**3GPP TSG RAN WG1 #116-bis R1-240XXXX**

**Changsha, Hunan Province, China, April 15th – 19th, 2024**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **38.213** | **CR** | **-** | **rev** | **-** | **Current version:** | **18.2.0** |  |
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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 correction on timing of first Msg3 repetition |
|  |  |
| ***Source to WG:*** | Moderator (Thales) |
| ***Source to TSG:*** | RAN1 |
|  |  |
| ***Work item code:*** | NR\_NTN\_enh |  | ***Date:*** | 17 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | 8 |
|  | *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:*** | In NTN, is introduced to determine the slot of msg3 transmission due to the large propogation delay in NTN. However, when msg3 PUSCH repetition transmission is enabled in NTN or HAPS, which are operated on paired specturm, the timeline for msg3 PUSCH repetition transmission is not specified.Moreover, should be considered for the timeline of msg3 repetition in ATG as well. According to Table 5.2-1 in TS38.101-1, some operating bands that are applicable to ATG are TDD bands(e.g., n34, n39, n41, n78, n79) and some are FDD bands. However, the formula for determining the timeline for msg3 repetition transmission on unpaird specturm does not take into account.  |
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| ***Summary of change:*** | For msg3 PUSCH repetition transmission, is counted to determine the transmission timing of first msg3 PUSCH repetition relative to reception time of RAR message when *cellSpecificKoffset* is provided. |
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| ***Consequences if not approved:*** | The transmission timing of msg3 PUSCH repetition when *cellSpecificKoffset* is provided on paired spectrum is not specified. The transmission timing of msg3 PUSCH repetition on unpaired specturm when *cellSpecificKoffset* is provided is not correct. |
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| ***Clauses affected:*** | 8.3 |
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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:*** |   |
|  |  |
| ***This CR's revision history:*** |  |

## 8.3 PUSCH scheduled by RAR UL grant

<<----- unchanged text omitted ----->>

Msg3 PUSCH retransmissions, if any, of the transport block, are scheduled by a DCI format 0\_0 with CRC scrambled by a TC-RNTI provided in the corresponding RAR message [11, TS 38.321].

With reference to slots for a PUSCH transmission scheduled by a RAR UL grant, if a UE receives a PDSCH with a RAR message ending in slot for a corresponding PRACH transmission from the UE, the UE transmits the PUSCH in slot , where and are provided in [6, TS 38.214] and is provided by *cellSpecificKoffset*; otherwise, if not provided, .

A UE can be provided in *BWP-UplinkCommon* a set of numbers of repetitions for a PUSCH transmission with PUSCH repetition Type A that is scheduled by a RAR UL grant or by a DCI format 0\_0 with CRC scrambled by a TC-RNTI. If the UE requests repetitions for the PUSCH transmission [11, TS 38.321], the UE transmits the PUSCH over slots, where is indicated by the 2 MSBs of the MCS field in the RAR UL grant or in the DCI format 0\_0 from a set of four values provided by *numberOfMsg3-RepetitionsList* or from {1, 2, 3, 4} if *numberOfMsg3-RepetitionsList* is not provided. The UE determines an MCS for the PUSCH transmission by the 2 LSBs of the MCS field in the RAR UL grant or by the 3 LSBs of the MCS field in the DCI format 0\_0, and determines a redundancy version and RBs for each repetition as described in [6, TS 38.214]. For unpaired spectrum operation, the UE determines the slots as the first slots starting from slot where a repetition of the PUSCH transmission does not include a symbol indicated as downlink by *tdd-UL-DL-ConfigurationCommon* or indicated as a symbol of an SS/PBCH block with index provided by *ssb-PositionsInBurst*, and is provided by *cellSpecificKoffset*; otherwise, if not provided, . For paired spectrum operation, the UE determines the slots as the first slots starting from slot where is provided by *cellSpecificKoffset;* otherwise, if not provided, .

The UE may assume a minimum time between the last symbol of a PDSCH reception conveying a RAR message with a RAR UL grant and the first symbol of a corresponding PUSCH transmission scheduled by the RAR UL grant is equal to msec, where is a time duration of symbols corresponding to a PDSCH processing time for UE processing capability 1 when additional PDSCH DM-RS is configured, is a time duration of symbols corresponding to a PUSCH preparation time for UE processing capability 1 [6, TS 38.214] and, for determining the minimum time, the UE considers that and correspond to the smaller of the SCS configurations for the PDSCH and the PUSCH. For , the UE assumes [6, TS 38.214].