**3GPP TSG RAN WG1#101-e R1-200xxxx**

**e-Meeting, May 25th – June 5th, 2020**

**Agenda Item: 7.2.2.1.2**

**Source: Moderator (Lenovo)**

**Title: [Draft] Feature lead summary for NR-U DL Signals and Channels**

**Document for: Discussion, Decision**

# Introduction

This document summarizes issues raised by documents submitted to RAN1#101-e on AI 7.2.2.1.2, and includes suggestions for the email discussion.

Where easily available from documents, the corresponding proposals are listed below as "P#".

# Classification of corrections by topics and issues

The following topics and issues have been identified by submitted contributions. Since the number of email discussions is limited to 3 in RAN1#101, only a very limited set of issues can be discussed. It is understood that more than 3 should be seen as essential correction discussion items for Rel-16 NRU.

The numbering of topics/issues from RAN1#100bis-e has been largely kept for consistency, with slight modifications of the description or new issues as applicable. Issues that have been brought up before but for which no input is available in this meeting are put in *italics*.

## Topic A: Search space

List of issues, proposals, and suggestions for handling in the email discussion phase.

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| --- | --- | --- | --- |
| Issue | Description | Reference Tdoc | FL suggestion |
| *A1* | *Search space group/set configuration* |  |  |
| A2 | Switching timer | R1-2003510, P2  R1-2004322, P1  R1-2004255, P6 | Alternative suggestion: Discuss A2+A5+A7 in Thread #1 |
| *A3* | *Processing time for switching* |  |  |
| A4 | Default SS group, incl. BWP switching | R1-2003368, P1-2  R1-2003510, P1  R1-2004083, P3  R1-2004516, P2 | Discuss in RAN1#101-e  Thread #1  (with A5) |
| A5 | Search space set switching behaviour | R1-2004083, P1-2  R1-2004255, P7 | Discuss with A4 |
| A6 | Search space BD adjustments/dropping | R1-2004011, P6 |  |
| A7 | Number of cell groups in *searchSpaceSwitchingGroupList-r16* | R1-2003840, P2 | Discuss as part of Thread #1 |

## Topic B: DCI format 2\_0, COT indication, RB set indication

List of issues, proposals, and suggestions for handling.

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| Issue | Description | Reference Tdoc | FL suggestion |
| B1 | Special states/indications in "available RB set indication" (e.g. no RB set information available yet) | R1-2003448, P1  R1-2003510, P4-5  R1-2004002, P1  R1-2004011, P3-4  R1-2004083, P10-P11  (R1-2004255, P1)  R1-2004322, P8 |  |
| B2 | Switch CAT4 LBT to CAT2 LBT | R1-2003368, P3 |  |
| B3 | Indication of "out of COT" | R1-2003510, P6 |  |
| B4 | Reference subcarrier spacing for COT duration indication | R1-2003510, P7 |  |
| B5 | SFI (+other fields) presence configurability in DCI format 2\_0 | R1-2003368, P4  R1-2003448, P4  R1-2003510, P3  R1-2003654, P4  R1-2003840, P5  R1-2004011, P1+P5+P8  R1-2004083, P4-6  R1-2004255, P2-3  R1-2004322, P3-4  R1-2004441, P5 | Discuss in RAN1#101-e  Thread #2 |
| B6 | COT duration indication/determination | R1-2004322, P7  R1-2004441, P4 |  |
| B7 | Channel occupancy in FBE (semi-static channel access) | R1-2003654, P5  R1-2004255, P4  R1-2004441, P6-8 |  |
| *B8* | *Available RB sets configuration* |  |  |
| B9 | UE behaviour outside COT duration | R1-2003448, P3  R1-2003858, P3  R1-2004002, P2  R1-2004011, P2 |  |
| B10 | SFI length configuration | R1-2004011, P7 |  |

## Topic C: PDSCH

List of issues, proposals, and suggestions for handling.

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| Issue | Description | Reference Tdoc | FL suggestion |
| C1 | PDSCH mapping on intra cell guard band | R1-2003448, P2  R1-2003726, P1 |  |
| C2 | CG PDSCH presence/dropping | R1-2003858, P4  R1-2004083, P7-P8  R1-2004214, P1  R1-2004255, P8-10 | Discuss with D1 |
| C3 | FDRA interpretation with DCI 1\_0 in CSS | R1-2003858, P5 |  |

## Topic D: CSI-RS

List of issues, proposals, and suggestions for handling.

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| --- | --- | --- | --- |
| Issue | Description | Reference Tdoc | FL suggestion |
| D1 | CSI-RS transmission power, measurements, validity/presence of periodic/semi-persistent CSI-RS | R1-2003368, P5  R1-2003448, P5-6  R1-2003510, P9  R1-2003654, P6  R1-2003840, P6  R1-2003858, P1-2+P4  R1-2004002, P3  R1-2004011, P9-11  R1-2004214, P1  R1-2004255, P8-10  R1-2004441, P1-3 | Discuss in RAN1#101-e  Thread #3  (with C2 and F1) |
| *D2* | *CSI-RS for tracking are confined to RB set* |  |  |

## Topic E: DMRS for PDSCH mapping type B

List of issues, proposals, and suggestions for handling.

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| Issue | Description | Reference Tdoc | FL suggestion |
| E1 | Shifting of DMRS | R1-2004516, P1 |  |

## Topic F: SSB transmission power

List of issues, proposals, and suggestions for handling.

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| Issue | Description | Reference Tdoc | FL suggestion |
| F1 | SSB transmission power for SSB-based RRM measurements | R1-2003510, P9 | Discuss with D1 |

# Capturing earlier agreements and spec alignment

The following issues have been identified as being agreed earlier, but having not been fully or correctly captured in the specs so far. It is suggested to discuss or reflect related proposals in the TP stage of RAN1#101-e.

Note that the numbering here is not consistent with the numbering of earlier meetings.

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| Issue | Description | Reference Tdoc |  |
| Z1 | PDCCH monitoring switching (timer, processing time, behaviour, configuration, …) | R1-2003654, P1-3  R1-2003840, P1+P3  R1-2003840, P4  R1-2004255, P5  R1-2004322, P2  R1-2004528, P1-3 |  |

# List of submitted TDocs

The following TDocs have been used to compile above summary:

R1-2003368 Remaining issues on physical DL channel design in unlicensed spectrum vivo

R1-2003448 Remaining issues on the DL channels for NR-U ZTE, Sanechips

R1-2003510 Maintenance on DL signals and channels Huawei, HiSilicon

R1-2003654 Remaining issues on DL signals and channels for NR-U MediaTek Inc.

R1-2003726 DL signals and channels for NR-unlicensed Intel Corporation

R1-2003840 DL signals and channels Ericsson

R1-2003858 DL signals and channels for NR-U Samsung

R1-2004002 Remaining issues in DL signals and channels for NR-U Spreadtrum Communications

R1-2004011 Remaining issues of DL signals and channels for NR-U LG Electronics

R1-2004083 Discussion on the remaining issues of DL signals and channels OPPO

R1-2004214 Remaining issues of DL signals and channels Apple

R1-2004255 Remaining issues on DL signals and channels Nokia, Nokia Shanghai Bell

R1-2004322 Remaining issues and corrections on DL signals and channels for NR-U Sharp

R1-2004441 TP for DL signals and channels for NR-U Qualcomm Incorporated

R1-2004516 Maintenance for DL signals and channels for NR-U Panasonic

R1-2004528 Text proposal for search space group switching Google Inc.