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

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

Source: moderator (vivo)

Title: Summary of [103-e-NR-NRU-06] email discussion

Agenda Item: 7.2.2

Document for: Discussion and Decision

1. Introduction

Following email thread was agreed for discussion [1]

* Email thread 6: CG1+CG4+CG5+CG2
1. Issues for discussion
	1. Issue 1: clarification on HARQ-ACK multiplexing

**TP#1**

================== Start of TP for TS 38.213 ========================

9. UE procedure for reporting control information

===================== Unchanged Texts Omitted ========================

If a UE would multiplex HARQ-ACK information in a PUSCH transmission that is configured by a *ConfiguredGrantConfig*, and includes CG-UCI [5, TS 38.212], then

* ~~the UE multiplexes the HARQ-ACK information in the PUSCH transmission~~ if the UE is provided *cg-CG-UCI-Multiplexing,* the UE multiplexes the HARQ-ACK information in the PUSCH transmission;
* otherwise, the UE does not transmit the PUSCH and multiplexes the HARQ-ACK information in a PUCCH transmission or in another PUSCH transmission.

======================= Unchanged Texts Omitted ==========================

======================= End of TP for TS 38.213 =======================

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* 1. Issue 2: HARQ-ACK feedback in CG-DFI for dynamic grant PUSCH

**TP#2**

-------------------------**Text proposal #1 starts for TS 38.213** ----------------------------

10.5 HARQ-ACK information for PUSCH transmissions

================== Unchanged Texts Omitted ================

For an initial transmission by a UE of a transport block in a PUSCH configured by *ConfiguredGrantConfig*, if the UE receives a CG-DFI that provides HARQ-ACK information for the transport block, the UE assumes that the transport block was correctly decoded if the HARQ-ACK information value is ACK; otherwise, the UE assumes that the transport block was not correctly decoded.

(Option1) For a PUSCH transmission scheduled by a DCI format, if the UE receives a CG-DFI that provides HARQ-ACK information for the transport block, the UE assumes that the transport block was correctly decoded if the HARQ-ACK information value is ACK; otherwise, the UE assumes that the transport block was not correctly decoded.

(Option 2) For a PUSCH transmission scheduled for a slot by a DCI format, if a UE is provided *PUSCH-CodeBlockGroupTransmission* for a serving cell, a value of HARQ-ACK information for a transport block of a corresponding HARQ process number is ACK if at least 10% of all the CBGs of PUSCH(s) scheduled by any DCI format in the same slot was correctly decoded; otherwise, a value of HARQ-ACK information is NACK.

For a PUSCH transmission scheduled by a DCI format, HARQ-ACK information for a transport block of a corresponding HARQ process number is valid if a first symbol of the PDCCH reception is after a last symbol of the PUSCH transmission by a number of symbols provided by *cg-minDFIDelay-r16* or, if the PUSCH transmission is over multiple slots,

- after a last symbol of the PUSCH transmission in a first slot from the multiple slots by a number of symbols provided by *cg-minDFIDelay-r16*, if a value of the HARQ-ACK information is ACK.

- after a last symbol of the PUSCH transmission in a last slot from the multiple slots by a number of symbols provided by *cg-minDFIDelay-r16*, if a value of the HARQ-ACK information is NACK.

<Unchanged Text Omitted>

------------------------- **Text proposal #1 ends for TS 38.213** -------------------------------

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* 1. Issue 4: clarification on min DFI delay

**TP#3**

------------start of TP for 38.213------------------------

10.5 HARQ-ACK information for PUSCH transmissions

A UE can be configured a number of search space sets to monitor PDCCH for detecting a DCI format 0\_1 with a DFI flag field and CRC scrambled with a CS-RNTI provided by *cs-RNTI*. The UE determines that the DCI format provides HARQ-ACK information for PUSCH transmissions based on an when a DFI flag field value is set to '1', if a PUSCH transmission is configured by *ConfiguredGrantConfig*.

The HARQ-ACK information corresponds to transport blocks in PUSCH transmissions for all HARQ processes for a serving cell of a PDCCH reception that provides DCI format 0\_1 or, if DCI format 0\_1 includes a carrier indicator field, for a serving cell indicated by a value of the carrier indicator field.

For a PUSCH transmission configured by *ConfiguredGrantConfig*, HARQ-ACK information for a transport block of a corresponding HARQ process ID is valid if a first symbol of the PDCCH reception is after a last symbol of the PUSCH transmission, or of any repetition of the PUSCH transmission, by a number of symbols provided by *cg-minDFIDelay-r16*.

For an initial transmission by a UE of a transport block in a PUSCH configured by *ConfiguredGrantConfig*, if the UE receives a CG-DFI that provides HARQ-ACK information for the transport block, the UE assumes that the transport block was correctly decoded if the HARQ-ACK information value is ACK; otherwise, the UE assumes that the transport block was not correctly decoded.

