3GPP TSG-RAN WG4 meeting #100-eR4-21xxxx

Electronic Meeting, 16 – 27 August 2021

**Agenda item:** 6.1.1.5, 6.1.1.6.3.12-20

**Source:** Moderator (Ericsson)

**Title:** Email discussion summary for [100-e][206] NR\_unlic\_RRM\_1

**Document for:** Information

# Introduction

The discussion covers NR-U AIs within 6.1.1.5 and 6.1.1.6.3.12-20.

**When updating this document, please remember to:**

* **use track changes while adding your comments in this document (only updates marked with change marks will be taken into the next version),**
* **change the file name, adding your company name, according to the instructions from RAN4 chair:**
* **Length of file names shall be reduced, e.g.**
  + **At the beginning of first round, moderators share / ftp / tsg\_ran / WG4\_Radio / TSGR4\_98\_e / Inbox / Drafts / [98e][101] NR\_NewRAT\_SysParameters\Summary\_101\_1st round\_v01.docx**
  + **After update by company A: Summary\_101\_1st round\_v02\_companyA**
  + **After update by company B: Summary\_101\_1st round\_v03\_companyA\_companyB**
  + **After update by company C: Summary\_101\_1st round\_v04\_companyB\_companyC**

## 1st round

The following list of open issues was identified, based on the contributions, for the 1st round.

The following colour marking is used below:

* A topic/issue proposed for discussion in: GTW session 1
* **Topic #1: Availability of SSB**

Sub-topic 1-1: Availability of SSB occasions for RLM

* + Issue 1-1-1: Whether to consider P factor when determining availability of SSB occasions for RLM
  + Issue 1-1-2: How frequent the UE shall determine the availability of SSB occasions for RLM: case 1 if DRX is not used
  + Issue 1-1-3: How frequent the UE shall determine the availability of SSB occasions for RLM: case 2 if DRX ≤ 320ms
  + Issue 1-1-4: How frequent the UE shall determine the availability of SSB occasions for RLM: case 2 if DRX > 320ms

Sub-topic 1-2: Availability of SSB occasions for BFD

* + Issue 1-2-1: Whether to consider P factor when determining availability of SSB occasions for BFD

Sub-topic 1-3: Availability of SSB occasions for L1-RSRP

* + Issue 1-3-1: Whether to consider P factor when determining availability of SSB occasions for L1-RSRP
  + Issue 1-3-2: How frequent the UE shall determine the availability of SSB occasions for L1-RSRP: case 1 if DRX is not used
  + Issue 1-3-3: How frequent the UE shall determine the availability of SSB occasions for L1-RSRP: case 2 if DRX ≤ 320ms
  + Issue 1-3-4: How frequent the UE shall determine the availability of SSB occasions for L1-RSRP: case 2 if DRX > 320ms
* **Topic #2: SCell activation/deactivation (delay and interruption)**
* **Topic #3: Other requirements**
* **Topic #4: Performance requirements**

Sub-topic 4-1: CCA parameters for RLM test cases

* + Issue 4-1-1: CCA parameters for RLM in-sync test cases in non-DRX
  + Issue 4-1-2: CCA parameters for RLM out-of-sync test cases

Sub-topic 4-2: CCA parameters for BFD and link recovery test cases

* + Issue 4-2-1: CCA parameters for BFD and link recovery test cases
  + Issue 4-2-2: Whether to remove test 2 in current BFD and CBD test cases

Sub-topic 4-3: Test to verify delay in HARQ feedback transmission

* + Issue 4-3-1: Whether to introduce new test to verify delay in sending HARQ feedback transmissions with UL CCA failure

