# **[101-e-NR-5G\_V2X\_NRSL-SL\_PHY\_Procedure-03] Email discussion/approval regarding HARQ operation + Sidelink CSI**

[101-e-NR-5G\_V2X\_NRSL-SL\_PHY\_Procedure-03] Email discussion/approval regarding HARQ operation + Sidelink CSI

* + Issue 3-1: Details of indicating SL HARQ feedback related information
  + Issue 4-2: How to determine the CQI table used for CSI reporting

Till 5/28, with potential TPs by 6/3 – Hanbyul (LGE)

**1. Details of indicating SL HARQ feedback related information**

Q1: Which SCI format includes the indication of HARQ feedback enable/disable and which 2nd SCI format can be used when HARQ feedback is disabled?

* Option 1-1: SCI format 1-A includes the indicator, and both SCI format 2-A and SCI format 2-B can be used when HARQ feedback is disabled
* Option 1-2: SCI format 1-A includes the indicator, and SCI format 2-A is used when HARQ feedback is disabled
* Option 1-3: Both SCI format 2-A and SCI format 2-B includes the indicator, and both SCI format 2-A and SCI format 2-B can be used when HARQ feedback is disabled
* Option 1-4: Only SCI format 2-A includes the indicator, and SCI format 2-A is used when HARQ feedback is disabled
* Option 1-5: Others (please specify)

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| Company | Preferred option | Comment |
| Intel | 1-3  2nd priority: 1-4 | It is preferred to indicate switching between blind and FB-based modes in 2nd stage SCI.  There is no L1 procedure requiring knowledge of the feedback request after 1st stage SCI.  Furthermore, putting the feedback request flag to the 2nd stage is aligned with the two-stage concept where the 1st stage is transparent to cast types and is release independent.  The 1st preference goes to 1-3, since in case a mix of blind and FB-based regimes is supported (pending RAN2 decision), it is better to have both options supported by format B in order to keep consistent TBS and 2nd stage SCI size between retransmissions. Otherwise, a UE needs to switch SCI formats between retransmissions that makes it more difficult to maintain same TBS. |
| LG | Option 1-4 | HARQ feedback enabling/disabling field is not necessary for all the cast type. Considering total SCI overhead, it would be efficient that only SCI format 2-A has this field. |
| Apple | 1-3 | To support the mixed blind reTx and feedback-based reTx, it is preferred to allow SCI format 2B to indicate no HARQ feedback. This could avoid the SCI format switch between initial transmission and retransmissions, which facilitates the TBS determination.  Furthermore, to save the signaling overhead, SCI format 2B indicates no HARQ feedback by a codepoint of communication range requirement (i.e., 0 meter).  We do not think it is necessary to indicate HARQ feedback in first stage SCI, since UEs interested in re-using other UEs’ reserved but not to be used resources due to HARQ-ACK, can decode the second stage SCI of those UEs. |
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Q2: Do you think Groupcast HARQ option 1 (i.e., NACK-only feedback) is supported when Zone ID or Communication range requirement are not provided? If yes, please specify how to support Groupcast HARQ option 1 in that case. If no, please specify how to operate HARQ when Groupcast HARQ option 2 is not applicable.

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| Company | Answer | Comment |
| Intel | Slight preference for to support NACK-only w/o range | This regime can be used when TX location is not yet available for connection-less groupcast. In this case, 0 distance is assumed for NACK-only regime and the rest of the procedure is the same as for the range-based regime. |
| LG | Yes | SCI format 2-A can be used to schedule groupcast with HARQ feedback Option 1, and the indicator to indicate HARQ feedback option will be present in the SCI format 2-A. |
| Apple | Support non-distance-based NACK-only feedback based on (pre)configuration | An infinite value is (pre)configured for communication range requirement per resource pool. The non-distance-based groupcast HARQ feedback option 1 is triggered if the communication range requirement field in the corresponding second stage SCI is set as infinite. |
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Q3: In LS from RAN2 [R1-2003255], followings are provided for the cast type indication:

