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

**eMeeting, May 25th – June 5th, 2020**

**Title:** DRAFTLS on RAN1 clarification on MWUS frequency allocation

**Response to:**

**Release:** Rel-16

**Work Item:** LTE\_eMTC5-Core

**Source:** Ericsson [RAN1]

**To:** RAN2

**CC:**

**Contact Person:**

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## 1. Overall Description:

RAN1 has realized that the below agreement regarding Group WUS that was made in RAN1 #99 opens up for ambiguous interpretations of the WUS frequency locations. For that reason, RAN1 would like to clarify the intention with the agreement in order for RAN2 to correctly capture the intended functionality in TS 36.304.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Agreement** [36.304]If Rel-15 WUS is configured, predefine the time/freq location for up to 4 WUS resources with 2-FDM and 2-TDM based on the 2-bit freqLocations of WUS resource 0 as

|  |  |  |  |
| --- | --- | --- | --- |
| freqLocation of WUS resource 0 | n0 | n2 | n4 |
| WUS resource locations if Rel-15 WUS is configured |

|  |  |  |  |
| --- | --- | --- | --- |
| *f* |   | 0 |  |
|  |  |  |  |
|  |  |  | *t* |

 | Alt1:

|  |  |  |  |
| --- | --- | --- | --- |
| *f* |   |  |  |
|  |  | 0 |  |
|  |  |  | *t* |

Alt2:

|  |  |  |  |
| --- | --- | --- | --- |
| *f* |  |  |  |
|  |  | 0 |  |
|  |  |  | *t* |

- Alt1 if NB is below center carrier; otherwise Alt2 |

|  |  |  |  |
| --- | --- | --- | --- |
| *f* |  |  |  |
|  |  |  |  |
|  |  | 0 | *t* |

 |

Above does not exclude 3 FDM WUS configuration case |

For the case when WUS resource 0 = n2, it is RAN1’s intention that WUS resources are allocated on PRBs towards the center of the carrier and not towards the edge of the carrier since that would increase strain on spectrum mask requirements. According to [1], RAN2 has captured this functionality in Table 7.5.x-1. A proposed updated version of the table, reflecting the intended functionality, is presented below, where track changes presents the differences compared to the version in [1].

<BEGIN TP for Table 7.5.x-1 of TS 36.304>

Table 7.5.x-1: WUS Resource frequency location

|  |  |
| --- | --- |
| ***WUS Resource******(***$N\_{ID}^{resource}$***)*** | ***Frequency location of WUS Resource ID 0*** |
| ***n0*** | ***n2 (Note 3)*** | ***n4 (Note 1)*** |
| ***NB below centre frequency*** | ***NB above centre frequency*** |
| WUS Resource 1 | n2 | ~~n0~~n4 | ~~n4~~n0 | n2 |
| WUS Resource 2 | n0 | n2 | n2 | n4 |
| WUS Resource 2(Note 2) | n4 | ~~n4~~n0 | ~~n0~~n4 | n0 |
| WUS Resource 3 | n2 | ~~n0~~n4 | ~~n4~~n0 | n2 |
| Note 1: This column is applicable if wus-Config is present.Note 2: This row is applicable for the resource pattern ID 7Note 3: ‘NB below centre frequency’ implies that NB is located in lower frequency relative to the centre frequency and vice versa. The rationale for this differentiation is to avoid allocating WUS resources on the outermost PRBs in a carrier. The frequency relation of resources is n4>n2>n0.Editor Note : It is FFS whether further updates needed for WUS Resource ID 0 =n2. |

<END TP for Table 7.5.x-1 of TS 36.304>

## 2. Actions:

**To RAN2 group.**

**ACTION:**

RAN1 respectfully asks RAN2 to take the above into account when specifying the frequency location of WUS resources.

## 3. Date of Next TSG-RAN WG1 Meetings

TSG-RAN WG1 Meeting #102 17 Aug – 28 Aug 2020 eMeeting

TSG-RAN WG1 Meeting #103 26 Oct – 13 Nov 2020 eMeeting

## References

1. [R2-2003920](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109bis-e/Docs/R2-2003920.zip), “Corrections to WUS group for eMTC,” Nokia, RAN2 #109bis, April 2020.