**3GPP TSG-RAN WG4 Meeting # 96-7 R4-20xxxxx**

**Electronic Meeting, 2-13 Nov., 2020**

**Agenda item:** 4.3, 4.6, 7.4.6, 7.4.7

**Source:** Moderator (ZTE Corporation)

**Title:** Email discussion summary for [96e] [304] NR\_EMC

**Document for:** Information

# Introduction

For the RAN4 [96e] [304] NR\_EMC, the main topics are about NR UE EMC, NR BS EMC and IAB EMC including agenda items 4.3, 4.6, 7.4.6 and 7.4.7.

According to the contributions in this meeting, no contributions under agenda 4.3 are available. Therefore, the discussions will separate into three parts:

 Topic #1: Agenda item 4.6: NR BS EMC

Topic #2: Agenda item 7.4.6: IAB EMC Core requirement

Topic #3: Agenda item7.4.7: IAB EMC Test/Performance requirement

*Briefly introduce background, the scope of this email discussion and provide some guidelines for email discussion if necessary.*

*List of candidate target of email discussion for 1st round and 2nd round*

* 1st round: TBA
* 2nd round: TBA

# Topic #1: NR BS EMC

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| **[R4-2015100](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015100.zip)** | Ericsson | Title: CR to TS 37.113 on Voltage dips and interruptions, Release 15***Reason for changes:*** Specification of the Voltage dips and interruptions (Test method and levels) requirement is not aligned with IEC 61000‑4‑11, nor with the NR BS EMC specification. Performance criteria is updated to reflect considerations on the test levels.***Summary of change:*** Corrects the Voltage dips and interruptions requirements to align with IEC specification. It also includes and update to the performance criteria according to the test levels. |
| **[R4-2015101](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015101.zip)** | Ericsson | Mirror CR for [R4-2015100](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015100.zip).Moderator note: The Tdoc is available. |
| **[R4-2015102](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015102.zip)** | Ericsson | Title: CR to TS 38.113 on Voltage dips and interruptions, Release 15***Reason for changes:*** Performance criteria is updated to reflect considerations on the test levels***Summary of change:*** Corrects the performance criteria according to the test levels defined by IEC |
| **[R4-2015103](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015103.zip)** | Ericsson | Mirror CR for [R4-201510](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015100.zip)2.Moderator note: The Tdoc is available. |
| **[R4-2015104](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015104.zip)** | Ericsson | Title: CR to TS 38.113 on Performance criteria for transient phenomena, Release 15***Reason for changes:*** Performance criteria for transient phenomena is updated to reflect alignment both with TS 37.113 MSR EMC (which includes also NR) standard and ETSI considerations.***Summary of change:*** updates the performance criteria for transient phenomena to reflect alignment both with TS 37.113 MSR EMC (which includes also NR) standard and ETSI considerations. |
| **[R4-2015105](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015105.zip)** | Ericsson | Mirror CR for [R4-201510](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015100.zip)4.Moderator note: The Tdoc is available. |
| **[R4-2015568](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015568.zip)** | Ericsson Inc. | Title: CR to TS 38.113 correcting Exclusion Bands Title, Release 15 ***Reason for changes:*** Correction to include missing title in section 4.4 (Exclusion Bands).***Summary of change:*** Corrects a missing title in section 4.4 (Exclusion Bands) |
| **[R4-2015569](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015569.zip)** | Ericsson Inc. | Mirror CR for [R4-2015](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015100.zip)568.Moderator note: The Tdoc is available. |
| **[R4-2015958](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015958.zip)** | Huawei | Title: CR to TS 38.113: correction of the scope and other technical improvements, Rel-15***Reason for changes:*** Multiple technical improvements were incorporated into TS 38.113, e.g. clarifiaction to the scope and redundant text, clarification on the test methodology for RF electromagnetic field, and more. ***Summary of change:*** 1. Redundant text is simplified.
2. Unused refernece to the internal TR removed.

