**3GPP TSG-RAN WG4 Meeting #** **95-e R4-2008693**

**Electronic Meeting, 25 May – 5 June, 2020**

**Agenda item:** 4.5, 4.8, 6.5.4

**Source:** Moderator (ZTE Corporation)

**Title:** Email discussion summary for [95e] [304] NR\_EMC

**Document for:** Information

# Introduction

For the RAN4#95-e\_#304\_NR\_NewRAT\_EMC, the main topics are about BS and UE EMC including agenda item 4.5, 4.8 and 6.5.4, The discussion will separate into two parts:

 Topic #1: NR EMC for agenda item 4.5

Topic #2: NR EMC for agenda item 4.8

Topic #3: IAB EMC for agenda item 6.5.4

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

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

# Topic #1: UE EMC

23 tdocs have been submitted to finish the TS 38.124 Rel-15. As per Mr. Chairman announcement, the TS 38.124 belongs to the ITU submit and no [] and TBD should be remained after this meeting.

## Companies’ contributions summary

23 tdocs with 1 discussion paper and 22 CRs submitted. Most of the CR contain more than one topic

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| **T-doc number** | **Company** | **Proposals / Observations** |
| [R4-2007060](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007060.zip) | Ericsson | 100MHz proposed as RX exclusion band. |
| [R4-2007061](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007061.zip) | Ericsson | Wired network port added. |
| [R4-2007062](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007062.zip) | Ericsson | Test methods and limits to complete subclause 8. |
| [R4-2007063](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007063.zip) | Ericsson | Wired network port definition added. |
| [R4-2007064](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007064.zip) | Ericsson | Test methods and limits to complete subclause 9. |
| [R4-2007065](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007065.zip) | Ericsson | New reference added as CISPR 32, TS 38.508 and TS 38.509. |
| [R4-2007066](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007066.zip) | Ericsson | Reuse the spurious emission limit of UE RF requirement. |
| [R4-2007444](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007444.zip) | Huawei | Part of correction are endorsed in RAN4#94-bis-e with some additional corrections added this meeting. |
| [R4-2007445](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007445.zip) | Huawei | DraftCR was endorsed in RAN4#94-bis-e. |
| [R4-2007446](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007446.zip) | Huawei | DraftCR was endorsed in RAN4#94-bis-e. |
| [R4-2007447](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007447.zip) | Huawei | DraftCR was endorsed in RAN4#94-bis-e. |
| [R4-2007448](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007448.zip) | Huawei | Part of correction are endorsed in RAN4#94-bis-e with some additional corrections added this meeting. |
| [R4-2007527](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007527.zip) | ZTE Corporation | To complete subclause 8 conducted emissions requirement. |
| [R4-2007528](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007528.zip) | ZTE Corporation | Test method and limits for CS. |
| [R4-2007529](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007529.zip) | ZTE Corporation | Test method and limits for voltage dips. |
| [R4-2007530](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007530.zip) | ZTE Corporation | Test method and limits for EFT. |
| [R4-2007531](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007531.zip) | ZTE Corporation | Test method and limits for ESD. |
| [R4-2007532](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007532.zip) | ZTE Corporation | Correction of references. |
| [R4-2007533](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007533.zip) | ZTE Corporation | Correction of RX exclusion band wording. |
| [R4-2007534](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007534.zip) | ZTE Corporation | CR to spurious emission which is aligned to 36.124. |
| [R4-2007535](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007535.zip) | ZTE Corporation | Test method and limits for Surge. |
| [R4-2007536](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007536.zip) | ZTE Corporation | Correction of test requirements of vehicular environment. |
| [R4-2007537](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007537.zip) | ZTE Corporation | Discussion of test requirements of vehicular environment to correct reference to the latest version as well as requirements. |

## Open issues summary

The CRs has multi-topic corrections, some big open issues are listed below, other detail correction discussion will be per CR basis and please provide further comments in subclause 1.3.

