3GPP TSG RAN WG1 Meeting #101-e R1-200xxxx

e-Meeting, May 25th – June 5th, 2020

Agenda Item: 7.2.4.2.1

Source: Moderator (Ericsson)

Title: Thread 3 on Resource allocation for NR sidelink Mode 1

Document for: Discussion, Decision

# Thread 3

[101-e- NR-5G\_V2X\_NRSL-Mode-1-03] Email discussion/approval on HARQ reporting to gNB

* Type-1 codebook for reporting in UL-SCH
  + Required changes to the Rel-15 procedures (as agreed) – TS 38.213 Section 9.1.2.2
* Type-2 codebook for reporting in UL-SCH
  + Required changes to the Rel-15 procedures (as agreed) – TS 38.213 Section 9.1.3.2

By 5/29, with potential TPs by 6/4 – Ricardo (Ericsson)

To facilitate the discussion, please provide your answers to the following questions. At the end, I have left room for other comments.

Please use the tables when providing your answers. My intention is to:

* Identify the changes to the spec. In my view, two aspects about this step are crucial: 1) identifying all impact to RAN2; 2) getting an idea of which parts of the Rel-15 spec are relevant for SL HARQ-ACK reporting in UL-SCH and which parts are not.
* Once there is common understanding about the parameters, start working on the changes to the spec. My intention is to address this by preparing a TP (based on the Rel-15 spec) and requesting companies’ views on it. I plan to prepare the TP as early as possible (but not earlier than 5/27). Given that this will be time consuming, the sooner we converge on the previous bullet, the better.

## Q1-1. Type-1 codebook for reporting in UL-SCH. Required changes to the Rel-15 procedures (as agreed) – TS 38.213 Section 9.1.2.2.

**Identify the parameters of the Rel-15 specification that are necessary for SL HARQ-ACK reporting to the gNB in UL-SCH using type-1 codebook. If appropriate, described the necessary changes.**

**NOTE: To ensure that all comments refer to the same version of the specification, make sure to use the latest Rel-15 version (v15.9.0).**

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| **Company** | **Views** |
| LG | “PDSCH-to-HARQ\_feedback timing indicator field” is replaced by “PSFCH-to-HARQ\_feedback timing indicator field”.  *“dl-DataToUL-ACK”* is replace by “sl-DataToUL-ACK”.  sl-PSFCH-ToPUCCH (it is for SL CG Type-1).  “DCI format 1\_0 or DCI format 1\_1” is replaced by “DCI format 3\_0”.  “SPS PDSCH” is replaced by “SL CG type-1 or SL CG type-2”.  DAI field in UL grant. |
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## Q1-2. Type-1 codebook for reporting in UL-SCH. Required changes to the Rel-15 procedures (as agreed) – TS 38.213 Section 9.1.2.2.

**Identify the parameters of the Rel-15 specification that are not necessary for SL HARQ-ACK reporting to the gNB in UL-SCH using type-1 codebook.**

**NOTE: To ensure that all comments refer to the same version of the specification, make sure to use the latest Rel-15 version (v15.9.0).**

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| **Company** | **Views** |
| NTT DOCOMO | UL DAI in DCI format 0\_1 should not be used for SL HARQ-ACK report on UL.  In our understanding, the UL DAI for type-1 CB is beneficial when any PDCCH other than the UL grant is not received. However, if UL DAI is used for SL HARQ-ACK report as well, UE cannot know which HARQ-ACK report should be multiplexed on the PUSCH, Uu or SL. Payload size of HARQ-ACK is different between Uu and SL. gNB needs to do blind decode always. |
| LG | harq-ACK-SpatialBundlingPUSCH (We do not use HARQ bundling scheme for SL)  SPS PDSCH release (For the CG release, MAC confirmation message will be used instead of AN on PUCCH or PUSCH)  ‘PCell’ in ‘DCI format 1\_0 with a counter DAI field value of 1 on the PCell’ (A single carrier will be used for NR sidelink mode 1)  UE behavior for dynamic DL BWP switching (We removed DL BWP switching part in the HARQ codebook for PUCCH)  For forward compatibility, it would be fine to introduce separate SAI field in UL grant instead of reusing UL DAI field. |
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## Q2-1. Type-2 codebook for reporting in UL-SCH. Required changes to the Rel-15 procedures (as agreed) – TS 38.213 Section 9.1.3.2**.**

