**3GPP TSG-RAN WG1 Meeting #112bis-e *R1-230xxxx***

 **E-meeting, 17 – 26 April, 2023**

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| *CR-Form-v12.2* |
| **[DRAFT]CHANGE REQUEST** |
|  |
|  | **38.213** | **CR** | **xxx** | **rev** | **-** | **Current version:** | **17.5.0** |  |
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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:***  | Draft CR on the HARQ-ACK CB for multicast SPS repetition |
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| ***Source to WG:*** | Moderator (Huawei), Samsung |
| ***Source to TSG:*** | R1 |
|  |  |
| ***Work item code:*** | NR\_MBS-Core |  | ***Date:*** | 2023-04-23 |
|  |  |  |  |  |
| ***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 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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | Regarding the pseudo-code of SPS PDSCH HARQ-ACK codebook generation, * Correct the parameters
* Clarify for multicast PDSCH if *pdsch-AggregationFactor-r16* is not included in *SPS-Config,* $N\_{PDSCH}^{repeat}$*=1.*
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| ***Summary of change:*** | a UE is configured to receive SPS PDSCHs from slot $n\_{D}-N\_{PDSCH}^{repeat}+1$ to slot $n\_{D}$ for SPS PDSCH configuration $s$ on serving cell $c$, excluding SPS PDSCHs that are not required to be received in any slot among overlapping SPS PDSCHs, if any according to [6, TS 38.214], or based on a UE capability for a number of PDSCH receptions in a slot according to [6, TS 38.214], or due to overlapping with a set of symbols indicated as uplink by *tdd-UL-DL-ConfigurationCommon* or by *tdd-UL-DL-ConfigurationDedicated* where $N\_{PDSCH}^{repeat}$ is provided by *pdsch-AggregationFactor-r16* in *sps-Config* or, if *pdsch-AggregationFactor-r16* is not included in *sps-Config*, by *pdsch-AggregationFactor* in *pdsch-config*, **or** **for multicast SPS PDSCHs,** $N\_{PDSCH}^{repeat}$ **is provided by *pdsch-AggregationFactor-r16* in *SPS-Config,* or, if *pdsch-AggregationFactor-r16* is not included in *SPS-Config,*** $N\_{PDSCH}^{repeat}$***=1,*** andHARQ-ACK information for the SPS PDSCH is associated with the PUCCH} |
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| ***Consequences if not approved:*** | Regarding the pseudo-code of SPS PDSCH HARQ-ACK codebook generation, * The parameters are not aligned with TS38.331.
* The defalut repetition number is different when *pdsch-AggregationFactor-r16* is not included in *SPS-Config for multicast SPS PDSCHs,* UE behavioris unclear per the specification.
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| ***Clauses affected:*** | 9.1.2 |
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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 ...  |
|  |  |
| ***Other comments:*** |  |
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| ***This CR's revision history:*** |  |

9.1.2 Type-1 HARQ-ACK codebook determination

< Unchanged parts are omitted >

In the following pseudo-code, SPS PDSCH receptions associated with a SPS PDSCH configuration are activated by a DCI format with CRC scrambled by a CS-RNTI or by a DCI format with CRC scrambled by a G-CS-RNTI.

Set $N\_{cells}^{DL}$ to the number of serving cells configured to the UE

Set $N\_{c}^{SPS}$ to the number of SPS PDSCH configurations configured to the UE for serving cell $c$

Set $N\_{c}^{DL}$ to the number of DL slots for SPS PDSCH receptions on serving cell $c$ with HARQ-ACK information multiplexed on the PUCCH

Set $j=0$ – HARQ-ACK information bit index

Set $c=0$ – serving cell index: lower indexes correspond to lower RRC indexes of corresponding cell

while $c<N\_{cells}^{DL}$

Set $s=0$ – SPS PDSCH configuration index: lower indexes correspond to lower RRC indexes of corresponding SPS configurations

while $s<N\_{c}^{SPS}$

Set $n\_{D}=0$ – slot index

while $n\_{D}<N\_{c}^{DL}$

if {

a UE is configured to receive SPS PDSCHs from slot $n\_{D}-N\_{PDSCH}^{repeat}+1$ to slot $n\_{D}$ for SPS PDSCH configuration $s$ on serving cell $c$, excluding SPS PDSCHs that are not required to be received in any slot among overlapping SPS PDSCHs, if any according to [6, TS 38.214], or based on a UE capability for a number of PDSCH receptions in a slot according to [6, TS 38.214], or due to overlapping with a set of symbols indicated as uplink by *tdd-UL-DL-ConfigurationCommon* or by *tdd-UL-DL-ConfigurationDedicated* where $N\_{PDSCH}^{repeat}$ is provided by *pdsch-AggregationFactor-r16* in *sps-Config* or, if *pdsch-AggregationFactor-r16* is not included in *sps-Config*, by *pdsch-AggregationFactor* in *pdsch-config*, or for multicast SPS PDSCHs, $N\_{PDSCH}^{repeat}$ is provided by *pdsch-AggregationFactor-r16* in *SPS-Config,* or, if *pdsch-AggregationFactor-r16* is not included in *SPS-Config,* $N\_{PDSCH}^{repeat}$*=1,* and

HARQ-ACK information for the SPS PDSCH is associated with the PUCCH

}

$\tilde{o}\_{j}^{ACK}$ = HARQ-ACK information bit for this SPS PDSCH reception

$j=j+1$;

end if

$n\_{D}=n\_{D}+1$;

end while

$s=s+1$;

end while

$c=c+1$;

end while

< Unchanged parts are omitted >