE fall back to RACH-less CLTM using UE based TA (2/5 companies)

The following were proposed on this issue:

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| **Option 1: UE always fall back to RACH-based CLTM** **R2-2505098 Lekha Wireless Solutions**Proposal 6: Upon TAT expiry during RACH-less CLTM execution, the UE shall initiate a random access procedure (preferably contention-free) to re-establish uplink timing, ensuring sync reliability.**R2-2505278 Xiaomi**Proposal 2: (MAC-28) During CLTM is ongoing, after the first transmission, if TAT timer expires while RACH-less LTM is ongoing, irrespective of whether the UE based TA is valid or not, fallback to RACH-based CLTM.**R2-2505584 LG**Proposal 3. [MAC-28] UE follows the PDCCH order based TA for the case that both PDCCH order based TA and UE based TA are available upon CLTM execution.Proposal 4. [MAC-28] During CLTM is ongoing, after the first transmission, if TAT timer expires while RACH-less LTM is ongoing, fallback to RACH-based CLTM even if UE based TA has been obtained.**Option 2: UE fall back to RACH-less CLTM using UE based TA****R2-2505098 Lekha Wireless Solutions**Proposal 7: Upon TAT expiry during RACH-less CLTM, the UE may continue transmissions if local TA validation (e.g., via downlink timing tracking) confirms TA remains within allowed tolerance; otherwise, trigger RA.**R2-2505696 Lenovo**Proposal 4: During CLTM is ongoing using TA from MAC CE, after the first transmission, if the TAT timer expires while RACH-less LTM using TA from MAC CE is ongoing, UE can fall back to RACHless CLTM using UE based TA. |

Based on the inputs from companies’ contributions, it seems most companies except the proponent prefer not consider UE based TA when UE performs RACH-less CLTM based on PDCCH ordered TA.

Based on above, rapporteur has re-structure the below proposal for discussion.

**Proposal 4a: (MAC-28) During CLTM is ongoing, after the first transmission, if TAT timer expires while RACH-less LTM is ongoing, UE always fall back to RACH-based LTM regardless whether UE based TA is valid.**

**Proposal 4b: (MAC-28) During CLTM is ongoing, after the first transmission, if TAT timer expires while RACH-less LTM is ongoing, UE falls back to RACH-less LTM if UE based TA is valid.**

**Discussion:**

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| **Offline agreement:** |

2.3.3 MAC-29 CLTM candidate configuration reconfigured/released

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| **Index** | **Issue description** | **Rapporteur suggestion** |
| MAC-29 | **When CLTM candidate configuration is reconfigured/released, whether/how to handle the stored TA value and the running TAT for the corresponding candidate cell.**[Rapp]: New added based on Offinno’s comments. | **Issue Type:** Not essential **How to address it:** based on companies’ contribution |

Based on the input, there are the following options for MAC-29 open issue that when CLTM candidate configuration is reconfigured/released, whether/how to handle the stored TA value and the running TAT for the corresponding candidate cell:

* Option 1: Stop the *ltm-Candidate-TimeAlignmentTimer* and release the stored TA value for the candidate cell if the corresponding CLTM candidate configuration is released. (5/6 companies)
* Option 2: Keep running the *ltm-Candidate-TimeAlignmentTimer* for the candidate cell if the corresponding CLTM candidate configuration is released. (1/6 companies)

The following were proposed on this issue:

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| **Option 1：Stops the *ltm-Candidate-TimeAlignmentTimer* and release the stored TA value for the candidate cell if the corresponding CLTM candidate configuration is released.** **R2-2505160 MediaTek**Proposal: The stored TA value for an LTM candidate cell should be released, and the corresponding TAT stopped, when the candidate cell is removed from the LTM candidate list.**R2-2505278 Xiaomi**Proposal 3: (MAC-29) When CLTM candidate configuration is reconfigured/released, the UE shall remove the stored TA value and stop the running TAT for the corresponding candidate cell.**R2-2505483 Apple**Proposal 2: Reconfiguration of a CLTM candidate cell does not affect C-TA value and C-TATimer status associated with the candidate cell in MAC.Proposal 3: Releas of a CLTM candidate cell will cause MAC to delete C-TA value and C-TATimer associated with the candidate cell.**R2-2505519 OPPO**1. The *ltm-Candidate-TimeAlignmentTimer* is stopped if corresponding LTM candidate config is released.

