**3GPP TSG-RAN WG4 Meeting # 97-e R4-201XXXX**

**Electronic Meeting, 2 – 13 Nov., 2020**

**Agenda item:** 7.9.2 and 7.9.3

**Source:** Moderator (Samsung)

**Title:** Email discussion summary for [97e][216] NR\_eMIMO\_RRM

**Document for:** Information

# Introduction

*Briefly introduce background, the scope of this email discussion and provide some guidelines for email discussion if necessary.*

Rel-16 NR eMIMO WI (i.e., Enhancements on MIMO for NR) is a RAN1 leading WI with below major enhancement in RAN1 area, in which the following items are identified for having RAN4 RRM requirement impact, based on previous RAN4 discussion:

* Enhancements on multi-beam operation
	+ DL/UL beam indication with reduced latency and overhead
	+ Beam failure recovery for SCell
	+ L1-SINR measurement

In last RAN4 meeting (RAN#96e), main tasks within the RRM core work scope have completed. In the subsequent meetings, online discussion will focus on the eMIMO RRM performance requirement of the above aspects for Release-16.

*List of candidate target of email discussion for 1st round and 2nd round*

* 1st round: TBA
* 2nd round: TBA

As the rapporteur company for Rel-16 MIMO enhancement WI, we would like to suggest the following candidate target of 1st and 2nd round email discussion:

* 1st round: Collect more views on all topics and to get progress as much as possible:
* 2nd round: Based on results from 1st round, complete outstanding issues and reach the consensus for the WF.

# Topic #1: RRM Core Remaining Issues

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2014244Discussion on RRM requirements for Multi-TRP | Apple | **Proposal #1: Update in MRTD requirements for NR CA that UE may assume that all signals from all CCs and multi-TRxP will be received within CP in intra-band contiguous CA scenario.** |

## 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

***RRM core requirement maintenance: correction and clarification***

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

**Issue 1-1-1: Clarification of multi-TRxP in MRTD requirements (section 7.6.4) for intra-band contiguous CA**

* Proposals (Apple): Update in MRTD requirements for NR CA that UE may assume that all signals from all CCs and multi-TRxP will be received within CP in intra-band contiguous CA scenario.
* Recommended WF
	+ Based on the 1st round discussion. Companies may discuss on the necessity and the wording.

**Issue 1-1-2: Update the definition of PBFD and PCBD in NR-DC case when** **both PCell and PScell configured**

* Proposals (Apple): Update the definition of PBFD and PCBD (section 8.5) for SSB based CBD, CSI-RS based BFD and CBD in NR-DC with SCell.
* Recommended WF
	+ Companies’ views are collected in 1st round discussion.

**Issue 1-1-3: Clarification of L1-SINR reporting with CSI-RS based CMR and dedicated IMR configured**

* Proposals (Ericsson): update clarification on M=1 case when at least one of the two signalling configured.
* Recommended WF
	+ Based on the 1st round discussion. Companies may discuss on the necessity.

**Issue 1-1-4: Clean up CR for RRM core requirement on L1-RSRP measurement procedure**

* Proposals (Samsung): Add the missing part for L1-RSRP measurement procedure which are previously agreed but missing due to ITU submission.
* Recommended WF
	+ Companies’ views are collected in 1st round discussion. Other corrections may be added.

## Companies views’ collection for 1st round

### Open issues

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

### 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** |
| R4-2014245Apple | Company A |
| Company B |
|  |
| R4-2014246Apple | Company A |
| Company B |
|  |
| R4-2015826Ericsson |  |
| R4-2016029Samsung |  |

## 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:* |

*Recommendations on WF/LS assignment*

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| --- | --- | --- |
|  | **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**  |
| 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)

## 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 #2: eMIMO RRM Performance General

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2014756Discussion on RRM Performance part for Rel-16 NR eMIMO | Samsung | Proposal 1: RAN4 shall study on and complete Rel-16 eMIMO RRM performance part following the work scope in Table 1. |

## 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 2-1

***Work scope of RRM performance requirement***

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

**Issue 2-1-1: Work scope of RRM performance part**

* Proposals (Samsung): RAN4 shall study on and complete Rel-16 eMIMO RRM performance part following the work scope in the Table 1. (4756)



* Recommended WF
	+ Companies’ views are collected in 1st round discussion. Companies may discuss on the scope and the impact on the spec.

