# **[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**

Agreements in RAN1#100bis-e

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| When the UE supports up to Nmax,psfch simultaneous PSFCH transmissions in a PSFCH TX occasion and UE have Nreq PSFCHs to be transmitted in a given PSFCH TX occasion, the UE selects N PSFCHs for actual transmission with ascending order of the priority in a PSFCH TX occasion as follows: * Case 1: When Nreq<=Nmax,psfch and $P\_{O,PSFCH}$ is (pre-)configured,
	+ Case 1-1: N=Nreq if the sum of $P\_{O,PSFCH}+10log\_{10}\left(2^{μ}\right)+α\_{PFSCH}⋅PL$ for the Nreq PSFCHs is smaller than or equal to $P\_{CMAX}$ determined for the Nreq PSFCH transmissions.
	+ Case 1-2: Otherwise, N is up to UE implementation under N >= X >= 1.
* Case 2: When Nreq>Nmax,psfch and $P\_{O,PSFCH}$ is (pre-)configured, the UE firstly selects Nmax,psfch PSFCHs with ascending order of the priority.
	+ Case 2-1: N=Nmax,psfch if the sum of $P\_{O,PSFCH}+10log\_{10}\left(2^{μ}\right)+α\_{PFSCH}⋅PL$ for the Nmax,psfch PSFCHs is smaller than or equal to $P\_{CMAX}$ determined for the Nmax,psfch PSFCH transmissions.
	+ Case 2-2: Otherwise, N is up to UE implementation under N >= X >= 1.
* Down select X in RAN1#101-e
	+ Alt 1: X = max {1, the largest value which doesn’t lead to the power limited case}
	+ Alt 2: X= 1
	+ Other alternatives are not precluded.
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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 | 1-32nd 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. |
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Q2: Do you think Groupcast HARQ option 1 (i.e., NACK-only feedback) 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. |
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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.
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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. |
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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. |
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