## 2nd round

TBD

# Topic #1: Availability of SSB

Contributions from AI 6.1.1.5.1 and 6.1.1.5.5 are discussed here.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2112114 | Apple | Proposal 1: *For RLM, the UE is not required to determine the availability of SSB occasions more frequent than:*  *• Once per max(10ms, TSSB\* P) if DRX is not used*  *• Once per max(10ms, ceil(1.5 \* P) \* TDRX, ceil(1.5 \* P) \* TSSB) if TDRX ≤ 320ms*  *• Once per TDRX \* P if TDRX > 320ms.*  Proposal 2: *For NR-U BFD, no need to specify how frequent UE would determine the availability of SSB occasions.*  Proposal 3: *For L1-RSRP, the UE is not required to determine the availability of SSB occasions more frequent than:*  *• Once per max(TReport, TSSB \* P) if DRX is not used*  *• Once per max(TReport, ceil(1.5\*P)\*max(TDRX,TSSB)) if TDRX ≤ 320ms*  *• Once per TDRX \*P if TDRX > 320ms.* |
| R4-2113108 | MediaTek Inc. | Proposal 1: *Regarding the availability of SSB occasions, P factor should be considered for RLM INS and L1-RSRP.*   * *For RLM INS, clarify the note as “the UE is not required to determine the availability of SSB occasions more frequent than once per P\*DRX cycle length, when configured with DRX.”* * *For L1-RSRP, add note as “the UE is not required to determine the availability of SSB occasions more frequent than once per [Max(TReport, 1.5\*P\* max(TDRX,TSSB)) if TDRX ≤ 320ms or per P\* TDRX if TDRX > 320m]”* |
| R4-2113461 | Ericsson | Proposal 1: *For RLM Qin, the UE, which is configured in DRX, is not required to determine the availability of SSB occasions more frequent than:*   * *Once per Max(100ms, 1.5 x P x Max(TDRX, TSSB)) if TDRX ≤ 320ms* * *Once per P x TDRX if TDRX > 320ms*   Proposal 2: *For L1-RSRP measurement, the UE, which is configured in DRX, is not required to determine the availability of SSB occasions more frequent than:*   * *Once per Max(TReport, 1.5 x P x Max(TDRX, TSSB)) if TDRX ≤ 320ms* * *Once per P x TDRX if TDRX > 320ms* |
| R4-2113878 | ZTE Corporation | Proposal: *For RLM/BFD/L1-RSRP, the P factor should also be considered.* |
| R4-2112115 | Apple | Draft CR on SSB availability for RLM and L1-RSRP R16 |
| R4-2113109 | MediaTek inc. | CR on availability of SSB occasions in R16 |
| R4-2113462 | Ericsson | Draft CR: Clarification of availability of SSB monitoring occasions for RLM and BM |

## Open issues summary

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

Background:

At RAN4#99-e meeting following issue was identified for further study [R4-2108253]:

|  |
| --- |
| Availability of SSB occasions for RLM/BFD/L1-RSRP   * FFS: whether to consider P factor for RLM/BFD/L1-RSRP |

### Sub-topic 1-1: Availability of SSB occasions for RLM In-sync

**Issue 1-1-1: How frequent the UE shall determine the availability of SSB occasions for RLM In-sync**

* Proposal 1 (Apple): For RLM, the UE is not required to determine the availability of SSB occasions more frequent than:
* Once per max(10ms, TSSB\* P) if DRX is not used
* Once per max(10ms, ceil(1.5 \* P) \* TDRX, ceil(1.5 \* P) \* TSSB) if TDRX ≤ 320ms
* Once per TDRX \* P if TDRX > 320ms.
* Proposal 2 (Ericsson): For RLM Qin, the UE, which is configured in DRX, is not required to determine the availability of SSB occasions more frequent than:
* Once per Max(100ms, 1.5 x P x Max(TDRX, TSSB)) if TDRX ≤ 320ms
* Once per P x TDRX if TDRX > 320ms
* Proposal 3 (MTK): For RLM INS, clarify the note as:
* The UE is not required to determine the availability of SSB occasions more frequent than once per P\*DRX cycle length, when configured with DRX.”
* Recommended WF
* The moderator proposes to focus on two issues:
  + Minimum period is 10ms (Apple, based on L1 indication) or 100ms (Ericsson, based on evaluation period))
  + Whether to specify the availability of SSB occasions for non-DRX case also.

### Sub-topic 1-2: Availability of SSB occasions for RLM Out-of-sync

**Issue 1-2-1: Whether to specify the availability of SSB occasions for RLM Out-of-sync.**

* Proposal 1 (Ericsson, MTK, Apple): No need to specify how frequent the UE would determine the availability of SSB occasions.
* Proposal 2 (ZTE): P factor should also be considered.
* Recommended WF
  + Discuss the proposals.

### Sub-topic 1-3: Availability of SSB occasions for BFD

**Issue 1-3-1: Whether to specify the availability of SSB occasions for BFD**

* Proposal 1 (Ericsson, MTK, Apple): No need to specify how frequent the UE would determine the availability of SSB occasions.
* Proposal 2 (ZTE): P factor should also be considered.
* Recommended WF
  + Discuss the proposals.

