**3GPP TSG-RAN WG4 Meeting # 98-bis-e R4-210XXXX**

**Electronic Meeting, 12th – 20th April, 2021**

**Agenda item:** 5.3.4, 8.11.4

**Source:** Moderator (ZTE Corporation)

**Title:** Email discussion summary for [98-bis-e] [302] NR\_EMC

**Document for:** Information

# Introduction

For the RAN4 [98-bis-e] [302] NR\_EMC, the main topics are about IAB EMC and NR repeaters EMC including agenda items 5.3.4 and 11.11.4. Therefore, the discussions will separate into two parts:

Topic #1: Agenda item 5.3.4: IAB EMC

Topic #2: Agenda item 8.11.4: NR Repeaters EMC

# Topic #1: IAB EMC

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| **[R4-2104960](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104960.zip)** | ZTE Corporation | **Proposal 1:** The spatial exclusion zone is only applicable to the IAB type 1-O or type 2-O with one antenna array plane. If an IAB type 1-O or type 2-O has two antenna arrays in two directions, it is recommended that the exclusion band be expanded instead of two spatial exclusion zones. |
| **[R4-2106510](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106510.zip)** | Ericsson | ***Observation 1****: IEC 61000-6-1 indicates that the performance level to evaluate the impact of transient phenomena is specified by the manufacturer.*  ***Observation 2:*** *The performance level may be replaced by a permissible loss of performance. If the minimum performance level or permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user reasonably expect from the apparatus if used as intended.*  ***Observation 3:*** *The approach followed by ETSI and 3GPP in the MSR standard for evaluating transient phenomena is aligned with IEC definition for performance criteria. This criterion should be followed when defining the Performance Criteria for Transient Phenomena for IAB.*  ***Observation 4:*** *It might be necessary to update EMC NR specification to align performance criteria for transient phenomena both with MSR/ETSI standard and the points refereed by IEC.*  Based on these elements we propose:  ***Proposal 1: To agree on the companion Draft CR to TS 38.175 [2] defining performance criteria for IAB.*** |
| **[R4-2106511](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106511.zip)** | Ericsson, ZTE | <Based on **[R4-2106510](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106512.zip)**>  Draft CR to TS 38.175 on IAB EMC test configurations and performance requirements  **Reason for change:** Introduction of test configurations and performance requirements in IAB EMC specification is required to complete the EMC IAB standard.  **Summary of change:** Introduction of test configurations and performance requirements in IAB EMC specification TS 38.175. |
| **[R4-2106512](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106512.zip)** | Ericsson | Observation 1: Considering the statement of IEC in [1], it is possible (when technically justified) to test the EUT by exposing fewer faces to the generating antenna.  Observation 2: Protection of the EUT should be part of the considerations when defining EMC RI requirements. In that sense, IAB node should be also protected as NR BS with the definition of spatial exclusion.  Observation 3: The implementation of spatial exclusion should be considered to protect the antenna array elements irrespective of the IAB node implementation.  Observation 4: Excluding sides of the IAB node during the RI test does not imply a relaxation on the testing or the requirements, since there are additional mechanisms to guarantee the performance of the EUT fits within regulatory requirements while protecting other services.  Observation 5: Antenna array is the key element to be protected during the Radiated Immunity test. Although there might be differences in the architecture setup/IAB implementation, IAB EMC standard shall secure both the fulfillment of the EMC requirements and the protection of the EUT.  Observation 6: IAB EMC specification should offer a basic guidance on how the testing procedure shall be carried out, setting the basic requirements for the testing, but without going on specific architecture considerations. Therefore, it would be enough to state that antenna array(s)/radiating elements shall be excluded/protected during RI testing.  Based on these elements we propose:  **Proposal 1:** To include the spatial exclusion concept under the Radiated Immunity considerations for EMC IAB specification TS 38.175.  **Proposal 2:** To agree on the companion Draft CR to TS 38.175 [4] adding spatial exclusion to Radiated Immunity testing. |
| **[R4-2106513](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106513.zip)** | Ericsson | <Based on **[R4-2106512](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106512.zip)**>  **Reason for change:** Introduction of spatial exclusion concept for IAB EMC CR to TS 38.175 on Spatial Exclusion for IAB EMC Radiated Immunity test.  **Summary of change:** Introduction of spatial exclusion concept for IAB EMC CR to TS 38.175 on Spatial Exclusion for IAB EMC Radiated Immunity test. |

## Open issues summary

*In last meeting, spatial exclusion for IAB EMC RI testing were discussed, However, no consensus were achieved, where one company think there existed some challenges while other companies think current NR BS methods can be reused. In the end, a WF (R4-2103773) incorporated some agreements on the IAB EMC RI testing with spatial exclusion was agreed.*