## Companies views’ collection for 1st round

### Open issues

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

### 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** |
| XXX | Company A |
| Company B |
|  |
| YYY | 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)

## 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 #3: L1-SINR 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** |
| R4-2014247Simulation results for L1-SINR Measurement accuracy | Apple | **Proposal #1: Define measurement accuracy for CMR based L1-SINR based on results from single shot measurement.****Proposal #2: Define measurement accuracy requirement for CMR based L1-SINR measurement as ±5 dB in FR1 and ±6.5 dB in FR2.** |
| R4-2014297Requirements for L1-SINR measurement accuracy | Qualcomm  | **Observation 1: Table 1 shows the statistics of L1-SINR simulation results in different scenarios.****Observation 2: Simulation results show +- 1.5 dB accuracy for all CMR + IMR scenarios and roughly +- 3 dB accuracy for CMR only scenarios.****Observation 3: The implementation margin for L1-RSRP measurement accuracy in FR2 is 1.5 dB higher than that in FR1.****Proposal 1: RAN4 uses following table to define the estimation accuracy requirements of L1-SINR.**

|  |  |  |
| --- | --- | --- |
|  | **FR1** | **FR2** |
| **CMR only** | **+- 5 dB** | **+- 6.5 dB** |
| **CMR + IMR** | **+- 3.5 dB** | **+- 5 dB** |

 |
| R4-2014603Discussion on L1-SINR measurement accuracy requirement | MediaTek | **Observation 1: For CMR only scenario, the L1-SINR measurement will become less inaccurate if either signal power is low (i.e. high SNR) or noise power is low (i.e. low SNR).****Proposal 1: For CMR only scenario, RAN4 need to evaluate L1-SINR accuracy requirement with side condition on Es/Iot = 25 dB, in addition to Es/Iot = -3 dB.****Proposal 2: For CMR only scenario L1- SINR for reporting, the absolute measurement accuracy is +/- 4.5 dB for FR1; +/- 4.5 dB for FR2 with side condition on CMR=-3dB.****Proposal 3: For SSB based CMR + NZP IMR L1-SINR for reporting, the absolute measurement accuracy is +/- 4 dB for FR1; +/- 4 dB for FR2 with side condition on CMR=-3dB and IMR=-3dB.****Proposal 4: For SSB based CMR + ZP-IMR L1-SINR for reporting, the absolute measurement accuracy is +/- 4 dB for FR1; +/- 4 dB for FR2 with side condition on CMR=-3dB and IMR=-3dB.****Proposal 5: For CSI-RS based CMR + NZP IMR L1- SINR for reporting, the absolute measurement accuracy is +/- 4 dB for FR1; +/- 4 dB for FR2 with side condition on CMR=-3dB and IMR=-3dB.****Proposal 6: For CSI-RS based CMR + ZP-IMR L1- SINR for reporting, the absolute measurement accuracy is +/- 4 dB for FR1; +/- 4 dB for FR2 with side condition on CMR=-3dB and IMR=-3dB.** |
| R4-2014758Simulation results summary for L1-SINR measurement accuracy | Samsung | **Summary of all submitted simulation results from interested companies for information.****It will be shared with companies for reference and submitted after all results updated** |
| R4-2014759Discussion on L1-SINR measurement accuracy requirement | Samsung | **Observation 1: Basically there are three levels of L1-SINR measurement accuracy for in total 5 scenarios: 1A, (2A, 2B), and (2C, 2D) respectively.****Observation 2: Very similar simulation results for L1-SINR measurement accuracy in both FR1 case and FR2 case.****Proposal 1: Under the normal condition, L1-SINR measurement accuracy is set to be +/-4.0dB for Scenario 1A; +/-3.5 dB for Scenario 2A and 2B; and +/-3.0dB for Scenario 2C and 2D.****Proposal 2: Under the extreme condition, L1-SINR measurement accuracy is set to be +/-5.0dB for Scenario 1A; +/-4.5 dB for Scenario 2A and 2B; and +/-4.0dB for Scenario 2C and 2D.****Proposal 3: Discuss on how to simplify the requirements scenarios/subsections in RAN4 for eMIMO performance part.** |
| R4-2015471Discussion on L1-SINR measurement accuracy requirements | Huawei, HiSilicon | **Proposal 1: It is suggested to define L1-SINR accuracy requirements based on the single shot L1-SINR measurement performance.****Proposal 2: It is suggested to define the L1-SINR accuracy requirements based on following five generalizes scenarios:*** + - **L1-SINR accuracy requirements with CSI-RS based CMR and no dedicated IMR configured**
		- **L1-SINR accuracy requirements with SSB based CMR and dedicated ZP-IMR configured**
		- **L1-SINR accuracy requirements with CSI-RS based CMR and dedicated NZP-IMR configured**
		- **L1-SINR accuracy requirements with SSB based CMR and dedicated ZP-IMR configured**
		- **L1-SINR accuracy requirements with CSI-RS based CMR and dedicated NZP-IMR configured**