### Sub-topic 1-4: Availability of SSB occasions for L1-RSRP

**Issue 1-4-1: How frequent the UE shall determine the availability of SSB occasions for L1-RSRP**

* Proposal 1 (Apple): For L1-RSRP, the UE is not required to determine the availability of SSB occasions more frequent than:
* Once per max(TReport, TSSB \* P) if DRX is not used
* Once per max(TReport, ceil(1.5\*P)\*max(TDRX,TSSB)) if TDRX ≤ 320ms
* Once per TDRX \*P if TDRX > 320ms
* Proposal 2 (Ericsson): For L1-RSRP measurement, the UE, which is configured in DRX, is not required to determine the availability of SSB occasions more frequent than:
* Once per Max(TReport, 1.5 x P x Max(TDRX, TSSB)) if TDRX ≤ 320ms
* Once per P x TDRX if TDRX > 320ms
* Proposal 3 (MTK): For L1-RSRP,
* add note as “the UE is not required to determine the availability of SSB occasions more frequent than once per [Max(TReport, 1.5\*P\* max(TDRX,TSSB)) if TDRX ≤ 320ms or per P\* TDRX if TDRX > 320m]”
* Recommended WF
* Companies’ proposals are aligned for DRX case. Apple also proposes to specify the case for non-DRX case but Ericsson and MediaTek do not. The moderator proposes to collect the view whether to specify the availability of SSB occasions for non-DRX case also.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Company A | **Sub-topic 1-1: Availability of SSB occasions for RLM In-sync** **Issue 1-1-1: How frequent the UE shall determine the availability of SSB occasions for RLM In-sync** **Sub-topic 1-2: Availability of SSB occasions for RLM Out-of-sync** **Issue 1-2-1: Whether to specify the availability of SSB occasions for RLM Out-of-sync.** **Sub-topic 1-3: Availability of SSB occasions for BFR** **Issue 1-3-1: Whether to specify the availability of SSB occasions for BFR** **Sub-topic 1-4: Availability of SSB occasions for L1-RSRP** **Issue 1-4-1: How frequent the UE shall determine the availability of SSB occasions for L1-RSRP** |
| MTK | **Issue 1-1-1: How frequent the UE shall determine the availability of SSB occasions for RLM In-sync**   * no DRX case is clear from our view. But no strong preference on whether to specify the availability of SSB occasions for non-DRX case also. * Agree with minimum of 10ms, while this clarification is on per measurement basis.   **Issue 1-2-1: Whether to specify the availability of SSB occasions for RLM Out-of-sync.**  Proposal 1. No L in the formula.  **Issue 1-3-1: Whether to specify the availability of SSB occasions for BFR**  Proposal 1. No L in the formula.  **Issue 1-4-1: How frequent the UE shall determine the availability of SSB occasions for L1-RSRP**  Same comment as Issue 1-1-1. |
| Apple | **Issue 1-1-1: How frequent the UE shall determine the availability of SSB occasions for RLM In-sync**  Option 1. In WF R4-2105700 it was agreed that “For RLM: The UE is not required to determine the availability of SSB occasions more frequent than once per L1 indication interval”.  **Issue 1-2-1: Whether to specify the availability of SSB occasions for RLM Out-of-sync.**  Proposal 1.  **Issue 1-3-1: Whether to specify the availability of SSB occasions for BFR**  The title of issue 1-3-1 shall be changed to “Whether to specify the availability of SSB occasions for **BFD**”. We support proposal 1 for BFD.  **Issue 1-4-1: How frequent the UE shall determine the availability of SSB occasions for L1-RSRP**  Proposal 1 for a full coverage. |
| Ericsson | **Issue 1-1-1: How frequent the UE shall determine the availability of SSB occasions for RLM In-sync**  We are fine with Proposal 1. As explained by Apple, we follow WF R4-2105700.  **Issue 1-2-1: Whether to specify the availability of SSB occasions for RLM Out-of-sync.**  Proposal 1.  **Issue 1-3-1: Whether to specify the availability of SSB occasions for BFR.**  Proposal 1. Agree with Apple. The question should be ‘Whether to specify the availability of SSB occasions for BFD.  **Issue 1-4-1: How frequent the UE shall determine the availability of SSB occasions for L1-RSRP**  We are fine with Proposal 1. |
| Qualcomm | **Issue 1-1-1: How frequent the UE shall determine the availability of SSB occasions for RLM In-sync**  We are fine with Proposal 1  **Issue 1-2-1: Whether to specify the availability of SSB occasions for RLM Out-of-sync.**  We are fine with Proposal 1  **Issue 1-3-1: Whether to specify the availability of SSB occasions for BFR.**  We are fine with Proposal 1  **Issue 1-4-1: How frequent the UE shall determine the availability of SSB occasions for L1-RSRP**  We are fine with Proposal 1. |
| Huawei | **Issue 1-1-1: How frequent the UE shall determine the availability of SSB occasions for RLM In-sync**  Fine with proposal 1.  **Issue 1-2-1: Whether to specify the availability of SSB occasions for RLM Out-of-sync.**  Fine with proposal 1.  **Issue 1-3-1: Whether to specify the availability of SSB occasions for BFR**  Fine with proposal 1.  **Issue 1-4-1: How frequent the UE shall determine the availability of SSB occasions for L1-RSRP**  Fine with proposal 1. |

