3GPP TSG RAN WG1 #100bis-e R1-200xxxx

e-Meeting, April 20th – 30th, 2020

Agenda Item: 7.2.4.2.1

Source: Moderator (Ericsson)

Title: Text proposal for TS 38.213 related to [100b-e-NR-5G\_V2X\_NRSL-Mode-1-04]

Document for: Endorsement

# 1 Introduction

This document contains a text proposal for supporting Type-2 codebook for SL HARQ-ACK reporting to the gNB.

Following the existing agreements, the TP takes TS 38.213 v15.9.0 as the starting point. All changes described here are made on top of the procedures for DL HARQ-ACK reporting in that version of the specification.

The motivation of the TP is as follows:

* Reasons for change: introduction of SL HARQ-ACK reporting to the gNB using type-2 codebook.
* Summary of changes: the Rel-15 procedure for DL HARQ-ACK reporting is reused for SL HARQ-ACK reporting to the gNB.
* Specs/Sections impacted: TS 38.212 Section 16.5
* Consequences if not approved: SL HARQ-ACK reporting to the gNB using type-2 codebook is not supported.

# 2 Text Proposal

### 9.1.3 Type-2 HARQ-ACK codebook determination

This subclause applies if the UE is configured with *pdsch-HARQ-ACK-Codebook = dynamic*.

#### 9.1.3.1 Type-2 HARQ-ACK codebook in physical uplink control channel

A UE determines monitoring occasions for PDCCH with DCI format 3\_0 for scheduling PSSCH transmissions with associated PSFCH receptions on an active DL BWP of a serving cell , as described in Subclause 10.1, and for which the UE transmits HARQ-ACK information in a same PUCCH in slot  based on

- PSFCH-to-HARQ\_feedback timing indicator field values for PUCCH transmission with HARQ-ACK information in slot  in response to PSFCH receptions

- Time gap field in DCI format 3\_0 for scheduling PSSCH transmission(s) with associated PSFCH reception(s).

- Time resource assignment in DCI format 3\_0 for scheduling PSSCH transmission(s) with associated PSFCH reception(s).

- A set of configured SL pool bitmaps

- The value of a period of PSFCH transmission occasion resources provided in *periodPSFCHresource*.

- The value of a minimum time gap to a PSFCH transmission provided in *MinTimeGapPSFCH*.

The set of PDCCH monitoring occasions for DCI format 3\_0 for scheduling PSSCH transmissions with associated PSFCH receptions is defined as the PDCCH monitoring occasions across active DL BWPs of the configured serving cell, ordered in ascending order of start time of the search space set associated with a PDCCH monitoring occasion. The cardinality of the set of PDCCH monitoring occasions defines a total number  of PDCCH monitoring occasions.

A value of the counter sidelink assignment indicator (SAI) field in DCI format 3\_0 denotes the accumulative number of { PDCCH monitoring occasion} in which PSSCH transmission(s) with associated PSFCH reception(s), up to the current PDCCH monitoring occasion, in ascending order of PDCCH monitoring occasion index , where .

Denote by the value of the counter SAI in DCI format 3\_0 in PDCCH monitoring occasion  according to Table 9.1.3-1.

If the UE transmits HARQ-ACK information in a PUCCH in slot  and for any PUCCH format, the UE determines the , for a total number of  HARQ-ACK information bits, according to the following pseudo-code:

Set  – PDCCH with DCI format 3\_0 monitoring occasion index: lower index corresponds to earlier PDCCH with DCI format 3\_0 monitoring occasion

Set 

Set 

Set 

Set  to the number of PDCCH monitoring occasion(s)

while 

if PDCCH monitoring occasion  is before an active UL BWP change on the PCell

;

else

if there is a PSFCH associated with a PSSCH transmission scheduled by PDCCH in PDCCH monitoring occasion 

if



end if

= HARQ-ACK information bit

end if

end if



end while

 for any 

if a SL configured grant is configured and is activated for a UE and it provides a grant for PSSCH transmission(s) such that a PSFCH reception is expected in a slot , where is the PSFCH-to-HARQ-feedback timing value for the SL configured grant



= HARQ-ACK information bit associated with the PSFCH reception(s) associated with the PSSCH transmission(s) scheduled by the SL configured grant

end if

If , the UE determines a number of HARQ-ACK information bits  for obtaining a transmission power for a PUCCH, as described in Subclause 7.2.1, as

where

- is the value of the counter SAI in the last DCI format 3\_0 scheduling PSSCH transmission(s) associated with PSFCH reception(s) that the UE detects within the  PDCCH monitoring occasions.

- if the UE does not detect any DCI format 3\_0 scheduling PSSCH transmission(s) associated with PSFCH reception(s) in any of the  PDCCH monitoring occasions.

- is the total number of DCI format 3\_0 scheduling PSSCH transmission(s) associated with PSFCH reception(s) that the UE detects within the  PDCCH monitoring occasions. if the UE does not detect any DCI format 3\_0 scheduling PSSCH transmission(s) with associated PSFCH reception(s) in any of the  PDCCH monitoring occasions.

- is the number of DCI format 3\_0 scheduling PSSCH transmission(s) with associated PSFCH reception(s) that the UE detects in PDCCH monitoring occasion .

- is the number of SL configured grants for which the UE transmits corresponding HARQ-ACK information in the same PUCCH as for HARQ-ACK information corresponding to PSFCH receptions within the  PDCCH monitoring occasions.

Table 9.1.3-1: Value of counter SAI in DCI format 3\_0

|  |  |  |
| --- | --- | --- |
| SAI MSB, LSB |  | Number of {PDCCH monitoring occasion} in which PSFCH is present, denoted as  and |
| 0,0 | 1 |  |
| 0,1 | 2 |  |
| 1,0 | 3 |  |
| 1,1 | 4 |  |