3GPP TSG RAN WG1 #103-e R1-200xxxx

e-Meeting, October 26th – November 13th, 2020

**Agenda item: 7.2.10**

**Source: Moderator (Nokia)**

**Title: Summary of Email discussion** **[103-e-NR-MRDC-CA-02]**

**Document for: Discussion and Decision**

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# 1 Introduction

This document facilitates and summarizes the AI 7.2.10 *Maintenance of Multi-RAT Dual-Connectivity and Carrier Aggregation enhancements* email thread #2:

[103-e-NR-MRDC-CA-02] Email discussion/approval on PC for DC, X-CC scheduling and 1-Tx enhancements until 10/29 with potential CRs by 11/5 – Karri (Nokia)

* **PC-DC Issue 2:** (R1-2007736 and CR1 for power control) Clarification on the timing relation for Dynamic Power Sharing
* **PC-DC Issue 3:** (R1-2008503, P1 and TP) On FDD scenario for Semi-Static-mode2 power control
* **PC-DC Issue 4:** (R1-2008694, TP) Alignment between UE capability description on TS38.306 and UE’s behaviour on TS38.213.
* **XCC A-1 (R1-2007736):** Discuss if there is a need to add the PDSCH starting time to determine the last DCI in order to be able to indicate different PRIs in the same PUCCH slot for the two HARQ-ACKs in the scenario described in R1-2007736.
* **XCC A-2 (R1-2007807):** The clarification on the RRC parameter applicability between URLLC priority based codebook and secondary PUCCH group codebook would seem to benefit from the suggested clarification. Discuss the TP1 and TP2 to TS38.213 sections 7.2 and 9 respectively.
* **XCC A-3 (R1-2007807):** Interoperability of the simultaneous configuration of *pdsch-HARQ-ACK-CodebookList-r16* and *pdsch-HARQ-ACK-Codebook-secondaryPUCCHgroup-r16* would seem to be in a need of clarification. Discuss how to resolve the interoperability issue.
* **XCC A-4 (R1-2008504):** Discuss the need for introducing the additional delay ‘d’ for *timeDurationForQCL* in case of CCS when *enableDefaultBeamForCCS* is not configured as proposed in section 3 of R1-2008504 to 38.214 subclause 5.1.5
* **1TX C-1 (R1-2007737):** There appears to be a discrepancy between the UE capabilities and the TS38.213 for the TDD and FDD PCell semi-static UL transmission in all subframes and a correction is needed. Discuss section 2.2 and CR4 in R1-2007737.

# 2 UL Power Control for Dual Connectivity

Three issues related to the UL power control for dual connectivity are in the scope of this email thread. The Email tread summary erroneously listed CR2 of ‘7736 as the text proposal in scope, but it should be obvious that this was a mistake as CR1 is the text proposal relevant to UL PC for DC.

* **PC-DC Issue 2:** (R1-2007736 and CR1 for power control) Clarification on the timing relation for Dynamic Power Sharing
* **PC-DC Issue 3:** (R1-2008503, P1 and TP) On FDD scenario for Semi-Static-mode2 power control
* **PC-DC Issue 4:** (R1-2008694, TP) Alignment between UE capability description on TS38.306 and UE’s behaviour on TS38.213.

### 2.1 PC-DC Issue 2

**PC-DC Issue 2:** (R1-2007736 and CR1 for power control) Clarification on the timing relation for Dynamic Power Sharing

**Moderator proposal:** Agree to CR1 in R1-2007736 to TS38.213 subclause 7.6.2

Company comments

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| --- | --- | --- |
| Company | Yes or No | Comments |
| ZTE | Yes | We are supportive of this CR.Currently, there are mixed descriptions on whether the PDCCH in MCG that is exactly Toffset before the transmission occasion in SCG should be considered valid or not. Some of the descriptions are even conflicting with each other. Blow is an example that conflicting with each other.

