**3GPP TSG-RAN WG4 Meeting # 111 R4-2410269**

**Fukuoka City, Fukuoka, Japan, 20th - 24th May, 2024**

**Agenda item:** 7.24.4

**Source:** Huawei, HiSilicon

**Title:** WF on RRM requirements for NR network energy saving

**Document for:** Approval

# Topic #1: Core requirements maintenance

### Sub-topic 1-1 SSB-less related

**Issue 1-1-1: Power difference conditions**

**Agreement:**

Clarify that EPRE difference is based on the EPRE normalized by SCSs of SSB of reference Cell and A-TRS/P-TRS of SSB-less Cell.

Only change [9] dB to 12 [dB] in this meeting.

Further discuss whether and how to support larger EPRE difference in next meeting:

* Option 1: Clarify that EPRE difference is smaller or equal to [12] dB + |20\*log (f1/f2)| - Margin, where f1 and f2 is the center frequency of reference Cell and SSB-less Cell and the value of Margin is FFS.
* Option 2: Further increase [12] dB and the value is FFS
* Option 3: Update the requirements with one more P-TRS sample for larger EPRE difference
* Other options are no precluded.

**Issue 1-1-2: Requirements applicability when multiple P-TRS are configured.**

**Agreement:**

The TRS used for activation shall be the one QCLed typeC with the SSB indirectly associated with the active TCI for PDCCH/PDSCH DMRS at reference cell

Note: The wording can be further improved and identify the potential spec impact if needed.

**Issue** **1-1-3: Multiple SSB-less SCells activation**

**Agreements:**

* + Also define requirements for following scenario:
    - When all to-be-activated SCells are SSBless on the same band and SCells are contiguous.
    - All to-be-activated SCells have same QCL source cell.
    - P-TRS is used.
      * Option 1: The multiple SCell activation delay requirements are based on TRS with the shortest periodicity. The detailed requirements can be discussed in the CR.
      * Option 2: UE activate each to-be-activated SCell based on the TRS on the SCell, and the requirements to be defined accordingly (i.e. single CC delay)
    - FFS A-TRS based requirements.

**Issue 1-1-5: Relation to R15 intra-band SSB-less**

**Agreement:**

From RAN4 understanding, for UE supports both R18 inter-band SSB-less and R15 intra-band contiguous SSB-less,

* It is not expected that the to-be-activated SCell is configured with QCL source to both intra-band contiguous and inter-band Cells [when the Rel-18 reference cell indication is not configured].
  + When R18 reference cell indication is configured, network configure with QCL source to both intra-band contiguous and inter-band Cells, there is no RAN4 agreement on whether Rel-15 or Rel-18 requirement is applied.
  + The above RAN4 understanding does not intend to trigger any further RAN2 discussion.

### Sub-topic 1-2 NES-based CHO related

**Issue 1-2-1: When CHO condition is not met anymore**

Discussed in CR directly.

# Topic #2: Performance part for NES – SSB-less

### Sub-topic 2-1 Requirements maintenance

**Issue 2-1-1: Test configurations for SSB-less – EPRE**

Discussed in CR directly.

**Issue 2-1-2: Test configurations for SSB-less – BW and SCS**

Discussed in CR directly.

**Issue 2-1-3: Test configurations for SSB-less – Reference Cell determination**

Discussed in CR directly.

# Topic #3: Perf: Performance part for NES - Others

**Issue 3-1-1: NES Cell DTX test case**

**Proposals:**

* + Option 1: For cell DTX test case, the TAT is set to 1280ms, and the UE shall be scheduled with PUSCH at every cell DTX cycle. (vivo)
  + Option 2: RAN4 confirms whether TE can allocate UL resources based on UE’s PRACH or SR in cell DTX inactive time. (vivo)