**3GPP TSG-RAN WG4 Meeting # 96-e R4-200XXXX**

**Electronic Meeting, 17 – 28 August., 2020**

**Agenda item:** 6.1.1.2, 6.1.2

**Source:** Moderator (Ericsson)

**Title:** Email discussion summary for [96e][228] LTE\_eMTC5\_RRM

**Document for:** Information

# Introduction

This document is the email discussion summary for [96e][229] LTE\_eMTC5\_RRM with the following topics covered

* Topic #1: Core requirements maintenance: RSS
* Topic #2: Core requirements maintenance: PUR
* Topic #3: Core requirements maintenance: MPDCCH improvement
* Topic #4: Core requirements maintenance: DL quality reporting
* Topic #5: Performance: RSS measurement accuracy
* Topic #6: Performance: Test cases

# Topic #1: Core requirements maintenance: RSS

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2009886 | Qualcomm Incorporated | CR: Corrections to RSS-based RSRP measurement requirements |
| R4-2011177 | Huawei, Hisilicon | **Proposal 1:** For RSRP1 and RSRP2 in PUR requirements in clause 4.7.4.3, N=1 if relaxed serving cell monitoring is not in use.**Proposal 2:** Define separate MPDCCH tables for Qout\_Cat M1 and QE1\_out\_CatM1.**Proposal 3-1:** For serving cell measurement in NC, RSS measurement period is defined as 3 DRX cycles, and the requirements are only applicable for DRX cycle of 320ms and 640ms.**Proposal 3-2:** For serving cell measurement in EC, RSS measurement period is defined as 5 DRX cycles, and the requirements are only applicable for DRX cycle of 320ms and 640ms.**Proposal 3-3:** For neighbor cell measurement in NC, RSS measurement period is defined as Table 2.**Proposal 3-4:** For neighbor cell measurement in EC, RSS measurement period is defined as Table 3 and Table 4.**Proposal 4-1:** Update the conditions for RSS measurement in Connected mode to reflect the time location of the last RSS subframe, the time relation between RSS and MG, and the dependency of RSS frequency location on UE capability.**Proposal 4-2:** For non-DRX in Connected mode and rmax\*G >= 80ms case, the RSS measurement period is defined as Max(rmax\*G, TRSS ) x N. |
| R4-2011178 | Huawei, Hisilicon | **CR:** RSS based measurement requriements |
| R4-2011179 | Huawei, Hisilicon | **CR:** RLM requriements based on enhanced MPDCCH |
| R4-2011180 | Huawei, Hisilicon | **CR:** PUR related requirements |
| R4-2011208 | Ericsson | **CR:** Correction of eMTC DL channel quality report mapping table and RSS measurement 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.*

### Sub-topic 1-1: Corrections to RSS based RSRP measurement requirements

*Sub-topic description:*

RSS measurement requirements were introduced into Release 16 specification at last meeting. Corrections to those are addressed in this subtopic.

*Open issues and candidate options before e-meeting:*

**Issue 1-1: Correction to serving cell RSS measurement period in normal coverage in IDLE mode**

Proposals:

* Proposal: For serving cell measurement in NC, RSS measurement period is defined as 3 DRX cycles, and the requirements are only applicable for DRX cycle of 320ms and 640ms.
* Recommended WF
	+ Discussions needed

**Issue 1-2: Correction to serving cell RSS measurement period in enhanced coverage in IDLE mode**

Proposals:

* **Proposal:** For serving cell measurement in EC, RSS measurement period is defined as 5 DRX cycles, and the requirements are only applicable for DRX cycle of 320ms and 640ms.
* Recommended WF
	+ Discussions needed

**Issue 1-3: Correction to neighbour cell RSS measurement period in normal coverage in IDLE mode**

Proposals:

* **Proposal:** For neighbor cell measurement in NC, RSS measurement period is defined as Table 2.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **DRX cycle length [s]** | **Tdetect,EUTRAN\_Intra\_NC [s] (number of DRX cycles)** | **Tmeasure,EUTRAN\_Intra\_NC [s] (number of DRX cycles)** | **Tevaluate,E-UTRAN\_intra\_NC****[s] (number of DRX cycles)** | **Tevaluate,E-UTRAN\_intra\_NC\_RSS****[s] (number of DRX cycles)** |
| 0.32 | 11.52 (36) | 1.28 (4) | 5.12 (16) | 3.84 (12) |
| 0.64 | 17.92 (28) | 1.28 (2) | 5.12 (8) | 3.84 (6) |
| 1.28 | 32(25) | 1.28 (1) | 6.4 (5) | 3.84 (3) |
| 2.56 | 58.88 (23) | 2.56 (1) | 7.68 (3) | 3.84 (3) |

