**3GPP TSG RAN WG1 #105-e R1-2105287**

**e-Meeting, May 10th – 27th, 2021**

**Agenda item:** 7.2.6

**Source:** Moderator (Samsung)

**Title:** Summary for Rel.16 NR eMIMO maintenance

**Document for:** Discussion and Decision

1. Introduction

The moderator summary of the maintenance-related issues raised in the submitted contributions for Rel.16 NR\_eMIMO maintenance is given below. The listed maintenance issues are under the usual designations:

* LP: low-PAPR RS
* MB: Multi-beam operation
* MT: Multi-TRP
* MU: Type-II enhancement for MU-CSI
* UL: UL full power transmission

An initial assessment on each of the issues is given (but can be revised based on the outcome of the discussion during the preparation week). The assessment will be used as a basis to select four issues (per chairman instruction) for further discussion in the upcoming weeks.

* *High priority (H):* this includes high-priority item (essential, pending issues, broken spec components) and proposed editorial changes that either enhance the clarity of the specs or correct mistakes
* *Non-essential (N)*: this includes all other purposes such as spec optimization and low priority issues
* *Editorial (E)*: this includes editorial issues that will be handled as editorial CRs (to be communicated to the editors/chairs) and thereby not counted toward the four-thread quota

1. Maintenance issues

The issues are summarized in the following table:

**Table 1 Summary**

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| **#** | **Issue (summary)** | **Companies** | **Initial assessment** | **Company inputs (if any)** |
| MB.1 | Revise the indentation level to capture the agreed behavior for MAC-CE based pathloss RS updates for PUSCH/SRS  FL: seems a valid problem since current spec may be misread such that PathlossReferenceRS-Id mapped to sri-PUSCH-PowerControlId = 0 is used even when enablePL-RS-UpdateForPUSCH-SRS is not configured. Regarding the exact TP, it may be better to revise the indentation level of the next bullet rather than the current TP. | CATT | H |  |
| MB.2 | Clarifying that applicable list of CCs is determined by indicated CC in the MAC-CE for simultaneous multi-CC spatial relation update for SRS  FL: current spec seems to have no issue since the applicable CC list is anyhow obtained by either simultaneousSpatial-UpdatedList1 or simultaneousSpatial-UpdatedList2, which are configured by RRC | ZTE | N |  |
| MB.3 | Current TS38.213 could be misinterpreted that multi-CC simultaneous TCI update cannot be applied to CORESET#0 (i.e. p=0) because CORESET index p starts from 1 in the same paragraph (either 0<p<12 or 0<p<16). TP proposes to include p=0 for the multi-CC simultaneous TCI update to be aligned with the related MAC-CE description. TP proposes to revise p to q to avoid potential misreading of the specification.  FL: proposed over several meetings but failed to be selected. Based on inputs in pre-phase, it seems that no company think that CORESET#0 is excluded but companies have different understanding whether or not the range of p in one text is independent from the other text in the same paragraph. If budget allows, it may be good to conclude on this issue including whether a TP is needed or not, and if needed, the exact TP. | Vivo | H |  |
| MB.4 | Updating *CORESETPoolIndex* upon completion of SCell-BFR procedure in mDCI-mTRP (TP1 in R1-2104582)  FL: This has been proposed multiple times but failed to be selected for discussion. Suggest at least to make a decision to close the issue. | ZTE | H |  |
| MB.5 | Update the operating conditions for applying measurement restriction for L1-SINR in 38.214 to be aligned with signalling design in 38.331, i.e., from “is not configured with” to “the value of … is configured as ‘notConfigured’”, and from “is configured with” to “the value of … is configured as ‘configured’”. (R1-2105537)  FL: This is to avoid inconsistency between 38.331 and 38.214, and it seems to be an editorial correction. | Huawei/HiSilicon | E |  |
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| MT.1 | Default TCI state for PDSCH of cross-carrier scheduling PDSCH in S-DCI system:   * R1-2104407 proposed to specify the default TCI state for cross-carrier scheduling PDSCH in S-DCI system * R1-2105288 also proposed to specify the default TCI state for PDSCH of cross-carrier scheduling * R1-2105842 proposed to discuss and clarify the understanding on the issue of default TCI state for cross-carrier scheduling in S-DCI system * R1-2105468 proposed default TCI state for PDSCH of cross-carrier scheduling for S-DCI and M-DCI system   Note: It has been proposed multiple times in previous meeting. Suggest to discuss it and at least make a conclusion | Lenovo/Mot, Samsung, ASUSTeK, vivo | H |  |
| MT.2 | The issue of that two PUCCHs or PUSCHs associated with different TRP overlap with another uplink transmission, e.g., CSI report   * R1-2104728 proposed to specify this case is not expected by the UE   Note: This issue has been proposed multiple times. The UE behavior is unclear when this issue happens. | OPPO | H |  |
| MT.3 | R1-2104729 proposed to clarify in 38.214 that the UE does not expect to receive the PDSCH TCI state activation command of 6.1.3.14 of 38.321 and the PDSCH TCI state activation command of 6.3.24 of 38.321 simultaneously.  Note: Per the current specification, when two CORESETPoolindex values are not configured, the gNB can use either MAC CE of 6.1.3.14 and 6.1.3.24 to activate PDSCH TCI state. 6.1.3.14 is for single-TRP and 6.1.3.24 is for S-DCI. If they are received simultaneously, the UE behavior is not clear. | OPPO | H |  |
| MT.4 | Specify the mapping between PDSCH transmission occasions and default TCI states for scheme 1a, 2a and 2b:   * R1-2104583 proposed to extend the specified mapping between PDSSCH transmission occasions and default TCI states for TDM schemes to scheme 1a, 2a and 2b of S-DCI. * R1-2105468 proposed to extend the mapping between PDSCH transmission occasion and default TCI state to scheme 2a/2b   Note: the issue was discussed in previous meeting | ZTE, vivo | N |  |
| MT.5 | The issue of radio link monitoring RS selection in M-DCI mTRP system:   * R1-2105085 proposed to enhance the method of UE determining RLM RS in M-DCI mTRP system by adding Lmax = 8.   Note: Number of CORESETs is increased to 5 for M-DCI system and UE feature include the number of RLM RSs. | Apple | H |  |
| MT.6 | The issue of DL SPS transmission in S-DCI mTRP system:   * R1-2105288 proposed to support URLLC schemes of FDMSChemeA, FDMSChemeB, TDMSchemeA and TDMSChemeB for SPS transmission * R1-2104651 proposed to clarify that the RV sequence used across multiple repetitions in schemes 2b, 3, and 4 is based on setting rvid=0. * R1-2105809 proposed CR draft that specifies the RV values to be assumed for DL SPS scheduled with single DCI based multi-TRP PDSCH repetition schemes and R1-2105810 proposed to discuss the DL SPS PDSCH repetition for S-DCI system   The issue of DL SPS in M-DCI mTRP:   * R1-2105288 also proposed to specify the association between CORESETPoolIndex and SPS transmission   Note: the issue of SPS in mTRP was discussed in pre-phase in previous meetings and some companies thought that is it is not essential to rel16 and maybe for later release. In last meeting, 4 companies support it as H and 4 companies suggested this is N | Samsung, Qualcomm, Ericsson | H |  |
| MT.7 | R1-2105288 proposes to Introduce a parameter X which can be corresponding to or can include a DCI decoding delay time for default TCI states of the single-DCI multi-TRP PDSCH repetition. UE applies the first TCI state to a receive symbols before decoding DCI. The value of X can be specified by one of the following candidates  Note: the threshold *timeDurationForQCL* already take into account the DCI decoding latency. | Samsung | N |  |
| MT.8 | R1-2104651 proposed that in S-DCI system, all the TCI states for PDSCH are reset to qnew after beam failure recovery.  Note: In PCell BFR, the TCI state for PDSCH scheduled by CORESET-BFR is qnew. For SCell BFR, re-setting the TCI state of PDSCH to qew was discussed during SCell BFR design. For S-DCI, there seems no issue here. | Qualcomm | N |  |
| MT.9 | R1-2104651 proposes to specify the BD/CCE limit when NR-DC and multi-DCI mTRP are configured  Note: This was discussed in pre-phase in a few previous meetings. In last meeting, 6 companies were ok to discuss it but 6 companies thought it is not needed. | Qualcomm | N |  |
| MT.10 | R1-2105538 proposed CR draft to correct the following errors in 38.214 related with RRC parameter names:   * Correction of RRC names of “enableDefaultTCIStatePerCoresetPoolIndex” as “enableDefaultTCI-StatePerCoresetPoolIndex”, and “enableTwoDefaultTCIStates” as “enableTwoDefaultTCI-States”. * When referring to PDSCH and PDCCH DMRS, they are associated with same value of coresetPoolIndex, instead of same coresetPoolIndex. | Huawei, HiSilicon | E |  |

1. Discussion and proposal

From the inputs shared by participating companies during the preparation phase, the following **observation** can be made:

* The following issues can be handled as E (a part of editorial CR):
* The following issues can be designated as H (requiring discussion and additional agreements/conclusions):

In light of the above observations, the moderator makes the following **proposals**:

* The following issues can be handled as E (a part of editorial CR):
* Continue discussion on 4 threads:
  + Thread 1 (moderator xx) Maintenance for yy: addressing zz
  + Thread 2 (moderator xx) Maintenance for yy: addressing zz
  + Thread 3 (moderator xx) Maintenance for yy: addressing zz
  + Thread 4 (moderator xx) Maintenance for yy: addressing zz

# References

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