* RX exclusion band
* Radiated emission test
* Unfinished test methods and limits in sub-clause 8
* Unfinished test methods and limits in sub-clause 9
* Vehicular environment requirements and reference update
* Wired network port

### Sub-topic 1-1

*Sub-topic description:*

RX exclusion band of UE is provided with two options.

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

**Issue 1-1: RX exclusion band**

* Proposals
	+ Option 1: 85MHz
	+ Option 2: 100MHz
	+ Option 3: Other value
* Recommended WF

### Sub-topic 1-2

*Sub-topic description:*

In current TS 38.124, radiated emission test refers to SM.329 while companies proposed to reuse radiated spurious requirement.

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

**Issue 1-2: Radiated emission test**

* Proposals
	+ Option 1: Use ITU-R SM.329 requirement
	+ Option 2: Use spurious emission requirement of UE RF
* Recommended WF

### Sub-topic 1-3

*Sub-topic description*

The applicability of emission test has listed full tests however, couple of them are not fully stated in the specification.

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

**Issue 1-3: Unfinished test methods and limits in sub-clause 8**

* Proposals
	+ Option 1: Reuse the methods and requirements from TS 36.124
	+ Option 2:
* Recommended WF
	+ Agree option 1 and further discuss if detail correction is needed.

### Sub-topic 1-4

*Sub-topic description*

The immunity tests listed in subclause 9 haven’t finished yet with some of the test methods and requirements blank.

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

**Issue 1-4: Unfinished test methods and limits in sub-clause 9**

* Proposals
	+ Option 1: Reuse the methods and requirements from TS 36.124
	+ Option 2:
* Recommended WF
	+ Agree option 1 and further discuss if detail correction is needed.

### Sub-topic 1-5

*Sub-topic description*

Vehicular environment requirements and reference update as the old ISO standard are not valid any more.

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

**Issue 1-5: Vehicular environment requirements and reference update**

* Proposals
	+ Option 1: Apply the latest reference and the most updated requirement..
	+ Option 2:
* Recommended WF
	+ Agree option 1 and further discuss if detail correction is needed.

### Sub-topic 1-6

*Sub-topic description*

The wired network port has been added by Ericsson.

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

**Issue 1-6: Wired network port**

* Proposals
	+ Option 1: Add the wired network port and the corresponding requirements.
	+ Option 2: Do not include wired network port for UE.
* Recommended WF

