**3GPP TSG-RAN WG4 Meeting #112 R4-24xxxxx**

**Maastricht, Netherlands, 19th – 23rd August 2024**

**Agenda item:** 8.4.4

**Source:** Moderator (Intel Corporation)

**Title:** Ad hoc minutes for [112][214] NR\_FR1\_lessthan\_5MHz\_BW\_Ph2

**Document for:** Decision

# Issues list

***RRM workplan***

**Issue 1-1-1 Workplan for RRM core parts**

***CA***

**Issue 2-1-1: SCell activation and deactivation delay requirements:**

**Issue 2-1-2: Measurement requirements for deactivated SCC:**

**Issue 2-1-3: Whether intra-band CA is in the scope:**

**Issue 2-1-4: IDLE mode CA measurement reporting:**

***DC***

**Issue 2-2-1: PSCell addition and release, conditional PSCell addition delay requirements:**

**Issue 2-2-2: PSCell change, conditional PSCell change delay requirements:**

**Issue 2-2-3: Handover with PSCell, conditional handover including target MCG and SCG:**

**Issue 2-2-4: SCG activation and deactivation delay requirements:**

***Others***

**Issue 2-3-1: NW indication on PBCH BW in MO configuration:**

**Issue 2-3-2: CGI reading:**

**Issue 2-3-3: EMR requirements:**

**Issue 2-3-4: requirements applicability:**

# Topic #1: RRM work plan

**Issue 1-1-1 Workplan for RRM core parts**

|  |  |
| --- | --- |
| Meeting | RRM |
| RAN4#112  Aug’24 | Discussions on   * Scope of RRM requirements for PSCell/SCell operating with 3MHz channel bandwidth   Agreements on   * Scope of RRM requirements |
| RAN4#112bis  Oct’24 | Discussions on   * RRM requirements for PSCell/SCell operating with 3MHz channel bandwidth * Possible draftCR contents   Agreements on   * RRM requirements for PSCell/SCell operating with 3MHz channel bandwidth * draftCR contents |
| RAN4#113  Nov’24 | Discussions on   * (continued) RRM requirements for PSCell/SCell operating with 3MHz channel bandwidth * CR contents   Agreements on   * RRM requirements for PSCell/SCell operating with 3MHz channel bandwidth * CR contents |

* Recommended WF
  + Endorse the RRM work plan.
* Discussions
* Agreement
  + The RRM work plan in the table is endorsed.

|  |  |
| --- | --- |
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| RAN4#112bis  Oct’24 | Discussions on   * RRM requirements for PSCell/SCell operating with 3MHz channel bandwidth * Possible draftCR contents   Agreements on   * RRM requirements for PSCell/SCell operating with 3MHz channel bandwidth * draftCR contents |
| RAN4#113  Nov’24 | Discussions on   * (continued) RRM requirements for PSCell/SCell operating with 3MHz channel bandwidth * CR contents   Agreements on   * RRM requirements for PSCell/SCell operating with 3MHz channel bandwidth * CR contents |

# Topic #2: RRM scope discussion

### Sub-topic 2-1 RRM scope for SCell configured with less than 5MHz bandwidth

**Issue 2-1-1: SCell activation and deactivation delay requirements:**

* Proposals
  + Option 1: Investigate if new SCell activation and deactivation delay requirements are needed to support less than 5MHz bandwidth in the target SCell in FR1.
  + Option 2: Specify new requirements for fine time tracking time which is included in the SCell activation delay requirements in FR1.
  + Option 3: RAN4 to decide the corresponding RRM requirement after RF session has concrete conclusions, e.g., whether or not we need multiple SCell activation, or whether or not more than 2 serving cells shall be considered in this inter-band CA with less than 5MHz.
* Recommended WF
  + Agree on option 1.
* Discussions

Qualcomm: both option 1 and option 2 are OK to Qualcomm.

Ericsson: Option 1 is preferred. We need to evaluate the SSB BW reduction impact on not only the time tracking but also on T\_firstSSB and T\_L1RSRP (needs averaging among PBCH DMRS results). for multiple SCell we should wait.

Apple: we propose Option 3 in parallel to option 1. We should start from single SCell cases. I d check if this new scope is about all the SCell activation cases? Rather we should focus on single SCell simple cases first.

ZTE: Option 1 and 2 are both OK to us. Option 1 is general.

Nokia: OK to option 1 and 2.

Intel: on option 3: current RF discussion focuses two carrier discussions. The work is going to complete in RF session in this meeting.

* Agreement
  + Specify new SCell activation delay requirements to support less than 5MHz bandwidth in the target SCell in FR1.
* Agreement
  + Start from single SCell activation delay requirements.

