**3GPP TSG-RAN WG2 Meeting #119R2-220**

**Electronic August 2022**

**Title: DRAFT**LS on further questions on feMIMO RRC parameters

**Response to: -**

**Release:** Rel-17

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

**Source:** ERICSSON to be replaced by 3GPP TSG-RAN WG2

**To:** 3GPP TSG-RAN WG1

**Contact Person:**

#### Name: Helka-Liina Määttänen

E-mail Address: Helka-liina.maattanen@ericsson.com

**Send any reply LS to: 3GPP Liaisons Coordinator,** **mailto:3GPPLiaison@etsi.org**

**Attachments:** None

**1. Overall Description:**

RAN2 discussed the field description of *addtionalPCI* in *TCI-state* and *cell* in *QCL-Info*.

The current definition of TCI-state in the RRC specification is so that for each TCI-state, single *additionalPCI* and two qcl-Types (i.e., *qcl-Type*1 and *qcl-Type2*) may be configured. For a qcl-Type, parameters such as *cell*, *referenceSignal*, etc., are configured.

The current field descriptions states:

***additionalPCI***

Indicates that this TCI state refers to an additional PCI different from serving cell PCI, as configured in *ServingCellConfig*.

***cell***

The UE's serving cell in which the *referenceSignal* is configured. If the field is absent, it applies to the serving cell in which the *TCI-State* is configured. The RS can be located on a serving cell other than the serving cell in which the *TCI-State* is configured only if the *qcl-Type* is configured as *typeC* or *typeD*. See TS 38.214 [19] clause 5.1.5.

**Question 1**

RAN2 would like to ask RAN1

1. whether current field description of *additionalPCI*  is correct or whether the *additionalPCI* should refer to the “*cell*” configured in the *QCL-info*.
2. RAN2 assumes additionalPCI is per TCI-state, i.e., there is no such case where qcl-Type1 and qcl-Type2 for the same TCI-state associate with different additionalPCI values. Please confirm whether this is also RAN1’s understanding.
3. if b) is confirmed, would there be need to state that “*cell*” cannot be two different values for *qcl-Type1* and *qcl-Type2*?

**Question 2**

RAN2 also would like to ask RAN1:

1. When ‘cell’ is absent in QCL-info in case of the TCI-state is referenced to another CC, what serving cell the reference signal is referred, the serving cell where the TCI-state is configured or the serving cell where the TCI-state is referenced

RAN2 also discussed the IE *TCI-UL-State* with respect to the need to update field descriptions of *additionalPCI* or the *servingCellId or ul-powerControl*

***additionalPCI***

Indicates the physical cell IDs (PCI) of the SSBs.

***servingCellId***

The UE's serving cell in which the *referenceSignal-r17* is configured. If the field is absent, it applies to the serving cell in which the *TCI-UL-State* is configured. The RS can be located on a serving cell other than the serving cell in which the *TCI-State* is configured only if the *qcl-Type* is configured as *typeC* or *typeD*. See TS 38.214 [19] clause 5.1.5.

***ul-powerControl***

Configures power control parameters for PUCCH, PUSCH and SRS for this TCI state. The field is present here only if *ul-powerControl* is not configured in any *BWP-Uplink-Dedicated* of this serving cell.

**Question 3**

RAN2 would like to ask RAN1

1. whether it is true that the *additionalPCI*  in IE *TCI-UL-State* is associated with the serving cell indicated by the field *servingCellId*?
2. RAN2 would also like to confirm whether the qcl-Type need be present in TCI-UL-State to be associated with reference signals configured in TCI-UL-State as the parameter excel R1-2202759 did not advice to include QCL Type for UL TCI state(row4)?
3. If b) is true, it is assumed that QCL related limitations should be deleted from the field description of the *servingCellId*? That is, whether the restriction i.e. "The RS can be located on a serving cell other than the serving cell in which the *TCI-State* is configured only if the *qcl-Type* is configured as *typeC* or *typeD*. See TS 38.214 [19] clause 5.1.5." in the field description of *servingCellId* is applicable or not?

**Pending part on offline discussion:**

RAN2 also discussed about the configuration flexibility of the UL powercontrol.

In Rel-17 unified TCI framework, TCI-State (joint type) and TCI-UL-State-r17 (UL-only type) can be optionally configured with a set of power control parameters (ul-powerControl-r17). According to TS 38.331 V17.1.0, there are two possible configuration cases: a) ul-powerControl-r17 is present in BWP-UplinkDedicated and it is absent in all joint TCI states and UL TCI states, b) ul-powerControl-r17 is absent in BWP-UplinkDedicated and it is present in all joint TCI states and UL TCI states. Considering the TCI-state/TCI-UL-State-r17 can be referenced to another BWP, so we have another two cases, c) ul-powerControl-r17 is present in BWP-UplinkDedicated and it is absent in all referenced joint TCI states and referenced UL TCI states, d) ul-powerControl-r17 is absent in BWP-UplinkDedicated and it is present in all referenced joint TCI states and referenced UL TCI states

However, RAN1’s agreements do not exclude the case that ul-powerControl-r17 is present in some (referenced) TCI states and is absent in other (referenced) TCI states (case e)). In case e), ul-powerControl-r17 can be configured in both BWP-UplinkDedicated and (referenced) joint TCI-State/TCI-UL-State-r17. When the indicated (e.g. currently used) (referenced) TCI state is not configured with ul-powerControl-r17, the UE uses ul-powerControl-r17 in BWP-UplinkDedicated. But for the indicated (referenced)TCI state is configured with ul-powerControl-r17and ul-powerControl-r17 is also present in BWP-UplinkDedicated, which one is available, the ul-powercontrol-r17 in (referenced)TCI state or ul-powerControl-r17 present in BWP-UplinkDedicated?

**Question 3**

RAN2 would like to ask RAN1 whether current specification is sufficient for UL powercontrol or whether further flexibility can be allowed

**2. Actions:**

**To RAN1 group:**

**ACTION:** RAN2 respectfully asks RAN1 to provide responses to above questions.

**3. Date of Next TSG-RAN WG2 Meetings:**

TSG-RAN WG2 Meeting #119-e October 2022 Electronic

TSG-RAN WG2 Meeting #120 November 2022 Europe