**3GPP TSG-RAN WG4 Meeting # 112 R4-2413404**

**Maastricht, NL, Aug. 19 – Aug. 23, 2024**

**Agenda item:** 5.31.7

**Source:** Moderator (CATT)

**Title:** Topic summary for [112][304] NR\_netcon\_repeater\_RF

**Document for:** Information

# Introduction

This contribution is the summary for the topic [304] NR\_netcon\_repeater\_RF. It covers the contributions in AI 5.31.

# Topic #1: NCR Core part maintenance

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| **R4-2411052** | CATT | **Observation 1: The Table 4.5-1 in TS 38.106 are confusing.** |
| **R4-2411125** | CATT | **Proposal 1: Add definition of NCR-MT class, NCR-Fwd class for downlink, and NCR-Fwd class for uplink.** |
| **R4-2411129** | CATT | **Proposal 1: Define ACS, in-band blocking, and receiver intermodulation for NCR-MT in TS 38.106 as stand-alone requirement instead of using reference method.** |
| **R4-2412334** | NEC | **Proposal 1:**  **To modify the NOTE for the simultaneous NCR-Fwd and NCR-MT transmission in the ACLR requirement tables as blow.**  **“For simultaneous NCR-Fwd and NCR-MT transmission, if the NCR-MT carrier is within the passband then the nominal channel bandwidth shall be calculated based on the BWpassband\_low or BWpassband\_high, where BWpassband\_low and BWpassband\_high are the passband bandwidth below and above the NCR-MT carrier, respectively. If the NCT-MT carrier is adjacent to the passband then ACLR requirement for NCR-MT shall be applied for the NCR-MT carrier side and the nominal channel bandwidth calculated with the passband bandwidth shall be used for the passband side. If the NCR-MT carrier is not adjacent to the passband then CACLR shall be applied in the gap between the passband and the NCR-MT carrier.”** |
| **R4-2412900** | NOKIA | **Observation 1: To ensure consistency and clarity, the definitions of terms finalized in the repeater RAN4 specifications should be incorporated into relevant specifications such as TS 38.106 [3], TS 38.115-1 [4], and TS 38.115-2 [5]. This will help to eliminate ambiguity and promote a unified understanding of terminology across related documents.**  **Observation 2: The table demonstrates that the terms "RF repeater" and "NR repeater" are used synonymously throughout the specifications to describe the same function.**  **Proposal 1: NR Repeater: This term will be used to refer to repeaters that are compliant with Release 17 and Release 18 specifications and operate without a mobile terminal (MT) i.e., control unit.**  **Proposal 2: Network-Controlled Repeater (NCR): This term will be used to refer to the Release 18 version of the repeater, encompassing both forward-link (NCR-Fwd) and mobile terminal (NCR-MT) configurations.**  **Proposal 3: The table demonstrates that the terms "RF repeater" and "NR repeater" are used synonymously throughout the specifications to describe the same function.**  **Observation 3: In addition to the previously mentioned terms, the specification uses the term "repeater" in a separate context. The term "Repeater" is used as a general term encompassing all types of repeaters, including:**  **- NR Repeater: This refers to the standard NR repeater, likely the older version or a general term for any NR repeater.**  **- Network-Controlled Repeater (NCR): This refers to the Release 18 version of the repeater, encompassing both forward-link (NCR-Fwd) and mobile terminal (NCR-MT) configurations.**  **Proposal 4: The term "Repeater" should be defined in the terminology list of all four specifications as follows: “A Repeater is a generic term that encompasses all variants of repeaters, including the NR repeater, NCR, NCR-Fwd, and NCR-MT.”** |

## Open issues summary

**Issue 1-1: NCR Class**

* Proposals: Add definition of NCR-MT class, NCR-Fwd class for downlink, and NCR-Fwd class for uplink. (CATT)
* Recommended WF
  + **To be discussed online**

**Issue 1-2: SA Requirements for ACS, IBB and Rx IMD**

* Proposals: Define ACS, in-band blocking, and receiver intermodulation for NCR-MT in TS 38.106 as stand-alone requirement instead of using reference method. (CATT)
* Recommended WF
  + **To be discussed online**

**Issue 1-3: ACLR requirement for NCR**

* Proposals: To modify the NOTE for the simultaneous NCR-Fwd and NCR-MT transmission in the ACLR requirement tables as below: (NEC)
  + For simultaneous NCR-Fwd and NCR-MT transmission, if the NCR-MT carrier is within the passband then the nominal channel bandwidth shall be calculated based on the BWpassband\_low or BWpassband\_high, where BWpassband\_low and BWpassband\_high are the passband bandwidth below and above the NCR-MT carrier, respectively. If the NCT-MT carrier is adjacent to the passband then ACLR requirement for NCR-MT shall be applied for the NCR-MT carrier side and the nominal channel bandwidth calculated with the passband bandwidth shall be used for the passband side. If the NCR-MT carrier is not adjacent to the passband then CACLR shall be applied in the gap between the passband and the NCR-MT carrier.
* Recommended WF
  + **To be discussed online**