|  |
| --- |
| If a UE - is provided *dynamic* for *nrdc-PCmode-FR1-r16* or for *nrdc-PCmode-FR2-r16*, and - indicates a capability to determine a total transmission power on the SCG at a first symbol of a transmission occasion on the SCG by determining transmissions on the MCG that- are scheduled by DCI formats in PDCCH receptions with a last symbol that is earlier by more than $T\_{offset}$ from the first symbol of the transmission occasion on the SCG, or are configured by higher layers, and - overlap with the transmission occasion on the SCG the UE determines a maximum transmission power on the SCG at the beginning of the transmission occasion on the SCG as - $min\left(\hat{P}\_{SCG},\hat{P}\_{Total}^{NR-DC}- \hat{P}\_{MCG}^{actual}\right)$, if the UE determines transmissions on the MCG with a $\hat{P}\_{MCG}^{actual}$ total power- $\hat{P}\_{Total}^{NR-DC}$, if the UE does not determine any transmissions on the MCGwhere- $T\_{offset}=max⁡\{T\_{proc,MCG}^{max},T\_{proc,SCG}^{max}\}$,- $T\_{proc,MCG}^{max}$ and $T\_{proc,SCG}^{max}$ is the maximum of $T\_{proc,2}$, $T\_{proc,CSI}$, $T\_{proc,release}^{mux}$, $T\_{proc,2}^{mux}$, and $T\_{proc,CSI}^{mux}$based on the configurations on the MCG and the SCG, respectively, when the UE indicates the value of 'long' for the capability, - $T\_{proc,MCG}^{max}$ and $T\_{proc,SCG}^{max}$ is the maximum of $T\_{proc,2}$, $T\_{proc,release}^{mux}$, $T\_{proc,2}^{mux}$based on the configurations on the MCG and the SCG, respectively, when the UE indicates the value of 'short' for the capability, and- $\hat{P}\_{MCG}^{actual}$ is the total power for the transmissions on the MCG that overlap with the transmission occasion on the SCG where $\hat{P}\_{MCG}^{actual}$ is determined based on transmissions configured by higher layers and on transmissions scheduled by DCI formats in PDCCH receptions with a last symbol that is at least $T\_{offset}$ before the first symbol of the transmission occasion on the SCG. |

Thus, we believe the CR is needed, otherwise network and UE are not clear how to understand the conflicting descriptions.  |
| Qualcomm | No | We do not think this is an essential. Here, “the first symbol of the transmission occasion on the SCG” is actual timing. Whether the exact timing T0 – T\_offset is expected DCI occasion or not is not a matter practically. |
| CATT | No  | This is not an correction. The wording in the current specification is clear enough.  |
| MTK | Yes | The proposal tries to clarify UE should consider power sharing for the following scenario (the PDCCH in MCG is exactly Toffset before the transmission occasion in SCG):which seems reasonable to us.To make it more clear, we think “last symbol” should be changed to “ending time of last symbol” and “first symbol” should be changed to “starting time of first symbol”. |
| Intel | Yes | We think the TP helps to maintain same rule universally |
| Samsung | Weak yes | Not an essential correction but good to align. |
| vivo | Yes | The clarification seems reasonable to us. |
| Nokia |  | A non-essential correction, but do not oppose the alignment |
| OPPO | open | Not essential. But we can keep open to it. |
| Ericsson | Yes | OK to align |

### 2.2 PC-DC Issue 3

**PC-DC Issue 3:** (R1-2008503, P1 and TP) On FDD scenario for Semi-Static-mode2 power control

* **Proposal 1 [R1-2008503]: To define the UE behaviour on FDD scenario for semi-static-mode2 power control in NR-DC, adopt the following TP to 38.213 Section 7.6.2:**

|  |
| --- |
| If a UE is provided *semi-static-mode2* for *nrdc-PCmode-FR1* or for *nrdc-Pcmode-FR2*- if the UE is not provided *tdd-UL-DL-ConfigurationCommon* for the MCG or SCG, the UE determines a transmission power for the MCG or for the SCG as described in Clauses 7.1 through 7.5 using or as the maximum transmission power, respectively.- if at least one symbol of slot of the MCG or of the SCG that is indicated as uplink or flexible to a UE by *tdd-UL-DL-ConfigurationCommon* and *tdd*-*UL-DL-ConfigurationDedicated*, if provided, overlaps with a symbol for any ongoing transmission overlapping with slot of the SCG or of the MCG, respectively, the UE determines a power for the transmission on the SCG or the MCG overlapping with slot as described in Clauses 7.1 through 7.5 using or , respectively, as the maximum transmission power- otherwise, the UE determines a power for the transmission on MCG or the SCG overlapping with slot , as described in [8-3, TS 38.101-3] and in Clauses 7.1 through 7.5 without considering or , respectively |

