**3GPP TSG-RAN WG1 Meeting #104bis-e *R1-210XXXX***

**e-Meeting, April 12th – 20th, 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **38.213** | **CR** | **DRAFT** | **rev** | **-** | **Current version:** | **16.5.0** |  |
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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:***  | Correction on SR reporting due to consistent LBT failure recovery |
|  |  |
| ***Source to WG:*** | Moderator(Nokia), vivo |
| ***Source to TSG:*** | R1 |
|  |  |
| ***Work item code:*** | NR\_unlic-Core |  | ***Date:*** | 2021-04-19 |
|  |  |  |  |  |
| ***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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | SR configuration *schedulingRequestID-BFR-*SCell has not been captured in the 38.213 specification. As a result, PHY layer of UE cannot report SR for consistent LBT failure recovery. |
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| ***Summary of change:*** | Specify that a UE can report SR on the PUCCH resource associated with *schedulingRequestID-LBT-SCell* configured when an SR is triggered for consistent LBT failure recovery by the MAC layer. |
|  |  |
| ***Consequences if not approved:*** | UE cannot report SR for consistent LBT failure recovery. |
|  |  |
| ***Clauses affected:*** | 9.2.4; 9.2.5.1 |
|  |  |
|  | **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:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

**<Unchanged parts are omitted>**

### 9.2.4 UE procedure for reporting SR

A UE can be configured by *SchedulingRequestResourceConfig* a set of configurations for SR in a PUCCH transmission using either PUCCH format 0 or PUCCH format 1. A UE can be configured by *schedulingRequestID-BFR-SCell* a configuration for LRR in a PUCCH transmission using either PUCCH format 0 or PUCCH format 1. A UE can be configured by *schedulingRequestID-LBT-SCell* a configuration for consistent LBT failure recovery, as described in [11, TS 38.321], in a PUCCH transmission using either PUCCH format 0 or PUCCH format 1. The UE can be provided, by *phy-PriorityIndex* in *SchedulingRequestResourceConfig*, a priority index 0 or a priority index 1 for the SR. If the UE is not provided a priority index for SR, the priority index is 0.

The UE is configured a PUCCH resource by *SchedulingRequestResourceId*, or by *schedulingRequestID-BFR-SCell*, or by *schedulingRequestID-LBT-SCell*, providing a PUCCH format 0 resource or a PUCCH format 1 resource as described in Clause 9.2.1. The UE is also configured a periodicity  in symbols or slots and an offset  in slots by *periodicityAndOffset* for a PUCCH transmission conveying SR. If  is larger than one slot, the UE determines a SR transmission occasion in a PUCCH to be in a slot with number  [4, TS 38.211] in a frame with number  if .

If  is one slot, the UE expects that  and every slot is a SR transmission occasion in a PUCCH.

If  is smaller than one slot, the UE determines a SR transmission occasion in a PUCCH to start in a symbol with index  [4, TS 38.211] if  where  is the value of *startingSymbolIndex*.

If the UE determines that, for a SR transmission occasion in a PUCCH, the number of symbols available for the PUCCH transmission in a slot is smaller than the value provided by *nrofSymbols*, the UE does not transmit the PUCCH in the slot.

SR transmission occasions in a PUCCH are subject to the limitations for UE transmissions described in Clause 11.1 and Clause 11.1.1.

The UE transmits a PUCCH in the PUCCH resource for the corresponding SR configuration only when the UE transmits a positive SR. For a positive SR transmission using PUCCH format 0, the UE transmits the PUCCH as described in [4, TS 38.211] by obtaining  as described for HARQ-ACK information in Clause 9.2.3 and by setting . For a positive SR transmission using PUCCH format 1, the UE transmits the PUCCH as described in [4, TS 38.211] by setting .

**<Unchanged parts are omitted>**

#### 9.2.5.1 UE procedure for multiplexing HARQ-ACK or CSI and SR in a PUCCH

In the following, a UE is configured to transmit $K$ PUCCHs for respective $K$ SRs in a slot, as determined by a set of *schedulingRequestResourceId*, a *schedulingRequestResourceId* associated with *schedulingRequestID-BFR-SCell*, and a *schedulingRequestResourceId* associated with *schedulingRequestID-LBT-SCell*, with SR transmission occasions that would overlap with a transmission of a PUCCH with HARQ-ACK information from the UE in the slot or with a transmission of a PUCCH with CSI report(s) from the UE in the slot.

If a UE would transmit a PUCCH with positive SR and at most two HARQ-ACK information bits in a resource using PUCCH format 0, the UE transmits the PUCCH in the resource using PUCCH format 0 in PRB(s) for HARQ-ACK information as described in Clause 9.2.3. The UE determines a value of  and  for computing a value of cyclic shift  [4, TS 38.211] where  is provided by *initialCyclicShift* of *PUCCH-format0*, and  is determined from the value of one HARQ-ACK information bit or from the values of two HARQ-ACK information bits as in Table 9.2.5-1 and Table 9.2.5-2, respectively.

