**3GPP TSG-RAN WG4 Meeting # 116bis** [**R4-2514811**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_116bis/Inbox/R4-2514811.zip)

**[Prague](https://www.3gpp.org/Specification-Groups/" \t "_blank), Czech, Oct. 13-17, 2025**

**Agenda item:** 6.16.1

**Source:** Moderator (vivo)

**Title:** WF on NR\_LPWUS\_RRM

**Document for:** Approval

# Topic #1: Agreement on RRM core requirement maintenance for LP-WUS/WUR

**Issue 1-1-1: LP-WUR operation with EMR**

No need further discussion on P1

**Issue 1-1-1-1: LP-WUR operation with Rel-18 EMR**

RAN4 confirms that there is no RRM spec impact for this issue.

**Issue 1-1-3 LP-WUR operation with RedCap**

The MR wake up delay of the 2Rx RedCap UE applies for 1Rx RedCap UE

**Issue 1-1-9: On the serving cell and interference cell LP-SS with opposite sequences for the case when {M, L}={1,6}**

Capture the following note in LP-WUR core requirements:

* + - Note: Higher margin may be required for UE to consider an entry or exit criteria fulfilled when LR related thresholds are configured, if the serving cell and neighbour cell are using opposite binary sequences for LP-SS, and LP-SS are transmitted on the same time and frequency resource in this two cells.

# Topic #2: Agreement on LP-WUR performance

**Issue 3-1-1 General aspects**

Ad-hoc meeting agreement:

RAN4 agree to define test cases for LP-WUR WI

Agreement:

Do not introduce a test mode from LP-WUR RRM performance test perspective

Close this issue

**Issue 3-2-2: On OOK based LR and OFDB based LR for test cases where LR results are used**

Agreement:

RAN4 defines separate test cases for LR measure PSS/SSS only and LR measure LP-SS only in the test case

FFS on use 320ms or 160ms for LP-SS periodicity

**Issue 3-2-2-1: On OOK based LR for test cases where LR results are used**

Ad-hoc meeting agreement:

For the OOK based LR,

Test cases should cover at least M = 1 and M > 1 scenarios

The test cases should not be duplicated or the test case number should not be increased for verifying different M value purpose.

Note: The {M,L} = {1,6} should not be used in test case for LR

**Issue 3-2-3: Test case design for entry/exit conditions for case 1/case 3**

Ad hoc meeting agreement:

RAN4 to define at least test cases for exit conditions.

FFS on whether to define test cases for evaluation of entry conditions.

**Issue 3-2-3-1: Detail on cases to be verified for entry/exit conditions for case 1/case 3**

Agreement:

* Define test cases for evaluation of exit conditions for the following cases.
  + UE exit Case 1 to legacy
    - TC1: UE exit Case 1 to legacy where only LP-SS signal is used in the test case for OOK based LR
  + UE exit Case 3 to legacy
    - TC2: UE exit Case 3 to legacy where only PSS/SSS signal is used in the test case for OFDM based LR
    - TC3: UE exit Case 3 to legacy where only LP-SS signal is used in the test case for OOK based LR
* The above agreement can be revisited if there no feasible way for test case design.

**Issue 3-2-4: Test case design for RRM relaxation**

Agreement:

* For RRM relaxation, define the following tests
  + intra-frequency cell re-selection

**Issue 3-2-5: Test case design for offloading case**

Agreement:

Cell reselection is triggered immediately at the timepoint X when exit from offloading (case 1) to legacy is triggered plus MR wake up period.

Cell reselection is triggered immediately at the timepoint X when exit from RRM relaxation (case 3) to legacy is triggered [plus MR wake up period].

**Issue 3-2-9: On FR1/FR2 for test case**

Agreement: Introduce one test case for FR2:

* + UE exit Case 3 to legacy
    - TC2: UE exit Case 3 to legacy where only PSS/SSS signal is used in the test case for OFDM based LR

# Topic #3: Recommendation for issues

### On maintenance issues

**Issue 1-1-10: On time T of cell selection requirements**

Close this issue

**Issue 1-1-11: On using LR measurement to check neighbour cell measurement criteria**

Up to RAN2, close this issue

**Issue 1-1-12: On maximum paging requirement**

Discuss directly in the CR, close this issue.

Other Topics for LP-WUR core part maintenance are contribution driven

### On issues for performance part

**Issue 3-1-1 General aspects**

Close this issue

**Issue 3-2-1: Test case scenarios**

Close this issue, topics under this issue could be discussed under other topics if needed

**Issue 3-2-2: On OOK based LR and OFDB based LR for test cases where LR results are used**

Close this issue

**Issue 3-2-2-1: On OOK based LR for test cases where LR results are used**

Close this issue

**Issue 3-2-3: Test case design for entry/exit conditions for case 1/case 3**

Continue discussion on whether to introduce a test case to verify when conditions for a particular state is not met, the UE should not enter into this particular state.

Note: Candidate states includes LP-WUR monitoring, serving cell measurement offloading and RRM relaxation.

**Issue 3-2-3-1: Detail on cases to be verified for entry/exit conditions for case 1/case 3**

Continue discussion on the concrete {M, L} value used in TC1 and TC3.

**Issue 3-2-4: Test case design for RRM relaxation**

Close this issue

**Issue 3-2-5: Test case design for offloading case**

Close this issue

**Issue 3-2-6: Test case design for LP-WUS monitoring**

Continue discussion

**Issue 3-2-7: Test case design for higher priority frequency layer search**

Continue discussion

**Issue 3-2-8: Others on test case configuration**

Close this issue

**Issue 3-2-9: On FR1/FR2 for test case**

Close this issue

**Issue 3-2-10: Others**

Continue discussion

# Topic #4: Test case list

**Issue 4-1: Test case list phase 1 based on existing agreements:**

|  |  |
| --- | --- |
| Test case list | Company |
|    TC1: UE exit Case 1 to legacy where only LP-SS signal is used in the test case for OOK based LR | vivo |
|    TC2: UE exit Case 3 to legacy where only PSS/SSS signal is used in the test case for OFDM based LR | ZTE |
|    TC3: UE exit Case 3 to legacy where only LP-SS signal is used in the test case for OOK based LR | Xiaomi |
|    TC4: Cell reselection to FR1 intra-frequency NR case for UE fulfilling Rel-19 LP-WUR RRM relaxation criterion | OPPO |
|    TC5: UE exit Case 3 to legacy where only PSS/SSS signal is used in the test case for OFDM based LR for FR2 | Qualcomm |

# Reference

[1] R4-2513516, Topic summary for [116bis][210] NR\_LPWUS\_RRM, vivo, RAN4 116bis

[2] [R4-2514810](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_116bis/Inbox/R4-2514810.zip), Ad-hoc minutes for NR\_LPWUS\_RRM, vivo, RAN4 116bis