**R2-2505788 ofinno**Proposal 5: Stop TA timer for a CLTM candidate cell when the candidate cell configuration corresponding to the CLTM candidate cell is released.**Option 2: Keep running the *ltm-Candidate-TimeAlignmentTimer* for the candidate cell if the corresponding CLTM candidate configuration is released.****R2-2505584 LG****Proposal 5. [MAC-29] The corresponding TAT keeps running if the candidate cell is released.** |

It seems most companies agree to stop the *ltm-Candidate-TimeAlignmentTimer* and release the stored TA value for the candidate cell if the corresponding CLTM candidate configuration is released, and no enough inputs on the UE behaviour when CLTM candidate configuration is reconfigured.

Based on above, rapporteur has re-structure the below proposal for discussion.

**Proposal 5a: (MAC-29)** **Stop the running *ltm-Candidate-TimeAlignmentTimer* and release the stored TA value for the candidate cell if the corresponding CLTM candidate configuration is released.**

**Proposal 5b: (MAC-29)** **Stop the running TAT for the corresponding candidate cell and release the stored TA value if the corresponding CLTM candidate configuration is reconfigured.**

**Discussion:**

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| **Offline agreement:** |

2.3.4 MAC-30 MAC PDU acquisition for Msg3/A buffer in fallback scenario

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| **Index** | **Issue description** | **Rapporteur suggestion** |
| MAC-30 | **If RACH-less CLTM fallback to RACH-based CLTM is declared due to PTAG expiration, how does UE obtain the MAC PDU from HARQ buffer to Msg3/A buffer.**[Rapp]: New added based on OPPO’s comments. | **Issue Type:** Not essential **How to address it:** based on companies’ contribution |

Based on the input, there are the following options on obtaining the MAC PDU for RACH-based CLTM:

* Option 1: No need to obtain the MAC PDU stored in Msg3/A buffer in case RACH-less CLTM fallback to RACH-based CLTM and the *RRCReconfigurationComplete* message can be re-transmitted after the competition of the RACH procedure. (2/7 companies)
* Option 2: UE needs to obtain the MAC PDU stored in Msg3/A buffer in case RACH-less CLTM fallback to RACH-based CLTM. (5/7companies)
	+ Option 2-1: It’s up to UE implementation to obtain the MAC PDU for 1st UL transmission and store in the Msg3/A buffer. (1 company)
	+ Option 2-2: Rely on RLC retransmission to obtain the MAC PDU for 1st UL transmission and store in the Msg3/A buffer. (1 company)
	+ Option 2-3: From the HARQ buffer of the HARQ process used for the first initial uplink transmission to obtain the MAC PDU for 1st UL transmission. (2 companies)
	+ Option 2-4: From the multiplexing and assembly entity to obtain the MAC PDU for 1st UL transmission. MAC subPDU(s) carrying MAC SDU from the obtained MAC PDU in RACH-less CLTM cell switch procedure will be included in the multiplexing and assembly entity. (1 company)

The following were proposed on this issue:

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| **Option 1: No need to obtain the MAC PDU for RACH-based CLTM and the RRCReconfigurationComplete message can be re-transmitted after the competition of the RACH procedure.****R2-2505160 MediaTek**Proposal: For the scenario where RACH-less CLTM falls back to RACH-based CLTM, no additional specification is needed for UE behavior regarding the transmission of *RRCReconfigurationComplete* message.**R2-2505278 Xiaomi**Proposal 4: (MAC-30) If RACH-less CLTM fallback to RACH-based CLTM is declared due to PTAG expiration, the *RRCReconfigurationComplete* message can be re-transmitted after the competition of the RACH procedure.**Option 2-1: It’s up to UE implementation to obtain the MAC PDU for 1st UL transmission and store in the Msg3/A buffer.****R2-2505483 Apple**Proposal 4: To support the fallback from RACH-less CLTM CS to RACH-based CLTM CS procedure, it’s up to UE implementation to obtain the MAC PDU for 1st UL transmission and store in the Msg3/A buffer. **Option 2-2: Relys on RLC retransmission to obtain the MAC PDU for 1st UL transmission and store in the Msg3/A buffer.****R2-2505584 LG**Proposal 6. [MAC-30] When RACH-less CLTM falls back to RACH-based CLTM due to PTAG expiration, the transmission of the *RRCReconfigurationComplete* message relys on RLC retransmission.**Option 2-3: From the HARQ buffer of the HARQ process used for the first initial uplink transmission to obtain the MAC PDU for 1st UL transmission.** **R2-2505620 NEC**Proposal 2. (MAC-30) When fallback from RACH-less LTM to RACH-based LTM, the UE obtains MAC PDU from the HARQ buffer of the HARQ process used for the first PUSCH transmission of LTM, and stores the obtained MAC PDU in the Msg 3 buffer or Msg A buffer of the RA procedure. **R2-2505519 OPPO**1. During the RACH-based CLTM which fallback from RACH-less CLTM, the MAC entity performs the following steps when generating Msg3/MsgA payload:
2. obtain the MAC PDU (initial uplink transmission) from the HARQ buffer corresponding to CG based initial uplink transmission
3. indicate to the Multiplexing and assembly entity to include MAC subPDU carrying MAC SDU from the obtained MAC PDU
4. obtain the MAC PDU to transmit from the Multiplexing and assembly entity and store it in the MsgA/ Msg3 buffer.