**Moderator proposal:** Agree to the TP of proposal 1 in R1-2008503 to TS38.213 subclause 7.6.2

Company comments

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| Company | Yes or No | Comments |
| ZTE | Yes | We are fine with the moderator proposal. |
| Qualcomm |  | OK with the intention but the TP is not accurate. It should be like following (including one more change that is to use “paired spectrum” explicitly):* if MCG or SCG comprises only paired spectrum, the UE determines a transmission power for the SCG or for the MCG as described in Clauses 7.1 through 7.5 using PSCG or PMCG, respectively.
 |
| CATT | Yes | Agree with Qualcomm’s revision.  |
| MTK | Yes | We are fine with QC’s modification. However, we want to clarify that, if we look at 38.213 g20 7.6.1A NE-DC, which also uses a power sharing method similar to semi-static-mode2:“If the UE is not provided tdd-UL-DL-ConfigurationCommon for the MCG, the UE determines a transmission power for the SCG as described in [13, TS 36.213] using as the maximum transmission power.”The original proposed text is more aligned with current spec. |
| Intel | Yes |  |
| Samsung | Yes | Agree with the intention and agree with QC’s observation but the simplest/consistent thing to do would be to replicate the text from NE-DC as belowIf the UE is not provided *tdd-UL-DL-ConfigurationCommon* for the MCG or the SCG, the UE determines a transmission power for the SCG or the MCG as described in Clauses 7.1 through 7.5 using PSCG or PMCG, respectively, as the maximum transmission power. |
| Vivo | Yes for the intention | The intention is fine but the TP is not correct, e.g., a TDD cell may also not be provided with tdd-UL-DL-ConfigurationCommon. |
| Nokia | Yes | Agree with the proposal in principle, some work seems to be still needed on the TP |
| OPPO | Yes in principle | Samsung’s wording seems better. Regarding to vivo’s comments, it seems possible not to configure tdd-UL-DL-ConfigurationCommon for a TDD cell according to the current TS 38.331. Is it a typical configuration for practical deployment?  |
| Ericsson | Yes | OK with TP and prefer wording in FL proposal |

### 2.3 PC-DC Issue 4

**PC-DC Issue 4:** (R1-2008694, TP) Alignment between UE capability description on TS38.306 and UE’s behaviour on TS38.213.

[R1-2008694] To avoid misalignmed between UE capability description on TS38.306 and UE behaviour desctiption on TS38.213, we suggest text proposal for TS38.213 as below:

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| --- |
| 7.6.2 NR-DC*<text omitted>*If a UE - is provided *dynamic* for *nrdc-Pcmode-FR1-r16* or for *nrdc-Pcmode-FR2-r16*, and - indicates a capability to support dynamic power sharing for intra-FR NR DC,~~- indicates a capability to determine a total transmission power on the SCG at a first symbol of a transmission occasion on the SCG by determining transmissions on the MCG that~~~~- are scheduled by DCI formats in PDCCH receptions with a last symbol that is earlier by more than~~ $T\_{offset}$ ~~from the first symbol of the transmission occasion on the SCG, or are configured by higher layers, and~~ ~~- overlap with the transmission occasion on the SCG~~ the UE determines a maximum transmission power on the SCG at a first symbol of a transmission occasion on the SCG by determining transmissions on the MCG thatIt - are scheduled by DCI formats in PDCCH receptions with a last symbol that is earlier by more than $T\_{offset}$ from the first symbol of the transmission occasion on the SCG, or are configured by higher layers, and - overlap with the transmission occasion on the SCG The maximum transmission power on the SCG is determined as ~~UE determines a maximum transmission power on the SCG at the beginning of the transmission occasion on the SCG as~~ - $min\left(\hat{P}\_{SCG},\hat{P}\_{Total}^{NR-DC}- \hat{P}\_{MCG}^{actual}\right)$, if the UE determines transmissions on the MCG with a $\hat{P}\_{MCG}^{actual}$ total power- $\hat{P}\_{Total}^{NR-DC}$, if the UE does not determine any transmissions on the MCG*<text omitted>* |

