3GPP TSG RAN WG1 #106-e R1-210XXXX

e-Meeting, August 16th – 27th, 2021

**Agenda item: 7.2.5**

**Source: Moderator (Nokia)**

**Title:** **Summary of [106-e-NR-L1enh-URLLC-04]**

**Document for: Discussion and Decision**

# Introduction

This document is created to facilitate the email discussion of

* [106-e-NR-L1enh-URLLC-04] Issue#8: Conflict between the first PUCCH repetition and semi-static configuration in Rel-15/16 - Klaus (Nokia)

Although not mentioned for this email thread by Mr. chairman, the intention is to have this completed by Aug 20th.

This email thread is triggered by the following discussion document.

[R1-2107555](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_106-e/Docs/R1-2107555.zip) UCI enhancements maintenance: Conflict between the first PUCCH repetition and semi-static configuration in Rel-15/16 Nokia/Nokia Shanghai Bell

The issue of the conflict of the first PUCCH repetition and semi-static configuration in Rel-15/16 had been discussed now for three meetings in a row, without conclusion. Reference is hereby made to the following documents from previous RAN1 meetings:

* [104-e-NR-L1enh-URLLC-02] in R1-2101841, see Sec. 2.3
* [104b-e-NR-L1enh-URLLC-02] in R1-2103867, see Sec. 2.2
* [105-e-NR-L1enh-URLLC-02] in R1-2106050, see Sec. 2.2

# Email discussions

**The following is discussed by Nokia/NSB in R1-210755:**

The group discussed during RAN1#105-e postponing of a PUCCH repetition that collides with SSB symbols or symbols indicated as DL. A consensus was reached how this should be handled in Rel-16, but it was noted that the same question was discussed for Rel-15 and then different implementation choices were allowed. A proposal was to include in the meeting minutes a note that concerns only Rel-16. Because the problem was discussed for Rel-15 and one approach was agreed then, it seems not possible to change that decision if there are objections. Therefore, we support adding the note in the form proposed in RAN1 #105-e. An objection was based on thinking that, as specifications are identical for Rel-15 and Rel-16, we should not make a note only for Rel-16. However, without a note, ambiguity would remain also with Rel-16 which seems unfortunate.”

**Proposal: Include in the Chairman’s Notes the clarification  
“It is clarified that, according to the running R16 specification, a PUCCH repetition in case  (including the first PUCCH repetition) is postponed to the next available slot if the PUCCH repetition collides with SSB symbols or symbols indicated as DL by*tdd-UL-DL-ConfigurationCommon* or *tdd-UL-DL-ConfigurationDedicated*.”**

In addition, CATT proposed to specifically mentioning that different interpretations are allowed in Rel-15:

“ **There may be different understandings/implementations for Rel-15 if the first PUCCH repetition collides with SSB symbols or symbols indicated as DL by *tdd-UL-DL-ConfigurationCommon* or *tdd-UL-DL-ConfigurationDedicated.”***

## 2.1 Round 1

As this had been discussed earlier, the moderator brings forward directly the proposals based on the latest status from RAN1#105-e. **Please add your companies name directly to the line below the proposals and further comments in the table below.**

**Proposal 1: Include in the Chairman’s Notes the clarification  
“It is clarified that, according to the running R16 specification, a PUCCH repetition in case  (including the first PUCCH repetition) is postponed to the next available slot if the PUCCH repetition collides with SSB symbols or symbols indicated as DL by*tdd-UL-DL-ConfigurationCommon* or *tdd-UL-DL-ConfigurationDedicated*.”**

* + **Support:** Nokia/NSB, CATT, vivo, HW/HiSi, DOCOMO, OPPO
  + **Object:** Samsung