**Option 2-4: From the Multiplexing and assembly entity to obtain the MAC PDU for 1st UL transmission. MAC subPDU(s) carrying MAC SDU from the obtained MAC PDU in RACH-less CLTM cell switch procedure will be included in the Multiplexing and assembly entity.****R2-2505349 Fujitsu****Proposal 4 (MAC-30): MAC subPDU(s) carrying MAC SDU from the obtained MAC PDU in RACH-less CLTM cell switch procedure will be included in the Multiplexing and assembly entity for the uplink transmission in a fallback RACH-based CLTM cell switch procedure.** |

Rapporteur understandings that in case 2-step RACH fallback to 4-step RACH, MAC PDU should be obtained from Msg.A buffer.

Based on above, rapporteur has re-structure the below proposal for discussion.

**Proposal 6: UE needs to obtain the MAC PDU to be stored in Msg3/A buffer in case RACH-less CLTM fallback to RACH-based CLTM.**

**Proposal 7: Discussion on the following options on how UE obtains the MAC PDU to be stored in Msg3/A buffer in case RACH-less CLTM fallback to RACH-based CLTM:**

* **Option 2-1: It’s up to UE implementation to obtain the MAC PDU for 1st UL transmission and store in the Msg3/A buffer. (1 company)**
* **Option 2-2: Rely on RLC retransmission to obtain the MAC PDU for 1st UL transmission and store in the Msg3/A buffer. (1 company)**
* **Option 2-3: From the HARQ buffer of the HARQ process used for the first initial uplink transmission to obtain the MAC PDU for 1st UL transmission. (2 companies)**
* **Option 2-4: From the multiplexing and assembly entity to obtain the MAC PDU for 1st UL transmission. MAC subPDU(s) carrying MAC SDU from the obtained MAC PDU in RACH-less CLTM cell switch procedure will be included in the multiplexing and assembly entity. (1 company)**

**Discussion:**

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| **Offline agreement:** |

2.3.5 MAC-31 Activated candidate TCI state(s) for target cell

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| **Index** | **Issue description** | **Rapporteur suggestion** |
| MAC-31 | **Upon the CLTM execution, whether activated candidate TCI state(s), other than the TCI state associated with the triggered beam, should be deactivated or not.**[Rapp]: New added based on vivo’s comments. | **Issue Type:** Not essential **How to address it:** based on companies’ contribution |

The following were proposed on this issue:

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| **R2-2505278 Xiaomi****Proposal 5: (MAC-31) Upon the CLTM execution, activated candidate TCI state(s), other than the TCI state associated with the triggered beam, should be deactivated.****vivo (R2-2505401):****Proposal 4: Activated Candidate TCI state(s), other than the TCI state associated with the selected beam, should be deactivated upon CLTM procedure being triggered.** **R2-2505483 Apple****Proposal 5: Upone CLTM execution, all the activated candidate TCI state(s) other than the TCI state associated with the trigged beam should be deactivated.** **R2-2505584 LG****Proposal 7. [MAC-31] The UE deactivates the activated Candidate TCI state(s) other than the TCI state associated with the triggered beam upon CLTM execution.** |

Based on above, it could be observed that companies’ views are aligned on this issue. While for the issue that using the “selected beam” or “triggered beam”, rapporteur thinks the “triggered beam” could be only applied to L1 based CLTM while not applied to L3 based CLTM, thus using “selected beam” is more suitable. Rapporteur has re-structure the below proposal for discussion.

**Proposal 8: Upon CLTM execution, all the activated candidate TCI state(s) other than the TCI state associated with the selected beam should be deactivated.**

**Discussion:**

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| **Offline agreement:** |

# 3 Conclusion

Based on the discussion above, we have the following offline agreement:

**Proposal: RAN2 to agree the below offline agreement:**

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| **Offline agreement for Event triggered L1 measurement:*** **.**

**Offline agreement for conditional intra-CU LTM:*** **.**
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4 Reference

1. Xxxx