**3GPP TSG-RAN WG4 Meeting # 112 R4-2414272**

Maastricht, Netherlands, 19th-23th, Aug, 2024

Title: WF on introduction of NR bands n87 and n88

Agenda item: 7.15.2

Source: Nokia

Document for: Approval

# 1 Background

This is a WF on bands n87 and n88.

# 2 Discussion

2.0 Regulatory aspectsRF requirements are based on ECC/Dec/(16)02 and ECC/Dec/(19)02 regulatory decisions, together with underlying ECC Report 283 on compatibility studies.

The following tasks are to be completed in this WID:

- Verify regulatory requirements for NB-IoT operation in 410-430 MHz frequency range

- Analyse annex 4 in ECC/Dec/(19)02 for the identification of any applicable requirements for in-band/guardband/standalone NB-IoT operation in bands n87 and n88

## 2.1 System parameters

System parameters in R4-2411945 are used.

No need for enhanced channel raster points.

## 2.2 UE RF requirements

Agreed changes are listed in Table 2.2-1 for both bands separately. As a reference LTE band 31 and 72 requirements are listed.

Table 2.2-1: Changes for UE specification 38.101-1 due to introduction of bands n87 and n88

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement** | **B87 in 36.101** | **n87 proposal** | **B88 in 36.101** | **n88 proposal** |
| **Operating bands** | 410 MHz – 415 MHz 420 MH z– 425 MHz | Re-use LTE | 412 MHz – 417 MHz 422 MH z– 427 MHz | Re-use LTE |
| **Channel bandwidths** | 1.4, 3 and 5 MHz | 3 and 5 MHz | 1.4, 3 and 5 MHz | 3 and 5 MHz |
| **EARFCN /** **NR-ARFCN** | LTE band specific | Needs n87 specific | LTE band specific | Needs n88 specific |
| **Sync-raster** | Not in LTE | Needs n87 specific | Not in LTE | Needs n88 specific |
| **TX–RX frequency separation** | 10 MHz | 10 MHz | 10 MHz | 10 MHz |
| **UE maximum output power** | PC1 and PC3 | PC1 and PC3 | PC1 and PC3 | PC1 and PC3 |
| **MPR** | Not band but LTE specific | PC3 MPR is not band specific. PC1 reuse MPR for PC1 for bands other than Band n14 | Not band but LTE specific | PC3 MPR is not band specific. PC1 reuse MPR for PC1 for bands other than Band n14 |
| **A-MPR** | No A-MPR | Not needed | No A-MPR | Not needed |
| **Output power dynamics** | Not band specific | Not band specific | Not band specific | Not band specific |
| **Transmit signal quality** | Not band specific | Not band specific | Not band specific | Not band specific |
| **Occupied bandwidth** | Not band specific | Not band specific | Not band specific | Not band specific |
| **Spectrum emission mask** | Not band specific | Not band specific | Not band specific | Not band specific |
| **ACLR** | Not band specific | NR ACLR is not a band specific. UTRAACLR is not applicable. | Not band specific | NR ACLR is not a band specific. UTRAACLR is not applicable. |
| **General spurious emissions** | Not band specific | Not band specific | Not band specific | Not band specific |
| **Spurious emissions for UE co-existence** | Is band specific | LTE requirement is a baseline | Is band specific | LTE requirement is a baseline |
| **Transmit intermodulation** | Not band specific | Not band specific | Not band specific | Not band specific |
| **REFSENS power level** | -95.7 for 3 MHz -93.5 for 5 MHz | Re-use LTE REFSENS as NRB is same for LTE and NR | -95.7 for 3 MHz -93.5 for 5 MHz | Re-use LTE REFSENS as NRB is same for LTE and NR |
| **REFSENS UL allocation** | 5 RB’s with Note 4 restriction | Re-use LTE specification with note 4 content | As an error not specified, maintenance CRs are provided into this meeting5 RB’s with Note 4 restriction | Re-use LTE specification with note 4 content |
| **Max input level** | Not band specific | Not band specific | Not band specific | Not band specific |
| **ACS** | Not band specific | Not band specific | Not band specific | Not band specific |
| **IBB** | Is band specific | Add n87 into FDL\_high < 2700 MHz and FUL\_high < 2700 MHz Table | Is band specific | Add n88 into FDL\_high < 2700 MHz and FUL\_high < 2700 MHz Table |
| **OBB** | Is band specific | Add n87 into FDL\_high < 2700 MHz and FUL\_high < 2700 MHz Table | Is band specific | Add n88 into FDL\_high < 2700 MHz and FUL\_high < 2700 MHz Table |
| **NBB** | Not band specific | Add n87 into NBB table | Not band specific | Add n88 into NBB table |
| **Spurious response** | Not band specific | Is frequency specific but no change is needed | Not band specific | Is frequency specific but no change is needed |
| **Wideband intermodulation** | Not band specific | Is frequency specific but no change is needed | Not band specific | Is frequency specific but no change is needed |
| **Spurious emissions** | Not band specific | Not band specific | Not band specific | Not band specific |

With the above table being the baseline, reassure that the UE RF requirements are aligned with the regulation captured in:

1. Table 6 and table 7 of Annex 3 in ECC/Dec/(16)02, and
2. Table 5 and table 6 of Annex 2 in ECC/Dec/(19)02.

## 2.2 BS requirements

Reassure that the BS RF requirements are aligned with the regulation captured in:

1. Annex 3 in ECC/Dec/(16)02, and.
2. Annex A2.2 and A2.3 in ECC/Dec/(19)02.

## 2.3 AOB

### 2.3.1 TR

Findings in TR 36.762 are considered as a baseline. Refrain from creating a new NR-specific TR.

Any NR-specific aspects can be captured in TR 36.762 (e.g. as informative note).

### 2.3.2 Work split

|  |  |
| --- | --- |
| **Specification** | **Responsible company for draft and formal CRs** |
| 38.101-1 | CATT |
| 38.133 | Ericsson |
| 38.106 | ZTE |
| 38.115-1 | ZTE |
| 38.174 | ZTE |
| 38.176-1 | ZTE |
| 38.176-2 | ZTE |
| 36.104 | Ericsson |
| 36.141 | Nokia |
| 37.104 | Nokia |
| 37.141 | Nokia |
| 38.104 | Nokia |
| 38.141-1 | Ericsson |
| 38.141-2 | Ericsson |
| 38.307 | Huawei |
| 37.105 | Huawei |
| 37.145-1 | Huawei |
| 37.145-2 | Huawei |

# 3 Conclusion

This contribution captures the agreements for introduction of bands n87 and n88 made in RAN4#112.

# 4 References

[1] RP-241663 New WID on introduction of NR bands n87 and n88, RAN4#104, Nokia