### CRs/TPs comments collection

*For close-to-finalize WIs and maintenance work, comments collections can be arranged for TPs and CRs. For ongoing WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2112115 (Apple) | Ericsson: Changes related to CBD are missing in the CR. |
| Company B |
|  |
| R4-2113109 (MediaTek inc.) | Ericsson: There are three CRs related to the same issue. Changes should be captured in one CR. This CR needs to be updated based on the agreements in sub-topic 1-1, 1-2, 1-3 and 1-4. |
| Company B |
|  |
| R4-2113462 (Ericsson) | Company A |
| Company B |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic 1-1, issue 1-1-1:** | **Sub-topic 1-1: Availability of SSB occasions for RLM In-sync** **Issue 1-1-1: How frequent the UE shall determine the availability of SSB occasions for RLM In-sync**  *Tentative agreements:*   * For RLM, the UE is not required to determine the availability of SSB occasions more frequent than: * Once per max(10ms, TSSB\* P) if DRX is not used * Once per max(10ms, ceil(1.5 \* P) \* TDRX, ceil(1.5 \* P) \* TSSB) if TDRX ≤ 320ms * Once per TDRX \* P if TDRX > 320ms.  **Sub-topic 1-2: Availability of SSB occasions for RLM Out-of-sync** **Issue 1-2-1: Whether to specify the availability of SSB occasions for RLM Out-of-sync.**  *Tentative agreements:*   * No need to specify how frequent the UE would determine the availability of SSB occasions.  **Sub-topic 1-3: Availability of SSB occasions for BFR** **Issue 1-3-1: Whether to specify the availability of SSB occasions for BFR**  *Tentative agreements:*   * No need to specify how frequent the UE would determine the availability of SSB occasions.  **Sub-topic 1-4: Availability of SSB occasions for L1-RSRP** **Issue 1-4-1: How frequent the UE shall determine the availability of SSB occasions for L1-RSRP**  *Tentative agreement:*   * For L1-RSRP, the UE is not required to determine the availability of SSB occasions more frequent than: * Once per max(TReport, TSSB \* P) if DRX is not used * Once per max(TReport, ceil(1.5\*P)\*max(TDRX,TSSB)) if TDRX ≤ 320ms * Once per TDRX \*P if TDRX > 320ms   *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

# Topic #2: SCell activation/deactivation (delay and interruption)

Contributions from AI 6.1.1.5.3 are discussed here.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2114099 | Huawei, HiSilicon | CR on maintenance of SCell activation requirements for NR-U R16 |

## Open issues summary

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

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Company A |  |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2114099 Huawei, HiSilicon | Apple: fine with CR |
| Ericsson: CR is fine. |
| Qualcomm: Fine with the CR |
|  | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic 2-1, issue 2-1-1:** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Topic #3: Other requirements

Contributions from AI 6.1.1.5.5 are discussed here.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| T-doc number | Company | Proposals / Observations |
| R4-2114101 | Huawei, HiSilicon | CR on maintenance of measurement requirements for NR-U R16 |
| R4-2113225 | Nokia, Nokia Shanghai Bell | Correction of NR-U inter-frequency cell identification and measurements requirements |

## Open issues summary

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

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Company A |  |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2114101 (Huawei, HiSilicon) | Apple: fine with the CR |
| Ericsson: We prefer to modify the wording, it is better to state; 'The requirements apply if rmtc-SubframeOffset [2] is configured.' instead of 'There is no requirements if rmtc-SubframeOffset [2] is not configured.' |
| Nokia:  we propose the following alternative update:  The requirement related to the generation method for the random offset value apply if rmtc-SubframeOffset [2] is not configured. |
| Huawei: Thanks for the comments. For Nokia’s proposed version, it is a bit unclear to us. We are fine with Ericsson’s wording. |
| R4-2113225 (Nokia, Nokia Shanghai Bell) | Apple: fine with the CR |
| Ericsson: We think the wording can be improve as follows:  *“The UE shall stop the measurement attempts on the SSB of a cell and perform the detection procedure again, like for any other SSB when the following conditions are met:*  *­ Lmeas > Lmeas,max and*  *­ Time period of unsuccessful measurement attempts exceeds the maximum time required for the cell to remain known as defined in clause 9.3A.6.3”* |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic 3-1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Topic #4: Performance requirements