* Recommended WF
	+ Discussions needed

**Issue 1-4: Correction to neighbour cell RSS measurement period in enhanced coverage in IDLE mode**

Proposals:

* Proposal: **For neighbor cell measurement in EC, RSS measurement period is defined as Table 3 and Table 4.**

**Table 3: Measurement period for RSS measurement of neighbour cells in EC with DRX**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SCH Ês/Iot of neighboring cell: Q2 [dB]** | **DRX cycle length [s]** | **Tdetect,EUTRAN\_Intra\_EC [s] (number of DRX cycles)**  | **Tmeasure,EUTRAN\_Intra\_EC [s] (number of DRX cycles)** | **Tevaluate,E-UTRAN\_intra\_EC****[s] (number of DRX cycles)** | **Tevaluate,E-UTRAN\_intra\_EC\_RSS****[s] (number of DRX cycles)** |
| **-15≤ Q2 < -6** | 0.32 | 330.24 (1032) | 1.28 (4) | 10.24 (32) | 6.4 (20) |
| 0.64 | 330.24 (516) | 1.28 (2) | 10.24 (16) | 6.4 (10) |
| 1.28 | 524.8 (410) | 1.28 (1) | 12.8 (10) | 6.4 (5) |
| 2.56 | 1039.36 (406) | 2.56 (1) | 15.36 (6) | 12.8 (5) |
| **Q2≥-6** | 0.32 | 16.64 (52) | 1.28 (4) | 10.24 (32) | 6.4 (20) |
| 0.64 | 23.04 (36) | 1.28 (2) | 10.24 (16) | 6.4 (10) |
| 1.28 | 38.4 (30) | 1.28 (1) | 12.8 (10) | 6.4 (5) |
| 2.56 | 66.56 (26) | 2.56 (1) | 15.36 (6) | 12.8 (5) |

**Table 4: Measurement period for RSS measurement of neighbour cells in EC with eDRX**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **eDRX\_IDLE cycle length [s]** | **DRX cycle length [s]** | **PTW length [s] (number of 1.28s periods)** | **Tdetect,EUTRAN\_Intra\_EC [s] (number *N* of DRX cycles) for neighboring cell with SCH Es/IoT:** **-15≤ Q2 < -6 [dB]** | **Tdetect,EUTRAN\_Intra\_EC [s] (number *N* of DRX cycles) for neighboring cell with SCH Es/IoT:****Q2≥-6 [dB]** | **Tmeasure,EUTRAN\_Intra\_EC [s] (number *N* of DRX cycles)** | **Tevaluate,E-UTRAN\_intra\_EC****[s] (number *N* of DRX cycles)** | **Tevaluate,E-UTRAN\_intra\_EC\_RSS****[s] (number *N* of DRX cycles)** |
| 5.12 ≤ eDRX\_IDLE cycle length ≤ 2621.44 | 0.32 | ≥1.28 (1) | Note 3 (406) | Note 3 (26) | 0.32 (1) | Note 3 (6) | Note 3 (5) |
| 0.64 | ≥1.28 (1) | 0.64 (1) | Note 3 (6) | Note 3 (5) |
| 1.28 | ≥2.28 (1) | 1.28 (1) | Note 3 (6) | Note 3 (5) |
| 2.56 | ≥2.56 (2) | 2.56 (1) | Note 3 (6) | Note 3 (5) |
| NOTE 1: The number of DRX cycles in this table is given for the DRX cycles within PTWs.NOTE 2: The eDRX\_IDLE cycle lengths are as specified in Section 10.5.5.32 of TS 24.008 [34].NOTE 3: The detection period and the evaluation period depend on the number *N* of DRX cycles and are calculated according to the formula below:.  |

s

* Recommended WF
	+ Discussions needed

**Issue 1-5: Correction to RSS measurement requirements in CONNECTED mode**

Proposals:

* **Proposal1:** Update the conditions for RSS measurement in Connected mode to reflect the time location of the last RSS subframe, the time relation between RSS and MG, and the dependency of RSS frequency location on UE capability.
* **Proposal2:** For non-DRX in Connected mode and rmax\*G >= 80ms case, the RSS measurement period is defined as Max(rmax\*G, TRSS ) x N.
* Recommended WF
	+ Discussions needed