4.1: refernce to the proper manufacturer declaration corrected. 4.2: reference to the NR-ARFCN in the BS core spec added.7.1: clarification note added for the referred IEC specifications, to avoid ambiguity on the alternative requirements. 8.2.1.4: text belonging to the Note edited accordingly. 9.2.2: clarification added on the (so far assumed to be the default) test methodology (as the alternative one is mentioned in the following statement) Other editorial corrections. |
| R4-2015959 | Huawei | Mirror CR for [R4-2015](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015100.zip)958. |

## Open issues summary

**Issue 1-1: Does Performance criteria need to be updated to reflect considerations on the test levels? (R4-2015100 for TS37.113, R4-2015102 for TS38.113, R4-2015106 for TS37.175 )**

* Proposals
	+ Option 1: Yes
	+ Option 2: No
* Recommended WF
	+ TBA

**Issue 1-2: If Yes is selected in the above, are the corrections on the Performance criteria section in R4-2015100/R4-2015102/R4-2015106 agreeable?**

* Proposals
	+ Option 1: Yes
	+ Option 2: No, wordings improvement are needed
* Recommended WF
	+ TBA

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 1-1: Sub topic 1-2: ….Others: |

### 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** |
| R4-2015100/5101 | Company A |
| Company B |
|  |
| R4-2015102/5103 | Company A |
| Company B |
|  |
| R4-2015104/5105 | Company A |
| Company B |
|  |
| R4-2015568/5569 | Company A |
| Company B |
|  |
| R4-2015958/5959 | 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:* |

*Suggestion on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title**  | **Assigned Company,****WF or LS lead** |
| #1 |  |  |

### 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)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation**  |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #2: IAB EMC Core requirement

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| **[R4-2015026](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015026.zip)** | ZTE Corporation | Title: CR to TS 38.175: IAB definition***Reason for changes:*** There are no definitions for IAB type***Summary of change:*** Add IAB type definitions |
| **[R4-2015027](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015027.zip)** | ZTE Corporation | Title: CR to TS 38.175: IAB definition***Reason for changes:*** The radiated eimssion IAB requirements need to be added***Summary of change:*** Add radiated eimssion IAB requirements |
| **[R4-2015106](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015106.zip)** | Ericsson | Performance criteria is updated to reflect considerations on the test levelsmove to topic #1. |
| **[R4-2015107](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015107.zip)** | Ericsson | **Observation 1***: 3GPP RAN4 seems to agree on reusing NR BS principles when defining most of the IAB EMC specification requirements. In that sense, 3GPP RAN4 might agree on reusing the values already defined in TS 38.174 [3] to define the exclusion band size for RI testing when not all the sides of the IAB node are exposed****.*** **Observation 2:** *The 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:** *NR BS EMC specification has considered both scenarios (with and without spatial exclusion) when defining the size of exclusion bands. When not possible to implement the exclusion zone (spatial exclusion), the size of the exclusion band should be wider than* ΔfOOB *to guarantee the protection of the IAB node during RI testing.*Based on these considerations, we propose:***Proposal 1: To reuse the Exclusion Band Size values defined for NR BS exclusion bands (receiver and transmitter) in the IAB EMC specification.******Proposal 2: To include two alternatives (with and without spatial exclusion) for the definition of the receiver exclusion bands for RI testing of IAB nodes.******Proposal 3: To agree on the companion CR to TS 38.175 [5] on exclusion bands.*** |
| **[R4-2015108](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015108.zip)** | Ericsson | CR based on 15107 |
| **[R4-2015109](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015109.zip)** | Ericsson | **Observation 1:** *3GPP has agreed that for IAB type 1-O and type 2-O, the radiated emission is covered by radiated spurious emission requirement in TS 38.174 [5].***Observation 2:** *3GPP has agreed on the definition of spurious emission for IAB node. Reusing the limits defined in the IAB RF spec in the IAB EMC specification is a reasonable approach. Same principle applied for NR BS EMC specification.*Based on these elements we propose:***Proposal 1: To define the IAB EMC Radiated Emissions requirements for IAB type 1-H reusing the ones already set in the IAB RF specifications.******Proposal 2: : To agree on the companion CR to TS 38.175 [6] on IAB EMC emission requirements.*** |
| **[R4-2015110](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015110.zip)** | Ericsson | CR based on 15109 |
| **[R4-2015111](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015111.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.* 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 CR to TS 38.175 [4] adding spatial exclusion to Radiated Immunity testing.*** |
| **[R4-2015112](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015112.zip)** | Ericsson | CR based on 15111. |

## Open issues summary

*Before e-Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 2-1

*Sub-topic description:*

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

In last RAN4 meeting, whether or not need the exclusion zone (spatial exclusion) for IAB have been discussed. Consequently, the spatial exclusion related texts are keep in [].

Also, due to the parallel discussion between IAB RF and IAB EMC, so some of the RF requirements for IAB EMC are keep in [].

