**3GPP TSG-RAN WG4 Meeting #104-e R4-2212689**

**Electronic Meeting, August 15 – August 26, 2022**

**Title:** LS on active TCI state list for UL TCI

**Response to:**

**Release:** Rel-17

**Work Item:** NR\_feMIMO-Core

**Source:** RAN WG4

**To:** RAN WG1/WG2

**Cc:**

**Contact Person:**

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**Attachments:**

**1. Overall Description:**

In RAN4 #103-e meeting, RAN4 has discussed active TCI list with UL TCI switching with path loss measurements.

A problem is found related to ‘active’ TCI state for ‘UL’ (which can be either UL TCI state or joint TCI state). For DL case, if target TCI state is in the activated TCI state list for PDSCH/PDCCH, the UE should track time and frequency sync on the resource RS. However, there is no statement for UL TCI corresponding to the activated TCI list. RAN1 also agreed that UE shall maintain path loss reference signal for all activated UL (or Joint) TCI states. But this causes some ambiguities as RAN4 has to defined requirements for what UE does when it's requested to use (UL or Joint) TCI state for which UE has or has not maintained the PL-RS:

1. If UE has an active UL (or joint) TCI state , should a UE track UL TCI state timing or frequency derived from DL-RS associated with TCI state in the same way as the UE does for activated DL TCI?

i-1. Which DL-RS can be used to track timing or frequency for activated UL TCI for non-serving cell (i.e. additional PCI(s) associated with a serving cell)? Specifically, how can a UE track timing or frequency for an active UL TCI state if SRS is indicated as source RS for the UL TCI?

1. If UE maintains the PL-RS of the active UL TCI state (or joint) TCI state as per the RAN1 agreement, does the UE maintain all of PL-RSs in the activated UL (or joint) TCI states to support inter-cell or mTRP scenarios?

ii-1. What are the UE capabilities for measuring pathloss to support the active UL TCI list in inter-cell and mTRP?

RAN4 notes that there is no UE capability related to pathloss measurement in TS38.306. RAN4 respectfully asks RAN1/2 to take RAN4 questions in consideration for UL TCI signaling and UE behaviors and define ‘active’ TCI state for ‘UL’.

**2. To RAN WG1 and WG2 group.**

**ACTION:** RAN1/2 kindly answers the questions from RAN4 in consideration for UE behaviors and capability for active TCI state for UL.

**3. Date of Next TSG-RAN WG4 Meetings:**

TSG-RAN4 Meeting #104-bis-e, Oct. 10, 2022.