**3GPP TSG-RAN WG4 Meeting # 111 R4-24XXXXX**

**Fukuoka, Japan, May 20th ‒ 24th, 2024**

**Agenda item: 7**.8.8

**Source:** Moderator (Nokia)

**Title:** Topic summary for [111][211] NR\_FR1\_lessthan\_5MHz\_BW

**Document for:** Information

# Introduction

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

# Topic #1: RRM core requirement maintenance

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2408160 | Nokia | CR  BigCR for NR\_FR1\_lessthan\_5MHz\_BW |
| R4-2408662 | Nokia | Draft CR  Summary of changes:   * Update 6.1.1.2.2 according to RAN4#110bis   Moderator Comment: Change in 6.1.1.2.2 is already captured in the endorsed Big CR from last meeting – Correct?   * Remove brackets from Table 8.1.2.1-3 * Remove brackets from Table 8.1.2.1-4 * Remove brackets from Table 8.5.2.1-2 * Remove brackets from Table 9.2.6.1-12 * Remove brackets from Table 9.3.4-11 * Remove brackets from Table 9.3.9.1-5 |
| R4-2409260 | Huawei, HiSilicon | Draft CR  Reason for change:  In RAN4#110-bis, the impact of PBCH puncture to HO requirements are agreed in R4-2406330. The change is only to 6.1.1.2.2 for FR1-FR1 HO, and same change is also needed for FR2-FR1 HO where FR1 target cell may be operating with 12 PRB SSB BW.  Summary of change:  Introduce same change as in R4-2406330 to FR2-FR1 HO.  Moderator comment: introduce same changes in 6.1.1.3.2 as is introduced into section 6.1.1.2.2. |
| R4-2409710 | Ericsson | Proposal 1: RAN4 to add following clarification in HO requirements section.  a. T∆ is time for fine time tracking, acquiring full timing information, SSB index reading and MIB reading of the target cell. |
| R4-2409711 | Ericsson | Draft CR  Summary of change:  Clarification to T\_Delta in HO requirements  Moderator comment: implemeting the proposal in R4-2409710 |

## Open issues summary

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

### Sub-topic 1-1

Sub-topic description:

Clarification of T∆ during handover.

Open issues and candidate options before meeting:

**Issue 1-1: Clarify T∆ during handover by adding ‘SSB index reading and MIB reading’**

* Proposals
  + Option 1: Agree on the clarification for ‘T∆’ as proposed in R4-2409710
  + Option 2: More discussion needed.
* Recommended WF
  + This was discussed and agreed to add a clarification in the requirements. However, the wording was left FFS in RAN4#110bis and agreed to further discuss and agree on the wording in RAN4#111 meeting.
  + Agree on the principle in TP in R4-2409710. Further discuss any wording updates during CR drafting.

### Sub-topic 1-2

*Sub-topic description*

Removal of square brackets as proposed in R4-2408662

*Open issues and candidate options before meeting:*

**Issue 1-2: Removal of square brackets as proposed in R4-2408662**

* Proposals
  + Option 1: yes
  + Option 2: no
* Recommended WF
  + Remove the square brackets as proposed in R4-2408662

### Sub-topic 1-3

*Sub-topic description*

Include the agreed changes for FR1-FR1 HO in section 6.1.1.2.2 into section 6.1.1.3.2 FR2-FR1 HO.

*Open issues and candidate options before meeting:*

**Issue 1-2: Update FR2-FR1 HO section 6.1.1.3.2 as proposed in R4-2409260**

* Proposals
  + Option 1: yes
  + Option 2: no
* Recommended WF
  + Update section 6.1.1.3.2 FR2-FR1 HO with the agreed changes from FR1-FR1 HO as proposed in R4-2409260.

