**3GPP TSG-RAN WG1 #103-e *R1-*** ***200xxxx***

**e-Meeting, October 26th – November 13th, 2020‎**

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| *CR-Form-v12.0* | | | | | | | | |
| **DRAFT CHANGE REQUEST** | | | | | | | | |
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|  | **38.213** | **CR** | **-** | **rev** | **-** | **Current version:** | **15.11.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](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:*** | Correction on HARQ-ACK generation for DL transmission with single TB when multi-TB is configured | | | | | | | | | |
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| ***Source to WG:*** | CATT | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Core | | | | |  | ***Date:*** | | | 2020-10-16 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | Rel-15 |
|  | *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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | 1. In current specification for Type-1 HARQ-ACK codebook, for a serving cell configured with reception of maximum two transport blocks, the HARQ-ACK generation for a PDSCH occasion in response to a PDCCH with DCI format 1\_0 is not defined, which may lead to misunderstanding that only one HARQ-ACK bit is generated for the PDSCH occasion when HARQ-ACK spatial bundling is not configured. Note that since there is description in the pseudo-code that “if the UE receives one transport block, the UE assumes ACK for the second transport block”, there should be no confusion when HARQ-ACK spatial bundling is configured. In addition, HARQ-ACK generation for a SPS PDSCH release for a serving cell configured with reception of maximum two transport blocks is missing. 2. In current specification for Type-2 HARQ-ACK codebook, in case UE is configured with reception of maximum two transport blocks, the HARQ-ACK feedback generation for a SPS PDSCH release is missing. | | | | | | | | |
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| ***Summary of change:*** | | 1. Delete the condition “an occasion for a candidate PDSCH reception can be in response to a PDCCH with DCI format 1\_1 and if” in clause 9.1.2.1 to include PDSCH occasions in response to a PDCCH with DCI format 1\_0. 2. Add “or a SPS PDSCH release” in clauses 9.1.2.1 and 9.1.3.1 to clarify the HARQ-ACK generation in response to a SPS PDSCH release. | | | | | | | | |
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| ***Consequences if not approved:*** | | 1. Undefined UE behaviour of HARQ-ACK generation for a PDSCH occasion in response to a PDCCH with DCI format 1\_0 for a serving cell configured with reception of maximum two transport blocks without HARQ-ACK spatial bundling for Type-1 HARQ-ACK codebook 2. Undefined UE behaviour of HARQ-ACK generation for SPS PDSCH release for both Type-1 and Type-2 HARQ-ACK codebooks in case UE is configured with reception of maximum two transport blocks. | | | | | | | | |
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| ***Clauses affected:*** | | 9.1.2.1, 9.1.3.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | **Isolated impact analysis:**  This CR has isolated impact on HARQ-ACK feedback bit generation for a DL transmission with a single TB and for SPS PDSCH release when multi-TB is configured for a serving cell.  The corrections in this CR are common understandings which may have no impact on both UE and gNB implementations. | | | | | | | | |
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| ***This CR's revision history:*** | |  | | | | | | | | |

#### 9.1.2.1 Type-1 HARQ-ACK codebook in physical uplink control channel

<unchanged part is omitted>

If *maxNrofCodeWordsScheduledByDCI* indicates reception of two transport blocks, when the UE receives a PDSCH with one transport block or a SPS PDSCH release, the HARQ-ACK information is associated with the first transport block and the UE generates a NACK for the second transport block if *harq-ACK-SpatialBundlingPUCCH* is not provided and generates HARQ-ACK information with value of ACK for the second transport block if *harq-ACK-SpatialBundlingPUCCH* is provided.

<unchanged part is omitted>

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

<unchanged part is omitted>

For a PDCCH monitoring occasion with DCI format 1\_0 or DCI format 1\_1 in the active DL BWP of a serving cell, when a UE receives a PDSCH with one transport block or a SPS PDSCH release, and the value of *maxNrofCodeWordsScheduledByDCI* is 2, the HARQ-ACK information is associated with the first transport block and the UE generates a NACK for the second transport block if *harq-ACK-SpatialBundlingPUCCH* is not provided and generates HARQ-ACK information with value of ACK for the second transport block if *harq-ACK-SpatialBundlingPUCCH* is provided.

<unchanged part is omitted>