**Proposal 3: For CMR only and CMR+ZP-IMR scenarios, the L1-SINR absolute accuracy requirements can be defined as +/-3.5dB under the side condition of CMR Es/Iot≥-3dB.****Proposal 4: For CMR only and CMR+ZP-IMR scenarios, the L1-SINR absolute accuracy requirements can be defined as +/-3.0dB under the side condition of CMR/IMR Es/Iot≥0dB.** |
| R4-2016239Simulation results of L1-SINR measurement accuracy | Nokia, Nokia Shanghai Bell | **The document has presented the simulation results of L1-SINR measurement accuracy for CMR-only, SSB+NZP-IMR, SSB+ZP-IMR, CSI-RS+NZP-IMR and CSI-RS+ZP-IMR.** |
| R4-2015827Simulation results of L1-SINR measurement accuracy | Ericsson | **Proposal 1: Derive L1-SINR measurement accuracy requirements based on the simulation results with M=1.****Proposal 2: After taking an average of companies simulation results, adopt the same methodology as L1-RSRP measurement accuracy to derive L1-SINR measurement accuracy 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 3-1

***Defining L1-SINR measurement accuracy requirement***

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

**Issue 3-1-1: Methodology for defining the L1-SINR accuracy requirements**

* Proposals
	+ Option 1: Reuse the same methodology of L1-RSRP requirement
	+ Option 2: Refer to the methodology of L1-RSRP requirement
* Recommended WF
	+ Companies’ views are collected in 1st round discussion. The difference between defining absolute accuracy requirement and relative accuracy requirement could be discussed.

**Issue 3-1-2: Alignment of companies’ simulation result for L1-SINR accuracy requirement**

* Proposals: Companies could clarify their simulation results and try to align the results based on which the accuracy requirement could be defined.
* Recommended WF
	+ Companies’ views are collected in 1st round discussion.

**Issue 3-1-3: Accuracy requirements of L1-SINR under normal condition**

* Proposals
	+ Option 1: For Scenario 1A: ±5 dB in FR1 and ±6.5 dB in FR2; for CMR + IMR: ±3.5 dB in FR1 and ±5 dB in FR2
	+ Option 2: For Scenario 1A: ±4.5 dB in FR1 and ±4.5 dB in FR2; for CMR + IMR: ±4 dB in FR1 and ±4 dB in FR2
	+ Option 3: +/-4.0dB for Scenario 1A; +/-3.5 dB for Scenario 2A and 2B; and +/-3.0dB for Scenario 2C and 2D
	+ Option 4: +/-3.5dB for Scenario 1A, 2A and 2B; and +/-3.0dB for Scenario 2C and 2D
* Recommended WF
	+ Companies’ views are collected in 1st round discussion. Companies may support one of the options or propose their values in the comments.

**Issue 3-1-4: Difference of accuracy requirements of L1-SINR between FR1 and FR2**

* Proposals
	+ Option 1: No obvious difference as it is SINR
	+ Option 2: Consider RF margin 1.5dB higher for FR2 than FR1
* Recommended WF
	+ Companies’ views are collected in 1st round discussion.

