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

e-Meeting, May 25th – June 5th, 2020

**Title:** [DRAFT] LS on UE capability on wideband carrier operation for NR-U

**Release:** Rel-16

**Work Item:** NR\_unlic-core

**Source:** RAN WG 1

**To:** RAN WG 4

**Cc:**

**Contact Person:**

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**1. Overall Description:**

RAN1 is discussing NR-U UE feature on wideband carrier operations about whether to add UE capabilities for Mode 1, Mode2 and Mode 3 from [1]. RAN1 would like to ask RAN4 for feedbacks about the following questions.

For DL operation, the following DL wideband operation cases are discussed:

1. Intra-band CA
2. Wideband carrier operation Modes 2/3 without scheduling intra-cell guard bands
   * Mode 2: Single wideband carrier when LBT is successful in a subset of the LBT sub-bands which are contiguous [1]
   * Mode 3: Single wideband carrier when LBT is successful in a subset of the LBT sub-bands which are non-contiguous [1]
3. Wideband carrier operation Modes 2/3 with scheduling intra-cell guard bands between transmitted contiguous LBT sub-bands
4. Wideband carrier operation Mode 1: single carrier wideband operation when LBT is successful in all LBT sub-bands [1]

* **Question 1:** Does RAN4 think AGC issues may prevent UE to meet RAN4 requirements for Mode 2 and Mode 3? Is there any difference in DL reception between Cases 1) 2) and 3) with respect to AGC when at least one of the sub-bands of a [BW or carrier] is not part of gNB’s acquired channel occupancy and contains interference from devices other than the UE’s serving gNB e.g. near-by WiFi AP?
* **Question 2:** Does UE require additional capability compared to single 20MHz carrier operation for support of any of above cases?
* **Question 3:** From RAN4 point of view, does “all LBT sub-bands” for Mode 1 refer to LBT sub-bands of configured carrier or BWP?
* **Question 4** If the answer is yes to Question 2 , does RAN4 plan to define the corresponding UE capabilities in RAN4?

For UL operation, the following UL wideband operation cases are discussed:

1. UL wideband operation Mode 2A (UL-WB Mode 2A): UE transmits if LBT passes for single scheduled LBT sub-band
2. UL wideband operation Mode 2B (UL-WB Mode 2B): UE transmits if LBT passes for scheduled multiple contiguous LBT sub-bands
3. UL wideband operation Mode 1 (UL-WB Mode 1): UE transmits only if LBT passes for all LBT sub-bands of BWP/carrier

* **Question 5:** Is change of transmit filtering required (as shown on Figure 1 for WB Mode 2B) to meet RAN4 requirements for any of UL cases 1)-3)? And is there any difference if intra-cell GBs between scheduled contiguous sub-bands are scheduled or not?
* **Question 6:** If answer to Question 5 is yes for any of the cases, does RAN4 plan to define the corresponding UE capabilities in RAN4?



Figure : Above is an example for Mode 2B.

**2. Actions:**

**To RAN WG 4 group**

**ACTION:** RAN WG1 respectfully asks RAN WG4 for a response to the above questions and take the above into consideration in their future work.

**3. Date of Next TSG-RAN WG1 Meetings:**

TSG-RAN WG1 Meeting #102 17 –28 August 2020 e-Meeting

**4. Reference**

[1] R4-1905209, “LS reply on wideband carrier operation for NR-U,” RAN4 #90bis, April 2019