**3GPP TSG-RAN WG1 Meeting #114bisR1-230xxxx**

**Xiamen, China, October 9th - October 13th, 2023**

**Agenda Item: 6**

**Source: Moderator (Lenovo)**

**Title: Summary on HARQ timing for CEMode B**

**Document for: Discussion and decision**

# Introduction

This document summarizes the discussions during RAN1#114bis agenda 6 on the following CR.

R1-2309791 Draft CR on HARQ timing for CEMode B Lenovo

R1-2309887 Clarification on UL timing for CE Mode B Ericsson

# Discussion

## Summary of the CR

As observed by [Lenovo, Ericsson], for FDD, the HARQ timing for multiple TBs scheduling for UE configured with CEMode B is missing. The corresponding CRs are proposed.

TP1a from Lenovo in R1-2309791

TS36.213

## 10.2 Uplink HARQ-ACK timing

For TDD or for FDD-TDD and primary cell frame structure type 2 or for FDD-TDD and primary cell frame structure type 1, if a UE configured with *EIMTA-MainConfigServCell-r12* for a serving cell, "UL/DL configuration" of the serving cell in Clause 10.2 refers to the UL/DL configuration given by the parameter *eimta-HARQ-ReferenceConfig-r12* for the serving cell unless specified otherwise.

**<Unchanged parts are omitted>**

For FDD, if a BL/CE UE is configured with CEModeA, the UE is not configured with higher layer parameter *harq-AckBundling* in *ce-PDSCH-MultiTB-Config* and multiple TB are scheduled in the corresponding DCI, or if the UE is configured with CEModeB and multiple TB are scheduled in the corresponding DCI, the BL/CE UE shall upon detection of a PDSCH intended for the UE and for which an HARQ-ACK shall be provided, transmit the HARQ-ACK response using the same  derived according to Clause 10.1.2.1 in subframe(s) with , *i =0,1, …, N-1*, where

- is the number of scheduled TB determined in the corresponding DCI;

- if the UE is not configured with higher layer parameter *interleaving* in *ce-PDSCH-MultiTB-Config* and the UE is not in half-duplex FDD operation

- ,

- otherwise

- **,**

**<Unchanged parts are omitted>**

TP2a from Ericsson in R1-2309887

TS36.213

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## 10.2 Uplink HARQ-ACK timing

For TDD or for FDD-TDD and primary cell frame structure type 2 or for FDD-TDD and primary cell frame structure type 1, if a UE configured with *EIMTA-MainConfigServCell-r12* for a serving cell, "UL/DL configuration" of the serving cell in Clause 10.2 refers to the UL/DL configuration given by the parameter *eimta-HARQ-ReferenceConfig-r12* for the serving cell unless specified otherwise.

------------------------------------------ Text Omitted ---------------------------------------------------------

For FDD, if a BL/CE UE is configured with CEModeA or CEModeB, and if the UE is not configured with higher layer parameter *harq-AckBundling* in *ce-PDSCH-MultiTB-Config* and multiple TB are scheduled in the corresponding DCI, the BL/CE UE shall upon detection of a PDSCH intended for the UE and for which an HARQ-ACK shall be provided, transmit the HARQ-ACK response using the same  derived according to Clause 10.1.2.1 in subframe(s) with , *i =0,1, …, N-1*, where

## Discussion

**Question 1: Do you agree with the intention of the CR?**

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| --- | --- |
| **Company** | **Comments** |
| Qualcomm | We agree to fix the issue that CEModeB is missing. |
| Huawei, HiSilicon | We agree to fix |
| Lenovo | We agree to fix |

**Question 2: Do you agree with the any of CR above? If not, what is your proposal?**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Qualcomm | We slightly prefer a simpler version:  “For FDD, if a BL/CE UE is not configured” |
| Huawei, Hisilicon | QC’s version looks even simpler. |
| Lenovo | If companies believe the update from QC or E/// will not lead to the misunderstanding that UE configured with CEMode B can be configured with HARQ bundling, we are OK with either proposal, QC’s proposal seems simpler. |

# References

1. R1-2309791 Draft CR on HARQ timing for CEMode B Lenovo
2. R1-2309887 Clarification on UL timing for CE Mode B Ericsson