**Issue 2-1: How to define IAB receiver exclusion band?**

* Proposals
	+ Tentative agreements: Reuse the Exclusion Band Size values defined for NR BS exclusion bands (receiver and transmitter) , and remove [] from the current values.
* Recommended WF
	+ TBA

**Issue 2-2: Whether or not include exclusion zone (spatial exclusion) for the definition of the receiver exclusion bands for RI testing of IAB nodes?**

* Proposals
	+ Option 1: Yes, two alternatives: with and without exclusion zone (spatial exclusion)(R4-2015107/5108/5111/5112)
	+ Option 2: No, one alternative: without exclusion zone (spatial exclusion)
	+ Option 3: Others
* Recommended WF
	+ TBA

**Issue 2-3: How to defined IAB radiated emission requirements?**

* Proposals
	+ Tentative agreements: Reuse the ones already set in the IAB RF specifications. (R4-2015109/5110/R4-2010648)
* Recommended WF
	+ TBA

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 2-1: Sub topic 2-2:….Others: |

### 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** |
| R4-2015026 | Company A |
| Company B |
|  |
|  |
| R4-2015027 | Company A |
| Company B |
|  |
|  |
| R4-2015106 | Company A |
| Company B |
|  |
|  |
| R4-2015108 | Company A |
| Company B |
|  |
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| R4-2015110 | Company A |
| Company B |
|  |
|  |
| R4-2015112 | Company A |
| Company B |
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## 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:* |

*Suggestion on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title**  | **Assigned Company,****WF or LS lead** |
| #1 |  |  |

### 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)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation**  |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #3: IAB EMC Test/Performance requirement

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| **[R4-2015028](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015028.zip)** | ZTE Corporation | **Proposal 1: The requirements of “4.5 test configurations” should wait for the outcomes of IAB RF test.****Proposal 2: For ancillary equipment performance assessment, it is proposed to reused from TS38.113.****Proposal 3: The requirements of “6 performance criteria” should wait for all the requirements IAB RF are completed.****Proposal 4: For the other sections, such as 4.1, 4.2, 4.3, 5, 8.1, and 9.1 in TS38.175, the work can be started standalone for IAB EMC.** |
| **[R4-2015113](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015113.zip)** | Ericsson | **Observation 1:** *Although standardization bodies such as CISPR or IEC have defined the limits and requirements for EMC testing, is up to 3GPP to define the way CISPR/IEC recommendations are going to be implemented in the definition of test limits and performance requirements.***Observation 2:** *The definition of IAB EMC performance requirements by 3GPP has to consider the IAB node as a whole (MT and DU) irrespective of its implementation.***Observation 3:** *The definition of IAB EMC specification has been based on reusing NR BS EMC specification. Same principle should be applied in the definition of the IAM EMC performance requirements.*Based on these elements we propose:***Proposal 1: To define the IAB EMC performance requirements reusing the ones already set in the NR BS EMC specification.******Proposal 2: : To agree on the companion CR to TS 38.175 [9] on exclusion bands.*** |
| **[R4-2015114](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015114.zip)** | Ericsson | CR based on 15113 |

## Open issues summary

*Before e-Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

All the IAB performance/test requirements are open*.* Meanwhile the discussions on the performance and test related requirements for the IAB RF in TS38.174 start in this meeting. Therefore, for IAB EMC test/performance part, it should be discussed one by one.

### Sub-topic 3-1

*Sub-topic description:*

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

**Issue 3-1: How to treat the requirements of test configurations (section 4.5) ?**

* Proposals
	+ Tentative agreements: Waiting for the outcomes of IAB RF test. (R4-2015028/5113/114)
* Recommended WF
	+ TBA

**Issue 3-2: How to treat the requirements of performance criteria (section 6.1 and 6.2)?**

* Proposals
	+ Option 1: Waiting for the outcomes of IAB RF test. (R4-2015028)
	+ Option 2: Reuse the ones already set in the NR BS EMC specification. (R4-2015113/114)
* Recommended WF
	+ TBA

**Issue 3-3: How to treat ancillary equipment requirement(section 5.4, 6.3 and 6.4)**

* Proposals
	+ Tentative agreements: Reuse the ones already set in the NR BS EMC specification (R4-2015028/5113/114)
* Recommended WF
	+ TBA

**Issue 3-4: How to treat test configurations for emission (section 8.1) and immunity(section 9.1)**

* Proposals
	+ Option 1: Waiting for the outcomes of IAB RF test. (R4-2015028)
	+ Option 2: Reuse the ones already set in the NR BS EMC specification. (R4-2015113/114)
* Recommended WF
	+ TBA

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 3-1: Sub topic 3-2:….Others: |

### 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** |
| R4-2015114 | Company A |
| Company B |
|  |
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## 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.*

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

*Suggestion on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title**  | **Assigned Company,****WF or LS lead** |
| #1 |  |  |

### 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)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation**  |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |