**3GPP TSG-RAN WG4 Meeting # 97-e R4-20XXXXX**

**Electronic Meeting, Nov 2 – 13, 2020**

**Agenda item:** 7.11.2, 7.11.3

**Source:** Moderator (Huawei, HiSilicon)

**Title:** Email discussion summary for [97e][217] NR\_RF\_FR1\_RRM

**Document for:** Information

# Introduction

This email thread discusses the RRM core part/ performance part for Tx switching between two uplink carriers in agenda 7.11.2/3.

List of candidate target of email discussion for 1st round and 2nd round:

* 1st round: Invite companies to review the recommended WF in each sub-topic, and provide comments.
* 2nd round: TBA

# Topic #1: Core part

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2014505 | China Telecom | (for TS 38.133)Indicate that for some EN-DC and UL CA configurations, DL interruption is not allowed. |
| R4-2014506 | China Telecom | (for TS 36.133)Indicate that for some EN-DC and UL CA configurations, DL interruption is not allowed. |
| R4-2015488 | Huawei, HiSilicon | 1. Correct the reference section of TS 38.214;2. The interruption length on 120Khz victim cell in NR SA for 210us uplink switching period shall be 14. |

## Open issues summary

N/A

## Companies views’ collection for 1st round

### Open issues

N/A

### CRs/TPs comments collection

*Major close-to-finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2014505(China Telecom) | Company A |
| Company B |
|  |
| R4-2014506(China Telecom) | Company A |
| Company B |
|  |
| R4-2015488(Huawei, HiSilicon) | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary**  |
| **Sub-topic#1** | *Tentative agreements:**Candidate options:**Recommendations for 2nd round:* |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title**  | **Assigned Company,****WF or LS lead** |
| #1 |  |  |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation**  |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #2: Test case

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2014503 | China Telecom | Proposal: To verify the symbol-level DL interruption in test:* Interruption location happens from symbol #[14-(Interruption length+2)] to the end of last GP symbol assuming 2 symbols for SRS transmission in special slot.
* Not consider MRTD in the test.
* Two options can be considered for PDCCH/PDSCH scheduling in the special slot:
	+ Option 1: PDCCH is scheduled on the symbol right before the DL interruption
	+ Option 2: PDCCH is scheduled in the first OFDM symbol, and PDSCH with mapping type A is scheduled from the second OFDM symbol to the symbol right before the DL interruption.
 |
| R4-2014504 | China Telecom | Define test case for DL interruptions at UE switching between NR uplink carrier 1 and NR uplink carrier 2 in FDD+TDD inter-band uplink CA case. |
| R4-2014733 | CMCC | Proposal : The test case for TX switching between NR carrier #1(TDD 30kHz) and NR carrier#2 (TDD 30kHz) in SA scenario:- Carrier#1 TDD UL/DL pattern is 3D1S4U, S = 10DL: 2GP: 2UL;- Carrier#2 TDD UL/DL pattern is 1D1S2U, S = 10DL: 2GP: 2UL;- SRS configuration:* resourceMappingstartPosition: 0
* resourceMappingnrofSymbols: n2

- Tx switching between carrier 1 and carrier 2 happens immediately before SRS transmission in special slot* DL interruption length shall not exceed the value defined in Table 8.2.2.2.10-1 depending on UE capability
* The test verifies whether UE correctly receive the PDCCH scheduled on the symbol which is right before the DL interruption in special slot on carrier#1 amd 2nd special slot of every 8 slots on carrier#2, so that it sends ACK/NACK correctly.
* No MRTD is set in the test.
* The test case is only applicable to UE which supports pdcch-MonitoringAnyOccasions or pdcch-MonitoringAnyOccasionsWithSpanGap.
 |
| R4-2014734 | CMCC | Define test case for DL interruptions at UE switching between NR uplink carrier 1 and NR uplink carrier 2 in TDD+TDD inter-band uplink CA case. |
| R4-2015486 | Huawei, HiSilicon | Proposal 1: The test case for TX switching between NR carrier #1(FDD 15kHz) and NR carrier#2 (TDD 30kHz) in SA scenario:- Carrier#2 TDD UL/DL pattern is 3D1S4U, S = 6DL: 4GP: 4UL;- SRS configuration:* resourceMappingstartPosition: 0
* resourceMappingnrofSymbols: n2

- Tx switching between carrier 1 and carrier 2 happens immediately before SRS transmission in special slot* DL interruption length shall not exceed the value defined in Table 8.2.2.2.10-1 depending on UE capability
* The test verifies whether UE correctly receive the PDCCH scheduled on the symbol which is right before the DL interruption in slot#1 on carrier#1, so that it sends ACK/NACK correctly.
* No MRTD is set in the test.
* The test case is only applicable to UE which supports pdcch-MonitoringAnyOccasions or pdcch-MonitoringAnyOccasionsWithSpanGap.

