3GPP TSG RAN WG4 Meeting #109 R4-232xxxx

Chicago, USA, November 13th – Novemeber 18th , 2023

**Agenda item:** 5.4

**Source:** Moderator (Apple)

**Title:** Topic summary for [109][202] Maintenance\_R17\_R18

**Document for:** Information

# Introduction

*Briefly introduce background, the scope of this email discussion (e.g. list of treated agenda items) and provide some guidelines for email discussion if necessary.*

In this section, the following topics are included

* 5.2.3 Rel-17 NR\_UE\_pow\_sav\_enh-Core
* 5.2.3 Rel-17 NR\_FeMIMO-Core
* 5.2.3 Rel-17 [LTE\_NR\_DC\_enh2-Core](https://portal.3gpp.org/desktopmodules/WorkItem/WorkItemDetails.aspx?workitemId=860149)
* 5.2.3 Rel-17 NR\_RRM\_enh2-Core
* 5.2.3 Rel-17 NR\_NTN\_Solutions-Perf
* 5.3 Rel-17 On release independence specs 38.307 and 36.307
* 5.2.3 Rel-17 NR NR\_pos\_enh-Core

# Topic #1: Rel-17 NR\_UE\_pow\_sav\_enh-Core

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

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| **T-doc number** |  **Title** | **Company** | **Proposals / Observations** |
| [**R4-2319048**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319048.zip) | [NR\_UE\_pow\_sav\_enh-Core]Discussion on maintenance issues in R17 RLMBFD relaxation | vivo | **Observation 1 In clause 8.1.2.2, 8.1.3.2. and 8.5.2.2, 8.5.3.2 of TS 38.133, the DRX cycle length are derived based on DRX configuration, and they are not impacted by whether DRX is used or not.****Observation 2 UE power saving gain will be impacted if UE entering/exiting RLM/BFD relaxation frequently due to data transmission.****Observation 3 Considering UAI reporting, UE may be involved in endless relaxation state change, which make the feature totally useless.****Proposal 1 For RLM/BFD relaxation requirements, the conditions for DRX cycle applicability need to be updated and can be defined as follow:****- No DRX is configured or DRX cycle is longer than 80ms.** |
| [**R4-2319948**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319948.zip) | [NR\_PowSav\_enh-Core]Discussion on maintaining issues for RLM/BFD relaxation requirements | Huawei, HiSilicon | ***Observation 1: For R17 power saving enhancement, RAN4 achieved the agreements that RLM/BFD relaxation is applicable for DRX cycle <=80ms.******Observation 2: For RLM/BFD relaxation, the current wording of the exiting condition on DRX cycle applicability does not align with RAN4 original agreements on DRX cycle applicability.******Observation 3: In R17, the good serving cell quality criterion and low-mobility criterion are mainly used for RLM/BFD relaxation evaluation and the evaluation are defined as multiple DRX cycles and multiple*** ***seconds respectively, i.e. a quite long time.******Observation 4: For RLM/BFD relaxation, the durations of DRX related timers are usually quite short and no longer than one DRX cycle, and the serving cell quality and UE mobility state will not change significantly during these timers running time.******Observation 5: If UE changes frequently between relaxation mode and non-relaxation mode due to short timer running, the power saving gain due to RLM/BFD relaxation is meaningless for UE.******Proposal 1: For RLM/BFD relaxation requirements, the exiting conditions for DRX cycle applicability need to be updated and can be defined as follow:******- No DRX is configured or DRX cycle is longer than 80ms*** |

## Open issues summary

*Before Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

For RLM/BFD relaxation requirements, the conditions for DRX cycle applicability need to be updated and can be defined as follow:

Proposal1:(vivo) No DRX is configured or DRX cycle is longer than 80ms.