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 1-1: Sub topic 1-2:….Others: |
| Qualcomm | Issue 1-1: We have a question for clarification. RAN4 didn’t agree on limiting the RSS period to 320/640ms. However, we agreed to make RSS based measurement applicable only if its measurement period is smaller than CRS based measurement. Is that what proposal 1 is trying to say? Since, with other DRX cycles, the measurement period will be longer than CRS? Issue 1-2: same question as in issue 1-1.Issue 1-3: There is a mistake in 2.56 DRX cycle number. 3 DRX cycles means 7.68s; not 3.84. Also, a question for clarification, why isn’t eDRX applicable in this case? Issue 1-4: seems ok.Issue 1-5: For proposal 1, we don’t quite understand why the following condition is crossed out:For proposal 2, our concern is that with the proposed change, there can be more than one T\_RSS between samples which effectively prolongs the measurement delay. Also, the accuracy results and the agreements so far all assume N successive RSS samples (N=3 for NC and N=5 for EC). |

### 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** |
| R4-2009886 | Company A |
| Company B |
|  |
| R4-2011178 | Company A |
| Company B |
| Qualcomm: why is “two successive subframes” condition removed from clause 4.7.2.1 (and similar places?). For neighbor cell measurement, why is the window changed to [n-6, n-2] from what it used to be [n-5, n-1]? |
| R4-2011208 | 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** |  |
|  |  |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title**  | **Assigned Company,****WF or LS lead** |
| #1 |  |  |

### CRs/TPs

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

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation**  |
|  |  |

## Discussion on 2nd round (if applicable)

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 1-1: Sub topic 1-2:….Others: |
|  |  |

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation**  |
|  |  |
|  |  |

# Topic #2: Core requirements maintenance: PUR

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2011180 | Huawei, Hisilicon | **CR:** PUR related requirements |
| R4-2011177 | Huawei, Hisilicon | **Proposal 1:** For RSRP1 and RSRP2 in PUR requirements in clause 4.7.4.3, N=1 if relaxed serving cell monitoring is not in use. |

## Open issues summary

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

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

### Sub-topic 2-1: Corrections to preconfigured uplink resources

*Sub-topic description:*

PUR requirements were introduced into Release 16 specification at last meeting. Corrections to those are addressed in this subtopic.

*Open issues and candidate options before e-meeting:*

**Issue 2-1: PUR and relaxed serving cell montoring**

* Proposal: For RSRP1 and RSRP2 in PUR requirements in clause 4.7.4.3, N=1 if relaxed serving cell monitoring is not in use.
* Recommended WF
	+ Discussions needed

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 1-1: Sub topic 1-2:….Others: |
| Qualcomm | Issue 2-1: ok with the proposal  |

### 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** |
| R4-2011180 | Company A |
| Company B |
| Qualcomm: I believe the intention is to negate the following sentence: - N=1 if relaxed serving cell monitoring, as defined in clause 4.7.2.1.1A for normal coverage or 4.7.2.2.1A for enhanced coverage, is NOT applied. |
|  | 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** |  |
|  |  |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title**  | **Assigned Company,****WF or LS lead** |
| #1 |  |  |

### CRs/TPs

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

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation**  |
|  |  |

## Discussion on 2nd round (if applicable)

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 1-1: Sub topic 1-2:….Others: |
|  |  |

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation**  |
|  |  |
|  |  |

# Topic #3: Core requirements maintenance: MPDCCH improvement

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2011177 | Huawei, Hisilicon | **Proposal 2:** Define separate MPDCCH tables for Qout\_Cat M1 and QE1\_out\_CatM1. |

## Open issues summary

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

### Sub-topic 3-1: MPDCCH transmission parameters

*Sub-topic description:*

Ambiguity related to MPDCCH transmission parameters for legacy RLM evaluation and RLM evaluation based on enhanced MPDCCH.

*Open issues and candidate options before e-meeting:*

**Issue 3-1:**

* Proposals: **Define separate MPDCCH tables for Qout\_Cat M1 and QE1\_out\_CatM1.**
* Recommended WF
	+ More discussions needed.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Qualcomm | Proposal makes sense. |
|  |  |
|  |  |

### 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** |
|  | Company A |
| Company B |
|  |
|  | 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** | *Tentative agreements:**Candidate options:**Recommendations for 2nd round:* |

*Suggestion on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title**  | **Assigned Company,****WF or LS lead** |
| #1 |  |  |

### 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)

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 1-1: Sub topic 1-2:….Others: |
|  |  |

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation**  |
|  |  |

# Topic #4: Core requirements maintenance: DL quality reporting

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2011208 | Ericsson | CR containing corrections to DL channel quality reporting |
|  |  |  |

