**3GPP TSG RAN WG1 Meeting #104-e R1-200xxxx**

**Jan 25th – Feb 5th, 2020**

**Agenda item: 7.2.2**

**Source: Moderator (Qualcomm Incorporated)**

**Title: Preparation phase email discussion for NR-U**

**Document for: Discussion and Decision**

# Introduction

The paper summarizes the preparation phase email discussion for contribution submitted to 7.2.2 on NR-U CR.

# Issues identified

## 2.1 Initial access signals and channels

For initial access signals and channels [1], the following issues have been identified

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| Issue # | Issue summary | # Contributions |
| Init-1 | Invalid SSB by SSB positions in burst for FBE | 1 |
| Init-2 | Clarification on usage of subCarrierSpacingCommon for unlicensed | 1 |

FL recommendations

* Both issues are to capture previous agreements properly and are editorial in nature

## 2.2 DL signals and channels

For DL signals and channels [2], the following issues have been identified

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| Issue # | Issue summary | # Contributions |
| DL-A1 | PDCCH monitoring for grouped search space sets | 1 |
| DL-B1 | Action time when UE receive MAC CE for (de)activation of Scell/CSI-RS/TCI state/SRS | 1 |
| DL-B2 | Discussion on LS from RAN4 in R1-2100008 | 1 |
| DL-C1 | Front-loaded DMRS collision with CORESET | 1 |
| DL-C2 | PDSCH mapping type B with durations larger than 7 symbols | 2 |
| DL-C3 | Processing time | 1 |
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FL recommendations:

## 2.3 UL signals and channels

For UL signals and channels [3], the following issues have been identified

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| **Issue #** | **Issue summary** | **# Contribution(s)** |
| UL-01 | Correction to description of FDRA field description in DCI 0\_0 and 0\_1 to ensure that it is defined both for the case when interlacing is configured and the case when interlacing is not configured. | 2 |
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FL recommendations (see further details in [3]):

## 2.4 Channel access

For channel access [4], the following issues have been identified

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| Issue # | Issue summary | # Contributions |
| CA 2.1 | LBT type for non-contiguous SRS and PUSCH/PUCCH | 1 |
| CA 2.2 | Clarifications to LBT with consecutive UL transmissions | 1 |
| CA 2.3 | Clarifications to channel access for semi-static channel occupancy | 7 |
| CA 2.4 | Clarifications to restrictions for Type 1 DL channel access / DRS | 2 |
| CA 2.5 | Clarifications to UL CWS adjustment | 1 |
| CA 2.6 | Multi-channel Channel Access | 2 |
| CA 2.7 | LBT type indication in DCI 0\_2 and 1\_2 | 1 |
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FL recommendations:

## 2.5 Initial access procedures

For Initial access procedures, no issue identified

## 2.6 HARQ enhancements

For HARQ enhancements [6], the following issues have been identified

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| Issue # | Issue summary | # Contributions |
| NRU-HARQ1 | Whether a correction is needed to specify the UE assumption on the values of NFI and DAI for a non-scheduled PDSCH group (in case of reporting enhanced Type 2 HARQ-ACK codebook in PUSCH or PUCCH). Discussed as issue A9 in the past. | 2 |
| NRU-HARQ2 | Whether there is a need to address FFS: Type-3 codebook with NDI where the UE has not yet obtained HARQ-ACK information for a TB corresponding to a scheduled PDSCH reception. Discussed as issue B4 in the past. | 4 |
| NRU-HARQ3 | Corrections on Type-3 HARQ-ACK codebook (broken down into 5 issues, see section 2.3) | 1 |
| NRU-HARQ4 | Corrections on power control for enhanced Type 2 and for Type-3 HARQ-ACK codebook (broken down into 4 questions, see section 2.4) | 1 |
| MultiPUSCH | Corrections on multi-PUSCH scheduling:   * Issue 1: possible ambiguity in the TDRA bitfield size in relation to *pusch-TimeDomainAllocationListForMultiPUSCH* * Issue 2: possible reference to a wrong RRC parameter instead of *pusch-TimeDomainAllocationListForMultiPUSCH* * Issue 3: possible ambiguous UE behaviour in case of simultaneous configuration of semi-static repetitions (with pusch-AggregationFactor) and pusch-TimeDomainAllocationListForMultiPUSCH | 3 |