Contributions from AI 6.1.1.6.3.12- 6.1.1.6.3.20 are discussed here.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2113240 | Nokia, Nokia Shanghai Bell | 1. Configure CCA model with LCCA\_DL=Lin,max and WCCA\_DL=Tidentify-NR\_CCA for the test cases of RLM in-sync test cases in non-DRX mode. 2. Do not configure the CCA parameters LCCA\_DL and WCCA\_DL for out-of-sync RLM test cases with CCA. |
| R4-2113241 | Nokia, Nokia Shanghai Bell | Draft CR correction RLM TCs for NR-U |
| R4-2114123 | Huawei, HiSilicon | CR on RLM for NR-U R16 |
| R4-2113243 | Nokia, Nokia Shanghai Bell | Proposal 1: *For the beam failure detection and link recovery test cases , configure LCCA\_DL=7 for TCs without DRX, LCCA\_DL=3 for TCs with DRX and WCCA\_DL= TEvaluate\_CBD\_SSB\_CCA.* |
| R4-2113244 | Nokia, Nokia Shanghai Bell | Correction of beam failure detection and link recovery TCs under CCA |
| R4-2113466 | Ericsson | Draft CR: Correction of beam management test cases for NR-U |
| R4-2114125 | Huawei, HiSilicon | Proposal: The PDCCH configuration shall be same as the hypothetical PDCCH in the spec and test 2 is not needed. |
| R4-2114126 | Huawei, HiSilicon | CR on TC of BFD and CBD for NR-U R16 |
| R4-2114128 | Huawei, HiSilicon | CR on TC of inter-RAT measurement procedure for NR-U R16 |
| R4-2113246 | Nokia, Nokia Shanghai Bell | Correction of inter-frequency measurement procedures TCs under CCA |
| R4-2114130 | Huawei, HiSilicon | CR on TC of inter-RAT SFTD measurement procedure for NR-U R16 |
| R4-2113470 | Ericsson | Paper explaining the design of intra-frequency/inter-frequency SS-RSRQ/SS-SINR measurement accuracy test cases for NR-U |
| R4-2113471 | Ericsson | Draft CR: Addition of SS-SINR/SS-RSRQ measurement accuracy tests for NR-U |
| R4-2114132 | Huawei, HiSilicon | CR on TC of intra-frequency measurement accuracy for NR-U R16 |
| R4-2113879 | ZTE Corporation | Observation: *Both DL and UL CCA failures need to be configured to the test equipment (TE), and the delay in sending HARQ feedback transmission should be included in the MAC CE based TCI state switch delay test case due to UL CCA failures.*  Proposal: *Define “MAC CE based TCI state switch delay” test case with UL CCA failure.* |
| R4-2113248 | Nokia, Nokia Shanghai Bell | Removal of TCI state switching TC for unlicensed bands |
| R4-2114134 | Huawei, HiSilicon | CR on removing TCI switching TC for NR-U R17 |

## Open issues summary

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

Background:

### Sub-topic 4-1: CCA parameters for RLM test cases

**Issue 4-1-1: CCA parameters for RLM in-sync test cases in non-DRX**

Proposals

* Proposal 1 (Nokia): Configure CCA model with LCCA\_DL=Lin,max and WCCA\_DL=Tidentify-NR\_CCA for the test cases of RLM in-sync test cases in non-DRX mode.

Recommended WF

* Discuss is proposal 1 can be agreed.

**Issue 4-1-2: CCA parameters for RLM out-of-sync test cases**

Proposals

* Proposal 1 (Nokia): Do not configure the CCA parameters LCCA\_DL and WCCA\_DL for out-of-sync RLM test cases with CCA.

Recommended WF

* Discuss is proposal 1 can be agreed.

### Sub-topic 4-2: CCA parameters for BFD and link recovery test cases

**Issue 4-2-1: CCA parameters for BFD and link recovery test cases**

Proposals

* Proposal 1 (Nokia): For the beam failure detection and link recovery test cases , configure LCCA\_DL=7 for TCs without DRX, LCCA\_DL=3 for TCs with DRX and WCCA\_DL= TEvaluate\_CBD\_SSB\_CCA .

Recommended WF

* Discuss is proposal 1 can be agreed.

**Issue 4-2-2: Whether to remove test 2 in current BFD and CBD test cases**

Proposals

* Proposal 1 (Huawei): The PDCCH configuration shall be same as the hypothetical PDCCH in the spec and test 2 is not needed.

Recommended WF

* Discuss is proposal 1 can be agreed.

### Sub-topic 4-3: Test to verify delay in HARQ feedback transmission

**Issue 4-3-1: Whether to introduce new test to verify delay in sending HARQ feedback transmissions with UL CCA failure**

Proposals

* Proposal 1 (ZTE): Define “MAC CE based TCI state switch delay” test case with UL CCA failure.