**Moderator proposal:** Agree to the TP of R1-2008964 to TS38.213 subclause 7.6.2

Company comments

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| Company | Yes or No | Comments |
| ZTE | Yes | We are fine with the above TP.Note: if the TP in “2.1 PC-DC Issue 2” is approved, then “by more than Toffset” above should be updated to “by at least Toffset”. |
| Qualcomm | Yes | OK with the change. |
| CATT | Yes | We are OK with the TP.  |
| MTK | Yes with modifications | This TP addressed the same paragraph as PC-DC Issue 2. To clarify UE should consider power sharing for the following scenario (the PDCCH in MCG is exactly Toffset before the transmission occasion in SCG):the modification in PC-DC Issue 2 should be integrated into this TP. To make it more clear, we think “last symbol” should be changed to “ending time of last symbol” and “first symbol” should be changed to “starting time of first symbol”. |
| Intel | Yes |  |
| Samsung | Yes with minor modifications | OK with the TP with a couple of minor modifications1. The for intra-FR NR DC is not necessary
2. Change the “The maximum transmission power on the SCG is determined as” to “The UE determines the maximum transmission power on the SCG as”
 |
| vivo | Yes | OK |
| Nokia | Yes | OK with the change |
| OPPO | Yes | In addition to the above changes suggested by other companies, we have one more minor change asthe UE determines a maximum transmission power on the SCG at a first symbol of a transmission occasion on the SCG by determining transmissions on the MCG that~~It~~  |
| Ericsson | Yes in principle | blue highlighted part below should be included to align with current text that is being deletedThe maximum transmission power on the SCG is determined at the beginning of the transmission occasion on the SCG as ~~UE determines a maximum transmission power on the SCG at the beginning of the transmission occasion on the SCG as~~  |

# 3 Cross carrier scheduling

Four issues related to cross carrier scheduling are in the scope of this email thread.

* **XCC A-1 (R1-2007736):** Discuss if there is a need to add the PDSCH starting time to determine the last DCI in order to be able to indicate different PRIs in the same PUCCH slot for the two HARQ-ACKs in the scenario described in R1-2007736.
* **XCC A-2 (R1-2007807):** The clarification on the RRC parameter applicability between URLLC priority based codebook and secondary PUCCH group codebook would seem to benefit from the suggested clarification. Discuss the TP1 and TP2 to TS38.213 sections 7.2 and 9 respectively.
* **XCC A-3 (R1-2007807):** Interoperability of the simultaneous configuration of *pdsch-HARQ-ACK-CodebookList-r16* and *pdsch-HARQ-ACK-Codebook-secondaryPUCCHgroup-r16* would seem to be in a need of clarification. Discuss how to resolve the interoperability issue.
* **XCC A-4 (R1-2008504):** Discuss the need for introducing the additional delay ‘d’ for *timeDurationForQCL* in case of CCS when *enableDefaultBeamForCCS* is not configured as proposed in section 3 of R1-2008504 to 38.214 subclause 5.1.5

### 3.1 XCC A-1 (R1-2007736)

**XCC A-1 (R1-2007736):** Discuss if there is a need to add the PDSCH starting time to determine the last DCI in order to be able to indicate different PRIs in the same PUCCH slot for the two HARQ-ACKs in the scenario described in R1-2007736.

 **“…***if the DSCH starting time in addition to the existing MO index and Cell index is not applied to determine the “last DCI”, then network has to indicate the same PRI in these different DCIs in this MO. This kind of restriction on network implementation has no justification. Thus, it is preferred that the PDSCH starting time in addition to the existing MO index and Cell index can also be applied to determine the “last DCI”.****”***[R1-2007736]

Moderator thought: The motivation for the gNB to need to be able to indicate different PRIs in this case is unclear.