**Issue 2-1-2: Measurement requirements for deactivated SCC:**

* Proposals
  + Option 1: RAN4 to discuss the impacts of less than 5MHz, in particular PBCH puncturing, to SSB index reading in deactivated SCC measurement.
  + Option 2: Specify time period requirements for time index detection for UE operating on a target cell with less than 5MHz SSB for deactivated SCell measurements in FR1.
* Recommended WF
  + Agree on option 1 or 2.
* Discussions
* Agreement
  + Specify SSB index identification delay requirements for UE with deactivated SCell measurements on a target cell with less than 5MHz SSB BW in FR1, taking into consideration the impacts from PBCH puncturing.

**Issue 2-1-3: Whether intra-band CA is in the scope:**

* Proposals
  + Option 1: Consider intra-band CA (both contiguous and non-contiguous) within the scope of the RRM requirements in Rel-19.
  + Option 2: Wait until RF room has concrete conclusion on intra-band CA combinations.
* Recommended WF
  + Discussion is needed.
* Discussions

MTK: wait for RF to complete.

Ericsson: consider option 3: intra-band CA is out of the scope of the WI.

Moderator: RF does not specify intra-band CA requirements in Rel-19.

Intel: RF only considers inter-band cases but there are potential requests from CoSP on intra-band cases also. RRM work should be generic to both intra-band and inter-band cases on requirements. We should do the work.

Huawei: do we know what is the impact to differentiate intra-band and inter-band cases? Maybe all are the same.

ZTE: same view to Ericsson. WID includes only inter-band cases.

Qualcomm: No impact whether to differentiate between intra- and inter- cases.

Intel: Huawei makes good points. We should not discuss it and introduce generic requirements.

**Issue 2-1-4: IDLE mode CA measurement reporting:**

* Proposals
  + Option 1: For 3MHz channel bandwidth, N2=[3+3] if the NR inter-frequency carrier for idle mode CA/DC measurement reporting is in FR1.
* Recommended WF
  + Discussion is needed.
* Discussions

### Sub-topic 2-2 RRM scope for PSCell configured with less than 5MHz bandwidth in NR-DC

**Issue 2-2-1: PSCell addition and release, conditional PSCell addition delay requirements:**

* Proposals
  + Option 1: Specify new PSCell addition delay requirements for PSCell configured with less than 5MHz channel bandwidth.
* Recommended WF
  + Agree on option 1.
* Discussions

**Issue 2-2-2: PSCell change, conditional PSCell change delay requirements:**

* Proposals
  + Option 1: RAN4 to discuss the impacts of less than 5MHz, in particular PBCH puncturing, to PSCell change delay requirements.
* Recommended WF
  + Agree on option 1.
* Discussions

**Issue 2-2-3: Handover with PSCell, conditional handover including target MCG and SCG:**

* Proposals
  + Option 1: SSB index acquisition of less than 5MHz cell can be extended in legacy requirement.
* Recommended WF
  + Agree on option 1.
* Discussions

**Issue 2-2-4: SCG activation and deactivation delay requirements:**

* Proposals
  + Option 1: Need FFS, if target PSCell is using 3MHz, the SSB index acquisition of less than 5MHz cell may extend the PSCell change requirement.
* Recommended WF
  + Agree on option 1.
* Discussions

### Sub-topic 2-3 Other RRM impacts

**Issue 2-3-1: NW indication on PBCH BW in MO configuration and/or HO command:**

* Proposals
  + Option 1: RAN4 to discuss whether NW indication on PBCH BW in MO configuration is needed considering a cell with less than 5MHz can be SCell.
  + Option 2: If SCell can use 12PRB SSB bandwidth in R19, it’s necessary to provide assistance information to UE regarding whether the PBCH is 12 or 20 PRBs in either MO or HO command.
* Recommended WF
  + Discussion is needed.

**Issue 2-3-2: CGI reading:**

* Proposals
  + Option 1: RAN4 to discuss and decide whether CGI reading is considered for less than 5MHz.
* Recommended WF
  + Discussion is needed.

**Issue 2-3-3: EMR requirements:**

* Proposals
  + Option 1: RAN4 to Study the Cell detection requirements in EMR measurements for less than 5MHz.
  + Option 2: RAN4 to study impact of reduced PBCH BW of 12PRBs for 3MHz channel bandwidth on EMR measurement with SSB index reading.
* Recommended WF
  + Discussion is needed.

**Issue 2-3-4: requirements applicability:**

* Proposals
  + Option 1: the features/scenarios not considered in R18 less than 5MHz RRM shall not be discussed in R19 CA/DC with less than 5MHz band, e.g., CSI-RS based L1/L3/RLM/BFD/CBD measurement.
* Recommended WF
  + Discussion is needed.