**3GPP TSG RAN WG1 Meeting #106-e R1-210xxxx**

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

**Agenda Item: 7.2.5**

**Source: Moderator (Huawei, HiSilicon)**

**Title: Summary of [106-e-NR-L1enh-URLLC-07] Issue#11: Correction on overlapping between SPS HARQ-ACK with HP and SPS HARQ-ACK with LP**

**Document for: Discussion and Decision**

# Introduction

Following email thread is dedicated to discuss the issue in R1-2106489 [1].

**Background of Changes:**

According to the agreements from the RAN1 #101-e meeting, the UE is required to handle collisions between a high priority configured UL transmission and low priority channels for the listed cases 1-4.

***Agreement***

*At least for handling collision between a high priority configured UL transmission and low priority channels in the following cases, it is up to UE implementation to ensure that the low priority UL transmission is cancelled, at the latest, from the first symbol that is overlapping with the high priority UL transmission:*

* *Case 1: Collision between a high priority SR PUCCH and any low priority channels*
* *Case 2: Collision between a high priority CG-PUSCH and a low priority PUCCH*
* *Case 3: Collision between a high priority PUCCH carrying only HARQ-ACK corresponding to PDSCH without corresponding PDCCH and any low priority configured uplink transmission.*
* *Case 4: Collision between a high priority PUSCH carrying SP-CSI, except the first PUSCH after the activation DCI, and a low priority PUCCH*

For case 3, for low priority configured uplink transmission, SPS HARQ-ACK with low priority is omitted in the current spec. This CR corrects the specification by including this missing case.

**Proposed Changes:**

Add the missing case 3 into 38.213 for UE’s collision handling between a high priority configured UL transmission and low priority channels.

Update the 38.213, Section 9 according to the following text proposal:

**Text Proposal for 38.213**

|  |
| --- |
| 9 UE procedure for reporting control information < Unchanged parts are omitted >  If a UE would transmit the following channels, including repetitions if any, that would overlap in time  - a first PUCCH of larger priority index with SR and a second PUCCH or PUSCH of smaller priority index, or  - a configured grant PUSCH of larger priority index and a PUCCH of smaller priority index, or  - a first PUCCH of larger priority index with HARQ-ACK information only in response to a PDSCH reception without a corresponding PDCCH and a second PUCCH of smaller priority index with HARQ-ACK information only in response to a PDSCH reception without a corresponding PDCCH, or a second PUCCH of smaller priority index with SR and/or CSI, or a configured grant PUSCH with smaller priority index, or a PUSCH of smaller priority index with SP-CSI report(s) without a corresponding PDCCH, or  - a PUSCH of larger priority index with SP-CSI reports(s) without a corresponding PDCCH and a PUCCH of smaller priority index with SR, or CSI, or HARQ-ACK information only in response to a PDSCH reception without a corresponding PDCCH, or  - a configured grant PUSCH of larger priority index and a configured PUSCH of lower priority index on a same serving cell  the UE is expected to cancel a repetition of the PUCCH/PUSCH transmissions of smaller priority index before the first symbol overlapping with the PUCCH/PUSCH transmission of larger priority index if the repetition of the PUCCH/PUSCH transmissions of smaller priority index overlaps in time with the PUCCH/PUSCH transmissions of larger priority index.  < Unchanged parts are omitted > |

# Company views

**Q1:** Do you agree with the analysis of background of changes and with the corresponding TP to include the missing case 3?

