**3GPP TSG RAN WG1 #110bis-e R1-22xxxxx**

**e-Meeting, October 10th – 19th, 2022**

Agenda Item: 7.2

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Title: Summary on email discussion 110bis-e-NR-R16-04

Document for: Discussion/Decision

# Introduction

In this contribution, we provided a summary on email discussion 110bis-e-NR-R16-04, which is about the draft CR R1-2208870 with the following proposed changes:

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| 6 Link recovery proceduresA UE can be provided, for each BWP of a serving cell, a set  of periodic CSI-RS resource configuration indexes by *failureDetectionResourcesToAddModList* and a set  of periodic CSI-RS resource configuration indexes and/or SS/PBCH block indexes by *candidateBeamRSList* or *candidateBeamRSListExt* or *candidateBeamRSSCellList* for radio link quality measurements on the BWP of the serving cell. If the UE is not provided  by *failureDetectionResourcesToAddModList* for a BWP of the serving cell, the UE determines the set  to include periodic CSI-RS resource configuration indexes with same values as the RS indexes in the RS sets indicated by *TCI-State* for respective CORESETs that the UE uses for monitoring PDCCH and, if there are two RS indexes in a TCI state, the set  includes RS indexes configured with *qcl-Type* set to 'typeD' for the corresponding TCI states. The UE expects the set  to include up to two RS indexes. The UE expects single port RS in the set . For the SCell, the UE expects single-port or two-port CSI-RS with frequency density equal to 1 or 3 REs per RB in the set . |

The reason for the change is as follows:

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| ***Reason for change:*** | In Rel-16, SCell BFR was introduced and the following sentence is defined to restrict the configuration for CBD RS configuration. However, there is no such sentence defined in Rel-15 spec, where PCell BFR is supported. It is unclear whether the following sentence is also applied to PCell BFR.“The UE expects single-port or two-port CSI-RS with frequency density equal to 1 or 3 REs per RB in the set .” |
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| ***Summary of change:*** | Clarify that the restriction on CBD RS configuration is for Rel-16 SCell BFR only. |
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| ***Consequences if not approved:*** | It is unclear whether the restriction on CBD RS configuration in Rel-16 spec is also applied to PCell BFR.  |

# Discussion

**Q1: Is the sentence “The UE expects single-port or two-port CSI-RS with frequency density equal to 1 or 3 REs per RB in the set .” in Rel-16 spec (not in Rel-15 spec) applied to spCell BFR?**

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| Company | Y or N? | Comments |
| Samsung | N | The sentence is for Rel-16 only. |
| ZTE | N | For Rel-16 only |
| Ericsson | N | It’s not in the R15 spec, so currently it’s only for R16 |
| QC | Y | The current spec means this restriction is applicable to SpCell BFR for R16 UE |
| vivo | N | For Rel-16 only |
| Huawei, Hisilicon | N | For Rel-16 only |
| Lenovo | N | For Rel-16 only |
| LG | Y | With current specification, the restriction applies to Rel-16 UEs for both SCell and SpCell BFR. Note that enhanced BFR is introduced for SpCell as well as for SCell, i.e. BFR MAC-CE transmission during RACH. |
| Moderator |  | It seems companies’ views are diverging. @LG, it is true that we introduced MAC CE based BFR for spCell in Rel-16, based on your comments, is it correct understanding that this restriction is only applicable for spCell when MAC CE based spCell BFR is enabled?@QC, since majority’s view is “N”, which I think is aligned with agreement and WI scope, would you like to accept it, or we just keep it unclear? |
| LG |  | @Mod, by current specification, the configuration restriction is applied to SpCell with or without BFR MAC-CE to our understanding. Even with this, R15 BFR has no issue since it is only a restriction of CSI-RS configuration. |
| QC |  | @Mod, the spec is clear to our understanding. Any change is NBC issue. In addition, enhancing R15 also happened in R16, e.g. the enhanced CBFR BFR with MAC-CE report. |

**Q2: If “No” to the Q1, do you agree with the proposed CR?**

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| Company | Y or N? | Comments |
| Samsung | Y | We support the CR. |
| ZTE | Y | We are fine.  |
| Ericsson | N | It’s a reasonable interpretation that it applies also for SpCell BFR, and since the NW does not know if it’s a Rel-15 or Rel-16 UE, it would anyway always use the single-port restriction. |
| QC | N | The current spec means this restriction is applicable to SpCell BFR for R16 UE. We don’t prefer to remove this restriction now |
| vivo | Y | We are fine with the CR |
| Huawei, Hisilicon | Y | We are fine. |
| Lenovo | Y | We are fine with the CR |
| Moderator |  | @Ericsson, I am afraid that I am confused. In Q1, it seems you answered “No”, which means the restriction is not applicable for spCell. Could you please clarify more? |

**Q3: If “Yes” to the Q1, how can UE distinguish whether it is communicating with a Rel-15 or Rel-16 gNB? Incorrect configuration may cause some additional UE behavior.**

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| Company | Comments |
| QC | As E/// mentioned, NW has to assume the restriction  |
| LG | Rel-16 UE shall support Rel-15 features so we see no issue. |
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