**3GPP TSG-RAN4 Meeting #106 *R4-2303264***

**Athens, Greece, 27th Feb. – 3rd March, 2023**

**Agenda item:** 5.2.5.2, 5.2.5.3

**Source:** Moderator (Ericsson)

**Title:** WF on R17 RedCap RRM maintenance

**Document for:** Approval

### PTW length for measurements with relaxation

**Minimum PTW length for measurements when relaxation criteria is met**

* + - For DRX=1.28, K3=4 and N1=4 at for the Tevauate.
		- For DRX=2.56,
			* Do not explicitly reduce/state the N1 or K3 values and for 2.56 s DRX cycle, for Tmeasure and Tevaluate, the PTW shall not exceed 40.96 sec.

### Applicability of eDRX for Rel-16 RRM relaxation for RedCap

**eDRX for Rel-16 RRM relaxation for RedCap**

RAN4 shall follow the same approach used to define the requirements of eDRX with Rel-17 stationary measurement relaxation to define the requirements for eDRX with Rel-16 low mobility and not-at-cell edge measurements relaxation for Rel-17 RedCap.

### Mobility procedures with NCD-SSBs

**Handover to a BWP with unmeasured SSB of a known cell**

* No conclusion on whether to add following condition on Tx power of the SSB of the target and measured SSBs:
	+ Option 1: Add condition on assumption on the TX power of the SSB of the target SSB and measured SSB as follows (underlined highlighted text is the addition to previous agreement).
		- For the case when the UE performs measurement on a SSB and handover to a BWP with un-measured SSB, the following apply:
			* The requirements apply for the scenario where the measured SSB and the SSB in the target BWP for HO belong to the same target cell, i.e., they share the same physCellID (PCI)
			* UE may assume that the TX power of the SSB of the target cell’s active BWP is same as that of the measured SSBs that belong to the same PCI
		- Note: the above agreement is for RedCap, where the measured SSB and the target SSB for HO of the same target cell are:
			* NCD-SSB and NCD-SSB, respectively
			* CD-SSB and NCD-SSB, respectively
			* NCD-SSB and CD-SSB, respectively
		- One additional sample is needed for known inter-frequency handover.

**Revision of the intra/inter-frequency definition in handover**

* No conclusion on whether to add following definition to handover requirement
	+ Option 1: Handover for a RedCap UE is defined as intra-frequency handover if the center frequency and subcarrier spacing (SCS) of the reference SSB of the serving cell is same as the center frequency and SCS of the reference SSB of the target cell, where:
		- The reference SSB of the serving cell is the SSB configured in the *BWP-specific* *servingCellMO*, if configured, else the SSB configured in the *servingCellMO*
		- The reference SSB of the target cell is the SSB configured in the *firstActiveBWP* of the target cell

**Intra-frequency cell measurement**

* Discuss whether to add follow condition to intra-frequency measurement:
	+ UE is not required to perform intra-frequency cell detection if the intra-frequency cell is already detected, where an intra-frequency cell is regarded as already detected if it has been meeting the following conditions:

-The MO with the same SSB frequency has already be configured, and

FFS on the following:

* the UE has sent a valid measurement report for the MO with the same frequency, and
* the SSB measured remains detectable according to the cee identification conditions specified in clause 9.2 and 9.3

**Revision of the intra/inter-frequency definition in RRC re-establishment**

* No consensus to add following definition in RRC re-establishment requirement:
	+ Option 1: A neighbor cell for RRC re-establishment procedures for a RedCap UE is defined as an intra-frequency cell if the center frequency (and subcarrier spacing (SCS)) of the reference SSB of the serving cell is same as the center frequency (and SCS) of the reference SSB of the neighbor cell; else it is considered as inter-frequency cell, where:
		- The reference SSB of the target cell is the CD-SSB of the target cell
		- The reference SSB of the serving cell is
			* Option 1: SSB configured in the *BWP-specific* *servingCellMO*, if configured, else the SSB configured in the *servingCellMO*
			* Option 2: CD-SSB of the serving cell
			* Option 3: SSB within the active BWP

### Others

**Inter-frequency cell reselection margin**

* For 1Rx RedCap UEs, relax the margin for inter-frequency and intra-frequency cell selection criteria by 1db to the following values:
	+ [6 dB] in FR1 or for reselections based on ranking or
	+ [7 dB] in FR1 for SS-RSRP reselections based on absolute priorities or
	+ [5 dB] in FR1 for SS-RSRQ reselections based on absolute priorities

# Performance part

### Applying of offset

**Offset for low mobility and stationary relaxed measurement criteria thresholds**

* Agreements

Remove the offset from s-SearchDeltaP-r16 and s-SearchDeltaP-Stationary-r17.

**Offset for cell selection and not-at-cell-edge criteria thresholds**

No consensus on whether to remove the offset from all not-at-cell-edge criteria thresholds. Following options were discussed.

* + Option 1: Remove the offset from all not-at-cell-edge thresholds.
	+ Option 2: RAN4 to keep the current offset value determined in previous RAN4 meetings.
		- Option 2a: Keep the offset and change it to +2dB for all not-at-cell-edge thresholds.
	+ Option 3:
		- Keep current RAN4 agreed offsets for *SearchThresholdP-r16* and *s-SearchThresholdP2-r17*
		- Remove the offset from the thresholds *SearchThresholdQ-r16* and *s-SearchThresholdQ2-r17*.
	+ Option 4: Apply “0 dB” 1 Rx. RedCap offset to *Qrxlevmin* and *Qqualmin*

**Offset for missing thresholds:** *rsrp-ThresholdSSB-SUL*

* No consensus on whether to apply the offset to following threshold. Following options were discussed.
	+ Option 1: Add +1 dB of offset to *rsrp-ThresholdSSB-SUL*.
	+ Option 2: not to consider an offset for *rsrp-ThresholdSSB-SUL* as this threshold is not applicable to RedCap UE’s.

**Offset for missing thresholds:** *rsrp-ThresholdMsg3*

* + Add +1 dB of offset to *rsrp-ThresholdMsg3.*