|  |  |
| --- | --- |
| Company | Comments |
| DOCOMO | Agree |
| Samsung | Agree |
| vivo | Agree |
| Sharp | Agree |
| Nokia/NSB | Agree |
| CATT | Agree |
| OPPO | Agree |
| Ericsson | Agree with the TP with edits.  One editorial point is, the PUCCH carrying HARQ-ACK codebook for SPS PDSCH should not refer to a single SPS PDSCH only. The HARQ-ACK codebook may carry HARQ-ACK bits for multiple SPS PDSCHs in Rel-16.  Another editorial point is, the bullet later used ‘lower priority index’, while ‘smaller priority index’ was used in all other places. Suggest to make this editorial correction together with the TP above. That is:  “  - a first PUCCH of larger priority index with HARQ-ACK information only in response to PDSCH(s) reception without corresponding PDCCH(s) and a second PUCCH of smaller priority index with HARQ-ACK information only in response to PDSCH(s) reception without corresponding PDCCH(s), or a second PUCCH of smaller priority index with SR and/or CSI, or a configured grant PUSCH with smaller priority index, or a PUSCH of smaller priority index with SP-CSI report(s) without a corresponding PDCCH, or  - a PUSCH of larger priority index with SP-CSI reports(s) without a corresponding PDCCH and a PUCCH of smaller priority index with SR, or CSI, or HARQ-ACK information only in response to PDSCH(s) reception without corresponding PDCCH(s), or  - a configured grant PUSCH of larger priority index and a configured PUSCH of smaller priority index on a same serving cell” |
| Qualcomm | Agree. Also, agree with the editorial changes proposed by Ericsson. |
| Intel | Agree. |
| ZTE | Agree |
| HW/HiSi | Agree. |
| Apple | Agree |

**Status after first round of discussion.**

12 companies have submitted their feedback.

* 11 companies agree with the original proposal (DOCOMO, Samsung, vivo, Sharp, Nokia/NSB, CATT, OPPO, Qualcomm, Intel, ZTE, HW/HiSi)
* 1 company agrees the TP with edits (Ericsson)
* 1 company (Qualcomm) is fine with the original TP and also with the changes proposed by Ericsson

Moderator comment: The edits proposed by Ericsson sound reasonable. I have also checked whether their modification in the last bullet (“lower” to “smaller”) would need to apply to other places of the specification. I did not find any, therefore I think it is fine to also include this editorial correction in the CR.

I would like to quickly check the situation in the group.

Please provide your answers not later than Aug 19 UTC 05:00 (AM).

**Q2**: Is also the TP below with the modifications proposed by Ericsson acceptable to capture the missing case 3?

|  |
| --- |
| 9 UE procedure for reporting control information < Unchanged parts are omitted >  If a UE would transmit the following channels, including repetitions if any, that would overlap in time  - a first PUCCH of larger priority index with SR and a second PUCCH or PUSCH of smaller priority index, or  - a configured grant PUSCH of larger priority index and a PUCCH of smaller priority index, or  - a first PUCCH of larger priority index with HARQ-ACK information only in response to PDSCH(s) reception without corresponding PDCCH(s) and a second PUCCH of smaller priority index with HARQ-ACK information only in response to PDSCH(s) reception without corresponding PDCCH(s), or a second PUCCH of smaller priority index with SR and/or CSI, or a configured grant PUSCH with smaller priority index, or a PUSCH of smaller priority index with SP-CSI report(s) without a corresponding PDCCH, or  - a PUSCH of larger priority index with SP-CSI reports(s) without a corresponding PDCCH and a PUCCH of smaller priority index with SR, or CSI, or HARQ-ACK information only in response to PDSCH(s) reception without corresponding PDCCH(s), or  - a configured grant PUSCH of larger priority index and a configured PUSCH of smaller priority index on a same serving cell  < Unchanged parts are omitted > |

|  |  |
| --- | --- |
| Company | Comments |
| vivo | We are fine with above TP. |
| OPPO | Support the TP |
| Sharp | We are fine with the above TP. |
| Nokia/NSB | Support the TP |
| DOCOMO | Support the TP |
| Apple | Support the TP |

# Outcome

TBD.

# References

[1]: R1-2106489 “Correction on overlapping between SPS HARQ-ACK with HP and SP HARQ-ACK with LP”, Huawei, HiSilicon, 3GPP TSG-RAN WG1 Meeting #106-e , E-meeting, Aug 16th-27th, 2021