**3GPP TSG-RAN WG4 Meeting #111 R4-2409956**

**Fukuoka, Japan, May 20 - 24, 2024**

**Title:** Way Forward for [111][314] NR\_LPWUS

**Agenda Item:** 10.14.5

**Source: Huawei, HiSilicon**

**Document for:** Approval

# 1. On the BS RF requirement for LP-WUS

## 1.1 Manufacture declaration on LP-WUS

**WF**

FFS on the following options for next meeting:

* Option 1: Set the LP-WUS power boosting a complete manufacture declaration feature, including whether supporting LP-WUS power boosting and the supported boosting level.
* Option 2: Minimum power boosting level in core specification together with manufacturer declaration in the conformance test specification.

## 1.2. Concept of LP-WUS dynamic range/power boosting

**WF**

FFS on the following options for next meeting:

* Option 1: Stick with the one in RAN4#110bis approved WF R4-2406140, which is:
  + The LP-WUS RB power dynamic range (or LP-WUS power boosting) is the difference between the average power of LP-WUS REs (which occupy certain REs within a NR transmission bandwidth configuration and the average power over all REs (from both LP-WUS and the NR carrier containing the LP-WUS REs).
* Option 2: Define EPRE ratio between LP-WUS and NR signals instead of power dynamic range.

## 1.3. Whether to preclude small CBW for consideration of LP-WUS power boosting

**WF**

FFS on the following options for next meeting:

* Option 1: Consider a power degradation limit, e.g., 2dB, for validating a configuration for LP-WUS representing by (EPRE ratio, channel bandwidth).
* Option 2: Only consider LP-WUS power boosting for CBWs larger than 20MHz.
* Option 3: Focus on CBWs >= 10MHz and different power boosting values can be considered for different CBW.
* Option 4: Not preclude small CBW for LP-WUS power boosting.

## 1.4. On applicable BS type for LP-WUS

**WF**

FFS on the following proposals for next meeting:

* Proposal 1: Not to set restriction on applicable BS types to support LP-WUS.
* Proposal 2: To decide on the applicable BS types after the applicable frequency range and bands for LP-WUS have been decided.
* Proposal 3: Consider BS type 1-C as applicable type to further discuss of LP-WUS power boosting. FFS other BS types.
* Proposal 4: Depend on power boosting level for certain BS type.
  + If power boosting is limited to 3 dB, all BS type 1-C, 1-H and 1-O can be considered.

## 1.5. On minimum value for LP-WUS power boosting

**WF**

FFS on the following options for next meeting:

* Option 1: Use [3dB] as starting point
  + It should be considered in conjunction with the supported CBWs.
* Option 2: To consider the power degradation of RBs other than LP-WUS signal within the carrier after the number of LP-WUS RBs have been decided in RAN1.

## 1.6. Whether a cap for LP-WUS power boosting should be considered

**WF**

FFS on the following options for next meeting:

* Option 1: Limit to 3dB for BS type 1-C, 1-H and 1-O.
* Option 2: FFS on the value in conjunction with the supported CBWs.
* Option 3: To consider the power degradation of RBs other than LP-WUS signal within the carrier after the number of LP-WUS RBs have been decided in RAN1.
* Option 4: Not consider to cap the LP-WUS power boosting.

## 1.7. Requirements other than power boosting that should be considered

**WF**

FFS on the following proposals for next meeting:

* Proposal 1: Unwanted emissions requirements of SEM and spurious emissions should be considered for transmitted signal with LP-WUS and NR in the same carrier.
* Proposal 2: FFS whether transmitted signal quality requirements should be defined for LP-WUS, at least for the EVM requirement.
* Proposal 3: Multi-band requirements at gNB side for LP-WUS.

## 1.8. Whether UE needs to know BS power boosting information for RRM measurement

**WF**

This issue will be discussed in RRM session. Not precluded in RF session if identified as necessary.

## 1.9. Whether to consider FR2 for LP-WUS

**WF**

* RAN4 focus on FR1 licensed bands for BS RF requirements.
  + FR2 is not precluded for further study.