Proposal2: (Huawei) *No DRX is configured or DRX cycle is longer than 80ms*

# Topic #2: Rel-17 NR\_FeMIMO-Core

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

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| **T-doc number** |  **Title** | **Company** | **Proposals / Observations** |
| [**R4-2319951**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319951.zip) | [NR\_FeMIMO-Core]Discussion on RRM maintaining issues for NR FeMIMO | Huawei, HiSilicon | ***Observation 1: For inter-cell BM in R17, the following case is not defined for CDP SSB based L1-RSRP measurements in FR2.**** ***Scenario A: when SSB is partially overlapped with GAP and SSB is partially overlapped with SMTC occasion (TSSB < TSMTCperiod) and SMTC occasion is not overlapped with GAP and TSMTCperiod = xRP and TSSB = 0.5\*TSMTCperiod***

***Proposal 1: For SC SSB based L1-RSRP measurements in section 9.5 in FR2, the sharing factor P1 needs to be applied for scenario A.******Proposal 2: For CDP SSB based L1-RSRP measurements in section 9.13 in FR2, the sharing factor for scenario A shall be added and the sharing factor P2 needs to be applied for scenario A.*** |

## Open issues summary

*Before Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

***Proposal 1(Huawei): For SC SSB based L1-RSRP measurements in section 9.5 in FR2, the sharing factor P1 needs to be applied for scenario A.***

***Proposal 2(Huawei): For CDP SSB based L1-RSRP measurements in section 9.13 in FR2, the sharing factor for scenario A shall be added and the sharing factor P2 needs to be applied for scenario A.***

# Topic#3: [LTE\_NR\_DC\_enh2-Core](https://portal.3gpp.org/desktopmodules/WorkItem/WorkItemDetails.aspx?workitemId=860149)

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

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| **T-doc number** | **Title** | **Company** | **Proposals / Observations** |
| [**R4-2319069**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319069.zip) | Discussion on PDCCH monitoring for SCG activation in R17 | vivo | **Proposal 1: For activation of SCG, RAN4 to clarify the UE behavior on PDCCH monitoring*** **Option 1: UE continuously monitor PDCCH without DRX functionality once upper layers indicate that SCG is activated**
* **Option 2: UE won’t monitor PDCCH during SCG activation procedure and starts to monitor PDCCH after SCG activation delay (i.e., Tactivation\_time specified in TS38.133)**
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| [**R4-2320280**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320280.zip) | LTE\_NR\_DC\_enh2-Core Aspects on Efficient activation/de-activation mechanism for one SCG | Nokia, Nokia Shanghai Bell | General aspects related known and unknown PSCell:1. RAN4 conditions currently defined for RACH-less access breaks the defined RAN2 procedures.
2. Update the known condition for the deactivated PSCell.
3. The known condition for deactivated FR2 PSCell are updated as below:

In FR2, the PSCell is known if it has been meeting the following conditions:**-** ~~During the last 5 seconds before the~~ **Upon reception of the SCG activation command:****- the UE has sent a valid measurement report for the PSCell being activated and****- One of the SSBs measured from the PSCell being activated remains detectable according to the cell identification conditions specified in clause 9.3.****- One of the SSBs measured from PSCell being activated also remains detectable during the PSCell activation delay Tactivation\_time according to the cell identification conditions specified in clause 9.3.**Tsearch for RACH-less and RACH-based PSCell activation:When ‘*bdf-and-RLM*’ with value ‘*true*’ is configured for the deactivated PSCell the UE shall perform BFD and RLM on the deactivated PSCell.Evaluation of RLM and BFD on a deactivated PSCell requires the UE to measure the deactivated PSCell regularly to evaluate the downlink radio link quality.If link problems have not been detected the link is currently regarded good enough for continuing the operation in the cell.When UE is configured with *bfd-and-RLM* and has not detected either beam failure or RLF on the deactivated PSCell, there is no need for additional measurements at PSCell activation.1. A UE which has not detected either BFD or RLF on the deactivated PSCell, need no additional measurements at PSCell activation (Tsearch = 0ms).
2. A UE which has detected either BFD or RLF on the deactivated PSCell is allowed additional measurements at PSCell activation (Tsearch = [TBD]ms).
3. For RACH based PSCell activation, RAN4 need to reconsider *Tsearch = 24\* Trs ms* for an unknown PSCell being activated with ‘*bdf-and-RLM*’ with value ‘*true*’, accounting for the RLM or BFD status upon activation.
4. For RACH-less based PSCell activation, conditions for when Tsearch = 0 ms needs to be reconsidered.
5. For RACH-less based PSCell activation, the UE behavior when the PSCell is unknown would need to be clarified.