If the UE would transmit negative SR and a PUCCH with at most two HARQ-ACK information bits in a resource using PUCCH format 0, the UE transmits the PUCCH in the resource using PUCCH format 0 for HARQ-ACK information as described in Clause 9.2.3.

Table 9.2.5-1: Mapping of values for one HARQ-ACK information bit and positive SR to sequences for PUCCH format 0

|  |  |  |
| --- | --- | --- |
| HARQ-ACK Value | 0 | 1 |
| **Sequence cyclic shift** |  |  |

Table 9.2.5-2: Mapping of values for two HARQ-ACK information bits and positive SR to sequences for PUCCH format 0

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| HARQ-ACK Value | {0, 0} | {0, 1} | {1, 1} | {1, 0} |
| **Sequence cyclic shift** |  |  |  |  |

If a UE would transmit SR in a resource using PUCCH format 0 and HARQ-ACK information bits in a resource using PUCCH format 1 in a slot, the UE transmits only a PUCCH with the HARQ-ACK information bits in the resource using PUCCH format 1.

If the UE would transmit positive SR in a first resource using PUCCH format 1 and at most two HARQ-ACK information bits in a second resource using PUCCH format 1 in a slot, the UE transmits a PUCCH with HARQ-ACK information bits in the first resource using PUCCH format 1 as described in Clause 9.2.3. If a UE would not transmit a positive SR in a resource using PUCCH format 1 and would transmit at most two HARQ-ACK information bits in a resource using PUCCH format 1 in a slot, the UE transmits a PUCCH in the resource using PUCCH format 1 for HARQ-ACK information as described in Clause 9.2.3.

If a UE would transmit a PUCCH with  HARQ-ACK information bits in a resource using PUCCH format 2 or PUCCH format 3 or PUCCH format 4 in a slot, as described in Clauses 9.2.1 and 9.2.3,  bits representing a negative or positive SR, in ascending order of the values of *schedulingRequestResourceId*,a *schedulingRequestResourceId* associated with *schedulingRequestID-BFR-SCell*, and a *schedulingRequestResourceId* associated with *schedulingRequestID-LBT-SCell*, are appended to the HARQ-ACK information bits and the UE transmits the combined  UCI bits in a PUCCH using a resource with PUCCH format 2 or PUCCH format 3 or PUCCH format 4 that the UE determines as described in Clauses 9.2.1 and 9.2.3. If one of the SRs is a positive LRR, the value of the  bits indicates the positive LRR. An all-zero value for the  bits represents a negative SR value across all $K$ SRs.

If a UE would transmit a PUCCH with  CSI report bits in a resource using PUCCH format 2 or PUCCH format 3 or PUCCH format 4 in a slot,  bits representing corresponding negative or positive SR, in ascending order of the values of *schedulingRequestResourceId*, a *schedulingRequestResourceId* associated with *schedulingRequestID-BFR-SCell*, and a *schedulingRequestResourceId* associated with *schedulingRequestID-LBT-SCell*, are prepended to the CSI information bits as described in Clause 9.2.5.2 and the UE transmits a PUCCH with the combined  UCI bits in a resource using the PUCCH format 2 or PUCCH format 3 or PUCCH format 4 for CSI reporting. If one of the SRs is a positive LRR, the value of the  bits indicates the positive LRR. An all-zero value for the  bits represents a negative SR value across all $K$ SRs.

If a UE transmits a PUCCH with  HARQ-ACK information bits,  SR bits, and  CRC bits using PUCCH format 2 or PUCCH format 3 in a PUCCH resource that includes  PRBs, the UE determines a number of PRBs  for the PUCCH transmission to be the minimum number of PRBs, that is smaller than or equal to a number of PRBs provided respectively by *nrofPRBs* in *PUCCH-format2* or *nrofPRBs* in *PUCCH-format3* and starts from the first PRB from the number of PRBs, that results to  and, if , , where , , , and  are defined in Clause 9.2.5.2. For PUCCH format 3, if  is not equal  according to [4, TS 38.211],  is increased to the nearest allowed value of *nrofPRBs* for *PUCCH-format3*[12, TS 38.331]. If , the UE transmits the PUCCH over the  PRBs.

If a UE is provided a first interlace of $M\_{Interlace,0}^{PUCCH}$ PRBs by *interlace0* in *InterlaceAllocation* and transmits a PUCCH with $O\_{ACK}$ HARQ-ACK information bits, $O\_{SR}=\left⌈log\_{2}\left(K+1\right)\right⌉$ SR bits, and $O\_{CRC}$ CRC bits using PUCCH format 2 or PUCCH format 3, the UE transmits the PUCCH over the first interlace if $\left(O\_{ACK}+O\_{SR}+O\_{CRC}\right)\leq M\_{Interlace,0}^{PUCCH}⋅N\_{sc,ctrl}^{RB}⋅N\_{symb-UCI}^{PUCCH}⋅Q\_{m}⋅r$; otherwise, if the UE is provided a second interlace by *interlace1* in *PUCCH-format2* or *PUCCH-format3*, the UE transmits the PUCCH over the first and second interlaces.

**<Unchanged parts are omitted>**