FL recommendations:

* HARQ1, HARQ2, HARQ3-issues2&3, HARQ4 (Q3&Q4) may not require a correction because they have already been discussed in the past without consensus on the essentiality of a correction
* Multi-PUSCH issue 1 may not require a correction
* HARQ3-issue1 requires a clarification from the proponent
* HARQ3-issue4, HARQ3-issue5, HARQ4 (Q1, and potentially Q2), Multi-PUSCH issue 2 and issue 3 may require a correction

## 2.7 CG enhancements

For CG enhancements [7], the following issues have been identified

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| Issue # | Issue summary | # Contributions |
| CG-TP1 | The intra-slot frequency hopping is supported while the inter-slot frequency hopping is not supported for NR-U configured grant PUSCH repetition | 1 |
| CG-TP2 | RRC parameter name alignment in 38.213 | 1 |
| CG-TP3 | for K=1 and UE provided with higher layer parameters *cg-nrofSlots* and *cg-nrofPUSCH-InSlot*, the case of whether UE transmits in *repK* earliest transmission occasion candidate is missing in 38.214 | 1 |
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FL recommendations:

* TP1 and TP3 can be discussed through email
* TP2 is editorial

## 2.8 Wideband operation

On wideband operation enhancements, no issue identified.

# Preparation phase discussion

We have identified many issues and we have limited email thread to discuss them. In the next tables, please provide your view on issues with the following notations

* “Y” if you believe the issue is important and needs email discussion
* “E” if you believe the issue is agreeable but editorial in nature. Potentially we can take all the editorial issues out for a separate fast track email approval.
* Empty if you believe the issue is not necessary to fix or low priority

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| Company | Init-1 | Init-2 | DL-A1 | DL-B1 | DL-B2 | DL-C1 | DL-C2 | DL-C3 | UL-01 |
| Qualcomm | E | E |  |  | Y | Y | Y | Y | E |
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| Company | CA 2.1 | CA 2.2 | CA 2.3 | CA 2.4 | CA 2.5 | CA 2.6 | CA.2.7 | CG-TP1 | CG-TP2 | CG-TP3 |
| Qualcomm |  | E | Y |  |  |  |  |  | E |  |
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| Company | HARQ1 (A9) | HARQ2 (B4) | HARQ3-issue1 | HARQ3- issues2&3 | HARQ3- issue4 | HARQ3- issue5 |
| Qualcomm |  |  | Y |  | E | E |
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|  | HARQ4  (answers may refer to Q1, Q2, Q3, Q4) | Multi-PUSCH  Issue 1 | Multi-PUSCH  Issue 2 | Multi-PUSCH  Issue 3 |
| Qualcomm |  | E | E | Y |
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Please provide additional company views below

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| **Company** | **View** |
| Qualcomm | For issue DL-B2, may have a separate email discussion for LS  For issue DL-C1/C2/C3, can combine them together in an email thread  For HARQ related issues, can combine them together in an email thread |
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# Reference

[1]. Reserved

[2]. R1-20xxxxx, FL summary for DL signals and channels, Lenovo

[3]. R1-20xxxxx, FL summary for UL signals and channels v2, Ericsson

[4]. R1-20xxxxx, FL summary for channel access procedures for NR-U, Nokia

[5]. R1-20xxxxx, FL summary for initial access procedure enhancements, Charter Communications

[6]. R1-20xxxxx, FL summary on NR-U HARQ maintenance, Huawei

[7]. R1-20xxxxx, FL summary for on NRU configured grant enhancement, Vivo

[8]. Reserved