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| * + RAN2 recently agreed the following working assumption:     - The V field is supported in a SL-SCH MAC subheader at least for future extensibility.   + In addition, when a NR MAC entity receives a MAC PDU, the MAC entity needs to understand the cast type associated to the received MAC PDU in order to determine the appropriate Rx UE behaviour e.g. to correctly perform packet filtering. When the MAC PDU is successfully decoded, RAN2 assumes that the V field in the SL-SCH MAC subheader can be used to explicitly indicate the cast type of the received MAC PDU for NR sidelink. However, when the MAC PDU is not successfully decoded, the corresponding cast type in SL-SCH MAC subheader could not be obtained.   + RAN2 recently made the following agreement that will be specified in 38.321:     - Sending HARQ ACK after checking the Layer-1 IDs in the SCI of the received MAC PDU, regardless of a result of checking the Layer-2 IDs in the MAC header, like sending HARQ NACK.   + Some companies think that an Rx UE should check the cast type as well as the Layer-1 IDs to correctly send HARQ feedback to a TX UE. As such, RAN2 would like to ask RAN1 if cast type information is useful from RAN1 perspective and will be provided in L1. |

From RAN1 perspective, the case type and M\_ID in the equation for the PSFCH resource index is determined by

* Option 3-1: SCI includes an explicit indication for the cast type.
  + If you support this option, please specify which SCI includes this indication.
* Option 3-2: SCI does not include an explicit indication for the cast type but includes an indication on whether M\_ID should be set to zero or a high layer provided parameter in the corresponding PSFCH transmission.
  + If you support this option, please specify which SCI includes this indication.
* Option 3-3: SCI includes no explicit indication for the cast type or M\_ID setting. M\_ID used for the corresponding PSFCH transmission is determined based on L1 ID(s).
  + If you support this option, please specify which layer will specify the L1 ID checking for M\_ID determination.
* Option 3-4: Others (please specify)

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| Company | Preferred option | Comment |
| Intel | 3-3 | Non-zero M\_ID can only be applied for unicast and groupcast option 2 which should have higher layer established context in order to operate. During this operation, a UE can associate L1/L2 identities and required M\_ID regime. L2 can be in charge of this association.  Further, the space of L1 IDs of 16+8 bit is sufficient to resolve ID ambiguities. |
| LG | Option 3-2 | According to the LS from RAN2, even for the MAC layer, they are trying to introduce cast type indicator in MAC subheader. In this case, it is unclear how the UE can decide the value of M\_ID by using the truncated version of L2 ID especially when the UE supports both unicast and groupcast with HARQ feedback Option 2 simultaneously.  In our view, for Option 3-1, SCI format 2-A can have indicator to indicate whether the value of M\_ID is zero or higher layer parameter. |
| Apple | 3-1 | In our view, L1 ID(s) are not guaranteed to distinguish between unicast and groupcast HARQ option 2, because they are derived from L2 ID(s) and their lengths are smaller. Hence, we prefer the second stage SCI format A has an explicit indication of cast-type (i.e., only between unicast and groupcast HARQ feedback option 2) so that PSFCH resource index is determined subsequently. We are also open to Option 3-2. |
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**2. How to determine the CQI table used for CSI reporting**

Q4: How is the CQI table used for CSI reporting determined?

* Option 4-1: The CSI triggering UE sends the CQI table via PC5-RRC
* Option 4-2: The CSI reporting UE determines the CQI table and indicates the selected table via CSI reporting MAC CE
* Option 4-3: The MCS table indicated in the associated CSI trigger is used as the CQI table.
* Option 4-4: Others (please specify)

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| Company | Preferred option | Comment |
| Intel | 4-1 | There is no justification for dynamic CQI table changes. Therefore, it is sufficient to negotiate the CQI table via PC5-RRC. |
| LG | Option 4-3 | It would be beneficial to dynamically adjust which CQI table is used for CSI reporting. In the last meeting, it is agreed that the CSI measurement window will not be overlapped. In this case, the CQI table associated with the MCS table indicated in the associated CSI trigger could be used without ambiguity between CSI-triggering UE and CSI-reporting UE. This is also beneficial in that no RAN2 impact is needed. |
| Apple | 4-1 |  |
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