Recommended WF

* Discuss is proposal 1 can be agreed.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  | **Sub-topic 4-1: CCA parameters for RLM test cases** **Issue 4-1-1: CCA parameters for RLM in-sync test cases in non-DRX**  **Issue 4-1-2: CCA parameters for RLM out-of-sync test cases** **Sub-topic 4-2: CCA parameters for BFD and link recovery test cases** **Issue 4-2-1: CCA parameters for BFD and link recovery test cases**  **Issue 4-2-2: Whether to remove test 2 in current BFD and CBD test cases** **Sub-topic 4-3: Test to verify delay in HARQ feedback transmission** **Issue 4-3-1: Whether to introduce new test to verify delay in sending HARQ feedback transmissions with UL CCA failure** |
| MTK | **Issue 4-1-1: CCA parameters for RLM in-sync test cases in non-DRX**  Fine with Proposal 1.  **Issue 4-1-2: CCA parameters for RLM out-of-sync test cases**  Fine with Proposal 1.  **Issue 4-2-1: CCA parameters for BFD and link recovery test cases**  Fine with Proposal 1.  **Issue 4-3-1: Whether to introduce new test to verify delay in sending HARQ feedback transmissions with UL CCA failure**  It should not be based on active TCI state switching delay, since there is no agreed TCs for it, as agreed in the last meeting [R4-2108261](https://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_99-e/Docs/R4-2108261.zip). |
| Ericsson | **Issue 4-1-1: CCA parameters for RLM in-sync test cases in non-DRX**  Proposal 1 is agreeable.  **Issue 4-1-2: CCA parameters for RLM out-of-sync test cases**  Proposal 1 is agreeable.  **Issue 4-2-1: CCA parameters for BFD and link recovery test cases**  Proposal 1 is agreeable.  **Issue 4-2-2: Whether to remove test 2 in current BFD and CBD test cases**  We are fine with the proposal.  **Issue 4-3-1: Whether to introduce new test to verify delay in sending HARQ feedback transmissions with UL CCA failure**  We have similar view as MTK that the WI is already closed and at this point no need to introduce new test cases. |
| Nokia | **Issue 4-1-1: CCA parameters for RLM in-sync test cases in non-DRX**  We agree with Proposal 1.  In our view this is the configuration that avoids Lmax for the RLM test cases.  **Issue 4-1-2: CCA parameters for RLM out-of-sync test cases**  We agree with Proposal 1.  Since RLM core requirements do not define Lmax for out-of-sync RLM, there is no need to define LCCA in that case.  **Issue 4-2-1: CCA parameters for BFD and link recovery test cases**  We agree with Proposal 1.  This is the necessary configuration for avoiding Lmax in BFD test cases.  **Issue 4-2-2: Whether to remove test 2 in current BFD and CBD test cases**  We agree with Proposal 1.  **Issue 4-3-1: Whether to introduce new test to verify delay in sending HARQ feedback transmissions with UL CCA failure**  We agree with MTK and Ericsson on that issue. |
| Qualcomm | **Sub-topic 4-1: CCA parameters for RLM test cases** **Issue 4-1-1: CCA parameters for RLM in-sync test cases in non-DRX**  Agree with proposal 1  **Issue 4-1-2: CCA parameters for RLM out-of-sync test cases**  Agree with proposal 1 **Sub-topic 4-2: CCA parameters for BFD and link recovery test cases** **Issue 4-2-1: CCA parameters for BFD and link recovery test cases**  Agree with proposal 1  **Issue 4-2-2: Whether to remove test 2 in current BFD and CBD test cases**  Fine with proposal 1 **Sub-topic 4-3: Test to verify delay in HARQ feedback transmission** **Issue 4-3-1: Whether to introduce new test to verify delay in sending HARQ feedback transmissions with UL CCA failure**  Agree with MTK, Ericsson and Nokia. No need to introduce new test case. |
| ZTE | **Issue 4-3-1: Whether to introduce new test to verify delay in sending HARQ feedback transmissions with UL CCA failure**  Can compromise to not define. |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| CRs on RLM | |
| R4-2113241 (Nokia, Nokia Shanghai Bell) | MTK:  On Table A.10.3.1.3.1-3, one typo on Note 9, LCCA\_DL and WCCA\_DL are defined in A.3.26.2.1 rather than Table 8.1A.2.2-1. Or Note 9 should be put on TEvaluate\_in\_SSB,CCA. |
| Ericsson: whether to add L\_CCA\_DL/W\_CCA\_DL depends on the conclusion of sub-topic 4-1. |
| Nokia:  We agree on putting Note 9 to TEvaluate\_in\_SSB\_CCA |
| R4-2114123 (Huawei, HiSilicon) | Ericsson: Same discussion as for BFD. We need to first have an agreement on whether to test 2. Why to remove UL CCA probability parameter P\_CCA\_UL ? How are the values for following parameters derived T1/T2/T3/T4/T5/D? Propose to merge with Nokia's CR R4-2113241. |
| Nokia:  The coverage of the changes is wider than in our CR R4-2113241, but we would like to have included the LCCA and WCCA configurations, as will also be discussed in our discussion paper R4-2113240. So we suggest that the changes from R4-2113241 are merged into this CR taking into account the outcome of the discussion related to RLM.  @Huawei, please confirm if you agree to proceed that way. |
|  |
| CRs on BFD and Link Recovery | |