# Topic #2: RRM performance requirements

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2407303 | Apple | Draft CR  Add test case of FR1 intra-frequency handover to unknown target cell for less than 5MHz |
| R4-2408042 | Qualcomm | Draft CR  New test case for RLM IS performance of 15PRB and 12 PRB bandwidth |
| R4-2408663 | Nokia | Draft CR  Introducing common configurations for 12, 15 and 12 PRB  Intrdocuing a new test case RLM-1 Radio Link Monitoring (SSB-based, FR1): DRX, Out-of-sync, 12 PRBs |
| R4-2408664 | Nokia | Draft CR  Intrdocuing test case RLM-1 Radio Link Monitoring (SSB-based, FR1): DRX, Out-of-sync, 15 PRBs in non-DRX mode |
| R4-2408665 | Nokia | Draft CR  Intrdocuing test case Cell reselection to FR1 intra-frequency NR for UE operating on a cell with less than 5MHz BW |
| R4-2408666 | Nokia | Discussion Paper  Observation 1: Using reference test case approach, test cases are more readable and less error prone.  Proposal 1: Use the following principles for Less than 5MHz test cases:  I. Use existing general test parameter table except for those parameters that have changed.  II. Use existing cell specific test parameter table except for those parameters that have changed.  III. Add reference to unchanged sections.  IV. If test procedure has not changed, refer to legacy test case test procedure. |
| R4-2409261 | Huawei | Draft CR  Introduce TC MR-1 for intra-frequency measurement delay with SBI reading should be defined for less than 5MHz. |
| R4-2409712 | Ericsson | Discussion Paper  Proposal 1: RAN4 to decide on whether to use existing configuration with some clarification as a note or define new RMC table for PDSCH, RMSI, and UE specific PDCCH. If decided to use new tables, consider tables listed in this paper as baseline.  Proposal 2: RAN4 to define new OCNG table which is similar as legacy table. The table discussed above can be taken as baseline.  Proposal 3: RAN4 to consider at refereeing legacy test as a reference instead of capturing the same test procedure again. |
| R4-2409713 | Ericsson | Draft CR  Intrdocuing test case for Beam Failure Detection and Link Recovery Test for FR1 PCell configured with SSB-based BFD and LR in non-DRX mode |
| R4-2409749 | MediaTek | Draft CR  The change is to include test case:  Event-4 SA event triggered reporting, SSB based, Time period for time index detection:  - Inter-frequency  - DRX,  - gaps,  -15 PRBs |

## Open issues summary

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

### Sub-topic 2-1

Sub-topic description:

RAN4 to use the principle of referring to existing reference legacy test for the common aspects and define new test cases focusing on the new aspects differing from the reference legacy test case.

Open issues and candidate options before meeting:

**Issue 2-1: Use of reference test case principle?**

* Proposals
  + Option 1: Yes
  + Option 2: No
* Recommended WF
  + All companies have followed the proposed principle in the submitted Draft CRs.
  + Agree on using use the principle of referring to existing reference legacy test for the common aspects and define new test cases focusing on the new aspects differing from the reference legacy test case.

### Sub-topic 2-2

Sub-topic description:

RAN4 to define new OCNG table.

Open issues and candidate options before meeting:

**Issue 2-2: RAN4 to define new OCNG table which is similar as legacy table?**

* Proposals
  + Option 1: Yes
  + Option 2: No
* Recommended WF
  + Agree to the proposal: RAN4 to define new OCNG table which is similar as legacy table.
  + The table discussed in R4-2409712 can be taken as baseline.
  + Details on how to capture this in specification can be discussed in CR drafting.

### Sub-topic 2-3

*Sub-topic description*

*Open issues and candidate options before meeting:*

RAN4 to decide on whether to use existing configuration with some clarification as a note or define new RMC table for PDSCH, RMSI, and UE specific PDCCH. If decided to use new tables, consider tables listed in this paper as baseline.

**Issue 2-3:** **Use existing configuration with some clarification as a note or** **define new RMC table for PDSCH, RMSI, and UE specific PDCCH?**

* Proposals
  + Option 1: Use existing configuration with some clarification as a note?
  + Option 2: define new RMC table for PDSCH, RMSI, and UE specific PDCCH?
* Recommended WF
  + To maintain specification clarity and quality moderator suggest option 2, defining new tables for the necessary configurations. Two companies have provided input. Details on how to capture this in specification can be discussed in CR drafting.

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