**Identify the parameters of the Rel-15 specification that are necessary for SL HARQ-ACK reporting to the gNB in UL-SCH using type-2 codebook. If appropriate, described the necessary changes.**

**NOTE: To ensure that all comments refer to the same version of the specification, make sure to use the latest Rel-15 version (v15.9.0).**

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| **Company** | **Views** |
| NTT DOCOMO | UL DAI field in DCI format 0\_1 is used to indicate SAI. |
| LG | In my reading, V\_temp2 needs to be introduced even for Type-2 codebook for reporting in PUCCH.  “PDSCH-to-HARQ\_feedback timing indicator field” is replaced by “PSFCH-to-HARQ\_feedback timing indicator field”.  *“dl-DataToUL-ACK”* is replace by “sl-DataToUL-ACK”.  sl-PSFCH-ToPUCCH (it is for SL CG Type-1).  “DCI format 1\_0 or DCI format 1\_1” is replaced by “DCI format 3\_0”.  “SPS PDSCH” is replaced by “SL CG type-1 or SL CG type-2”.  DAI field in UL grant. |
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## Q2-2. Type-2 codebook for reporting in UL-SCH. Required changes to the Rel-15 procedures (as agreed) – TS 38.213 Section 9.1.3.2**.**

**Identify the parameters of the Rel-15 specification that are not necessary for SL HARQ-ACK reporting to the gNB in UL-SCH using type-2 codebook.**

**NOTE: To ensure that all comments refer to the same version of the specification, make sure to use the latest Rel-15 version (v15.9.0).**

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| **Company** | **Views** |
| LG | harq-ACK-SpatialBundlingPUSCH (We do not use HARQ bundling scheme for SL)  SPS PDSCH release (For the CG release, MAC confirmation message will be used instead of AN on PUCCH or PUSCH)  ‘PCell’ in ‘DCI format 1\_0 with a counter DAI field value of 1 on the PCell’ (A single carrier will be used for NR sidelink mode 1)  UE behavior for dynamic DL BWP switching (We removed DL BWP switching part in the HARQ codebook for PUCCH)  *PDSCH-CodeBlockGroupTransmission* (CBG is not supported for NR SL.)  Second-HARQ-ACK sub-codebook (This is for CBG-based HARQ-ACK)  For forward compatibility, it would be fine to introduce separate SAI field in UL grant instead of reusing UL DAI field. |
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## Q3. Configuration.

**Which of the following options is preferable:**

* **Option 1: For SL HARQ-ACK reporting to the gNB, the values of beta\_offset configured for DL HARQ-ACK reporting in PUSCH are used.**
* **Option 2: For SL HARQ-ACK reporting to the gNB, the values of beta\_offset are configured separately from the values for DL HARQ-ACK reporting.**

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| **Company** | **Views** |
| NTT DOCOMO | Support option 2.  We agreed that PUCCH configuration is separate from Uu. The motivation is to consider different performance requirements between Uu and SL. From the same reason, separate configuration is reasonable.  BTW, how about *scaling*, which is used in rate-matching formula as beta\_offset? Please see clause 6.3.2.4.1.1 of 38.213. The same option as beta\_offset should be taken. |
| LG | We are supportive of Option 1. This is similar approach of determining HARQ codebook type for NR SL.  It is a communication between UE and the serving cell, and we do not see the necessity of having separate configuration for NR SL. |
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## Q4. Other issues.

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| **Company** | **Views** |
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