**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** |  |
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| *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:*** |  |
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| ***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 canbe 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)* |
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| ***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 |
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|  | **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 ...  |
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| ***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>