For a PUSCH transmission scheduled by a DCI format, HARQ-ACK information for a transport block of a corresponding HARQ process ID is valid if a first symbol of the PDCCH reception is after a last symbol of the PUSCH transmission by a number of symbols provided by *cg-minDFIDelay-r16*  or, if the PUSCH transmission is over multiple slots,

- after a last symbol of the PUSCH transmission in a first slot from the multiple slots by a number of symbols provided by *cg-minDFIDelay-r16*, if a value of the HARQ-ACK information is ACK.

- after a last symbol of the PUSCH transmission in a last slot from the multiple slots by a number of symbols provided by *cg-minDFIDelay-r16*, if a value of the HARQ-ACK information is NACK.

UE does not expect to be configured with different *cg-minDFIDelay-r16* among multiple *ConfiguredGrantConfig* in one BWP.

------------end of TP -------------------------------

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* 1. Issue 5: multi PUSCH related TPs

**TP#4**

----------------------------------------- TP for 38.213 10.2------------------------------------------------------

10.2 PDCCH validation for DL SPS and UL grant Type 2

A UE validates, for scheduling activation or scheduling release, a DL SPS assignment PDCCH or a configured UL grant Type 2 PDCCH if

- the CRC of a corresponding DCI format is scrambled with a CS-RNTI provided by *cs-RNTI*, and

- the new data indicator field in the DCI format for the enabled transport block is set to '0' or set to all ‘0’ when DCI includes NDIs for multiple PUSCHs, and

- the DFI flag field, if present, in the DCI format is set to '0', and

- if validation is for scheduling activation and if the PDSCH-to-HARQ\_feedback timing indicator field in the DCI format is present, the PDSCH-to-HARQ\_feedback timing indicator field does not provide an inapplicable value from dl-DataToUL-ACK.

<unchanged part omitted>

-------------------------------------------------END OF TP -----------------------------------------------------------

**TP#5**

----------------------------------------- TP for 38.214 6.1.2.3------------------------------------------------------

A set of allowed periodicities *P* are defined in [12, TS 38.331]. The higher layer parameter *cg-nrofSlots-r16*, provides the number of consecutive slots allocated within a configured grant period. The higher layer parameter *cg-nrofPUSCH-InSlot-r16* provides the number of consecutive PUSCH allocations within a slot, where the first PUSCH allocation follows the higher layer parameter *timeDomainAllocation* for Type 1 PUSCH transmission or the higher layer configuration according to [10, TS 38.321], and UL grant received on the DCI for Type 2 PUSCH transmissions, and the remaining PUSCH allocations have the same length and PUSCH mapping type, and are appended following the previous allocations without any gaps. The same combination of start symbol and length and PUSCH mapping type repeats over the consecutively allocated slots. If the PUSCH time domain resource allocation configuration is determined according to the Table 6.1.2.1.1-1A, and *pusch-Config* includes *pusch-TimeDomainAllocationList-ForMultiPUSCH,* the first PUSCH allocation follows the first SLIV in the indicated entry by the higher layer parameter *timeDomainAllocation* for Type 1 PUSCH transmission or UL grant received on the DCI for Type 2 PUSCH transmissions.

<unchanged part omitted>

-------------------------------------------------END OF TP-----------------------------------------------------------

**TP#6**

----------------------------------------- TP for 38.214 6.1.2.3------------------------------------------------------

A set of allowed periodicities *P* are defined in [12, TS 38.331]. The higher layer parameter *cg-nrofSlots-r16*, provides the number of consecutive slots allocated within a configured grant period. The higher layer parameter *cg-nrofPUSCH-InSlot-r16* provides the number of consecutive PUSCH allocations within a slot, where the first PUSCH allocation follows the higher layer parameter *timeDomainAllocation* for Type 1 PUSCH transmission or the higher layer configuration according to [10, TS 38.321], and UL grant received on the DCI for Type 2 PUSCH transmissions, and the remaining PUSCH allocations have the same length and PUSCH mapping type, and are appended following the previous allocations without any gaps. The same combination of start symbol and length and PUSCH mapping type repeats over the consecutively allocated slots. For the PUSCH retransmission scheduled by a PDCCH with CRC scrambled by CS-RNTI, if the PUSCH time domain resource allocation configuration applies the Table 6.1.2.1.1-1A, and *pusch-Config* includes *pusch-TimeDomainAllocationList-ForMultiPUSCH,* the NDI = 0 indicatesthe corresponding SLIV is not applicable, and NDI=1 indicates retransmission with the corresponding indicated SLIV.

<unchanged part omitted>

-------------------------------------------------END OF TP-----------------------------------------------------------

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# References

[1] R1-2008888, “………..”, RAN1#103-e