3GPP TSG-RAN WG1 Meeting #110bis R1-220xxxx

e-Meeting, October 10th – 14th, 2022

**Agenda item:** 7.1

**Source:** Moderator (Qualcomm Incorporated)

**Title:** [110bis-e-NR-R15-08] - Discussion on timeline for group power control command

**Document for:** Discussion and Decision

# Background

This email discussion is to treat the following contribution (CR for Rel-16):

R1-2209934 Draft CR on Clarification on timelines for group power control command Qualcomm Incorporated

The contribution above proposes to define the timelines for group power control as . According to the proponents, based on the current specifications the UE has zero or negative time to decode a DCI and apply the TPC command. For completeness, the “reasons for change”, “summary of change” and actual CR change are shown below:

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| ***Reason for change:*** | Current specification does not clarify what is the required timeline for application of TPC commands carried over group DCIs (DCI format 2\_2 scrambled by TPC-PUCCH-RNTI or TPC-PUSCH-RNTI, or DCI format 2\_3 scrambled by TPC-SRS-RNTI).For instance, if we conside the case of using 2\_2 for power control of CG-PUSCH, where the CG-PUSCH reads as follows (TS 38.213, 7.1.1):- If a PUSCH transmission is configured by *ConfiguredGrantConfig*, is a number of symbols equal to the product of a number of symbols per slot, , and the minimum of the values provided by *k2* in *PUSCH-ConfigCommon* for active UL BWP of carrier of serving cell *k2* is defined in TS 38.331 as follows:PUSCH-TimeDomainResourceAllocation ::=  SEQUENCE {    k2                                      INTEGER(0..32)                                  OPTIONAL,   -- Need S    mappingType                             ENUMERATED {typeA, typeB},    startSymbolAndLength                    INTEGER (0..127)}The minimum value for *k2* is zero, therefore can be zero. This leads to the UE having to apply the TPC command non-causally, which is non-implementable.A similar issue is present in subclause 7.2.1 for PUCCH and 7.3.1 for SRS. |
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| ***Summary of change:*** | Clarify that the timeline between the reception of a TPC command and its application to a PUSCH is . This timeline is the same as the one defined in 11.1.1. |

11.3 Group TPC commands for PUCCH/PUSCH

**<Unchanged parts are omitted>**

The UE does not expect to apply a TPC command on a PUSCH or PUCCH transmission if the first symbol of the PUCCH or the PUSCH occurs within relative to a last symbol of a CORESET where the UE detects the DCI format 2\_2 carrying the TPC command. is the PUSCH preparation time for the corresponding UE processing capability [6, TS 38.214] assuming , and corresponds to the smallest SCS configuration between the SCS configuration of the PDCCH carrying the DCI format 2\_2 and the SCS configuration of the PUCCH or PUSCH.

11.4 SRS switching

**<Unchanged parts are omitted>**

The UE does not expect to apply a TPC command on an SRS transmission if the first symbol of the SRS occurs within relative to a last symbol of a CORESET where the UE detects the DCI format 2\_3 carrying the TPC command. is the PUSCH preparation time for the corresponding UE processing capability [6, TS 38.214] assuming , and corresponds to the smallest SCS configuration between the SCS configuration of the PDCCH carrying the DCI format 2\_3 and the SCS configuration of the SRS.

1. Discussion – Round 1

Please provide input by Tuesday 11th 23:59pm CET

**Q1: Do you agree that the current timelines for power control are not defined (potentially leading to unimplementable UEs) and, therefore, a CR is needed?**

* **If the answer is negative, please provide your understanding on the minimum time between end of the PDCCH carrying a DCI 2\_2 or 2\_3 and the first channel/signal the UE has to apply the power control to (in actual time).**

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**Q2: If the questions to Q1 is “YES”, do you have any comments on the CR? (e.g. value of processing time, how to capture the restriction, etc.)**

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1. Conclusions

TBD