**Issue 3-1-5: Accuracy requirements of L1-SINR under extreme condition**

* Proposals
	+ Option 1: 1dB higher for extreme condition than normal condition
	+ Option 2: Other values
* Recommended WF
	+ Companies’ views are collected in 1st round discussion.

### Sub-topic 3-2

***Settings for L1-SINR measurement accuracy requirement***

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

**Issue 3-2-1: Measurement samples for defining L1-SINR accuracy requirements**

* Proposals
	+ Option 1: L1-SINR accuracy requirements is defined based on the single shot L1-SINR measurement performance, i.e. M = 1.
	+ Option 2: Other values.
* Recommended WF
	+ Support M = 1, i.e. L1-SINR accuracy requirements is defined based on the single shot L1-SINR measurement performance.

**Issue 3-2-2: Side condition of Ês/Iot for accuracy requirement**

* Proposals
	+ Option 1: -3dB for Scenario 1A, 2A and 2B; 0dB for Scenario 2C and 2D
	+ Option 2: -3dB for all scenarios
* Recommended WF
	+ Companies’ views are collected in 1st round discussion.

**Issue 3-2-3: Io condition of dBm/BWChannel for accuracy requirement**

* Proposals
	+ Option 1: Define accuracy requirement for “Max Io -50 dBm” only
	+ Option 2: Define accuracy requirement for “Max Io -70 dBm” and “Min Io -70 dBm + Max Io -50 dBm”
* Recommended WF
	+ Companies’ views are collected in 1st round discussion.

### Sub-topic 3-3

***Spec structure for L1-SINR measurement accuracy requirement***

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

**Issue 3-3-1: Scenarios for L1-SINR measurement accuracy requirement in the spec**

* Proposals
	+ Option 1: Each scenarios (1A, 2A, 2B, 2C, 2D) for one sub-section.
	+ Option 2: Simplify the scenarios/subsections for accuracy requirement
		- Option 2a: Combine scenarios with the same requirement and side condition into one subsection ([1A], [2A, 2B], [2C, 2D]).
		- Option 2b: other spec structures
* Recommended WF
	+ Companies’ views are collected in 1st round discussion. Companies may propose their preference and the reason.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 3-1: Sub topic 3-2:….Others: |

### 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** |
| R4-2016240Nokia, Nokia Shanghai Bell | Company A |
| Company B |
|  |
|  | Company A |
| Company B |
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## 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:* |

*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*

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| --- | --- |
| **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)

## 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 #4: Test Case for L1-SINR Measurement

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2014604Discussion on test cases for L1-SINR measurement | MediaTek | **Observation 1: In current TS 38.133 specification, the CSI-RS resources set are configured with “repetition=OFF” in all L1-RSRP measurement test case.****Proposal 1: For procedure and performance requirement, to define the NZP CSI-RS based L1-SINR measurement test case as NZP CSI-RS with “repetition=OFF” rather than “repetition=ON”.****Proposal 2: Regarding the L1-SINR measurement procedure, to define the test case with NZP CSI-RS as IMR rather than with CSI-IM as IMR.****Proposal 3: For CMR only scenario, no need to define the test case for the measurement procedure** |
| R4-2015472Discussion on L1-SINR measurement tests for NR eMIMO | Huawei, HiSilicon | **Proposal 1: It is suggested to define 5 L1-RSRP measurement test cases in sections A.4.6, A.4.7, A.5.6, A.5.7, A.6.6, A.6.7, A.7.6 and A.7.7. And the structure of L1-RSRP measurement test cases could be defined as follows: see the table in R4-2015472.****Proposal 2: The L1-RSRP measurement test setups are proposed as Table 2.****Proposal 3: CSI-IM configurations and one type of aperiodic CSI-RS configuration with repetition=off need to be introduced as IMR.** |

