**3GPP TSG RAN WG1 Meeting #106-e R1-21xxxx**

**E-meeting, August 16th – 27th, 2021**

**Agenda Item: 7.2.10**

**Source: Huawei, HiSilicon**

**Title: Moderator summary of [106-e-NR-MRDC-CA-03]**

**Document for: Discussion and Decision**

# Introduction

This contribution is feature lead summary on email discussion on corrections to 38.213 on SCell dormancy for power saving ([R1-2106514](file:///C:\Users\T00496~1\AppData\Local\Docs\R1-2106514.zip) and [R1-2106515](file:///C:\Users\T00496~1\AppData\Local\Docs\R1-2106515.zip)).

# Email discussion

## Change 1: Remove “one or both” in TS38.213 for SCell dormancy indication by DCI format 0\_1/1\_1

It was proposed in [1][2] that According to 38.331, if configured, DCI format 0\_1 and 1\_1 are configured simultaneously for a search space set. According to 38.212, if the higher layer parameter(s) *dormancyGroupWithinActiveTime* are configured, both DCI format 0\_1 and 1\_1 should contain the field of "SCell dormancy indication" which has at least 1 bit. Therefore, the current description of "if one or both of DCI format 0\_1 and DCI format 1\_1 include a SCell dormancy indication field" causes misunderstanding that it allows only one of the DCI format 0\_1 and DCI format 1\_1 includes a SCell dormancy indication field.

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| 38.21310.3 PDCCH monitoring indication and dormancy/non-dormancy behaviour for SCells ======skipped part=======  If a UE is provided search space sets to monitor PDCCH for detection of DCI format 0\_1 and DCI format 1\_1 and if ~~one or both of~~ DCI format 0\_1 and DCI format 1\_1 include a SCell dormancy indication field,  - the SCell dormancy indication field is a bitmap with size equal to a number of groups of configured SCells, provided by *dormancyGroupWithinActiveTime*,  - each bit of the bitmap corresponds to a group of configured SCells from the number of groups of configured Scells  - if the UE detects a DCI format 0\_1 or a DCI format 1\_1 that does not include a carrier indicator field, or detects a DCI format 0\_1 or DCI format 1\_1 that includes a carrier indicator field with value equal to 0  - a '0' value for a bit of the bitmap indicates an active DL BWP, provided by *dormantBWP-Id*, for the UE for each activated SCell in the corresponding group of configured SCells  - a '1' value for a bit of the bitmap indicates  - an active DL BWP, provided by *firstWithinActiveTimeBWP-Id*, for the UE for each activated SCell in the corresponding group of configured SCells, if a current active DL BWP is the dormant DL BWP  - a current active DL BWP, for the UE for each activated SCell in the corresponding group of configured SCells, if the current active DL BWP is not the dormant DL BWP  - the UE sets the active DL BWP to the indicated active DL BWP  ======skipped part======= |

Please provide your input/views on the proposed change#1:

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| Company | Comment |
| Intel | We are supportive to the changes |
| vivo | The current text may not be wrong; it just defines a case that cannot be configured by current RRC. Having saying that, we are also OK if the majority prefer to remove that text. |
| MTK | Support the change |
| ZTE | Ok with the change. |
| CATT | We believe current specification is correct and don’t think this is essential correction. UE could be configured with DL SPS and UL dynamic grant or DL dynamic grant or UL CG. There could be one of DCI format 0\_1 and DCI format 1\_1 carrying SCell dormancy indication. |
| Qualcomm | Fine with the change. |
| Ericsson | OK to handle as an editorial change along with other changes under [106-e-NR-MRDC-CA-01] thread. |
| Nokia | There is no issue with the spec as the “one or both” leads to no conflict with the RRC that always ends up configuring either none, or both and the case with “one” just never happens. Could be taken in the same CR as is being produced for outer editorials in MRDC-CA-01 thread if this is really considered as an essential correction. |

## Change 2: Remove SCell dormaincy indiction with exception of “indication of SPS PDSCH release” since SCell dormancy indication is only supported for DCI format 1\_1 with CRC scrambled by C-RNTI or MCS-RNTI (no CS-RNTI).

It was proposed in [1][2] that considering a SPS PDSCH release indication is carried by a DCI with CRC scrambled by a CS-RNTI, and a PDCCH is considered as a Case 2 PDCCH only if the CRC of DCI format 1\_1 is scrambled by a RNTI which includes C-RNTI and MCS-C-RNTI, therefore, the description of “the UE considers the DCI format 1\_1 as not indicating a SPS PDSCH release” should be removed to avoid confusion on the understanding.

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| 38.21310.3 PDCCH monitoring indication and dormancy/non-dormancy behaviour for SCells ======skipped part=======  If a UE is provided search space sets to monitor PDCCH for detection of DCI format 1\_1, and if  - the CRC of DCI format 1\_1 is scrambled by a C-RNTI or a MCS-C-RNTI, and if  - a one-shot HARQ-ACK request field is not present or has a ‘0’ value, and if  - the UE detects a DCI format 1\_1 on the primary cell that does not include a carrier indicator field, or detects a DCI format 1\_1 on the primary cell that includes a carrier indicator field with value equal to 0, and if  - *resourceAllocation* = *resourceAllocationType0* and all bits of the frequency domain resource assignment field in DCI format 1\_1 are equal to 0, or  - *resourceAllocation* = *resourceAllocationType1* and all bits of the frequency domain resource assignment field in DCI format 1\_1 are equal to 1, or  - *resourceAllocation = dynamicSwitch* and all bits of the frequency domain resource assignment field in DCI format 1\_1 are equal to 0 or 1  the UE considers the DCI format 1\_1 as indicating SCell dormancy, not scheduling a PDSCH reception ~~or indicating a SPS PDSCH release~~, and for transport block 1 interprets the sequence of fields of  ======skipped part======= |