**Moderator proposal:** Do NOT agree to the CR2 in R1-2007736

Company comments

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| --- | --- | --- |
| Company | Yes or No | Comments |
| ZTE |  | We believe CR2 in R1-2007736 is needed.The gNB may set the PRI field based on the PUCCH resource set. Different PUCCH resource set may need different PRI value. For example, if two DCIs are transmitted in the same MO, for the first DCI, gNB understands that PUCCH resource set 0 is applied according to the current codebook size. However, for the second DCI in the same MO, gNB understands that PUCCH resource set 1 is applied because the codebook size is increased. In this case, different PRI may be beneficial. |
| Qualcomm | No  | If UE has received multiple scheduling DCIs in a same PO, it is reasonable that the HARQ-ACK in the same codebook on the same PUCCH reasonable. It seems unnecessary to further fragment the feature to support HARQ-ACK in different codebooks for scheduling DCIs in same PO. |
| Spreadtrum | No | Agree with Qualcomm, it should be same PRI in all DCIs in a same PO. There is no reason for gNB indicates different values for different DCIs. |
| CATT | No | Agree with moderator that the motivation to indicate different PRIs in the same MO is unclear. |
| MTK |  | We are fine to accept CR2 in R1-2007736 with potential benefit indicated by ZTE. |
| Intel  | No | Agree with Qualcomm |
| Samsung | Yes  | The CR and is consistent with the overall design - currently the spec allows DCIs scheduling on cells with different index to indicate different PRI at the same MO. However, it is also ACKed that without the CR, there will be some inconsistency in the specs but they will not be ‘broken’. |
| vivo | No | The mentioned issue is not essential and can be handled by implementation. |
| Nokia | No | Not a correction, but a modification of functionality that is not essential. Do not support agreeing to the change |
| Ericsson | No | It’s nice to have but may not be essential. |

### 3.2 XCC A-2 (R1-2007807)

**XCC A-2 (R1-2007807):** The clarification on the RRC parameter applicability between URLLC priority based codebook and secondary PUCCH group codebook would seem to benefit from the suggested clarification. Discuss the TP1 and TP2 to TS38.213 sections 7.2 and 9 respectively.

**Moderator proposal:** Agree to the TPs to TS 38.213 subclauses 7.2 and 9 in R1-2007807

Company comments

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| --- | --- | --- |
| Company | Yes or No | Comments |
| ZTE | Yes | We are fine with the moderator proposal. |
| Qualcomm | Yes | We are fine with the TPs. |
| Spreadtrum | Yes | We are fine with the TPs. |
| ASUSTeK | Yes | We are fine with the TPs |
| CATT | Yes | We are fine with the TPs. |
| MTK | Yes | We are fine with the TPs. |
| Intel | Yes | We are fine with the TPs. |
| Samsung | Yes |  |
| vivo | Yes | We are fine with the TPs. |
| Nokia | Yes | OK with the TPs |
| Ericsson | Yes |  |

### 3.3 XCC A-3 (R1-2007807)

**XCC A-3 (R1-2007807):** Interoperability of the simultaneous configuration of *pdsch-HARQ-ACK-CodebookList-r16* and *pdsch-HARQ-ACK-Codebook-secondaryPUCCHgroup-r16* would seem to be in a need of clarification. Discuss how to resolve the interoperability issue.

**Proposal 2 [R1-2007807]: “**Discuss whether to introduce a new RRC parameter to separately configure the HARQ-ACK codebook type for the two HARQ-ACK codebooks for the secondary PUCCH group. If the new RRC parameter is not introduced, clarify that *pdsch-HARQ-ACK-Codebook-secondaryPUCCHgroup-r16* should not be configured or should be ignored if *pdsch-HARQ-ACK-CodebookList-r16* is configured.”

Moderator thought: The absolute necessity for the new RRC parameter is not clear, and the ASN.1 has been frozen since June/2020, hence the introduction of a new RRC parameter is not recommended.

**Moderator proposal:** Do NOT introduce a new RRC parameter. Agree that *pdsch-HARQ-ACK-Codebook-secondaryPUCCHgroup-r16* should be ignored if *pdsch-HARQ-ACK-CodebookList-r16* is configured.