## 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 4-1

***Spec structure for L1-SINR measurement procedure test cases***

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

**Issue 4-1-1: Scenarios defined for L1-SINR measurement procedure test cases in the spec**

* Proposals
	+ Option 1: All scenarios are defined follow the same methodology as L1-RSRP, i.e. (5 scenarios x 2 FR x 2 DRX)
	+ Option 2: Simplify the test scenarios defined for the test
		- Option 2a: Each scenario (1A, 2A, 2B, 2C, 2D) corresponding to either DRX and non-DRX
		- Option 2b: Define the test case with NZP-CSI-RS as IMR for dedicated IMR scenario and not to define the tests with CSI-IM as IMR.
		- Option 2c: For dedicated IMR scenario, only define (non-DRX x CSI-IM IMR) and (DRX x CSI-RS IMR) test case
		- Option 2d: other solutions
* Recommended WF
	+ Companies’ views are collected in 1st round discussion.

**Issue 4-1-2: Whether to define test cases for CMR only scenario**

* Proposals
	+ Option 1: Define test cases for CMR only scenario
	+ Option 2: Do not define test cases for CMR only scenario
* Recommended WF
	+ Companies’ views are collected in 1st round discussion.

### Sub-topic 4-2

***Settings for L1-SINR measurement procedure test cases***

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

**Issue 4-2-1: Repetition configuration for NZP-CSI-RS based L1-SINR measurement test case**

* Proposals
	+ Option 1: Repetition = off
* Recommended WF
	+ Support Repetition = off for all cases in L1-SINR measurement test case.

**Issue 4-2-2: IMR configuration for L1-SINR measurement test case**

* Proposals
	+ Option 1: CSI-IM configurations and one type of aperiodic CSI-RS configuration with repetition=off need to be introduced in 38.133 Annex A
	+ Option 2: Other solutions
* Recommended WF
	+ Companies’ views are collected in 1st round discussion.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 4-1: Sub topic 4-2:….Others: |

### 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** |
| R4-2014291Qualcomm  | Company A |
| Company B |
|  |
| R4-2014757Samsung | Company A |
| Company B |
|  |
| R4-2015473Huawei, HiSilicon |  |
|  |  |

## 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:* |

*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**  |
| 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)

### 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** |
| R4-2014292Qualcomm  | Company A |
| Company B |
|  |
| R4-2015474Huawei, HiSilicon | Company A |
| Company B |
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## 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 #5: Test Case for Scell Beam Failure Recovery

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2014605Discussion on test cases for SCell BFR | MediaTek | **Observation 1: Only consider the periodic CSI-RS as BFD-RSs for SCell BFR in test case.****Proposal 1: To configure CSI-RS resources as CBD-RSs in FR2****Proposal 2: To introduce test cases for Beam Failure Detection and Link Recovery with the following cases:****• FR1 SCell configured with CSI-RS based BFD and SSB-based CBD in non-DRX mode****• FR2 SCell configured with CSI-RS based BFD and CSI-RS-based CBD in non-DRX mode****• FR1 SCell configured with CSI-RS based BFD and SSB-based CBD in DRX mode****• FR2 SCell configured with CSI-RS based BFD and CSI-RS-based CBD in DRX mode****Observation 2: The test for “BFD and link recovery procedure” and “Link Recovery with Link Recovery Request (LRR)” are ending up with performing random access procedure and PUCCH transmission, respectively.****Proposal 3: To check the PRACH transmission as the test requirement in test case “BFD and link recovery procedure”** |
| R4-2015828Link recovery test with link recovery requests | Ericsson | **Proposal 1: RAN4 defines two test cases for link recovery in SCell.** **• Scenario 1: Network does not configure PUCCH for SR for BFR MAC CE****• Scenario 2: Network configures PUCCH for SR for BFR MAC CE****Proposal 2: Test setup of two scenarios, e.g., time duration, q0/q1 configuration, are common for both scenarios.****Proposal 3: Scenario 1 does not configure PUCCH as same as the existing BFR tests on PCell/PSCell, although Scenario 2 configures PUCCH for SR for BFR MAC CE. It verifies UE transmits RACH for SR, followed by BFR MAC CE containing a beam associated with the candidate beam set q1.****Proposal 4: Scenario 2 verifies UE transmits PUCCH with an LRR, followed by BFR MAC CE containing a beam associated with the candidate beam set q1.** |

