**3GPP TSG RAN WG1 #100bis-e** **R1-200XXXX**

**e-meeting, April 20-30, 2020**

**Agenda item: 7.2.2.2.1**

**Source: Moderator (Nokia)**

**Title: TPs related to the email discussion [100b-e-NR-unlic-NRU-ChAcc-01]**

**Document for: Discussion and Decision**

# 1 Introduction

This document captures the text proposals related to the following RAN1#100bis-e email thread:

[100b-e-NR-unlic-NRU-ChAcc-01] Email discussion/approval on clarifications to LBT with consecutive UL transmissions by 4/23; if necessary, followed by endorsing the corresponding TPs by 4/28 – Timo (Nokia)

During the preparation phase it was identified that the following TDocs and proposals relate to corrections and clarifications to consecutive UL transmissions:

**Issue #2** Clarifications to LBT with consecutive UL transmissions

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| Clarifications to LBT with consecutive UL transmissions | R1-2001534 (2.7)  R1-2001652 (2.3)  R1-2001705 (2.2)  R1-2001759 (2.1)  R1-2001935 (p7)  R1-2001987 (p3)  R1-2002117 (p2, p3)  R1- 2002193 (p4)  R1-2002383 (p1)  R1-2002530 (p1)  R1-2002632 (p4, p5) |

This contribution provides text proposals for some of the related aspects.

# 2. TPs

## 2.1 LBT type after failing to transmit first PUSCH(s) of a set scheduled by an UL grant

From the agreement in [100b-e-NR-unlic-NRU-ChAcc-01]:

Agreement:

For LBT type and CP extension, after failing to transmit first PUSCH(s) of a set scheduled by a single UL grant,

* If a UE fails to access the channel with UL Type 2B channel access, Type 2A UL channel access shall be used for the following consecutively scheduled transmissions.
* If a UE fails to access the channel prior to the first of the consecutive UL transmissions, it shall use “0” CP extension for the subsequent UL transmissions irrespective of the CP extension indicated in the scheduling grant.

Would a text proposal be needed for the above or is the plan to leave it to the editor? If a TP is needed, it can be discussed until 4/28.

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| \*\*\* <Beginning of **Text Proposal 1**> \*\*\* 4.2.1.0.1 Channel access procedures for consecutive UL transmission(s) For contiguous UL transmission(s), the following are applicable:  - If a UE is scheduled to transmit a set of UL transmissions including PUSCH using a UL grant, and if the UE cannot access the channel for a transmission in the set prior to the last transmission according to one of Type 1 or Type 2A UL channel access procedures, the UE shall attempt to transmit the next transmission according to the channel access type indicated in the UL grant. Otherwise, if the UE cannot access the channel for a transmission in the set prior to the last transmission according to Type 2B UL channel access procedure, the UE shall attempt to transmit the next transmission according to the Type 2A UL channel access procedure.  - If a UE is scheduled by a gNB to transmit a set of UL transmissions including PUSCH using a UL grant, the UE shall apply a CP extension value “0” for the UL transmissions in the set other than the first one.  - If a UE is scheduled to transmit a set of consecutive UL transmissions without gaps including PUSCH using one or more UL grant(s) and the UE transmits one of the scheduled UL transmissions in the set after accessing the channel according to one of Type 1, Type 2A, Type 2B or Type 2C UL channel access procedures, the UE may continue transmission of the remaining UL transmissions in the set, if any.  - A UE is not expected to be indicated with different channel access types for any consecutive UL transmissions without gaps in between the transmissions.  \*\*\* <End of **Text Proposal 1**> \*\*\* |

Companies are asked to provide their views on the TP using the Table below:

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| **Company / Org.** | **View on FL proposal #4** |
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## 2.2 LBT type for consecutive CG transmissions

From the agreement in [100b-e-NR-unlic-NRU-ChAcc-01]:

Finally, regarding the proposal to discuss the TP on LBT type for consecutive CG transmissions, in general we should work on TPs in the second phase only if there is consensus that there is something missing that needs to be captured in a TP. It was not clear that is the case here, but let’s continue discussion as Timo recommends.

Discuss if the second change in TP7 of R1-2001534 is agreeable, possibly with some modifications until 4/28

The second change of the text proposal TP#7 from R1-2001534 is copied below, renamed as TP2:

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| \*\*\* <Beginning of **Text Proposal 2**> \*\*\*  4.2.1.0.1 Channel access procedures for consecutive UL transmission(s)  For contiguous UL transmission(s), the following are applicable:  - If a UE is scheduled to transmit a set of UL transmissions including PUSCH using a UL grant , and if the UE cannot access the channel for a transmission in the set prior to the last transmission, the UE shall attempt to transmit the next transmission according to the channel access type indicated in the UL grant.  - If a UE is scheduled to transmit a set of consecutive UL transmissions without gaps including PUSCH using one or more UL grant(s) and the UE transmits one of the scheduled UL transmissions in the set after accessing the channel according to one of Type 1 or Type 2 UL channel access procedures, the UE may continue transmission of the remaining UL transmissions in the set, if any.  - If a UE is configured to transmit a set of consecutive PUSCH transmissions on resources configured by the gNB, the time domain resource configuration defines multiple transmission occasions at which the UE may access the channel according to Type 1 UL channel access procedure, each transmission occasion starts at the starting symbol of a configured grant PUSCH within the duration of the COT.  - A UE is not expected to be indicated with different channel access types for any consecutive UL transmissions without gaps in between the transmissions.  \*\*\* <End of **Text Proposal 2**> \*\*\* |

Companies are asked to provide their views on the TP using the Table below:

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| **Company / Org.** | **View on FL proposal #4** |
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## 2.3 Direct transmission of UL transmission(s) following configured grant UL transmission(s)

From the agreement in [100b-e-NR-unlic-NRU-ChAcc-01]:

Agreement:

Back-to-back transmission of GC-PUSCH and dynamically scheduled PUSCH is supported in NR-U with restrictions similar to those in LTE LAA.