## 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** |
|  |  |
|  |  |
|  |  |
|  |  |

### 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** |
| R4-2011208 | Company A |
| Company B |
| Qualcomm: OK with DL quality changes but prefer to merge RSS changes into one CR since HW and QC also have CRs on RSS. |
|  | 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**  |
|  |  |

*Suggestion on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title**  | **Assigned Company,****WF or LS lead** |
| #1 |  |  |

### 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)

Session chair: Based on comment it is not clear if there is a consensus on the proposed tentative agreement. Recommend confirming in the 2nd round.

|  |  |
| --- | --- |
| **Company** | **Comment**  |
| XXX | Sub topic 1-1:  |
|  |  |

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation**  |
|  |  |
|  |  |

# Topic #5: Performance: RSS measurement accuracy

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2011181 | Huawei, Hisilicon | **Proposal:** Define the absolute accuracy requirements for RSS based measurement as in Table 3. |
| R4-2011182 | Huawei, Hisilicon | **CR:** Accuracy requirements for RSS based measurement |
| R4-2011206 | Ericsson | **Proposal:** Use 3 dB RF margin for the BL UEs and 2.5 dB for non-BL UEs. |
| R4-2011207 | Ericsson | **CR:** Introduction of RSS measurement accuracy for Rel-16 MTC |

## Open issues summary

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

### Sub-topic 5-1: Accuracy requirements

*Sub-topic description:*

At last meeting following agreements were reached RF margins:

Non-BL UE: 2.5 dB

BL UE:

Option 1: 3 dB

Option 2: 4 dB

*Open issues and candidate options before e-meeting:*

**Issue 5-1: RF margin to use for RSS measurement for BL UE**

* Proposals
	+ Option 1: 3 dB
	+ Option 2: 4 dB
* Recommended WF
	+ Discussions needed

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 2-1: Sub topic 2-2:….Others: |
| Qualcomm | Issue 5-1: no strong view but slightly prefer to be consistent with CRS based RF margin, i.e., 4 dB. |

### 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** |
| R4-2011182 |  |
|  |
|  |
| R4-2011207 |  |
|  |
|  |

## 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** | *Tentative agreements:**Candidate options:**Recommendations for 2nd round:* |

*Suggestion on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title**  | **Assigned Company,****WF or LS lead** |
| #1 |  |  |

### 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)

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 1-1: Sub topic 1-2:….Others: |
|  |  |
|  |  |
|  |  |

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation**  |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
|  |  |

# Topic #6: Performance: Test cases

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2009872 | Qualcomm Incorporated | **Proposal 1:** RAN4 to specify performance tests for DL channel quality reporting in 4-bit reporting mode according to Table 1.**Proposal 2:** RAN4 to not specify any performance tests for group WUS.**Proposal 3:** RAN4 to specify performance tests for MPDCCH performance improvement according to Table 2.**Proposal 4:** RAN4 to not specify any tests for transmission in PUR occasions. **Proposal 5:** RAN4 to specify performance test for RSS-based RSRP measurement in connected mode for serving cell with AWGN channel according to Table 3.  |
| R4-2011183 | Huawei, Hisilicon | **Proposal 1:** RAN4 to define RRM test for PUR related requirements: Tx timing accuracy and RSRP changed based TA validation.**Proposal 2:** RAN4 to define RRM tests for RLM and event E1 reporting based on improved MPDCCH performance.**Proposal 3-1:** RAN4 to define RRM tests for relaxed serving cell monitoring.**Proposal 3-2:** RAN4 to define RRM tests for cell reselection, event triggered reporting and measurement accuracy for RSS based RSRP measurement.**Proposal 4:** RAN4 to define RRM tests for DL channel quality reporting for both Msg3 based reporting in idle mode and MAC CE based reporting in connected mode. |
| R4-2011205 | Ericsson | **Proposal #4:** RAN4 shall reuse existing test configurations (RMCs and OCNGs) for defining new test cases. **Proposal #5:** Test case discussions are summarized as follows: |

## Open issues summary

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

### Sub-topic 6-1: Test for DL channel quality reporting

*Sub-topic description:*

*Open issues and candidate options before e-meeting:*

**Issue 6-1: Test for DL channel quality reporting**

* Proposal 1: RAN4 shall define test for channel quality reporting
* Proposal 2:RAN4 to define RRM tests for DL channel quality reporting for both Msg3 based reporting in idle mode and MAC CE based reporting in connected mode.
* Proposal 3: New test case in IDLE mode needed and CONNECTED mode needed
* Recommended WF
	+ Try to agree on proposal 2 which seem to capture all other proposals.

**Issue 6-2: Test parameters for DL channel quality reporting**

* Proposals 1: **RAN4 to specify performance tests for DL channel quality reporting in 4-bit reporting mode according to Table 1.**

Table 1 4-bit DL channel quality reporting tests for idle and connected states

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Index | State | Mode | Test | Note |
| 1 | Idle | A | AL = 24, RP > 1 | Tests for FDD/HD-FDD/TDD, AWGN |
| 2 | Idle | B | AL = 24, RP > 1 | Tests for FDD/HD-FDD/TDD, AWGN |
| 3 | Connected | A | AL < 24, RP = 1 | Tests for FDD/HD-FDD/TDD, AWGN |
| 4 | Connected | B | AL = 24, RP > 1 | Tests for FDD/HD-FDD/TDD, AWGN |

* Recommended WF
	+ Discussions needed

### Sub-topic 6-2: Test for preconfigured uplink resources

*Sub-topic description:*

*Open issues and candidate options before e-meeting:*

**Issue 6-3: Test for preconfigured uplink resources**

* Proposal 1: New test case to verify TA validation using two RSRP measurements.
* Proposal 2: RAN4 to not specify any tests for transmission in PUR occasions.
* Proposal 3: RAN4 to define RRM test for PUR related requirements: Tx timing accuracy and RSRP changed based TA validation.
* Recommended WF
	+ Discussions needed

### Sub-topic 6-3: Test for MPDCCH improvement

*Sub-topic description:*

*Open issues and candidate options before e-meeting:*

**Issue 6-4: Test for MPDCCH improvement**

* Proposal 1: **RAN4 to define RRM tests for RLM and event E1 reporting based on improved MPDCCH performance.**
* **Proposal 2: RAN4 to specify performance tests for MPDCCH performance improvement according to Table 2.**

Table 2 MPDCCH performance improvement tests

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Index | State | Mode | Test | Note |
| 1 | Non-DRX | A | RLM OOS | Tests for FDD/HD-FDD/TDD, AWGN |
| 2 | Non-DRX | B | RLM OOS | Tests for FDD/HD-FDD/TDD, AWGN |

* Proposal 3: **Introduce a new RLM test case to verify improved MPDCCH feature.**
* Recommended WF
	+ Introduce at least RLM OOS test cases with improved MPDCCH parameters.
	+ More discussions needed whether to introduce event E1 and regarding what scenarios to test exactly.

**Issue 6-5: Test for mobility enhancement**

* Proposal 1: RAN4 to specify performance test for RSS-based RSRP measurement in connected mode for serving cell with AWGN channel according to Table 3.
* Table 3 RSS-based RSRP measurements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Index | State | Mode | Test | Note |
| 1 | Connected | A | Non-BL  | Tests for FDD/HD-FDD/TDD, AWGN  |
| 2 | Connected | A | BL | Tests for FDD/HD-FDD/TDD, AWGN  |
| 3 | Connected | B | Non-BL | Tests for FDD/HD-FDD/TDD, AWGN  |
| 4 | Connected | B | BL | Tests for FDD/HD-FDD/TDD, AWGN  |

* Proposal 2: **RAN4 to define RRM tests for relaxed serving cell monitoring.**
* **Proposal 3: RAN4 to define RRM tests for cell reselection, event triggered reporting and measurement accuracy for RSS based RSRP measurement.**
* **Proposal 4:** New test case in CONNECTED mode needed to verify RSS measurement accuracy for the serving cell
* Recommended WF
	+ RAN4 agrees to introduce test for RSS measurement, but more discussions needed on the test case scenarios.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 2-1: Sub topic 2-2:….Others: |
| Qualcomm | Issue 6-1: Proposal 2 is fine.Issue 6-2: We think the list in Proposal 1 is a reasonable set and pre-conditions. Issue 6-3: We prefer option 2 and don’t know how practical test issues can be resolved as discussed in our paper. We’re open to sending an LS to RAN5 and soliciting their feedback if other companies insist on having tests for PUR. Issue 6-4: Generally, RAN4 does not mix two optional features in a test. We think testing RLM OOS is sufficient in terms of this enhanced feature and testing event E1 does not have much added value.Issue 6-5: We are ok with proposal 2 as well. However, we don’t think testing RSS-based measurement in both idle and connected mode is necessary.  |

### 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** |
|  | 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** | *Tentative agreements:**Candidate options:**Recommendations for 2nd round:* |

*Suggestion on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title**  | **Assigned Company,****WF or LS lead** |
|  |  |  |

### 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)

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 1-1: Sub topic 1-2:….Others: |
|  |  |

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation**  |
|  |  |