## Companies views’ collection for 1st round

### Open issues

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| **Company** | **Comments** |
| Ericsson | Sub-topic 1-1: Even though the 85 MHz value has been part of the UE EMC standard, ETSI is currently discussing to increase the Exclusion Band size proposing 100 MHz. This is an alignment with ETSI UE EMC spec. ETSI Part 52 considers the following“NR FR1 SA and NSA Receiver exclusion bandAs defined in clause 4.3.3 of ETSI EN 301 489-1 [1] where n=1 and Channel Width is as follows:• NR Channel Width 100 MHz.• E-UTRA Channel Width 20 MHz.NOTE: For systems that support multiple channel widths, the Channel Width used should be the widest support by the EUT.Sub-topic 1-2: Our approach is to use spurious emission requirement of UE RF. Again our preference would be to remove completely this requirement from the EMC spec, but if not possible, an alignment with existing agreements within 3GPP is our option.Sub-topic 1-3 and 1-4: In both cases (immunity and emissions), we think the best option is reusing the methods and requirements defined in 36.124. Ericsson has submitted contributions covering these subtopics. We understand ZTE is proposing the same approach. If there is an agreement, we could discuss a split in the submission of final/corrected versions of the corresponding CRs.Sub-topic 1-5: Open to discuss the update in the vehicular environment requirements. If there is an update that needs o be included in the standard, we don´t have any objection. We would like more context on this update.Subtopic 1-6: The purpose is again to align the considerations of 3GPP standard as much as possible to the ones included in ETSI standard. |
| Huawei | Sub-topic 1-1: internal cross-check ongoing among option 1 and 2. The status of part -52 is to be clarified – it seems not to be available for NR, yet. Sub-topic 1-2: this topic became more controversial than initially thought. Some feedback to related aspects: 1. The initial aim was to fix the observed technical issues in this requirement in TS 38.124 – as shared in the initial dCR last meeting. Then it was further observed that there is misalignment with the TS 38.101-1.2. In our view, the related UE RF requirement was derived based on SM.329 – so those two proposed options are somewhat confusing. 3. We are open to discuss how to approach the potential removal of those requirements from the EMC specifications. Our preference is to do it across all the EMC specs, which is clearly not possible this meeting. 4. Based on the above: Option 2 is preferred (as seen as not in conflict with SM.329), and then we can discuss how to fix RE requirements in EMC specs in future, for all the BS and UE specs. Sub-topic 1-3: agree to reuse. Focus on the proposed CRs content and revisions. Sub-topic 1-4: same as above.Sub-topic 1-5: update seems valid. Focus on CRs content and revisions. Question for clarification is whether the V2X team shall be somehow informed (beyond regular EMC email shared on RAN4 reflector) about this (for their information and visibility).Subtopic 1-6: for a moment we have some concerns if this is needed for UE – so we tend to prefer Option 2. More views are welcome on this topic to reach common understanding.  |
| ZTE | Subtopic 1-1: We prefer option 1 as to keep the 85MHz. Agree with Huawei that the -52 is not published yet. Subtopic 1-2: We don’t agree to remove the RE requirement from the EMC spec. One similar requirement is the EIRP and EIS requirement for Hybrid AAS in Rel-13. These requirement are brought into use at the specific time frame to reflect specific requirements. For the RE requirement, of course the spurious emission is tested for antenna port/TAB port, however, if we remove it, the spurious emission coming out other than antenna port/TAB port cannot be assessed in this case. We need to be really careful if we want to remove any of the requirement. But for this meeting, we think it is better to focus on the finish of the TS 38.124 for submission to ITU so we prefer option 2.Subtopic 1-3:Seems quite converge that the WF can be agreed.Subtopic 1-4: Seems quite converge that the WF can be agreed.Subtopic 1-5: Threse requirements are from ISO so it should be widely spread for all the V2X interested companies. Subtopic 1-6: Our concern is whether the UE will have a wired network port so we prefer option 2. |

