3GPP TSG RAN WG2 Meeting #119bis-e *DRAFT\_*R2-2210936

Online, October, 2022

**Title: LS on SL LBT failure indication and consistent SL LBT failure**

**Response to: -**

**Release: Release 18**

**Work Item: NR\_SL\_enh2**

**Source: RAN2**

**To: RAN1**

**Cc: -**

**Contact person: Xiao XIAO**

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**Send any reply LS to: 3GPP Liaisons Coordinator,** **mailto:3GPPLiaison@etsi.org**

**Attachments:** **-**

# 1 Overall description

In RAN2 #119bis-e, RAN2 discussed consistent SL LBT failure detection and recovery procedure for SL-U and made the following agreements:

Agreement on consistent LBT failure:

1: SL-specific LBT failure indication from PHY is needed for SL-specific consistent LBT failure detection in the MAC. How/whether it is used for other purposes can be further discussed.

2: Support SL-specific consistent LBT failure detection and recovery procedure in the MAC for SL-U. Details of recovery to be further worked on granularity of (consistent) LBT failure.

3: Send LS to RAN1 asking “When an SL-specific LBT failure indication is notified for an SL transmission by the PHY, in which resource granularity the SL-specific LBT failure can be considered as being detected (e.g. per Resource Pool, per RB set, per SL BWP, etc.)?

 - Detailed wording can be discussed during the email discussion. Some background information (e.g. why/what we (actually) ask) can be also provided.

4: As the general principle, reuse the consistent LBT failure detection procedure in NR-U as the baseline for SL-specific consistent LBT failure detection in SL-U.

5: As in NR-U, introduce the following parameters and variables for the SL-specific consistent LBT failure detection in SL-U as the baseline:

 - An SL-specific LBT failure indication counter (e.g. SL\_LBT\_COUNTER);

 - An SL-specific maximum LBT failure instance count threshold (e.g. sl-LBT-FailureInstanceMaxCount);

 - An SL-specific LBT failure detection timer (e.g. sl-LBT-FailureDetectionTimer).

6: Reuse the following MAC behaviors on TIMER/COUNTER handling in NR-U for SL-specific consistent LBT failure detection procedure in SL-U as the baseline:

 - As in NR-U, if an SL-specific LBT failure indication is received from the lower layer, the SL-specific LBT failure indication counter (e.g. SL\_LBT\_COUNTER) is incremented by one.

 - As in NR-U, if an SL-specific LBT failure indication is received from the lower layer, start or restart the SL-specific LBT failure detection timer (e.g. sl-LBT-FailureDetectionTimer)

 - As in NR-U, if the SL-specific LBT failure indication counter value is equal to or larger than the SL-specific maximum LBT failure instance count threshold (e.g. sl-LBT-FailureInstanceMaxCount), consistent LBT failure is triggered/declared by the MAC entity.

 - As in NR-U, if the SL-specific LBT failure detection timer (e.g. sl-LBT-FailureDetectionTimer) expires, the SL-specific LBT failure indication counter (e.g. SL\_LBT\_COUNTER) is reset to 0.

 - As in NR-U, if the maximum LBT failure instance count threshold (e.g. sl-LBT-FailureInstanceMaxCount) or SL-specific LBT failure detection timer (e.g. sl-LBT-FailureDetectionTimer) is reconfigured, SL-specific LBT failure indication counter (e.g. SL\_LBT\_COUNTER) is reset to 0.

7: Support the mechanism that a mode-1 UE can indicate the SL-specific consistent LBT failure to the gNB. FFS on a mode-2 UE in RRC\_CONNECTED.

To support consistent SL LBT failure detection procedure in SL-U, RAN2 agreed to reuse the consistent LBT failure detection procedure in NR-U as the baseline. RAN2 found that for SL-U, how consistent SL LBT failure detection should be performed depends on in which granularity an SL LBT failure instance is indicated to MAC, when the SL LBT failure is notified by PHY.

For example, in NR-U when LBT failure is notified due to an intended UL transmission by PHY, MAC considers the LBT failure as an LBT failure instance indicated for the UL BWP where the LBT failure has happened, so that “Consistent LBT failure is detected *per UL BWP* by counting LBT failure indications, for all UL transmissions, from the lower layers to the MAC entity” as specified in TS 38.321.  By contrast, for SL-U RAN1 has already agreed to support only one SL BWP on a SL-U carrier (as in legacy R16/17 NR SL), which is essentially different from NR-U from resource configuration perspective. Thus, it is unclear to RAN2, when SL LBT failure is notified by PHY due to an intended SL transmission, whether the SL LBT failure can still be considered as an LBT failure instance indicated for the SL BWP where the SL LBT failure has happened, or alternatively it needs to be considered as an SL LBT failure instance indicated in other resource granularity (e.g. indicated for an SL resource pool, for an SL RB set, etc). This will affect RAN2’s decision on whether consistent SL LBT failure detection can be (or needs to be) performed in other granularity (e.g. per resource pool, per RB set, etc.) than the per BWP manner as in NR-U.

Therefore, RAN2 respectively request RAN1 to provide the guideline on the following question related to the SL LBT failure indication.

* **Question**: When SL LBT failure is notified by PHY due to an intended SL transmission, what is the granularity in which MAC can consider that the SL LBT failure has been detected (e.g. whether MAC can consider that the SL LBT failure has been detected per SL BWP, per SL resource pool, per RB set, etc.).

# 2 Actions

**To RAN1**

**ACTION:** RAN2 respectfully request RAN1 to provide the feedback on the above **Question** regarding the granularity of SL LBT failure indication.

# 3 Dates of next TSG RAN WG2 meeting

TSG RAN WG2 Meeting #120 14 November – 18 November 2022 Toulouse, France

TSG RAN WG2 Meeting #121 27 February – 03 March 2023 Athens, Greece