**3GPP TSG-RAN WG1 Meeting #112b-e *R1-23XXXXX***

**E-Meeting, April 17 – 26, 2023**

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| *CR-Form-v12.2* | | | | | | | | |
| **DRAFT CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.213** | **CR** | **XX** | **rev** | **-** | **Current version:** | **17.5.0** |  |
|  | | | | | | | | |
| *For* [***HELP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Corrections on Type 3 HARQ-ACK codebook | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Moderator (Nokia), CATT, Qualcomm | | | | | | | | | |
| ***Source to TSG:*** | R1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_IIOT\_URLLC\_enh-Core | | | | |  | ***Date:*** | | | 2023-04-19 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | * For Type-3 HARQ-ACK codebook determination, it is not clear how serving cells and HARQ processes of serving cells are to be included in a Type-3 HARQ-ACK codebook configured with *perCC* or *perHARQ*. * In the determination of the handling of different priority indexes is not clear | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | * Clarify the mapping relationship between the bitmap of *perCC* and corresponding serving cell index, the mapping relationship between bitmap of *perHARQ* and corresponding serving cell index and HARQ process number and the meaning of bit 0/1 indicated by *perCC* or *perHARQ.* * Clarify that for a serving cell the UE is not expected to be configured with a different maximum number of CBGs for different priority indexes | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | * Unclear UE behavior for the Type-3 HARQ-ACK codebook determination based on *perCC* or *perHARQ* Type-3 HARQ-ACK codebook configuration. * Unclear UE behavior for the Type-3 HARQ-ACK codebook determination based on CBG configurations for different priority indexes. | | | | | | | | |
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| ***Clauses affected:*** | | 9.1.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | |  | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

9.1.4 Type-3 HARQ-ACK codebook determination

If a UE is provided *pdsch-HARQ-ACK-OneShotFeedback*, the UE determines HARQ-ACK information bits, for a total number of HARQ-ACK information bits, of a Type-3 HARQ-ACK codebook according to the following procedure. If the UE is provided *pdsch-HARQ-ACK-EnhType3ToAddModList* and a DCI format scheduling PDSCH reception and triggering the Type-3 HARQ-ACK codebook includes an enhanced Type 3 codebook indicator field that provides a value for *pdsch-HARQ-ACK-EnhType3Index*, the UE determines a size of a set of indicated serving cells and a size of a set of indicated HARQ process numbers for each indicated serving cell and each indicated HARQ process number from the entry in *pdsch-HARQ-ACK-EnhType3ToAddModList* corresponding to the *pdsch-HARQ-ACK-EnhType3Index* value. Each bit from MSB to LSB provided by *perCC* corresponds to a serving cell in ascending order of serving cell index, where value ‘1’ or value ‘0’ indicate HARQ-ACK for the corresponding serving cell is included or not included in the Type 3 HARQ-ACK codebook, respectively. Each bit string provided by *perHARQ* corresponds to a serving cell in ascending order of serving cell index, and each bit from MSB to LSB within a bit string corresponds to a HARQ process number on a corresponding serving cell in ascending order of HARQ process number, where value ‘1’ or value ‘0’ indicate HARQ-ACK for the corresponding HARQ process number on the corresponding serving cell is included or not included in the Type 3 HARQ-ACK codebook, respectively. If the DCI format does not include the enhanced Type 3 codebook indicator field, the *pdsch-HARQ-ACK-EnhType3Index* value is zero.

Set to the number of configured serving cells or, when applicable, to

Set to the value of *nrofHARQ-ProcessesForPDSCH* for serving cell , if provided; else, set . When applicable, set to

Set to the value of *maxNrofCodeWordsScheduledByDCI* for serving cell if *harq-ACK-SpatialBundlingPUCCH* is provided and , or if *harq-ACK-SpatialBundlingPUCCH* is not provided, or if *maxCodeBlockGroupsPerTransportBlock* is provided for serving cell ; else, set

Set to the number of HARQ-ACK information bits per TB for PDSCH receptions on serving cell as described in clause 9.1.1 if *maxCodeBlockGroupsPerTransportBlock* is provided for serving cell and *pdsch-HARQ-ACK-OneShotFeedbackCBG* or *pdsch-HARQ-ACK-EnhType3CBG* is provided; else, set . A UE provided with *pdsch-HARQ-ACK-OneShotFeedbackCBG* or *pdsch-HARQ-ACK-EnhType3CBG* does not expect to be provided with a different value of *maxCodeBlockGroupsPerTransportBlock* for different priority indexes in *pdsch-CodeBlockGroupTransmissionList* for serving cell *c*

Set if *pdsch-HARQ-ACK-OneShotFeedbackNDI* or *pdsch-HARQ-ACK-EnhType3NDI* is provided; else set

Set – serving cell index in the set of serving cells

Set – HARQ process number index in the set of numbers of HARQ processes

Set – TB index

Set – CBG index

Set

< Unchanged parts are omitted >