### 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.*

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| **CR/TP number** | **Comments collection** |
| [R4-2007060](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007060.zip) | Ericsson:We provide a EB value aligned with new ETSI definitionHuawei: - depends on conclusion on issue 1-1.- There is also a proper CR from Huawei resubmitted in 7446, based on the Endorsed content. How to deal with such parallel CRs shall be clarified (but if needed, that it is rather source company CR (based on the Endorsed one) being revised to incorporate such modification).- There is also related ZTE CR correcting the symbols in 7533, i.e. only one of the CRs (7060, 7446, 7533) can be proceeded – otherwise this would result in changes on changes. ZTE: Do not agree with the 100MHz. If the European standard to be considered, currently the CCSA from China proposed “maximum supported channel bandwidth” as RX exclusion band for UE. Than how to merge a fixed value?Ericsson: The proposal on 100 MHz, comes from a mature draft shared with the ETSI community. However, and considering we are just talking about a draft, it is OK to keep the 85 MHz Exclusion Band. |
| [R4-2007061](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007061.zip) | Ericsson:We include the wired network port to the immunity applicability table and correcting the frequency range limit for RI test. Huawei: - As the Endorsed content is submitted by the proponents for Agreement in a separate CR, we need to avoid changes on changes as not to confuse MCC during implementation. Probably the best options is to keep the Endorsed CR and the new modifications as two independent CRs, and not to mix the content. - Some changes (f.range) were also included in the updated CR in R4-2007444.- "wired network port" was not used in TS 36.124. Application of the "wired network port" to the UE is questionable (definition below). Also, there is no 8.7 section in this spec - refer to ZTE CR in R4-2007527. *wired network ports: point of connection for voice, data and signalling transfers intended to interconnect widely dispersed systems by direct connection to a single-user or multi-user communication network (for example PSTN, ISDN, xDSL, LAN and similar networks) NOTE 1: A port generally intended for interconnection of components of the EUT (e.g. RS-232, IEEE 1284™ [i.28] (parallel printer), Universal Serial Bus (USB), IEEE 1394™ [i.29] ("Fire Wire"), etc.) and used in accordance with its functional specifications (e.g. for the maximum length of cable connected to it), is not considered to be a wired network port under this definition. NOTE 2: See CENELEC EN 55032 [31]. NOTE 3: These ports may support screened or unscreened cables and may also carry AC or DC power where this is an integral part of the communication specification.*ZTE: Do not agree to add the wired network port as it is not valid for UE.Ericsson: Thanks Huawei for the clarification. We can continue the update of UE EMC spec without including the Wired network port. |
| [R4-2007062](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007062.zip) | Ericsson: In this CR, missing emission methods and parameters are included in the UE EMC spec (including wired port). We also add the interpretation of the measurement results.Huawei: - Similar content from ZTE: refer to ZTE CR in R4-2007527: ZTE approach of not copy-pasting limits is better (similar to what we did for other IEC specs in BS EMC).- 8.2.5 (Interpretation of the measurement results) is not covered in ZTE CR.ZTE: We prefer not to copy paste the value form referred standard so that no more maintenance work will be needed when these referred standard is updated.Ericsson: Thanks ZTE and Huawei for your input. Agree with keeping the simplification avoiding copying -pasting limits.  |
| [R4-2007063](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007063.zip) | Ericsson: Adding the definition of the wired network port as written in ETSI standard. In this CR we also suggest a correction to the UE definition according to ETSI.Huawei: - wired network: this change is specific to another CR and shall be included in the CR in 7061, if it is Agreed. - UE definition: the definitions shall be aligned among (NR) spec, if possible. Is this modification sourced from other specification?ZTE: Similar to 7061, it should be merged.Ericsson: See our comment above about Wired Network Port.UE definition takes as reference the ETSI definition. Our concern is what will happen to the EUTRA UEs that can operate in the NR context if we take the new UE definition proposed by Huawei in one of the CRs? |
| [R4-2007064](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007064.zip) | Ericsson: In this CR, missing immunity methods and parameters are included in the UE EMC spec. We see a difference in the vehicular environment section presented by ZTE.Huawei: - same change in multiple ZTE CRs- The same comments as to ZTE CRs apply. - some editorial corrections (drafting rules)ZTE: Additional vehicle requirement should be added as per ZTE’s CR.Ericsson: Agree with incorporating vehicle requirement proposed by ZTE. |
| [R4-2007065](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007065.zip) | Ericsson: Editorial CR adding the corresponding references to a text proposed by Huawei in the previous meeting. We see Huawei in R4-2007444 updated these referencesHuawei: the same change as in the update of the Endorsed CR from Huawei in R4-2007444.ZTE: We have also proposed changes for reference.Ericsson: OK to keep the changes proposed by Huawei in the update of the endorsed CR. |
| [R4-2007066](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007066.zip) | Ericsson: Proposing to reuse the spurious emissions limits defined in the UE RF spec. Huawei: - related to issue 1-2.- Huawei CR from previous meeting re-submitted in R4-2007445. There are some additional corrections needed for the Scope section. - ZTE CR in R4-2007534.ZTE: We don't agree with the method as for 36.124, SM.329 is used instead of 36.101.Ericsson: We support Huawei´s proposed CR.Huawei: it seems that we need to analyze what is the read delta among those two approaches, and what is really missing for the IMT submission. If we refer to SM.329, some band-specific aspects will not be considered. |
| [R4-2007444](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007444.zip) | Ericsson: OK |
| [R4-2007445](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007445.zip) | Ericsson: Similar to our contribution [R4-2007066](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007066.zip)Huawei: there are some additional corrections to the Scope section needed as well, which are not included in [R4-2007066](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007066.zip). ZTE: We have different proposal for RE requirement in our 7543Ericsson: See our comment above on supporting Huawei´s CR. |
