**3GPP TSG-RAN WG4 Meeting # 107 R4-2310444**

**Incheon, Korea (Republic Of), 22 - 26 May 2023**

**Agenda item:** 8.18.4

**Source:** Ericsson

**Title:** Topic summary for [107][305] NR\_LTE\_EMC\_enh

**Document for:** Information

# Introduction

This agenda item will handle all contributions related to NR\_LTE\_EMC\_enh aspects:

* BS EMC enhancements
* UE EMC enhancements
* Rel 15/16 Maintenance

# Topic #1: Work Plan

Work plan for UE EMC enhancements was approved during meeting 104-bis-e in R4-2216488

Work plan for BS EMC enhancements was approved during meeting 105 in R4-2220135

If there are any suggestions to modifications of the work plan or WI scope, please write here and submit until Friday 10 am UTC. These comments will be used by the Moderator to suggest the topics to the chair. This table will not appear in the final summary that will be submitted on Friday 17 UTC.

|  |  |
| --- | --- |
| **Company** | **Proposals / Observations** |
|  | **Observation**:  **Proposal:** |

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
|  |  |  |

## Open issues summary

### Sub-topic 1-1

# Topic #2: BS EMC Enhancements

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2308997 | Ericsson | **Proposal 1:** An MSR BS with “common hardware” is defined as an MSR BS declared to employ radio digital unit which has the ability to handle the signals from all RATs in common active components and have no RAT-specific hardware blocks.  **Proposal 2:** For the current framework in clause 4.5 BS test configurations for both immunity and emission tests, only test up to two CSs with the largest number of RATs, which include all declared supported RATs, and all subsets of supported CSs are not required to be tested.  **Proposal 3:** Take R4-2308998 as start point of implementation of EMC enhancements in TS 37.113. |
| R4-2308998 | Ericsson | **CR to TS 37.113**  Proposes implementation of EMC enhancements in the EMC MSR BS specifications |
| R4-2309043 | Nokia, Nokia Shanghai Bell | [**Proposal 1:** MSR BS with same baseband components for all radio access technologies without any RAT-specific hardware blocks, is subject to EMC immunity test enhancement.](#_Toc134447726)  [**Proposal 2:** It is sufficient to test up to two CSs with the largest number of RATs, which include all declared supported RATs, and all subsets of supported CSs are not required to be tested.](#_Toc134447727)  [**Observation 1:** MSR BS specification includes broader variety of capability set than AAS BS specifications. Test requirements and Test Tolerances for NB-IoT in-band, NB-IoT guard band, or standalone NB-IoT operation are not supported by AAS BS and not covered by specifications.](#_Toc134447728)  [**Proposal 3:** CSs/TCs in TS 37.145-1/-2 can cover the outcome of test simplification for TS 37.114 related to broadband RATs.](#_Toc134447729) |
| R4-2309691 | Huawei Technologies Sweden AB | **Proposal 1:** any outcome of the “common HW” discussion shall not impact the existing MSR RF specifications.  **Proposal 2:** any outcome of the “common HW” discussion shall not introduce any implementation limitation for the MSR BS architectures.  **Proposal 3:** “common HW” issues may be addressed by the manufacturer declarations.  **Proposal 4:** Specify CS testing reduction based on manufacturer declaration for the test coverage.  **Proposal 5:** reuse MSR BS conclusions and apply the same manufacturer declaration based solutions for AAS BS EMC testing simplification. |

## Open issues summary

### Sub-topic 2-1

*Sub-topic description:* MSR BS with “common hardware”

**Issue 2-1: Definition – we have two proposals, see Proposal 1 in tdocs 8997 and 9043**

1. MSR BS declared to employ radio digital unit which has the ability to handle the signals from all RATs in common active components and have no RAT-specific hardware blocks.
2. MSR BS with same baseband components for all radio access technologies without any RAT-specific hardware blocks

C)\_any outcome of the “common HW” discussion shall not impact the existing MSR RF specifications (R4-2309691)

**Companies are encouraged to start from these proposals and finalize a term that can be used in the text of the specifications, if possible without the need to introduce a new definition.**

**Issue 2-2: Handling of the new term for the MSR BS with “common hardware”**

**Following proposals are formulated, starting from the discussion in tdoc 9691, but adding more details and explanations**

**Proposal C:** Use of the MSR BS with “common HW” shall not impact the existing MSR RF specifications, but rather be an addition to the current requirements.

**Proposal D:** For this new type of MSR BS only the simplified procedure is applicable (this means the current test procedure only apply for those BS which are not declared as MSR BS with “common hardware”).

Note: it is not recommended to NOT have more than one test method for the same type of radio equipment.

**Proposal E:** Any outcome of the “common HW” discussion shall not introduce any implementation limitation for the MSR BS architectures.

Note: In order to take advantage of the new simplified test procedure the manufacturer shall choose the architecture based on common hardware.

**Proposal F:** “common HW” properties of the MSR BS will be declared by the manufacturer and will be used as a criterium to apply the simplified test procedure based on reduced number of CSs.