| R4-2113244 (Nokia, Nokia Shanghai Bell) | Ericsson: it depends on the conclusion of sub-topic 4-2. |
| Nokia:  Given the discussion on Issue 1-1 of Thread [100-e][207] NR\_unlic\_RRM\_2, we would like to revise that CR and set LCCA and WCCA as not configured for the test cases with DRX. |
| R4-2113466 (Ericsson) | Nokia:  CRs from Nokia and Huawei cover the same clauses. Can we merge the CRs into R4-2114126? |
| Company B |
| R4-2114126 (Huawei, HiSilicon) | Ericsson: CR to remove test 2. It depends on the conclusion of issue 4-2-2. |
| Nokia:  We agree with the changes by Huawei.  We would like also to include the CCA parameters that we introduced in our Draft CR R4-2113244.  Should the CRs be merged? |
| CR on inter-frequency/inter-RAT/SFTD measurement procedure | |
| R4-2114128 (Huawei, HiSilicon) | Ericsson: OK. |
| Nokia  1: The DRX.10 configuration has a DRX cycle of 640 ms and a TAT (time alignment timer) of 500 ms. We believe there is no need on changing the DRX configuration to DRX.12, because that one has the same DRX cycle and doesn’t configure the TAT.  2: Consider updating the clause that defines the DL/UL CCA models from A.3.20 to A.3.26  3: Table A.10.4.4-2.1-4, Note 5 is not properly aligned with the rest of the notes. |
| R4-2113246 (Nokia, Nokia Shanghai Bell) | Ericsson: OK |
| Nokia  We noticed that in Table A.10.4.2.4.1-2 E-UTRAN TDD carrier is mentioned, when it may be either FDD or TDD, and we would like to have a revision to fix that. |
| R4-2114130 (Huawei, HiSilicon) | Ericsson: The bracket from T1 can be removed as well. |
| Company B |
| R4-2114132 (Huawei, HiSilicon) | Ericsson: OK. |
| Nokia  1: Consider including a sentence defining the different sub-test, i.e. Test 1, Test 2, Test 3. For instance: "Two sub-tests (Test 1 and Test 2) are provided with different N\_oc on Cell 2 and Cell 3"  2: Consider updating the clause that defines the DL/UL CCA models from A.3.20 to A.3.26  3: Check the reference to the side notes on the P\_CCA definitions depending on the type of channel access. For example, in Table A.10.5.1.1.2-2, Notes 6 and 8 are used for both semi-static and dynamic channel access |
| CR on SS-SINR/SS-RSRQ measurement accuracy test cases | |
| R4-2113471 (Ericsson) | Nokia  1: Consider the addition of the CCA probabilities (P\_CCA\_DL/UL) as part of the test parameters tables.  2: Consider including a sentence defining the different sub-test, i.e. Test 1, Test 2, Test 3. For instance: "Two sub-tests (Test 1 and Test 2) are provided with different N\_oc on Cell 2 and Cell 3"  3: In some of the tables, N\_oc is only defined for dBm/SCS. Please consider to add the corresponding rows for dBm/15 kHz.  4: The selected SSB configuration is not in line with previous agreements. SSB.1 CCA and SSB.2 CCA should be used for semi-static and dynamic channel access, respectively.  5: Consider adding the SMTC configuration in each test case  6: Consider updating the clause that defines the DL/UL CCA models from A.3.20 to A.3.26 |
| Company B |
| CR on TCI state switching test cases | |
| R4-2113248 (Nokia, Nokia Shanghai Bell) | Ericsson: OK. |
| Company B |
| R4-2114134 (Huawei, HiSilicon) | Ericsson: OK. |
| Company B |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic X-1** | **Sub-topic 4-1: CCA parameters for RLM test cases** **Issue 4-1-1: CCA parameters for RLM in-sync test cases in non-DRX**  *Tentative agreement:*   * Configure CCA model with LCCA\_DL=Lin,max and WCCA\_DL=Tidentify-NR\_CCA for the test cases of RLM in-sync test cases in non-DRX mode.   **Issue 4-1-2: CCA parameters for RLM out-of-sync test cases**  *Tentative agreement:*   * Do not configure the CCA parameters LCCA\_DL and WCCA\_DL for out-of-sync RLM test cases with CCA.  **Sub-topic 4-2: CCA parameters for BFD and link recovery test cases** **Issue 4-2-1: CCA parameters for BFD and link recovery test cases**  *Tentative agreement:*   * For the beam failure detection and link recovery test cases , configure LCCA\_DL=7 for TCs without DRX, LCCA\_DL=3 for TCs with DRX and WCCA\_DL= TEvaluate\_CBD\_SSB\_CCA .   **Issue 4-2-2: Whether to remove test 2 in current BFD and CBD test cases**  *Tentative agreement:*   * The PDCCH configuration shall be same as the hypothetical PDCCH in the spec and test 2 is not needed.  **Sub-topic 4-3: Test to verify delay in HARQ feedback transmission** **Issue 4-3-1: Whether to introduce new test to verify delay in sending HARQ feedback transmissions with UL CCA failure**  *Tentative agreement:*   * RAN4 agrees to not define “MAC CE based TCI state switch delay” test case with UL CCA failure.   *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
|  |  |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on … | YYY |  |
| LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
| WF on NR-U RRM Requirements | Ericsson | To capture all agreements in RAN4#100-e in email thread: [100-e][206] NR\_unlic\_RRM\_1 |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-2114099 | CR on maintenance of SCell activation requirements for NR-U R16 | *Huawei, Hisilicon* | Agreeable |  |