| [R4-2007446](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007446.zip) | Ericsson: Similar to our contribution R4-2007060 but we extend the EB to 100 MHz.Huawei: - Question for clarification to Ericsson: was this extension already agreed in ERM WG EMC? It seems that related -52 update for NR is not yet published. - Only one of the CRs (7060, 7446, 7533) can be proceeded – otherwise this would result in changes on changes.ZTE: Depends on the discussion of RX exclusion band, as similar comments in 7060 for considering the CCSA requirement as well.Ericsson: We can withdraw this contribution. |
| [R4-2007447](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007447.zip) | Ericsson: OK |
| [R4-2007448](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007448.zip) | Ericsson: OK |
| [R4-2007527](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007527.zip) | Ericsson: Similar to our contribution R4-2007062, difference we declare the wired network port and include tables with some limits.Huawei: - text seems to be based on TS 36.124. For clarification purposes, it shall be discussed why the following statements were removed (i.e. not included in this CR): 8.3.2: "The measurement receiver shall be in accordance with the requirements of section one of CISPR 16 1 [14]."8.4.2: "Mains connected ancillary equipment which is not part of the EUT shall be connected to the mains via a separate LISN. According to subclause 11.9 of CISPR 16 1 [14], the Protective Earth (PE) wire shall also be terminated by a 50 \*//50 \*H common mode RF impedance."- there is some concern whether this test is really applicable and needed to teh NR UE, as the preconditions for this test is "DC cables longer than 3 m". Even for CPE type of NR UE, this is kind of deployment is rather low probability. Probably it would be good to to least have some clarification note in the TS explaining why such tests are listed at all. - LISN to be added to the list of abbreviations- some editorials - revision neededZTE: For Huawei’s comment:CISPR 16-1 is removed and only CISPR 32 is referred because the CISPR 16-1 is already in the CISPR 32 so we remove it.Huawei: fine to update the reference, but the whole sentences were removed. Shall we keep those removed sentences, but with the updated referenes? |
| [R4-2007528](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007528.zip) | Ericsson: Similar to our contribution R4-2007064Huawei: - there is no Annex A in the spec, while the CR refers to it.- hanging paragraph to be fixed (drafting rules) |
| [R4-2007529](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007529.zip) | Ericsson: Similar to our contribution R4-2007064Huawei: - hanging paragraph to be fixed (drafting rules) |
| [R4-2007530](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007530.zip) | Ericsson: Similar to our contribution R4-2007064Huawei: - hanging paragraph to be fixed (drafting rules) |
| [R4-2007531](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007531.zip) | Ericsson: Similar to our contribution R4-2007064Huawei: - hanging paragraph to be fixed (drafting rules)- Cat.B CR to Rel-15 is not allowed. Shall be Cat F.- same change in Ericsson CR in 7064Ericsson; In general, there should be an agreement on how to incorporate all the changes in the spec. Our proposal is to use only one Tdoc where all the modifications are included. We propose to reuse Ericsson’s with the corresponding simplification in the references and limits. ZTE can cosource this contribution. |
| [R4-2007532](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007532.zip) | Ericsson: Adjustment in the references OK. Important to see the impact on other CRs.Huawei:- As the Endorsed content is submitted by the proponents for Agreement in a separate CR, we need to avoid changes on changes as not to confuse MCC during implementation. Probably the best options is to keep the Endorsed CR and the new modifications as two independent CRs, and not to mix the content. - ISO 7637 Part 1 [14] reference was deleted, while it is used in the text. |
| [R4-2007533](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007533.zip) | Ericsson: OKHuawei: - there is also a proper CR from Huawei resubmitted in 7446, based on the Endorsed content. - there is also Ericsson CR correcting the offset value in 7060.- technical corrections seems OK, but the implementation is not consistent (some symbols still to be corrected in that CR)- Only one of the CRs (7060, 7446, 7533) can be proceeded – otherwise this would result in changes on changes.Ericsson: It is better to align in one CR all the proposed changes |
| [R4-2007534](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007534.zip) | Ericsson: It differs from our approach.Huawei: - based on drafting rules, it is not allowed to re-number the tables in the TS which is under change control. - lower edge of the spur range: agree that the 30MHz shall be the lower end of the spur range for the RE, as per SM.329. Still, in case of BS type 1-O, the lower limit was kept as 9kHz (as it was felt that the SM.329 is not the only reasoning here), while for FR2 is starts from 30MHz. Anyway, this 9kHz corrections requires alignment with the RF spec, i.e. the modification in the dCR Endorsed last meeting was based on the TS 38.101. Before proceeding with this CR, we need to somehow check with the UE RF group on such modification - probably a discussion paper would be needed to explain it. - this particular CR is change on change, which is not allowed. The Huawei CR in R4-2007445 shall be revised to address such corrections, if agreed.Ericsson: Our suggestion is to take CR in R4-2007445 proposed by Huawei as base for discussion. We also think that the alignment with the UE RF spec is necessary. |
| [R4-2007535](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007535.zip) | Ericsson: Similar to our contribution R4-2007064Huawei: hanging paragraph to be fixed (drafting rules) |
| [R4-2007536](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007536.zip) | Ericsson: We are open to discuss the source of this update.Huawei: - instead of copy-pasting content from the ISO specs, it is suggested to simply refer to them - same as we did for other IEC standards already. - hanging paragraph to be fixed (drafting rules)- please note, that TS 38.101-1 included the following definition: "Vehicular UE: A UE embedded in a vehicle, permanently connected to an embedded antenna system that radiates externally for NR operating bands.NOTE: Vehicular UE does not refer to other UE form factors placed inside the vehicle.". We shall clarify is this is also applicable to the EMC spec here.Ericsson: OK with the update. |