**Proposal G:** “common HW” issues may be addressed by the manufacturer declarations (R4-2309691)

Recommended WF

* + TBA

### Sub-topic 2-2

*Sub-topic description* Which RATs can substitute others (when it comes to test cases)

*We have a tentative agreement that needs to be confirmed*

**Issue 2-2: TBA**

* Proposal G: NR/E-UTRA can cover UTRA
* Proposal H: NB-IoT cover GSM

Recommended WF

* + TBA

### Sub-topic 2-3

*Sub-topic description* Reduced number of CSs to be tested

*Open issues and candidate options before f2f meeting: There is a proposal to reduce the number of CS to be tested to maximum 2, given they consider maximum number of supported RATs.*

**Issue 2-3: TBA**

* + Option 1: only test up to two CSs with the largest number of RATs, which include all declared supported RATs, and all subsets of supported CSs are not required to be tested.
  + Option 2**:**  Specify CS testing reduction based on manufacturer declaration for the test coverage (R4-2309691)

Recommended WF

* + TBA

### Sub-topic 2-4: AAS BS EMC consideration

Proposals:

Option 1**:** reuse MSR BS conclusions and apply the same manufacturer declaration based solutions for AAS BS EMC testing simplification.

Option 2: other (please specify)

Recommended WF

* + TBA

# Topic #3: UE EMC Enhancements

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-230 | Xiaomi | **Proposal 1:** No test simplification apply to Radiated emission test.  **Proposal 2:** For other emission test besides radiated emission, such as Conducted emission DC power input/output port, Conducted emissions, AC mains power input/output port, Harmonic current emissions (AC mains input port), Voltage fluctuations and flicker (AC mains input port), it is proposed to have one CA combination and one DC combination that the UE supports as example combinations.  **Proposal 3:** It is proposed that no test simplification apply to the radiated immunity and ESD test.  **Proposal 4:** For Fast transients common mode, RF common mode (0.15 MHz to 80 MHz), Transients and surges, vehicular environment, Voltage dips and interruptions, Surges, common and differential mode, these 5 tests all focus on the power supply and hence it is proposed to have one CA combination and one DC combination that the UE supports as example combinations.  **Proposal 5:** To select one band from below 1GHz as low band and one band from {n41, n77, n78, n79} which is the typical 5G NR band for one CA and one DC combination.  **Proposal 6:** If the proposed combinations are not supported by UE, it is proposed that UE declare a test band combination for such case. |

## Open issues summary

As there is only one contribution please comment directly on the proposals until Friday 10 am UTC. These comments will be used by the Moderator to suggest the topics to the chair. The goal is to provide a good start for the discussions already in the final summary that will be submitted on Friday 17 UTC

|  |  |
| --- | --- |
| **Proposal** | **Company: comments. (Please agree/disagree and/or suggest a WF)** |
| **Proposal 1** |  |
| **Proposal 2** |  |
| **Proposal 3** |  |
| **Proposal 4** |  |
| **Proposal 5** |  |
| **Proposal 6** | Ericsson: OK with Proposal 1-4. Proposal 5 gives some guidance, but it is still not clear what is the principle for selecting CA and DC combinations. As to proposal 6, manufacturer declaration approach cannot be used to decide which combination shall be tested. |

# Topic #4: Rel 15/16 Maintenance

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2307796 |  |  |

**List of submitted CRs (Cat-A are not included)**

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Title / Summary of changes** |
| R4-2307796 | ZTE | CR on TS 37.113 MSR base station test configuration and performance criteria R17   * adds reference to two Notes in a table * introduces bandwidth of 35 and 45 MHz |
| R4-2307797 | ZTE | CR on TS 37.113 MSR base station test configuration R15   * similar to 7796 |
| R4-2307798 | ZTE | * cat A |
| R4-2307799 | ZTE | CR on TS 38.113 NR BS performance criteria   * adds 35 and 45 MHz channel bandwidth in the list |
| R4-2307807 | ZTE | CR on TS 38.175 IAB performance criteria   * adds 35 and 45 MHz channel bandwidth in the list |
| R4-2309000 | Ericsson | CR to TS 38.175: Corrections in clause 1 Scope and clause 9 Immunity  Moderator: this is a resubmission of previously proposed changes |

please comment directly on the CRs until Friday 10 am UTC. These comments will be used by the Moderator to suggest the topics to the chair. The goal is to provide a good start for the discussions already in the final summary that will be submitted on Friday 17 UTC.

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| --- | --- |
| **Proposal** | **Company: comments. (Please agree/disagree and/or suggest a WF)** |
| R4-2307796 | Ericsson: Agree CRs R4-2307796/7/8/9, R4-2307807 |
| R4-2307797 |  |
| R4-2307798 |  |
| R4-2307799 |  |
| R4-2307807 |  |
| R4-2309000 | Ericsson: Agree, the content in R4-2309000 was already agreed during RAN4#106. |