Tsearch in RACH-less based PSCell activation delay:1. Define RACH-less based PSCell activation delay such that it is not conditioned on the when the last valid measurement report was sent.
2. For the RACH-less based PSCell activation the condition when Tsearch = 0ms applies while the TCI state is known.

Based on this we propose to update the RACH-less based PSCell activation as follows, if the proposed changes in proposal 2 for known PSCell conditions are not updated:1. For RACH-less based PSCell activation, if *bfd-and-RLM* is configured and TCI state is known, Tsearch = 0 ms or if the PSCell is a known FR2 PScell, Tsearch = 0 ms~~. if the target cell is a known FR2 PScell~~. Otherwise, there are no requirements.

Otherwise, if the proposed known PSCell conditions as proposed in proposal 2 are agreeable, the current conditions for RACH-less access need no changes.Tsearch in RACH-based PSCell activation delay:1. For RACH based PSCell activation, if the target cell is a known NR FR2 PSCell, Tsearch = 0 ms. If the target cell is an unknown FR2 PSCell configured with bfd-and-RLM with value true and no RLM has occurred, then Tsearch = [12]\* Trs ms, otherwise if Es/Iot ≥ -2 dB, then Tsearch = 24\* Trs ms..

Requirements for deactivated SCG in FR1:FR2 SCG activation discussion is also valid for FR1 SCG activation in Rel-18 WI.PSCell activation delay and PSCell DRX:1. UE shall start monitoring PDCCH on the activated PSCell immediately after the SCG activation delay.

We have captured these changes in our CR [11]. |
| [**R4-2320283**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320283.zip) | LTE\_NR\_DC\_enh2-Core Alignment of RAN4 requirements with RAN2 procedures | Nokia, Nokia Shanghai Bell | 1. Update the RAN4 UE requirements capturing that tci-ActivatedConfig can be configured for a deactivated SCell and direct activated SCell.
2. If proposal 1 is not agreeable, send LS to RAN2 clarifying the RAN2 understanding of the applicability of tci-ActivatedConfig.
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| [**R4-2320620**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320620.zip) | Discussion on Rel-17 RRM remaining issues | Ericsson | **SCG activation LTE\_NR\_DC\_enh2:**[Proposal 1: Remove the 5 seconds time constraint for the known/unkown side conditions](#_Toc149835043)[Proposal 2: Update the current FR1-FR2 NR-DC SCG activation test case A.7.5.15 to garantee the UE performance.](#_Toc149835044) |

## Open issues summary

*Before Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

**Issue 1: PDCCH monitoring for SCG activation**

Proposal 1(vivo): For activation of SCG, RAN4 to clarify the UE behavior on PDCCH monitoring

Option 1: UE continuously monitor PDCCH without DRX functionality once upper layers indicate that SCG is activated

Option 2: UE won’t monitor PDCCH during SCG activation procedure and starts to monitor PDCCH after SCG activation delay (i.e., Tactivation\_time specified in TS38.133)

**Issue 2: Known and unknown conditions for the deactivated PSCell.**

Proposal 1: (Nokia,Ericsson): The known condition for deactivated FR2 PSCell are updated as below:

In FR2, the PSCell is known if it has been meeting the following conditions:

- ~~During the last 5 seconds before the~~ Upon reception of the SCG activation command:

- the UE has sent a valid measurement report for the PSCell being activated and

- One of the SSBs measured from the PSCell being activated remains detectable according to the cell identification conditions specified in clause 9.3.

- One of the SSBs measured from PSCell being activated also remains detectable during the PSCell activation delay Tactivation\_time according to the cell identification conditions specified in clause 9.3.