*Table 4.4.1-1: ΔfRX offset values for IAB (cited form TS38.175)*

|  |  |  |  |
| --- | --- | --- | --- |
| *IAB type* | *IAB operating band characteristics* | *RI test setup* | *ΔfRX (MHz)* |
| *IAB type 1-O* | *FUL,high – FUL,low < 100 MHz* | *With exclusion zone* | *[20]* |
|  |  | *Without exclusion zone* | *[60]* |
|  | *100 MHz ≤ FUL,high – FUL,low ≤ 900 MHz* | *With exclusion zone* | *[60]* |
|  |  | *Without exclusion zone* | *[200]* |

### Sub-topic 1-1

**Issue 1-1: Whether or not the current values of spatial exclusion zone of NR BS can be reused in the IAB RI testing (i.e. ΔfRX )?**

* Proposals
  + Tentative agreements: Yes (R4-2106512, R4-2106513, R4-2104960)
* Recommended WF
  + TBA

**Issue 1-2: How to address the “spatial exclusion”?**

* Proposals
  + Option 1:
    - Proposal:The spatial exclusion zone is only applicable to the IAB type 1-O or type 2-O with one antenna array plane. If an IAB type 1-O or type 2-O has two antenna arrays in two directions, it is recommended that the exclusion band be expanded instead of two spatial exclusion zones.
  + Option 2: TBA
* Recommended WF
  + TBA

**Issue 1-3: How to define the Performance Criteria for Transient Phenomena for IAB?**

* Proposals
  + Option 1: aligned with IEC definition
  + Option 2: Others
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

*One of the two formats, i.e. either example 1 or 2 can be used by moderators.*

**Example 1**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 1-1:  Sub topic 1-2: |

### CRs/TPs comments collection

*For close-to-finalize WIs and maintenance work, comments collections can be arranged for TPs and CRs. For ongoing WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| **[R4-2106511](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106511.zip)** | Company A |
| Company B |
|  |
| **[R4-2106513](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106513.zip)** | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic #1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

# Topic #2: NR Repeaters EMC

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| **[R4-2104961](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104961.zip)** | ZTE Corporation | Skeleton TS 38.114 |
| **[R4-2106514](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2106514.zip)** | Ericsson | **Proposal 1:** To rely on CISPR/IEC and ETSI recommendations to define the NR RF Repeaters EMC requirements.  **Proposal 2:** Discuss the changes and additions needed to cover EMC NR Repeaters in coordination with RF section. |
| **[R4-2107252](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2107252.zip)** | Nokia, Nokia Shanghai Bell | 1. Option 2: It is premature to decide, pending on the repeater RF discussion, more discussions are needed for TDD NR repeaters. 2. For FDD NR repeaters, TS 36.113 and TS 38.113 can act as a starting point. |

## Open issues summary

*A new TS (TS38.114) is agreed for NR Repeaters EMC according to the revised WID for NR repeaters (RP-210818).*

### Sub-topic 2-1

*Sub-topic description:*

*Open issues and candidate options before e-meeting:*

**Issue 2-1: NR Repeaters EMC TS (i.e. TS38.114) skeleton**

* Proposals
  + Tentative agreements: Agree on the skeleton in [R4-2104961](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98bis_e/Docs/R4-2104961.zip).
* Recommended WF
  + TBA

### Sub-topic 2-2

*As the discussion on repeaters RF core requirement are underway, also the some EMC requirements are pending on the outcomes of the RF discussion.*

**Issue 2-2-1: Whether or not the following EMC requirements are referred to CISPR or IEC specifications and can be applied to NR FDD/TDD repeaters?**

* + Radiated emission(ancillary equipment), conducted emission (including DC power input/output port, AC mains power input/output port, Telecommunication port) , Harmonic current emissions(AC mains input port), Voltage fluctuations and flicker (AC mains input port)
  + RF electromagnetic field (80 MHz to 6000 MHz), conducted immunity (0.15 MHz - 80 MHz), ESD, EFT, Voltage dips, surges
* Proposals
  + Tentative agreements: Yes
* Recommended WF
  + TBA

**Issue 2-2-2: Other than the requirements mentioned in issue 2-2-1, how to define the other requirements (such as radiated emission requirement) for NR TDD repeaters?**

* Proposals
  + Option 1: Pending on the repeater RF discussion, more discussions are needed for TDD NR repeaters.
  + Option 2: TBA
* Recommended WF
  + TBA

**Issue 2-2-3: Other than the requirements mentioned in issue 2-2-1, how to define the other requirements (such as radiated emission requirement) for NR FDD repeaters?**

* Proposals
  + Tentative agreements: TS 36.113 and TS 38.113 can act as a starting point
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

Sub topic 2-1

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |

Sub topic 2-2

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| XXX | Company A |
| Company B |
|  |
| YYY | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on … | YYY |  |
| LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
|  |  |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents

## 2nd round

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-210xxxx | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-210xxxx | LS on … | ZZZ | Agreeable, Revised, Noted |  |
|  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. Do not include hyper-links in the documents