Please provide your input/views on the proposed change#2:

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| Company | Comment |
| Intel | We are supportive to the changes |
| vivo | OK with the change. |
| MTK | Support the change |
| ZTE | Ok with the change. |
| CATT | We don’t think this is essential correction but OK to remove the redundancy wording |
| Qualcomm | Fine with the change. |
| Ericsson | OK to handle this as an editorial change along with other changes under [106-e-NR-MRDC-CA-01] thread. |
| Nokia | Doesn’t seem essential as the DCI cannot indicate SPS PDSCH release, it is not wrong to say that the DCI is not in this case indicating SPS PDSCH release. That said, it seems consistent to remove, as an editorial change and could be taken in MRDC-CA-01 thread for 38.213 MRDC-CA changes. |

## Change#3: Corrections on configuration of dormant BWP needed for SCell dormancy

It was proposed in [1][2] that for a configured SCell, if the higher layer parameters dormantBWP-Id and/or firstWithinActiveTimeBWP-Id are not configured, when a Case 2 PDCCH is detected, the UE cannot execute the specified procedure, considering the UE does not have dormant BWP and first non-dormant BWP on the SCell. In order to correct this issue, it is proposed in [1][2] to restrict that the specified procedure only applies to the activated SCell(s) configured with the higher layer parameters *dormantBWP-Id* and *firstWithinActiveTimeBWP-Id*.

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| 38.21310.3 PDCCH monitoring indication and dormancy/non-dormancy behaviour for SCells ======skipped part=======  the UE considers the DCI format 1\_1 as indicating SCell dormancy, not scheduling a PDSCH reception or indicating a SPS PDSCH release, and for transport block 1 interprets the sequence of fields of  - modulation and coding scheme  - new data indicator  - redundancy version  and of  - HARQ process number  - antenna port(s)  - DMRS sequence initialization  as providing a bitmap to each configured SCell, in an ascending order of the SCell index, where, for an activated SCell configured with *dormantBWP-Id* and *firstWithinActiveTimeBWP-Id*,  - a ‘0’ value for a bit of the bitmap indicates an active DL BWP, provided by *dormantBWP-Id*, for the UE for ~~a corresponding~~ the activated SCell  - a ‘1’ value for a bit of the bitmap indicates  - an active DL BWP, provided by *firstWithinActiveTimeBWP-Id*, for the UE for ~~a corresponding~~ the activated SCell, if a current active DL BWP is the dormant DL BWP  - a current active DL BWP, for the UE for ~~a corresponding~~ the activated SCell, if the current active DL BWP is not the dormant DL BWP  - the UE sets the active DL BWP to the indicated active DL BWP  ======skipped part======= |

Please provide your input/views on the proposed change#3:

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| Company | Comment |
| Intel | We are supportive to the changes |
| vivo | The change seems not necessary. The text “provided by *dormantBWP-Id*” and “provided by *firstWithinActiveTimeBWP-Id*” in the sub bullets already cover the condition. If they are not configured, it is clearly an error case. |
| MTK | Fine with the change |
| ZTE | Not ok with the change.  This change is a NBC. With the existing spec, N bits are needed to indicate SCell dormancy when there are N configured Scells, regardless whether the SCell is activated or deactivated, regardless whether the SCell is configured with dormantBWP-Id or not. If the change is approved, only the activated SCell configured with dormantBWP-Id is counted.  If I remember correctly, this issue was discussed long time ago, during that time, companies thought that the reserved bits are enough to indicate dormancy for each configured SCell, no big issue with the existing spec. I may try to dig out the discussion history later on. |
| Huawei, HiSilicon | Some further feedback on ZTE’s comments. Actually, our intention is not to change the number of bits to indicate SCell dormancy. The number of bits are still based on the configured Scells according to the unchanged part of “as providing a bitmap to each configured SCell, in an ascending order of the SCell index,”.  The intention of the change is to make clear that the SCell dormancy adaptation procedure shown in the sub-bullets are applied for a SCell configured with *dormantBWP-Id* and *firstWithinActiveTimeBWP-Id*. For a configured SCell, if the higher layer parameters *dormantBWP-Id* and/or *firstWithinActiveTimeBWP-Id* are not configured, when a Case 2 PDCCH is detected, the UE cannot execute the specified procedure, considering the UE does not have dormant BWP and first non-dormant BWP on the SCell. |
| CATT | We don’t agree this change. We agree with vivo that the spec would not cover the error case when dormant BWP is not configured. |
| Qualcomm | Agree with vivo, no change is needed. |
| ZTE2 | Thanks for Huawei’s clarification. Then we don’t have strong concern for this change. Although we don’t see strong need to update the spec as clarified by vivo, CATT and Qualcomm, we won’t object this change if majority companies prefer to have this change. |
| Ericsson | Not OK with change as proposed but open to discuss this issue further. As discussed in RAN1#103e, we are open to clarify that PDCCH DCI format 1\_1 handling is not be impacted for UEs not configured any dormant BWP. |
| Nokia | Not OK with the change as it stands as there is a confusion as pointed out by ZTE that even if not intended, this seems to adapt the number of bits in the DCI, but it would be OK to clarify that the bits are not acted on for cells with no dormant BWP. |

# Conclusions

# References

1. R1-2106514 Discussion on corrections of Scell dormancy for power saving Huawei, HiSilicon
2. R1-2106515 Corrections of Scell dormancy for power saving Huawei, HiSilicon