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| *Company* | *Further comments* |
| Apple | We are fine with Proposal 1 in general, but we think the interpretation of R15 (either following Proposal 1 or leave it to UE implementation) should also be clarified to achieve common understanding. Therefore, we do not think Proposal 1 should be agreed without any clarification for R15. |
| Samsung | Fine with the proposal but without the “according to the running R16 specification”.  For this value of , the reasons again are that there is no difference in the Rel-16 text from the Rel-15 text and there was no Rel-16 WI that was related to that text. Without the removal of the above statement, there is no justification for the proposal to be agreeable.  >>Moderator reply: I fully understand, that in case the specs hasn’t changed it is a bit illogical to have different interpretations in different release for the same specs text. But without any clarification (as pointed out by HW/HiSi and DoCoMo below, and Nokia in the input document), such ambiguity in future releases cannot be prevented.  Specifically, as PUCCH repetition due to the introduction of coverage enhancements may become more important & useful, from network vendor and network operation perspective it would be crucial and help already if R16+ UEs would adopt the same understanding.  [Samsung follow up]: It is surprising that companies (including ones with products) are OK with having undefined specifications and UE behaviour for Rel-15, especially as the specifications have not changed and as a Rel-16 UE/gNB modem will not implement anything different than a Rel-15 UE/gNB modem. While it is true that one company suggested a Release-dependent understanding of the exact same text (that was completely unaffected in Rel-16), that event is unfortunate but it cannot possibly become a RAN1 endorsement for undefined Rel-15 specifications (and RAN1 did not previously agree to a different interpretation). If the specifications were left undefined every time someone claimed to have misinterpreted something, there would be no functioning deployments.  In any case, there is no ambiguity in the specifications that would require a clarification. Also, the present discussion topic is not even relevant to Rel-16 URLLC (there is nothing in 9.2.6 of 213 that relates to Rel-16 URLLC). |
| HW/HiSi | Support. We should avoid having the same ambiguity as for Rel-15. |
| DOCOMO | Support. UE behavior in Rel-16 should be clarified, which is also essential for the discussion in future releases. |
| Qualcomm | Fine with the proposal. |
| Intel | Fine with the proposal. |

**Proposal 2: Include in the Chairman’s Notes the additional further clarification as a sub-bullet to Proposal 1:**“ **There may be different understandings/implementations for Rel-15 if the first PUCCH repetition collides with SSB symbols or symbols indicated as DL by *tdd-UL-DL-ConfigurationCommon* or *tdd-UL-DL-ConfigurationDedicated.”***

* + **Support:** Nokia/NSB, CATT, OPPO
  + **Object:** Samsung

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| *Company* | *Further comments* |
| CATT | The sub-bullet was proposed to address Apple’s concern. We are also fine with Proposal 1 only without the sub-bullet. |
| vivo | We are also fine with Proposal 1 only without the sub-bullet. |
| Apple | We support Proposal 2, i.e., further clarification on R15 behavior.  The concern we have is that we do not know how to interpret R15 without any notes. As mentioned above, we are fine with either leaving to UE implementation or adopting the same understanding as R16, as long as it is clarified.  >>Moderator reply: clearly this would be the cleanest solution, but did not work out earlier. Maybe we could try this in the next round (to address Samsung concern on Proposal 1) as a last try to have this clarified.  A question for CATT/vivo: without the sub-bullet, what is your understanding of R15? If the common understanding is to leave it to UE implementation, we could also be fine. But then I do not quite understand why we cannot explicitly have the notes to clarify it. |
| Samsung | There may be different understandings with everything in the specifications. That is not a RAN1 issue. If someone has a different understanding, a Rel-15 CR is the proper venue together with an explanation of what in the text creates the different understanding or what needs to be explained.  This issue has been discussed for way too long already and we should not be wasting time going in circles. |
| HW/HiSi | We are fine with proposal 1 without agreeing on Proposal 2.  One clarification on proposal 2, is it really that there are different understandings? Or is the common understanding that it is up to the UE implementation? |
| DOCOMO | No strong view as long as Proposal 1 is concluded. |
| Qualcomm | We share similar view as HW/HiSi. In our understanding, the Rel-15 behaviour is up to the UE implementation. |
| Intel | Agree with HW-HiSi and others that Proposal 2 is not necessary and Rel-15 behavior is just left up to implementation. |