Moderator: It is proposed to split the work to finish the whole spec based on the submitted CRs and discussion.

## 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:*No tentative agreement for 1st round.*Candidate options:*Option 1:100MHzOption 2:85MHzOption 3: max supported channel bandwidth*Recommendations for 2nd round:*To further discuss. If no consensus can be reached, recommend to choose option 2. |
| **Sub-topic#2** | *Tentative agreements:*To agree option 2 *Candidate options:*Option 1: Use ITU-R SM.329 requirementOption 2: Use spurious emission requirement of UE RF *Recommendations for 2nd round:*To agree option 2 and focus on the CR. |
| **Sub-topic#3** | *Tentative agreements:*Reuse the methods and requirements from TS 36.124*Candidate options:**Recommendations for 2nd round:*To focus on the CR. |
| **Sub-topic#4** | *Tentative agreements:*Reuse the methods and requirements from TS 36.124*Candidate options:**Recommendations for 2nd round:*To focus on the CR. |
| **Sub-topic#5** | *Tentative agreements:*To agree the vehicular environment requirement and reference update*Candidate options:**Recommendations for 2nd round:*To focus on the CR. |
| **Sub-topic#6** | *Tentative agreements:*Do not add the wired network port to the TS.*Candidate options:**Recommendations for 2nd round:*Note the discussion paper and corresponding CR. |

*Recommendations 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 provides recommendation on CRs/TPs Status update*

Moderator: As many companies have submitted CRs this meeting, for work split perspective, a basic principle to treat these CRs is Ericsson to take the chapter 8 emission requirements and ZTE to take the chapter 9 immunity requirements. Other chapters and CRs are assigned per tdoc basis.