| R4-2114100 (cat-A) | CR on maintenance of SCell activation requirements for NR-U R17 | Huawei, Hisilicon | Agreeable |  |
| R4-2114101 | CR on maintenance of measurement requirements for NR-U R16 | Huawei, Hisilicon | Revised |  |
| R4-2114102 (cat-A) | CR on maintenance of measurement requirements for NR-U R17 | Huawei, Hisilicon | Return to |  |
| R4-2113225 | Correction of NR-U inter-frequency cell identification and measurements requirements | Nokia, Nokia Shanghai Bell | Revised |  |
| R4-2113226 (cat-A) | Correction of NR-U inter-frequency cell identification and measurements requirements | Nokia, Nokia Shanghai Bell | Return to |  |
| R4-2113241 | Draft CR correction RLM TCs for NR-U | Nokia, Nokia Shanghai Bell | Merged | Merged with R4-2114123 |
| R4-2113242 (cat-A) | Draft CR correction RLM TCs for NR-U | Nokia, Nokia Shanghai Bell | Withdrawn |  |
| R4-2114123 | CR on RLM for NR-U R16 | Huawei, Hisilicon | Revised | Please include the changes from R4-2113241 |
| R4-2114124 (cat-A) | CR on RLM for NR-U R17 | Huawei, Hisilicon | Return to |  |
| R4-2113244 | Correction of beam failure detection and link recovery TCs under CCA | Nokia, Nokia Shanghai Bell | Merged | To be merged with R4-2114126 |
| R4-2113245 (cat-A) | Correction of beam failure detection and link recovery TCs under CCA | Nokia, Nokia Shanghai Bell | Withdrawn |  |
| R4-2113466 | Draft CR: Correction of beam management test cases for NR-U | Ericsson | Merged | To be merged with R4-2114126 |
| R4-2113467 (cat-A) | Draft CR: Correction of beam management test cases for NR-U | Ericsson | Withdrawn |  |
| R4-2114126 | CR on TC of BFD and CBD for NR-U R16 | Huawei, Hisilicon | Revised | To include changes from R4-2113466 and R4-2113244 |
| R4-2114127 (cat-A) | CR on TC of BFD and CBD for NR-U R17 | Huawei, Hisilicon | Return to |  |
| R4-2114128 | CR on TC of inter-RAT measurement procedure for NR-U R16 | Huawei, Hisilicon | Revised |  |
| R4-2114129 (cat-A) | CR on TC of inter-RAT measurement procedure for NR-U R17 | Huawei, Hisilicon | Return to |  |
| R4-2113246 | Correction of inter-frequency measurement procedures TCs under CCA | Nokia, Nokia Shanghai Bell | Revised |  |
| R4-2113247 (cat-A) | Correction of inter-frequency measurement procedures TCs under CCA | Nokia, Nokia Shanghai Bell | Return to |  |
| R4-2114130 | CR on TC of inter-RAT SFTD measurement procedure for NR-U R16 | Huawei, Hisilicon | Revised |  |
| R4-2114131 (cat-A) | CR on TC of inter-RAT SFTD measurement procedure for NR-U R17 | Huawei, Hisilicon | Return to |  |
| R4-2114132 | CR on TC of intra-frequency measurement accuracy for NR-U R16 | Huawei, Hisilicon | Revised |  |
| R4-2114133 (cat-A) | CR on TC of intra-frequency measurement accuracy for NR-U R17 | Huawei, Hisilicon | Return to |  |
| R4-2113471 | Draft CR: Addition of SS-SINR/SS-RSRQ measurement accuracy tests for NR-U | Ericsson | Revised |  |
| R4-2113472 (cat-A) | Draft CR: Addition of SS-SINR/SS-RSRQ measurement accuracy tests for NR-U | Ericsson | Return to |  |
| R4-2113248 | Removal of TCI state switching TC for unlicensed bands | Nokia, Nokia Shanghai Bell | Agreeable |  |
| R4-2113249 (cat-A) | Removal of TCI state switching TC for unlicensed bands | Nokia, Nokia Shanghai Bell | Agreeable |  |
| R4-2114134 | CR on removing TCI switching TC for NR-U R16 | Huawei, Hisilicon | Merged | Merged with R4-2113248 |
| R4-2114135 | CR on removing TCI switching TC for NR-U R17 | Huawei, Hisilicon | Withdrawn |  |
| R4-2112115 | Draft CR on SSB availability for RLM and L1-RSRP R16 | Apple | Merged | To be merged with R4-2113462 |
| R4-2112116 (cat-A) | Draft CR on SSB availability for RLM and L1-RSRP R17 | Apple | Withdrawn |  |
| R4-2113109 | CR on availability of SSB occasions in R16 | MediaTek inc. | Merged | To be merged with R4-2113462 |
| R4-2113462 | Draft CR: Clarification of availability of SSB monitoring occasions for RLM and BM | Ericsson | Revised |  |
| R4-2113463 (cat-A) | Draft CR: Clarification of availability of SSB monitoring for RLM and BM | Ericsson | Return to |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents

## 2nd round

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-210xxxx | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-210xxxx | LS on … | ZZZ | Agreeable, Revised, Noted |  |
|  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. Do not include hyper-links in the documents

# Annex

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|  |  |  |
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Note:

1. Please add your contact information in above table once you make comments on this email thread.
2. If multiple delegates from the same company make comments on single email thread, please add you name as suffix after company name when make comments i.e. Company A (XX, XX)