**3GPP TSG-RAN WG1 Meeting #105-e *R1-210xxxx***

**E-meeting, May 10th - 27th, 2021**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **DRAFT CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.213** | **CR** | **xxxx** | **rev** | **-** | **Current version:** | **16.5.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Correction on half-duplex operation in CA with unpaired spectrum | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Moderator (NTT DOCOMO, INC.), Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | R1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI16 | | | | |  | ***Date:*** | | | 2021-05-26 |
|  |  | | | |  | |  | | |  |
| ***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 can be 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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | UE can report the DL/UL collision handling capability for a band or band combination (BC) not supporting simultaneous transmission and reception on two carriers within one band or on different bands, and the gNB can configure the UE for such collision handling.  However, when a UE supports *simultaneousRxTxInterBandCA* for a BC, and can support *half-DuplexTDD-CA-SameSCS-r16* for each single band only, it is not clear what is the intended UE reporting given that a UE cannot report DL/UL collision handling capability for the BC in this scenario. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Clarify that the DL/UL collision handling is supported by a UE capable of such handling for each band within a band combination where the UE supports inter-band simultaneous transmission and reception. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | It is not clear whether gNB has correct/same understanding with UE on whether the UE can support simultaneous transmission and reception within each band of a band comibnation in order for a proper configuration. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 11.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | The original behaviour was introduced in RAN#87 38.213CR0097 in RP-200195 and later corrected in RAN#88 38.213CR0113 in RP-200697. RAN1 also agreed 38.213CR0215 in R1-2104010 in RAN1#104bis-e.  **Isolated Impact Analysis:**  The CR impact is isolated to the configuration of the collision handling for half duplex UEs in unpaired band with CA only, and has no impact to any other functionality. The feature is broken before the RRC and L1 corrections are introduced as in R1-2104010, and it cannot be used with earlier versions of the specifications. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**<Unchanged parts are omitted>**

11.1 Slot configuration

**<Unchanged parts are omitted>**

If a UE

- is configured with multiple serving cells and is provided *half-duplex-behavior* = 'enable', and

- is not capable of simultaneous transmission and reception on any of the multiple serving cells, and

- indicates support of capability for half-duplex operation in CA with unpaired spectrum, and

- is not configured to monitor PDCCH for detection of DCI format 2\_0 on any of the multiple serving cells,

for a set of symbols of a slot that are indicated to the UE for reception of SS/PBCH blocks in a first cell of the multiple serving cells by *ssb-PositionsInBurst* in *SystemInformationBlockType1* or by *ssb-PositionsInBurst* in *ServingCellConfigCommon*, when provided to the UE, the UE does not transmit PUSCH, PUCCH, or PRACH in the slot if a transmission would overlap with any symbol from the set of symbols, and the UE does not transmit SRS in the set of symbols of the slot in

* any of the multiple serving cells if the UE is not capable of simultaneous transmission and reception as indicated by *simultaneousRxTxInterBandCA* among the multiple serving cells, and
* any one of the cells corresponding to the same band as the first cell, irrespective of any capability indicated by *simultaneousRxTxInterBandCA*.

For a set of symbols of a slot corresponding to a valid PRACH occasion and  symbols before the valid PRACH occasion, as described in Clause 8.1, the UE does not receive PDCCH, PDSCH, or CSI-RS in the slot if a reception would overlap with any symbol from the set of symbols. The UE does not expect the set of symbols of the slot to be indicated as downlink by *tdd-UL-DL-ConfigurationCommon* or *tdd-UL-DL-ConfigurationDedicated*.

For a set of symbols of a slot indicated to a UE by *pdcch-ConfigSIB1* in *MIB* for a CORESET for Type0-PDCCH CSS set, the UE does not expect the set of symbols to be indicated as uplink by *tdd-UL-DL-ConfigurationCommon*, or *tdd-UL-DL-ConfigurationDedicated*.

If a UE is scheduled by a DCI format to receive PDSCH over multiple slots, and if *tdd-UL-DL-ConfigurationCommon*, or *tdd-UL-DL-ConfigurationDedicated*, indicate that, for a slot from the multiple slots, at least one symbol from a set of symbols where the UE is scheduled PDSCH reception in the slot is an uplink symbol, the UE does not receive the PDSCH in the slot.

If a UE is scheduled by a DCI format to transmit PUSCH over multiple slots, and if *tdd-UL-DL-ConfigurationCommon*, or *tdd-UL-DL-ConfigurationDedicated*, indicates that, for a slot from the multiple slots, at least one symbol from a set of symbols where the UE is scheduled PUSCH transmission in the slot is a downlink symbol, the UE does not transmit the PUSCH in the slot.

If a UE

- is configured with multiple serving cells and is provided *half-duplex-behavior* = 'enable', and

- is not capable of simultaneous transmission and reception on any of the multiple serving cells, and

- indicates support of capability for half-duplex operation in CA with unpaired spectrum, and

- is not configured to monitor PDCCH for detection of DCI format 2-0 on any of the multiple serving cells,

the UE determines a reference cell for a symbol as an active cell with the smallest cell index among

* the configured multiple serving cells if the UE is not capable of simultaneous transmission and reception as indicated by *simultaneousRxTxInterBandCA* among the multiple serving cells, and
* the cells in those bands that include more than one configured carrier frequency, irrespective of any capability indicated by *simultaneousRxTxInterBandCA*

where the symbol is configured as

- downlink, or uplink, as indicated by *tdd-UL-DL-ConfigurationCommon* or *tdd-UL-DL-ConfigurationDedicated*

- uplink, if the symbol is flexible and the UE is configured to transmit SRS, PUCCH, PUSCH, or PRACH on the symbol

- downlink, if the symbol is flexible and the UE is configured to receive PDCCH, PDSCH or CSI-RS on the symbol

**<Unchanged parts are omitted>**