Company comments

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| --- | --- | --- |
| Company | Yes or No | Comments |
| ZTE |  | We are fine to introduce a new RRC parameter. There are two separate RRC parameters to configure same/different HARQ-ACK codebook types for each PUCCH group, i.e., pdsch-HARQ-ACK-Codebook for primary PUCCH group and pdsch-HARQ-ACK-Codebook-secondaryPUCCHgroup-r16 for the secondary PUCCH group. However, there is only one RRC parameter *pdsch-HARQ-ACK-CodebookList-r16* to configure the URLLC enhanced HARQ-ACK codebook per CG. If two PUCCH groups are configured, it is not clear whether *pdsch-HARQ-ACK-CodebookList-r16* is applied to primary PUCCH group, secondary PUCCH group or both. Also, as 38.331 shown below, if *pdsch-HARQ-ACK-CodebookList-r16* is configured, pdsch-HARQ-ACK-Codebook is ignored.

|  |
| --- |
| ***pdsch-HARQ-ACK-CodebookList***A list of configuration for at least two simultaneously constructed HARQ-ACK codebooks. Each configuration in the list is defined in the same way as *pdsch-HARQ-ACK-Codebook* (see TS 38.212 [17], clause 7.3.1.2.2 and TS 38.213 [13], clauses 7.2.1, 9.1.2, 9.1.3 and 9.2.1). If this field is present, the field *pdsch-HARQ-ACK-Codebook* is ignored for the case at least two HARQ-ACK codebooks are simultaneously constructed. |

Based on the above, there are at least the following approaches.**Approach#1**: UE is not expected to configure two PUCCH groups if *pdsch-HARQ-ACK-CodebookList-r16* is configured.**Approach#2**: The same RRC configuration *pdsch-HARQ-ACK-CodebookList-r16* is applied to both primary PUCCH group and secondary PUCCH group if two PUCCH groups are configured.**Approach#3**: The RRC configuration *pdsch-HARQ-ACK-CodebookList-r16* is only applied to primary PUCCH group and add another new RRC parameter for the secondary PUCCH group.**Approach#4**: The RRC configuration *pdsch-HARQ-ACK-CodebookList-r16* is only applied to primary PUCCH group and do NOT introduce another new RRC parameter for the secondary PUCCH group. In this case, UE still follows RRC parameter pdsch-HARQ-ACK-Codebook-secondaryPUCCHgroup-r16 for the second PUCCH group.It seems we have to choose one of the approaches above, some more discussion may be beneficial. Our preference for these approaches are as following, i.e., Approach#3 > Approach#2 > Approach#4 > Approach#1.  |
| Qualcomm | No | Agree with Moderator that no new RRC parameter is necessary to avoid ASN.1 impact. |
| Spreadtrum |  | Regarding this later stage, it is not proposed to introduce a new RRC parameter as in Approach#3. As other approaches, Approach#4 is better. In this case, gNB can configure two HARQ-ACK codebooks in the first PUCCH cell group which can be used for eMBB and URLLC traffics. And only one HARQ-ACK codebook is generated in the second PUCCH cell group, which is sufficient from our understanding. According to Moderator’s proposal, we can also fine with it. |
| ASUSTeK |  | Proposal from the modulator is fine. Prefer a solution without a new RRC parameter. |
| CATT |  | Given that companies prefer to avoid introducing new RRC parameter, we are fine with the proposal from moderator. |
| MTK |  | We are fine with the moderator proposal. |
| Intel |  | We are fine with Moderator’s proposal |
| Samsung |  | Fine with the proposal from the moderator.  |
| vivo | No | No new RRC parameter is needed. On the other hand, we think a straightforward solution would be that such kind of configuration is not allowed. |
| Nokia | No RRC parameter | Agree to clarify the UE behavior as suggested by the moderator’s proposal, but should not add a new RRC parameter at this stage. |
| Ericsson | No new RRC parameter | Agree with moderator proposal. |

### 3.4 XCC A-4 (R1-2008504)

**XCC A-4 (R1-2008504):** Discuss the need for introducing the additional delay ‘d’ for *timeDurationForQCL* in case of CCS when *enableDefaultBeamForCCS* is not configured as proposed in section 3 of R1-2008504 to 38.214 subclause 5.1.5

Moderator thought: ASUSTeK made a compelling argument that the change is not needed as as base station would always configure *enableDefaultBeamForCCS-r16* for cross carrier scheduling with different numerologies. That is, the proposed change is non-essential.