~~Proposal 2 (Ericsson): Remove the 5 seconds time constraint for the known/unkown side conditions~~

Proposal 3 (Ericsson): Update the current FR1-FR2 NR-DC SCG activation test case A.7.5.15 to garantee the UE performance.

**Issue 3: Tsearch delay for known and unknown PSCell being activated.**

* 1. Proposals (Nokia):
		1. A UE which has not detected either BFD or RLF on the deactivated PSCell, need no additional measurements at PSCell activation (Tsearch = 0ms).
		2. A UE which has detected either BFD or RLF on the deactivated PSCell is allowed additional measurements at PSCell activation (Tsearch = [TBD]ms).
		3. For RACH based PSCell activation, RAN4 need to reconsider *Tsearch = 24\* Trs ms* for an unknown PSCell being activated with ‘*bdf-and-RLM*’ with value ‘*true*’, accounting for the RLM or BFD status upon activation.
		4. For RACH-less based PSCell activation, conditions for when Tsearch = 0 ms needs to be reconsidered.
		5. For RACH-less based PSCell activation, the UE behavior when the PSCell is unknown would need to be clarified.
		6. Define RACH-less based PSCell activation delay such that it is not conditioned on the when the last valid measurement report was sent.
		7. For the RACH-less based PSCell activation the condition when Tsearch = 0ms applies while the TCI state is known.
		8. For RACH-less based PSCell activation, if *bfd-and-RLM* is configured and TCI state is known, Tsearch = 0 ms or if the PSCell is a known FR2 PScell, Tsearch = 0 ms~~. if the target cell is a known FR2 PScell~~. Otherwise, there are no requirements.
		9. For RACH based PSCell activation, if the target cell is a known NR FR2 PSCell, Tsearch = 0 ms. If the target cell is an unknown FR2 PSCell configured with bfd-and-RLM with value true and no RLM has occurred, then Tsearch = [12]\* Trs ms, otherwise if Es/Iot ≥ -2 dB, then Tsearch = 24\* Trs ms..
		10. UE shall start monitoring PDCCH on the activated PSCell immediately after the SCG activation delay.

**Issue 4: Alignment of RAN4 requirements with RAN2 procedures**

Proposal (Nokia): Update the RAN4 UE requirements capturing that tci-ActivatedConfig can be configured for a deactivated SCell and direct activated SCell.

If proposal is not agreeable, send LS to RAN2 clarifying the RAN2 understanding of the applicability of tci-ActivatedConfig.

# Topic #4: NR\_RRM\_enh2-Core

## Companies’ contributions summary

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| **T-doc number** | **Title** | **Company** | **Proposals / Observations** |
| [**R4-2319347**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319347.zip) | [NR\_RRM\_enh2-Core] Discussion on maintenance for R17 RRM enhancement | Huawei, HiSilicon | **Observation 1: In legacy multiple SCell activation requirements as specified in section 8.3.7, it is always assumed that Cell search is not needed for an FR2 to-be-activated SCell.****Observation 2: Only sharing of cell search among FR1 Cells are considered in legacy requirements.****Observation 3: The sharing of cell search between FR1 and FR2 PUCCH SCell are not considered in existing requirements.****Proposal 1: To solve the issue that the scenario cannot be covered by current requirements, when FR2 PUCCH SCell activation with FR1 SCell when both FR2 PUCCH SCell and FR1 SCell need cell searching, RNA4 to consider following options:****Option 1: No requirements for FR2 PUCCH SCell activation with FR1 SCell when both FR2 PUCCH SCell and FR1 SCell need cell searching.****Option 2: Define requirement for FR2 PUCCH SCell activation with FR1 SCell when both FR2 PUCCH SCell and FR1 SCell need cell searching, and consider necessary delay extension based on current requirements.** |

## Open issues summary

Proposal (Huawei): To solve the issue that the scenario cannot be covered by current requirements, when FR2 PUCCH SCell activation with FR1 SCell when both FR2 PUCCH SCell and FR1 SCell need cell searching, RNA4 to consider following options:

Option 1: No requirements for FR2 PUCCH SCell activation with FR1 SCell when both FR2 PUCCH SCell and FR1 SCell need cell searching.