Proposal 2: Test case for DL Interruptions at UE switching between LTE 1Tx carrier and NR 2Tx carrier in inter-band ENDC can refer to NR SA test case, except:- Carrier#2 TDD UL/DL pattern is 3D1S4U, S = 10DL: 2GP: 2UL;* The test verifies whether UE correctly receive the PDCCH scheduled on the symbol which is right before the DL interruption in special slot on carrier#2, so that it sends ACK/NACK correctly.
 |
| R4-2015487 | Huawei, HiSilicon | Define test case for DL Interruptions at UE switching between LTE 1Tx carrier and NR 2Tx carrier in inter-band ENDC. |

## Open issues summary

### Sub-topic 2-1: Principle and general parameters for test case

**Issue 2-1-1: How to verify the symbol-level DL interruption in test**

* Proposals
	+ Option 1(Huawei, CMCC): PDCCH is scheduled on the symbol right before the DL interruption. UE supports *pdcch-MonitoringAnyOccasions* or *pdcch*-*MonitoringAnyOccasionsWithSpanGap*.
	+ Option 2(China Telecom): PDCCH is scheduled in the first OFDM symbol, and PDSCH with mapping type A is scheduled from the second OFDM symbol to the symbol right before the DL interruption.
* Recommended WF
	+ Further discussion

**Issue 2-1-2: Whether MRTD is considered in test cases**

* Proposals
	+ Option 1(China Telecom, CMCC, Huawei): No
* Recommended WF
	+ No MRTD is set in the test.

**Issue 2-1-3: SRS configuration in the special slot**

* Proposals
	+ Option 1(Huawei, China Telecom, CMCC): SRS configuration refers to SRSConf.1 in Table A.4.4.1.1.1-3 in TS 38.133 except that:

• resourceMappingstartPosition: 0

• resourceMappingnrofSymbols: n2

* Recommended WF
	+ SRS configuration refers to SRSConf.1 in Table A.4.4.1.1.1-3 in TS 38.133 except that:

• resourceMappingstartPosition: 0

• resourceMappingnrofSymbols: n2

### Sub-topic 2-2: Specific parameters for DL Interruptions at UE switching between LTE 1Tx carrier and NR 2Tx carrier in inter-band ENDC

**Issue 2-2-1: TDD configuration**

* Proposals
	+ Option 1 (Huawei): Carrier#2 TDD UL/DL pattern is 3D1S4U, S = 10DL: 2GP: 2UL
* Recommended WF
	+ Is option 1 agreeable?

**Issue 2-2-2: Which symbol to be verified?**

* Proposals
	+ Option 1:
		- symbol #4 or symbol#5 or symbol #8 on the special slot on NR TDD carrier depending on UE capability *uplinkTxSwitchingPeriod*
		- symbol level DL interruption can’t be verified in LTE



* Recommended WF
	+ Is option 1 agreeable?

### Sub-topic 2-3: Specific parameters for DL interruptions at switching between two uplink carriers in FDD-TDD CA (SA)

**Issue 2-3-1: TDD configuration**

* Proposals
	+ Option 1 (China Telecom): Carrier#2 TDD UL/DL pattern is 3D1S4U, S = 10DL: 2GP: 2UL
* Recommended WF
	+ Is option 1 agreeable?

**Issue 2-3-2: Which symbol to be verified?**

* Proposals
	+ Option 1(China Telecom):
		- For NR FDD carrier (Cell 1), this test verifies that the UE correctly receive the PDCCH scheduled on the symbol #8 or symbol #9 or symbol #10 in the second slot of every 4 slots (i.e., the slot overlapping with the special slot of the NR TDD carrier) depending on UE capability *uplinkTxSwitchingPeriod*
		- For NR TDD carrier (Cell 2), this test verifies that the UE correctly receive the PDCCH scheduled on the symbol #4 or symbol #5 or symbol #8 on the special slot depending on UE capability *uplinkTxSwitchingPeriod*
* Recommended WF
	+ Is option 1 agreeable?

### Sub-topic 2-4: Specific parameters for DL interruptions at switching between two uplink carriers in TDD-TDD CA (SA)

**Issue 2-4-1: TDD configuration**

* Proposals
	+ Option 1 (CMCC):

- Carrier#1 TDD UL/DL pattern is 3D1S4U, S = 10DL: 2GP: 2UL;

- Carrier#2 TDD UL/DL pattern is 1D1S2U, S = 10DL: 2GP: 2UL

* Recommended WF
	+ Is option 1 agreeable?

**Issue 2-4-2: Which symbol to be verified?**

* Proposals
	+ Option 1(CMCC):
		- For NR TDD PCell (Cell 1), this test verifies that the UE correctly receive the PDCCH scheduled on the symbol #4 or symbol #5 or symbol #8 on the special slot depending on UE capability uplinkTxSwitchingPeriod.
		- For NR TDD SCell (Cell 2), this test verifies that the UE correctly receive the PDCCH scheduled on the symbol #4 or symbol #5 or symbol #8 on the 2nd special slot of every 8 slots depending on UE capability uplinkTxSwitchingPeriod.



* Recommended WF
	+ Is option 1 agreeable?

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 1-1Issue 1-1-1: Issue 1-1-2:Sub topic 1-2: Sub topic 1-3: |

### CRs/TPs comments collection

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| Company B |
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## Summary on 2nd round (if applicable)

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| --- | --- |
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