**Moderator proposal:** Do NOT agree to the TP in section 3 of the R1-2008504 to TS 38.214 subclause 5.1.5

Company comments

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| --- | --- | --- |
| Company | Yes or No | Comments |
| ZTE |  | We are fine with the Moderator proposal.First of all, we would like to clarify the current specification.In Rel-15, only same-SCS cross-carrier scheduling is allowed and no default beam is supported because UE is always expected to be scheduled with scheduling delay larger than the *timeDurationForQCL*.In Rel-16, if *enableDefaultBeamForCCS* is configured, the existing spec is clear. If *enableDefaultBeamForCCS* is NOT configured, it seems this case is covered by the following spec.

|  |
| --- |
| *When the UE is configured with CORESET associated with a search space set for cross-carrier scheduling and the UE is not configured with [enableDefaultBeamForCSS], the UE expects tci-PresentInDCI is set as 'enabled' or tci-PresentForDCI-Format1-2-r16 is configured for the CORESET, and if one or more of the TCI states configured for the serving cell scheduled by the search space set contains 'QCL-TypeD', the UE expects the time offset between the reception of the detected PDCCH in the search space set and the corresponding PDSCH is larger than or equal to the threshold timeDurationForQCL.* |

* Then for same-SCS cross-carrier scheduling, it has not issue as this is the same UE behavior as Rel-15.
* While for different-SCS cross-carrier scheduling, *timeDurationForQCL* may be not sufficient. As clarified by Moderator and ASUSTeK, one way to handle this issue is that network always configures *enableDefaultBeamForCSS* for UEs configured with different-SCS cross-carrier scheduling. In this case, as long as UE supports FG18-5a together with FG18-5 (DL cross-carrier scheduling with different SCS), the UE behavior is clear.
 |
| Qualcomm | Yes | We agree with MediaTek that a clarification CR is needed. This makes the spec accurately reflect previous agreements. As for ASUSTeK’s argumentd, there is no agreement that network always configures *enableDefaultBeamForCSS* for different-SCS cross-carrier scheduling. We also do not think such a new agreement is needed just for fixing an alignment issue. |
| Spreadtrum | Yes | We support the TP in section 3 of the R1-2008504. It captures the previous agreement correctly in the spec. |
| ASUSTeK |  | We are fine with the proposal from the Moderator. The TP is not essential as it handles a case/scenario which is never explicitly discussed or agreed. We also don’t think the mentioned agreement intends to cover the concerned case of the TP and the agreement has been correctly reflected in current TS 38.214. |
| MTK |  | Same view with QC and Spreadtrum. A clarification CR is needed to align to previous RAN1 agreements. For the comment from ASUSTeK, there is no agreement that network always configures *enableDefaultBeamForCSS* for different-SCS cross-carrier scheduling. Also, UE may not even support default beam behavior due to the Rel-16 UE feature “18-5a: Default QCL assumption for cross-carrier scheduling”. Can ASUSTeK further clarify where in the spec or agreement captured that “network always configures *enableDefaultBeamForCSS* for different-SCS cross-carrier scheduling”? |
| Samsung | Yes | For similar reasons as stated by MTK |
| vivo | No | Agree with Moderator’s proposal. It can be handled by network implementation. |
| Nokia |  | OK with the change, but also OK not to adopt it. |
| ASUSTeK2 |  | Actually we have explained below in the preparation phase.In RAN1#97, we agree the following:Agreements**:**When PDSCH and its scheduling PDCCH are in the different CCs, if the PDCCH-to-PDSCH delay < *~~Threshold-Sched-Offset~~ timeDurationForQCL* or if the TCI information is absent from the DCI, the UE obtains its QCL assumption for the scheduled PDSCH from the activated TCI state with the lowest ID applicable to PDSCH in the active BWP of the scheduled cellRel-16 default beam behavior is agreed for cross-carrier scheduling (irrespective of same/different SCS). In other words, **only Rel-16 default beam behavior mentioned above was agreed for different-SCS cross-carrier scheduling. We never agree to support Rel-15 default beam behavior for different-SCS cross-carrier scheduling**. Based on the existing TS38.214, the only way to apply Rel-16 default beam behavior is to configure *enableDefaultBeamForCSS*. Therefore, one could only deduce base station should reasonable configure *enableDefaultBeamForCSS* for different-SCS cross-carrier scheudling to apply Rel-16 default beam behavior. Or could MTK clarify when we agree to support Rel-15 default beam behavior for different-SCS cross-carrier scheduling?Note that there are so many mis-configurations in the standard that it is impossible to explicitly agree every single one. |
| Ericsson |  | OK to change or leave spec as is. |
| MTK2 |  | @ASUSTek: Yes, we are aware that there is an agreement about default beam in RAN1#97 as you stated. However, later in RAN1 #100b, RAN1 decided to make it an optional feature during the online conference call for Rel-16 UE features. You can find the corresponding agreement in “R1-2002884: Summary on 100b-e-NR-UEFeatures-MRDCCA-02”**Agreements:**Following FGs are included in the UE features list for MR-DC/CA enhancements* FG18-5a for Default QCL assumption for cross-carrier scheduling with same/different SCS
	+ Dependency with other corresponding FGs will be discussed later.

