**3GPP TSG RAN WG1 Meeting #104-e R1-21xxxxx**

**E-meeting, January 25 –February 5, 2021**

**Agenda Item: 6.2.2**

**Source: Moderator (Huawei)**

**Title: Feature lead summary #1 on [104-e-LTE-NB\_IoTenh3-01]**

**Document for: Discussion and Decision**

# Introduction

This contribution provides discussion on the following issue:

[104-e-LTE-NB\_IoTenh3-01] PUR issues – Mixiang (Huawei)

* Issue#1: Transmission scheme for NPDSCH configured by PUR-RNTI ([R1-2101282](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_104\Docs\R1-2101282.zip))
* Issue#2: DCI size alignment ([R1-2100562](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_104\Docs\R1-2100562.zip))
* Issue#3: Adding parameter name ([R1-2101703](file:///C:\Users\wanshic\OneDrive%20-%20Qualcomm\Documents\Standards\3GPP%20Standards\Meeting%20Documents\TSGR1_104\Docs\R1-2101703.zip))
* Discussion and decision by Jan 29, TPs by Feb 5

# Issues

## Issue#1: Transmission scheme for NPDSCH configured by PUR-RNTI (R1-2101282)

**Description**: Huawei/HiSilicon (R1-2101282) points out that the transmission scheme for NPDSCH configured by PUR-RNTI is not specified, and proposes to specify the same transmission scheme rules as for other usages of NPDSCH. Otherwise, the UE cannot know the transmission scheme for NPDSCH configured by PUR-RNTI.

**TP#1**: The following TP#1 for TS 36.213 is proposed by Huawei/HiSilicon (R1-2101282):

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| --------------------------- Text starts (TS 36.213, clause 16.4.1)----------------------------- 16.4.1 UE procedure for receiving the narrowband physical downlink shared channel < Unchanged parts are omitted >  If a UE is configured by higher layers to decode NPDCCH with CRC scrambled by the PUR-RNTI, the UE shall decode the NPDCCH and the corresponding NPDSCH according to any of the combination defined in Table 16.4.1-9. The scrambling initialization of the NPDSCH corresponding to these NPDCCHs is by PUR-RNTI.  Table 16.4.1-9: NPDCCH and NPDSCH configured by PUR-RNTI   |  |  |  | | --- | --- | --- | | DCI format | Search Space | Transmission scheme of NPDSCH corresponding to NPDCCH | | DCI format N1 | UE specific by PUR-RNTI | If the number of NPBCH antenna ports is one, Single-antenna port, port 2000 is used (see Clause 16.4.1.1), otherwise Transmit diversity (see Clause 16.4.1.2). |   < Unchanged parts are omitted >  --------------------------- Text ends (TS 36.213, clause 16.4.1)----------------------------- |

### Question

**Question: Regarding Issue#1, do you agree with TP#1 above?**

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| --- | --- | --- |
| **Company** | **Agree?** | **Comments** |
| Ericsson | Yes | We are ok, since the TP adds complementary information and it is consistent with other parts of the spec. |
| QC | Yes |  |
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## Issue#2: DCI size alignment (R1-2100562)

**Description**: ZTE (R1-2100562) points out for NB-IoT, the DCI size of format N0 scrambled by C-RNTI and the DCI size of format N0 scrambled by PUR-RNTI may be different. If the DCI size of format N0 scrambled by C-RNTI and the DCI size of format N0 scrambled by PUR-RNTI are different, when format N1 needs padding, it is not clear that the target DCI size of format N0 is based on format N0 scrambled by C-RNTI or format N0 scrambled by PUR-RNTI.

**TP#2**: The following TP#2 for TS 36.212 is proposed by ZTE (R1-2100562):

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| --------------------------- Text starts (TS 36.212, clause 6.4.3.2)-----------------------------  6.4.3.2 DCI Format N1  **<Unchanged parts are omitted>**  If the number of information bits in format N1 is less than that of format N0 in the same search space and the format N1 CRC is not scrambled by G-RNTI, zeros shall be appended to format N1 until the payload size equals that of format N0.  **<Unchanged parts are omitted>**  --------------------------- Text ends (TS 36.212, clause 6.4.3.2)----------------------------- |

### Question

**Question: Regarding Issue#2, do you agree with TP#2 above?**

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| **Company** | **Agree?** | **Comments** |
| Ericsson | See comment | We think is better to re-use the wording that in MTC has been used for the same purpose:  6.4.3.2 DCI Format N1  **<Unchanged parts are omitted>**  If the number of information bits in format N1 mapped onto a given search space is less than that of format N0 for scheduling the same serving cell and mapped onto the same search space, and the format N1 CRC is not scrambled by G-RNTI, zeros shall be appended to format N1 until the payload size equals that of format N0.  **<Unchanged parts are omitted>** |
| QC | See comment | We agree with this issue, but we wonder if this is not a legacy issue that would happen also with other search spaces (e.g. temporary C-RNTI during connected mode CBRA). If so, it should be corrected in a previous version of the specification. |
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## Issue#3: Adding parameter name (R1-2101703)

**Description**: Ericsson (R1-2101703) points out in R2-2009609 “NB-IoT row 17”, it is mentioned that the parameter “dl-CarrierConfig-r13” was added by RAN2, relying on the following cited agreement: “In the RRC configuration for PUR, include the DL carrier location for receiving a DL response to PUR transmissions”.

**TP#3**: To incorporate the RAN2 update, the following TP#3 for TS 36.213 is proposed by Ericsson (R1-2101703):

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| --------------------------- Text starts (TS 36.213, clause 16.6)-----------------------------  **<Unchanged parts are omitted>**  For UE-specific search space by PUR-RNTI, the UE is configured by the higher layer parameter *dl-CarrierConfig-r13* with a NB-IoT carrier for monitoring of NPDCCH UE-specific search space,  - the UE shall monitor the NPDCCH UE-specific search space on the higher layer configured NB-IoT carrier,  - the UE is not expected to receive NPSS, NSSS, NPBCH on the higher layer configured NB-IoT carrier if the NB-IoT carrier is not the same as the NB-IoT carrier on which NPSS/NSSS/NPBCH are detected.  **<Unchanged parts are omitted>**  --------------------------- Text ends (TS 36.213, clause 16.6)----------------------------- |

### Question

**Question: Regarding Issue#3, do you agree with TP#3 above?**

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| **Company** | **Agree?** | **Comments** |
| Ericsson | Yes | Following the action in the LS R2-2009609, it incorporates the parameter name *dl-CarrierConfig-r13* added by RAN2. |
| Qualcomm | No | We think the current spec is clear already, since 36.331 already clarifies the meaning of the parameters (in any case, this is an editorial change). If there is strong consensus to correct this, it should be written as “*dl-CarrierConfig-r13* within *pur-PhysicalConfig-r16*”, since *dl-CarrierConfig* is present in many other places. |
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# Summary

# Reference

1. R1-2100562 Clarification on DCI size alignment for NB-IoT ZTE
2. R1-2101703 PUR maintenance issues for Rel-16 NB-IoT Ericsson
3. R1-2101282 Correction on transmission scheme for NPDSCH configured by PUR-RNTI Huawei, HiSilicon