Discuss the exact TP taking TP#9 in R1-2001534 as the starting point (until 4/28)

The text proposal TP#9 from R1-2001534 is copied below, renamed as TP3:

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| \*\*\* <Beginning of **Text Proposal 3**> \*\*\*  4.2.1.0.1 Channel access procedures for consecutive UL transmission(s)  \*\*\* Unchanged text is omitted \*\*\*  For UL transmission(s) following configured grant UL transmission(s), the following are applicable:  - If a UE is scheduled by a DCI received from a gNB to transmit UL transmission(s) starting from symbol in slot using Type 1 channel access procedure without CP extension, and if the UE starts configured grant UL transmissions before slot using Type 1 channel access procedure, and the scheduled UL transmission(s) occupies all the RBs of the same channels occupied by the configured grant UL transmission(s) or all the RBs of a subset thereof, the UE may directly transmit the scheduled UL transmission(s) according to the received DCI from symbol in slot without a gap, if the priority class value of the performed channel access procedure is larger than or equal to the priority class value indicated in the DCI, and the configured grant UL transmission shall end at the symbol preceding symbol . The sum of the lengths of the configured grant UL transmission(s) and the scheduled UL transmission(s) shall not exceed the maximum channel occupancy time corresponding to the priority class value used to transmit the configured grant UL transmission(s). Otherwise, the UE shall terminate the configured grant UL transmission by dropping the transmission of at least the CG-PUSCH before symbol in slot and transmit the scheduled UL transmission(s) according to the received DCI.  \*\*\* Unchanged text is omitted \*\*\*  \*\*\* <End of **Text Proposal 3**> \*\*\* |

Companies are asked to provide their views on the TP using the Table below:

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| **Company / Org.** | **View on FL proposal #4** |
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# 3. Conclusions

TBA

# References

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| 1 | [**R1-2001534**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_100b_e/Docs/R1-2001534.zip) | Maintainance on the channel access procedure | Huawei, HiSilicon |
| 2 | [**R1-2001652**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_100b_e/Docs/R1-2001652.zip) | Remaining issues on the channel access procedures | vivo |
| 3 | [**R1-2001705**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_100b_e/Docs/R1-2001705.zip) | Remaining issues on the channel access procedure for NR-U | ZTE, Sanechips |
| 4 | [**R1-2001759**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_100b_e/Docs/R1-2001759.zip) | Discussion on the remaining issues of channel access procedure | OPPO |
| 5 | [**R1-2001935**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_100b_e/Docs/R1-2001935.zip) | Remaining issues of channel access procedure for NR-U | LG Electronics |
| 6 | [**R1-2001987**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_100b_e/Docs/R1-2001987.zip) | Channel access mechanism for NR-unlicensed | Intel Corporation |
| 7 | [**R1-2002031**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_100b_e/Docs/R1-2002031.zip) | Channel access procedures | Ericsson |
| 8 | [**R1-2002117**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_100b_e/Docs/R1-2002117.zip) | Channel access procedures for NR-U | Samsung |
| 9 | [**R1-2002193**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_100b_e/Docs/R1-2002193.zip) | Remaining Issues on Channel Access Procedures for NR-U | Nokia, Nokia Shanghai Bell |
| 10 | [**R1-2002247**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_100b_e/Docs/R1-2002247.zip) | Remaining issues on channel access procedures for NR-U | ETRI |
| 11 | [**R1-2002383**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_100b_e/Docs/R1-2002383.zip) | Remaining issues and corrections on channel access procedure for NR-U | Sharp |
| 12 | [**R1-2002405**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_100b_e/Docs/R1-2002405.zip) | Remaining issues on channel access for NR-U operation | MediaTek Inc. |
| 13 | [**R1-2002434**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_100b_e/Docs/R1-2002434.zip) | Remaining issues on channel access procedures for NR-U | NTT DOCOMO, INC. |
| 14 | [**R1-2002465**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_100b_e/Docs/R1-2002465.zip) | TP on shared spectrum in NR-U | NEC |
| 15 | [**R1-2002530**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_100b_e/Docs/R1-2002530.zip) | TP for Channel access procedures for NR unlicensed | Qualcomm Incorporated |
| 16 | [**R1-2002632**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_100b_e/Docs/R1-2002632.zip) | Remaining issues on channel access procedure for NR-U | WILUS Inc. |
| 17 | [**R1-2002684**](http://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_100b_e/Docs/R1-2002684.zip) | COT sharing information in CG-UCI | Lenovo, Motorola Mobility |