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| [R4-2007060](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007060.zip) | Revised. Depends on the conclusion of subtopic 1-1, if any consensus can be reached then focus on the CR otherwise it will be noted. |
| [R4-2007061](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007061.zip) | Noted. |
| [R4-2007062](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007062.zip) | Revised.Ericsson to take care of the chapter 8 emission requirements. RE requirement will be treated in Huawei’s paper R4-2007445. |
| [R4-2007063](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007063.zip) | Noted |
| [R4-2007064](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007064.zip) | Noted. |
| [R4-2007065](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007065.zip) | Noted.As similar change has been proposed and endorsed by Huawei R4-2007444. |
| [R4-2007066](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007066.zip) | Noted.The RE requirement will be corrected in Huawei paper R4-2007445. |
| [R4-2007444](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007444.zip) | Agreed. |
| [R4-2007445](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007445.zip) | Revised.To further find the delta between current UE spurious emission requirement and the requirement of SM.329. If no, the original CR can be agreed. |
| [R4-2007446](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007446.zip) | Revised.Depneds on the 2nd round discussion for subtopic 1-2. If no conclusion reached, suggest note this CR. |
| [R4-2007447](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007447.zip) | Agreed. |
| [R4-2007448](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007448.zip) | Agreed. |
| [R4-2007527](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007527.zip) | Noted.Chapter 8 requirements will be corrected in Ericsson’s R4-2007062. |
| [R4-2007528](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007528.zip) | Revised |
| [R4-2007529](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007529.zip) | Revised |
| [R4-2007530](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007530.zip) | Revised |
| [R4-2007531](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007531.zip) | Revised |
| [R4-2007532](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007532.zip) | Revised.To take care of reference part and align with the endorsed content last meeting. |
| [R4-2007533](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007533.zip) | Noted.Depends on the result of R4-2007446. If agreed, Huawei to merge the correction of this CR. |
| [R4-2007534](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007534.zip) | Noted.To take R4-2007445 to the RE requirement. |
| [R4-2007535](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007535.zip) | Revised. |
| [R4-2007536](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007536.zip) | 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: 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** |
| R4-2007058 | Ericsson | Proposal 1: To agree in using only TC 21 and 22 defined in TS 37.141 [3] for EMC testing of MSR BS as presented in this contribution.  |
| R4-2007449 | Huawei | **Proposal 1**: agree on the introduction of the direct field strength measurement for the EMC Radiated Emissions requirements of the *BS type 1-C* and *BS type 1-H* in TS 38.113.  |

## Open issues summary

The open issue are summarized as:

* Test configuration reduction
* Direct field strength measurement test method

### Sub-topic 2-1

*Sub-topic description:*

Test configuration reduction is proposed by Ericsson.

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

**Issue 2-1: Test configuration reduction.**

* Proposals
	+ Option 1: To agree in using only TC 21 and 22 defined in TS 37.141 [3] for EMC testing of MSR BS as presented in this contribution
	+ Option 2:
* Recommended WF

### Sub-topic 2-2

*Sub-topic description*

Direct field strength measurement test method has been proposed by Huawei.

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

**Issue 2-2: Direct field strength measurement test method**

* Proposals
	+ Option 1: To agree the introduction of the direct field strength measurement for the EMC Radiated Emissions requirements of the *BS type 1-C* and *BS type 1-H* in TS 38.113.
* Recommended WF