**Issue 1-4: Terminology for NCR**

* Proposals: The term will be defined by following approach: (Nokia)
  + NR Repeater: repeaters compliant with R17 and R18, No NCR-MT (control unit).
  + NCR: R18 repeater, including both NCR-Fwd and NCR-MT
  + Repeater: A generic term, including the NR repeater, NCR, NCR-Fwd, and NCR-MT.
* Recommended WF
  + **To be discussed online**

# Topic #2: CRs for NCR core part maintenance

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2411053 | CATT | CR for TS 38.106, Correction on Applicability of requirements for NCR |
| R4-2411054 | CATT | CR for TS 38.106, Correction on general requirements for NCR |
| R4-2411055 | CATT | CR for TS 38.106, Correction on antenna connector and TAB connector related symbols for NCR |
| R4-2411126 | CATT | (NR\_netcon\_repeater-Core)CR for TS 38.106, Correction on network controlled repeater classes for NCR |
| R4-2411130 | CATT | (NR\_netcon\_repeater-Core)CR for TS 38.106, Correction on requirement for 5MHz channel bandwidth for NCR MT |
| R4-2411709 | Murata | CR to TS 38.106 Correction on requirement set applicability |
| R4-2412335 | NEC | CR to 38.106: ACLR requirements for NCR |
| R4-2412338 | NEC | CR to 38.106: Requirement set applicability |
| R4-2412795 | ZTE | CR on 38.106 for NCR requirements |
| R4-2412901 | Nokia | CR to TS 38.106 with updates and corrections |

## Open issues summary

**Issue 2-1: Requirement set applicability related**

* CR involved:
  + **R4-2411053 (CATT), R4-2411709 (Murata) and R4-2412338 (NEC)**
* Recommended WF
  + **Conflicting, to be checked during the meeting**

**Issue 2-2: R4-2411054 CATT**

* Recommended WF
  + **To be checked during the meeting**

**Issue 2-3: R4-2411055 CATT**

* Recommended WF
  + **To be Agreed**

**Issue 2-4: R4-2411126 CATT**

* Recommended WF
  + **To be checked during the meeting**

**Issue 2-5: R4-2411130 CATT**

* Recommended WF
  + **To be checked during the meeting**

**Issue 2-6: R4-2412335 NEC**

* Recommended WF
  + **This depends on the discuss outcome for Issue 1-3**

**Issue 2-7: R4-2412795 ZTE**

* Recommended WF
  + **To be Agreed**

**Issue 2-8: R4-2412901 Nokia**

* Recommended WF
  + **This depends on the discuss outcome for Issue 1-4**

# Topic #3: CRs for NCR conformance/EMC part maintenance

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2411056 | CATT | Maintenance CR to TS 38.115-1: NCR conformance part |
| R4-2411057 | CATT | Maintenance CR to TS 38.115-2: NCR conformance part |
| R4-2411127 | CATT | (NR\_netcon\_repeater-Perf)CR for TS 38.115-1, Correction on network controlled repeater classes for NCR |
| R4-2411128 | CATT | (NR\_netcon\_repeater-Perf)CR for TS 38.115-2, Correction on network controlled repeater classes for NCR |
| R4-2411131 | CATT | (NR\_netcon\_repeater-Perf)CR for TS 38.115-1, Correction on requirement for 5MHz channel bandwidth for NCR MT |
| R4-2411712 | Murata | CR to TS 38.115-1: Correction on Scope |
| R4-2411713 | Murata | CR to TS 38.115-2 Correction to introduce NCR type 1-H in part2 |
| R4-2411714 | Murata | CR to TS 38.115-1 Editorial Correction on Clause number of Unwanted emissions |
| R4-2411715 | Murata | CR to TS 38.115-1 Editorial Correction on Clause number of Unwanted emissions |
| R4-2412336 | NEC | CR to 38.115-1: ACLR requirements for NCR |
| R4-2412337 | NEC | CR to 38.115-2: ACLR requirements for NCR |
| R4-2412339 | NEC | CR to 38.115-1: Clause title corrections |
| R4-2412340 | NEC | CR to 38.115-2: Clause title corrections |
| R4-2412714 | ZTE | Maintenance CR of NCR to TS 38.115-1 |
| R4-2412715 | ZTE | Maintenance CR of NCR to TS 38.115-2 |
| R4-2412796 | ZTE | CR on 38.115-1 for NCR conformance testing |
| R4-2412797 | ZTE | CR on 38.115-2 for NCR conformance testing |
| R4-2412902 | Nokia | CR to TS 38.114 with updates and corrections |
| R4-2412903 | Nokia | CR to TS 38.115-1 with updates and corrections |
| R4-2412904 | Nokia | CR to TS 38.115-2 with updates and corrections |
| R4-2413254 | HUAWEI | NCR type 2-O testing: MT requirements testing restrictions |