## 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

***Spec structure for Scell Beam Failure Recovery test cases***

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

**Issue 5-1-1: Scenarios defined for Beam Failure Recovery test cases**

* Proposals
	+ Option 1:
		- Scenario 1: Network does not configure PUCCH for SR for BFR MAC CE
		- Scenario 2: Network configures PUCCH for SR for BFR MAC CE
	+ Option 2: Other solutions
* Recommended WF
	+ Companies’ views are collected in 1st round discussion. Also the subsection titles for the test should be defined.

**Issue 5-1-2: The setting of cases to be defined for each scenario**

* Proposals
	+ Option 1: Define setting combination for each scenario as table below

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Mode** | **BFD-RSs** | **DRX** | **FR** | **CBD-RSs** |
| ED-DC / Standalone (SA) | CSI-RS | non-DRX | FR1 | SSB |
| FR2 | CSI-RS |
| DRX(40 ms for FR1 and640 ms for FR2) | FR1 | SSB |
| FR2 | CSI-RS |

* + Option 2: Other combinations
* Recommended WF
	+ Companies’ views are collected in 1st round discussion. Maintain the necessary cases and try to reduce the total number.

### Sub-topic 5-2

***Defining Scell Beam Failure Recovery test cases***

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

**Issue 5-2-1: Configuration for Beam Failure Recovery test cases**

* Proposals
	+ Option 1: Reuse the same test parameters for both scenarios with the same setting
	+ Option 2: Other solutions
* Recommended WF
	+ Companies’ views are collected in 1st round discussion.

**Issue 5-2-2: UE behaviour of BFR for the scenario dedicated PUCCH is not configured**

* Proposals
	+ Option 1: UE shall transmit preamble on a beam associated with the candidate beam set q1.
	+ Option 2: UE shall transmit preamble on a beam followed by BFR MAC CE containing a beam associated with the candidate beam set q1.
* Recommended WF
	+ Companies’ views are collected in 1st round discussion. This is a somewhat new requirement, UE behaviour should be clarify in the test.

**Issue 5-2-3: UE behaviour of BFR for the scenario dedicated PUCCH is configured**

* Proposals
	+ Option 1: UE shall transmit PUCCH with LRR, followed by BFR MAC CE containing a beam associated with the candidate beam set q1.
* Recommended WF
	+ Companies’ views are collected in 1st round discussion. This is a somewhat new requirement, UE behaviour should be clarify in the test.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 5-1: Sub topic 5-2:….Others: |

### 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** |
| R4-2014606MediaTek | Company A |
| Company B |
|  |
| R4-2015829Ericsson | 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:* |

*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**  |
| 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)

## 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: Test Case for Pathloss RS Activation Delay

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2014010Test cases for applicable timing for PL RS activated by MAC-CE | ZTE  | **Proposal 1: Test cases for MAC-CE based pathloss RS activation delay shall be defined in TS 38.133.****Proposal 2: Endorse draft CR [4]. (R4-2014011)****Proposal 3: Define test cases for both FR1 and FR2.** |
|  |  |  |

## 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

***Defining Pathloss RS Activation Delay Test Case***

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

**Issue 6-1-1: Whether to define the test case for MAC-CE based pathloss RS activation delay**

* Proposals
	+ Option 1: Define the test case
	+ Option 2: Do not define the test case
* Recommended WF
	+ Companies’ views are collected in 1st round discussion.

**Issue 6-1-2: How to define the test case for MAC-CE based pathloss RS activation delay**

* Proposals:
	+ Option 1: Reflect the RS change by the power headroom report (PHR) from the UE
	+ Option 2: Other test methods
* Recommended WF
	+ Companies’ views are collected in 1st round discussion. RAN4 could discuss on testability and test method first.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 6-1: Sub topic 6-2:….Others: |

### 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** |
|  |  |
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## 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:* |

*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**  |
| 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)

### 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** |
| R4-2014011ZTE | Company A |
| Company B |
|  |
|  |  |
|  |
|  |

## 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”* |