At the same time, according to the below RAN1 #99 agreement:**Agreements**:* The same additional beam switching timing (d) as agreed for A-CSI under 7.2.13.4 is used for PDSCH being cross-carrier scheduled with different numerologies

The additional beam switching timing (d) is added without connection to the default beam behavior. Therefore, the proposed clarification CR is needed to align to previous RAN1 #99 agreements. To our understanding this is not related to Rel-15 default beam behavior since there is no Rel-15 default beam behavior as you mentioned. If a R16 UE does not support “FG18-5a for Default QCL assumption for cross-carrier scheduling with same/different SCS”, NW has to give TCI information in the DCI and configure a PDCCH-to-PDSCH delay > timeDurationForQCL (with additional beam switching timing d), which is similar to Rel-15 cross-carrier scheduling behavior. |
|  |  |  |

# 4 1-Tx EN-DC enhancements

One issue related to single Tx EN-DC enhancements is in the scope of this email thread.

* **1TX C-1 (R1-2007737):** There appears to be a discrepancy between the UE capabilities and the TS36.213 ~~TS38.213~~ for the TDD and FDD PCell semi-static UL transmission in all subframes and a correction is needed. Discuss section 2.2 and CR4 in R1-2007737.

**Moderator proposal:** Agree to the TP of CR4 in R1-2007737 to TS36.213 ~~TS38.213~~ subclause 5.1 and 8

Company comments

|  |  |  |
| --- | --- | --- |
| Company | Yes or No | Comments |
| ZTE | Yes | We are supportive of the above TP.Note: The TP is for 3**6**.213 instead of 3**8**.213. |
| Qualcomm | Yes | OK with the proposal. |
| MTK | Yes | Same comment as ZTE |
| Samsung | Yes | OK with the proposal and the ‘38 🡪 36’ change |
| Nokia | Yes | OK with the proposal |

# 5 Conclusions

To be written

# 6 References

1. R1-2009219 Moderator summary of the 4 feature lead summaries of 7.2.10 in preparation of RAN1#103-e, Moderator (Nokia)
2. R1-2008897 FL summary on support of unaligned frame boundary for R16 NR inter-band CA, Moderator (CMCC)
3. R1-2009210 Summary of maintenance issues for SCell Dormancy, Moderator (Ericsson)
4. R1-2009218 Feature Lead summary on singe Tx enhancements, and cross carrier scheduling and A-CSI RS triggering, Moderator (Nokia)
5. R1-2009231 Feature lead summary #1 on UL Power Control for NN-DC, Moderator (Apple Inc.)