## Open issues summary

**Issue 3-1: CRs for TS 38.115-1**

* Recommended WF
  + **To be checked during the meeting**

**Issue 3-2: CRs for TS 38.115-2**

* Recommended WF
  + **To be checked during the meeting**

**Issue 4-3: R4-2412902 Nokia**

* Recommended WF
  + **To be checked during the meeting**

# Topic #4: MU/TT and LS to RAN5

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2413246 | HUAWEI | **Proposal 1:** As a justification for the reuse of FR2 UE TT values from TS 38.521-2 into NCR test specification TS 38.115-2 for MT-specific requirements, reflect device size limitation of 30cm in TS 38.115-2.  **Proposal 2:** Agree on the LS toRAN5, informing on the reuse of the FR2 UE TT values in TS 38.115.2, for the purpose of MT-specific requirements testing. RAN4 to ask RAN5 to be updated on any further plans or updates of test requirements reused in TS 38.115-2. |
| R4-2413255 | HUAWEI | **To RAN WG5**  **ACTION:** RAN WG4 respectfully asks RAN WG5 to inform RAN4 in case open issues or testability issues of OTA maximum input level, OTA ACS and OTA blocking would be resolved.  Additionally, RAN WG4 would like to ask whether RAN WG5 has any specific plans to work on the above-mentioned aspects within Rel-19 timeframe. |

## Open issues summary

**Issue 4-1: MU & TT for NCR OTA testing**

* Proposals
  + As a justification for the reuse of FR2 UE TT values from TS 38.521-2 into NCR test specification TS 38.115-2 for MT-specific requirements, reflect device size limitation of 30cm in TS 38.115-2. (HUAWEI)
* Recommended WF
  + **To be discussed during the meeting**

**Issue 4-2: LS to RAN5**

* Option 1 (HUAWEI)
  + Send LS to RAN5
* Other options are not precluded
* Recommended WF
  + **To be discussed during the meeting**

# Annex: CRs and draft CRs to specifications

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Suggest status** | **Comments** |
| R4-2411053 | Return to | - [**Company**] : [Comments] |
| R4-2411054 | Return to | - [**Company**] : [Comments] |
| R4-2411055 | Agreed | - [**Company**] : [Comments] |
| R4-2411056 | Return to | - [**Company**] : [Comments] |
| R4-2411057 | Return to | - [**Company**] : [Comments] |
| R4-2411127 | Return to | - [**Company**] : [Comments] |
| R4-2411128 | Return to | - [**Company**] : [Comments] |
| R4-2411130 | Return to | - [**Company**] : [Comments] |
| R4-2411131 | Return to | - [**Company**] : [Comments] |
| R4-2411709 | Return to | - [**Company**] : [Comments] |
| R4-2411712 | Return to | - [**Company**] : [Comments] |
| R4-2411713 | Return to | - [**Company**] : [Comments] |
| R4-2411714 | Return to | - [**Company**] : [Comments] |
| R4-2411715 | Not available | - [**Company**] : [Comments] |
| R4-2412335 | Return to | - [**Company**] : [Comments] |
| R4-2412336 | Return to | - [**Company**] : [Comments] |
| R4-2412337 | Return to | - [**Company**] : [Comments] |
| R4-2412338 | Return to | - [**Company**] : [Comments] |
| R4-2412339 | Return to | - [**Company**] : [Comments] |
| R4-2412340 | Return to | - [**Company**] : [Comments] |
| R4-2412714 | Return to | - [**Company**] : [Comments] |
| R4-2412715 | Return to | - [**Company**] : [Comments] |
| R4-2412795 | Agreed | - [**Company**] : [Comments] |
| R4-2412796 | Return to | - [**Company**] : [Comments] |
| R4-2412797 | Return to | - [**Company**] : [Comments] |
| R4-2412901 | Return to | - [**Company**] : [Comments] |
| R4-2412902 | Return to | - [**Company**] : [Comments] |
| R4-2412903 | Return to | - [**Company**] : [Comments] |
| R4-2412904 | Return to | - [**Company**] : [Comments] |
| R4-2413254 | Return to | - [**Company**] : [Comments] |