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

**E-Meeting, April 20 – 30, 2020**

**Agenda Item: 6.2.2.4**

**Source: Moderator (Huawei)**

**Title: TP on SPS**

**Document for: Discussion and Decision**

# Introduction

This document provides the text proposal as the outcome of the following email discussion [1]

[100b-e-LTE-NB\_IoTenh3-Coex-NR-03] Clarification for SPS and fully reserved subframe (Editorial) – Yubo (Huawei)

* Issues #5, #6 in R1-2002700

# Discussion

**Reason for changes:**

With the sentence “associated with C-RNTI or SPS C-RNTI using UE-specific NPDCCH search space”, the SPS NPUSCH is not considered in resource reservation as it’s not using UE-specific NPDCCH search space.

**Summary of changes:**

The NPUSCH transmission without a corresponding NPDCCH is also considered in resource reservation.

**Specs/sections impacted:**

Sections of 36.211: 10.1.3.6, 10.1.4.2 ,

Sections of 36.213: 16.5

**Consequences if not approved:**

The SPS NPUSCH may not be considered for resource reservation.

===============================Start of text proposal to TS 36.211====================

10.1.3.6 Mapping to physical resources

<unchanged parts are omitted>

If higher layer parameter *valid-subframe-config-UL* or *slot-reserved-resource-config-UL* is configured, then in case of NPUSCH format 1 transmission associated with C-RNTI or SPS C-RNTI using UE-specific NPDCCH search space with the Resource reservation field in the DCI set to 1 including NPUSCH format 1 transmission without a corresponding NPDCCH, or in case of NPUSCH format 2 transmission associated with C-RNTI using UE-specific NPDCCH search space,

- In a subframe that is fully reserved,

- for , the NPUSCH transmission is postponed until the next NB-IoT uplink subframe that is not fully reserved.

- for , the NPUSCH transmission in the slot is postponed until the next slot spanning over two contiguous uplink subframes not overlapping with any uplink subframe that is fully reserved.

- In a subframe that is partially reserved, the SC-FDMA symbols overlapping with reserved symbols shall be counted in the NPUSCH mapping but not used for transmission of the NPUSCH.

<unchanged parts are omitted>

10.1.4.2 Mapping to physical resources

The sequence  shall be multiplied with the amplitude scaling factor  and mapped in sequence starting with  to the sub-carriers.
The set of sub-carriers used in the mapping process shall be identical to the corresponding NPUSCH transmission as defined in clause 10.1.3.6.
The mapping to resource elements  shall be in increasing order of first, then , and finally the slot number. The values of the symbol index  in a slot are given in Table 10.1.4.2-1.

**Table 10.1.4.2-1: Demodulation reference signal location for NPUSCH.**

|  |  |
| --- | --- |
| **NPUSCH format** | **Values for**  |
|  |  |
| 1 | 4 | 3 |
| 2 | 0,1,2 | 2,3,4 |

If higher layer parameter *valid-subframe-config-UL* or *slot-reserved-resource-config-UL* is configured, then in case of NPUSCH transmission format 1 associated with C-RNTI or SPS C-RNTI using UE-specific NPDCCH search space and the Resource reservation field in the DCI is set to 1 including NPUSCH format 1 transmission without a corresponding NPDCCH, or in case of NPUSCH format 2 transmission associated with C-RNTI using UE-specific NPDCCH search space,

- In a slot that is fully reserved, the demodulation reference signal transmission is dropped.

- In a SC-FDMA symbol that is reserved, the demodulation reference signal transmission is dropped.

<unchanged parts are omitted>

===============================End of text proposal to TS 36.211====================

===============================Start of text proposal to TS 36.213====================

<unchanged parts are omitted>

16.5 Narrowband physical uplink shared channel related procedures

For a NB-IoT UE that supports *twoHARQ-Processes-r14* or the UE is configured with higher layer parameter *multi-TB-Unicast-config*, there shall be a maximum of 2 uplink HARQ processes.

For a NB-IoT UE and NPUSCH transmission using preconfigured uplink resource, there shall be 1 uplink HARQ process.

A NB-IoT UE shall determine whether a subframe is a NB-IoT UL subframe as follows

- If higher layer parameter *valid-subframe-config-UL* or *slot-reserved-resource-config-UL* is configured

- for NPUSCH format 1 transmission associated with C-RNTI or SPS C-RNTI using UE-specific NPDCCH search space including NPUSCH format 1 transmission without a corresponding NPDCCH

- if the Resource reservation field in the DCI is set to 0, then the subframe is assumed as a NB-IoT UL subframe

- if the Resource reservation field in the DCI is set to 1, then the subframe is assumed as a NB-IoT UL subframe if it is not fully reserved according to the higher layer parameters.

- for NPUSCH format 2 transmission

- the subframe is assumed as a NB-IoT UL subframe if it is not fully reserved according to the higher layer parameters.

- In all other cases,

- for TDD, a NB-IoT UE shall assume a subframe as a NB-IoT UL subframe if, for a NB-IoT carrier, it is configured as NB-IoT UL subframe by higher layers

- for FDD, a NB-IoT UE shall always assume a subframe as a NB-IoT UL subframe.

===============================End of text proposal to TS 36.213====================

# Summary

# References

1. R1-200xxxx Feature lead summary #1 on 100b-e-LTE-NB\_IoTenh3-Coex-NR-03 Moderator(Huawei)