Option 2: Define requirement for FR2 PUCCH SCell activation with FR1 SCell when both FR2 PUCCH SCell and FR1 SCell need cell searching, and consider necessary delay extension based on current requirements

# Topic #5: Rel-17 NR\_NTN\_Solutions-Perf

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

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| --- | --- | --- | --- |
| **T-doc number** | **Title** | **Company** | **Proposals / Observations** |
| [**R4-2320746**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320746.zip) | [NR\_NTN\_Solutions-Perf] On timing considerations for NTN performance tests | Nokia, Nokia Shanghai Bell | [Observation 1: There is not satellite propagation anymore for UE transmit timing test cases, nor difference in the satellite reference orbital model used by TE and the implemented by the UE.](#_Toc149938703)[Proposal 1: Remove Tmargin from the UE transmit timing test case as a consequence of the new simplified version of the NTN configuration for the test cases.](#_Toc149938704) |
| **[R4-2320620](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320620.zip)** | Discussion on Rel-17 RRM remaining issues | Ericsson | **Tmargin for NR UE Transmit Timing Test:**[Proposal 3: For NTN UE Transmit Timing Test we have = 0.](#_Toc149835045) |

## Open issues summary

*Before Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

[Proposal (Nokia): Remove Tmargin from the UE transmit timing test case as a consequence of the new simplified version of the NTN configuration for the test cases.](#_Toc149938704)

# Topic #5: On release independence specs 38.307 and 36.307

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

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| **T-doc number** | **Title** | **Company** | **Proposals / Observations** |
| [**R4-2318514**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2318514.zip) | discussion on release independence specs 38.307 and 36.307 | Nokia, Nokia Shanghai Bell | **proposed to replace an explicit reference to specification release with release number by referring to release as “this release”. CRs are provided for latest versions of 36.307 [1] and 38.308 [2].** |

## Open issues summary

*Before Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

Proposal(Nokia):proposed to replace an explicit reference to specification release with release number by referring to release as “this release”. CRs are provided for latest versions of 36.307 [1] and 38.308 [2].

# Topic #6: Rel 17 NR\_pos\_enh-Core

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

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| **T-doc number** | **Title** | **Company** | **Proposals / Observations** |
| **[R4-2320620](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320620.zip)** | Discussion on Rel-17 RRM remaining issues | Ericsson | **Observation 4: The TA validation procedure, which is used by the UE to validate the TA for SRS transmission for positioning in RRC\_INACTIVE state was introduced by RAN2 in their specifications in Rel-17 e.g. clause 5.26.2 in TS 38.321 and clause 5.7.17 in TS 38.331.****Observation 5: RAN4 requirements for the above TA validation procedure to validate the TA for SRS transmission for positioning in RRC\_INACTIVE state are missing in TS 38.133.****Observation 6: TA validation procedure to validate the TA before every SRS transmission for the positioning in RRC\_INACTIVE is fundamentally identical to the TA validation for CG-SDT transmission except that the former uses a new signaled threshold “inactivePosSRS-RSRP-ChangeThreshold” and there is no subsequent SRS transmissions within the same SRS period.****Proposal 5: Define TA validation requirements for SRS transmission for positioning in RRC\_INACTIVE state in TS 38.133.****Proposal 6: The TA validation requirements for SRS transmission can be based on the existing TA validation requirements defined for CG-SDT in clause 5.5.3 by adapting the SRS specific as aspects e.g. using *inactivePosSRS-RSRP-ChangeThreshold* and no subsequent SRS transmission per period.** |

## Open issues summary

**Proposal 1(Ericsson): Define TA validation requirements for SRS transmission for positioning in RRC\_INACTIVE state in TS 38.133.**

**Proposal 2(Ericsson): The TA validation requirements for SRS transmission can be based on the existing TA validation requirements defined for CG-SDT in clause 5.5.3 by adapting the SRS specific as aspects e.g. using *inactivePosSRS-RSRP-ChangeThreshold* and no subsequent SRS transmission per period.**