**3GPP TSG-RAN WG1 Meeting #103-e *R1-20xxxxx***

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

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **38.213** | **CR** |  | **rev** |  | **Current version:** | **16.3.0** |  |
|  |
| *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:***  | Correction on Type2 HARQ-ACK codebook construction |
|  |  |
| ***Source to WG:*** | Moderator (Huawei) |
| ***Source to TSG:*** | R1 |
|  |  |
| ***Work item code:*** | NR\_L1enh-URLLC-Core |  | ***Date:*** | 2020-11-02 |
|  |  |  |  |  |
| ***Category:*** | F |  | ***Release:*** | Rel-16 |
|  | *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:*** | Capture the correction on Type2 HARQ-ACK codebook construction as outcome of issue A-1 in [103-e-NR-L1enh-URLLC-02].  |
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| ***Summary of change:*** | Capture the correction on Type2 HARQ-ACK codebook construction as outcome of issue A-1 in [103-e-NR-L1enh-URLLC-02]. |
|  |  |
| ***Consequences if not approved:*** | The specification is incomplete. |
|  |  |
| ***Clauses affected:*** | 9.1.3.1 |
|  |  |
|  | **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:*** |  |

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

< Unchanged parts are omitted >

If the UE transmits HARQ-ACK information in a PUCCH in slot and for any PUCCH format, the UE determines the , for a total number of HARQ-ACK information bits, according to the following pseudo-code:

Set  – PDCCH with DCI format scheduling PDSCH reception or SPS PDSCH release monitoring occasion index: lower index corresponds to earlier PDCCH monitoring occasion

Set 

Set 

Set 

Set 

Set  to the number of serving cells configured by higher layers for the UE

- if, for an active DL BWP of a serving cell, the UE is not provided *CORESETPoolIndex* or is provided *CORESETPoolIndex* with value 0 for one or more first CORESETs and is provided *CORESETPoolIndex* with value 1 for one or more second CORESETs, and is provided *ACKNACKFeedbackMode = JointFeedback,* the serving cell is counted two times where the first time corresponds to the first CORESETs and the second time corresponds to the second CORESETs

- if the UE indicates *PDSCH-Number-perMOperCell*, a serving cell is counted times where is the number of PDSCH receptions that can be scheduled for the serving cell by DCI formats in PDCCH receptions at a same PDCCH monitoring occasion based on the reported value of *PDSCH-Number-perMOperCell*

Set  to the number of PDCCH monitoring occasion(s)

while 

Set  – serving cell index: lower indexes correspond to lower RRC indexes of corresponding cell

while 

if PDCCH monitoring occasion  is before an active DL BWP change on serving cell  or an active UL BWP change on the PCell and an active DL BWP change is not triggered in PDCCH monitoring occasion 

;

else

if there is a PDSCH on serving cell  associated with PDCCH in PDCCH monitoring occasion , or there is a PDCCH indicating SPS PDSCH release on serving cell 

if 



end if



if 



else



end if

if *harq-ACK-SpatialBundlingPUCCH* is not provided and the UE is configured by *maxNrofCodeWordsScheduledByDCI* with reception of two transport blocks for at least one configured DL BWP of at least one serving cell,

 = HARQ-ACK information bit corresponding to the first transport block of this cell

 = HARQ-ACK information bit corresponding to the second transport block of this cell

elseif *harq-ACK-SpatialBundlingPUCCH* is provided to the UE and  is a monitoring occasion for PDCCH with a DCI format that supports PDSCH reception with two transport blocks and the UE is configured by *maxNrofCodeWordsScheduledByDCI* with reception of two transport blocks in at least one configured DL BWP of a serving cell,

 = binary AND operation of the HARQ-ACK information bits corresponding to the first and second transport blocks of this cell

else

 = HARQ-ACK information bit of this cell

end if

end if



end if

end while



end while

if UE does not set and

end if

if 



end if

if *harq-ACK-SpatialBundlingPUCCH* is not provided to the UE and the UE is configured by *maxNrofCodeWordsScheduledByDCI* with reception of two transport blocks for at least one configured DL BWP of a serving cell,

else

end if

 for any 

If a UE is configured to receive SPS PDSCH and the UE multiplexes HARQ-ACK information for one activated SPS PDSCH reception in the PUCCH in slot , the UE generates one HARQ-ACK information bit associated with the SPS PDSCH reception and appends it to the HARQ-ACK information bits.

If a UE is configured to receive SPS PDSCH and the UE multiplexes HARQ-ACK information for multiple activated SPS PDSCH receptions in the PUCCH in slot , the UE generates the HARQ-ACK information as described in Clause 9.1.2 and appends it to the HARQ-ACK information bits.

< Unchanged parts are omitted >