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Ericsson | Sub topic 2-2: To use EM field strength measurement as an alternative to substitution method is a commonly used praxis today (test labs, ANSI). It seems ok. |
| Huawei | - We see the evolving concept being resubmitted for number of meetings, with no proper agenda allocated: this is MSR proposal while it is submitted to the NR agenda. - We are still wondering how EMC emissions testing can be reduced based on such assumptions. This topic can be compared to the RF TRP measurements: wo do NOT know where the largest emissions will occur. - "This makes it necessary to repeat several times testing procedures in order to cover all the possible combinations." - do not fully agree with this statement. TC discussion for RF took long time to optimize then and remove redundancies. - O4: "The mode(s) that produce(s) the highest emissions could be selected for the final measurements." Clarification is needed on how to select the mode which produces the highest emissions.- drawing any conclusions in the EMC emissions area based on single product assumptions/measurements is not seen as the agreeable way forward.  |
| ZTE | Subtopic 2-1: The proposal as only use TC21/TC22 to cover all the MSR cases seems not agreeable. If a MSR BS supports only UTRA+E-UTRA, how can we use TC21/TC22 to this base station? We think some of the concept can be further discussed but it seems too early to draw any conclusion.Subtopic 2-2: As we explained last meeting, this seems not be a new test method. For me, it is more like a calculation to metric transmission. The field strength measurement can be one middle step of the power measurement. Also when we compare the current RF test method, for different test method, it will not have influence on the core requirement so that the requirement can be compared for each test method. We have concern on changing the core requirement. |
| Nokia, Nokia Shanghai Bell | Sub-topic 2-1: Issue 2-1: Test configuration reductionThe intention of the contribution is clear, which is to reduce test time as complexity in EMC testing is increasing. However, the methodology used to reach TC 21 and TC 22 needs further elaboration and analysis. The open question is whether the selected TC, which are TC 21 and TC 22, are a good representative. Sub-topic 2-2: Issue 2-2: Direct field strength measurement test methodReferring to the paper, there is only one sentence concerning test site validation: “The direct radiated field strength measurement is required to be performed on a validated test site in accordance with CISPR 16 [3] or ANSI C63.4 [5].”Further details and discussions are needed instead of just making references to CISPR 16 and ANSI C63.4.  |
| Huawei | To reply ZTE on 2-2: We have replied to the very same comment in the related discussion paper. We do not care if this is called a “new test method” or not. The motivation behind the proposal was presented for multiple meetings, and it was recognized as practical way to ease testability, at least in some cases. This proposal is to ease the testing and allow time reduction – therefore we are wondering where the ZTE concern is coming from. First you say that this is modification of the “calculation to metric transmission” and then you claim that this is “changing the core requirement” – this is somehow contradicting and we are not sure what is the ZTE concern here. Comparison to the RF test methods: please note, that for some requirements (i.e. OOB blocking), we also consider translation from the power level to the field strength, e.g. TS 38.141-2, clause 7.6.5, Table 7.6.5.1.1-1:*The RMS field-strength level in V/m is related to the interferer EIRP level at a distance described as , where EIRP is in W and r is in m; for example, 0.36 V/m is equivalent to 36 dBm at fixed distance of 30 m.*The core requirements is not modified and it is just different metric to measure it. This was clearly explained and backed by the references to EMC standards. To reply Nokia on 2-2: The approach of referring to the external standards is done on purpose in order to avoid unnecessary copy-pasting from external standards to RAN4 specs – such approach creates spec maintenance issues. It would be good to clarify Nokia’s concern: is it related to the lack of details provided in the CR, or some background motivation for such reference? Maybe we can try to provide more details.  |
|  |  |
|  |  |

### 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** |
| R4-2007059 | Ericsson contribution endorsed in the previous meeting. |
| Huawei: - as commented last meeting, we would like to take this opportunity to further clarify the text (i.e. not to give impression that the RC is actually the only test method considered now) - revision is proposed. We will share proposed revision ASAP.- as it needs to be revised anyway: there are deletions of the text which was introduced in this CR - this shall be cleaned up. - cover page: title say Draft CR. |
| Ericsson: We can take the revision. |
| Nokia, Nokia Shanghai Bell: OK |
| R4-2007450 | Ericsson: We are OK with the CR. |
| ZTE: Same comment on the discussion paper. |
| Nokia, Nokia Shanghai Bell: The same comments as for R4-2007449. There is only one sentence about test site validation. The CR should capture the outcome of any future discussions on this issue. The CR is not clear. |
| R4-2007547 | Moderator: Need to add Ericsson as co-source |
| Ericsson: We are OK with the CR. |
| Huawei: - as commented last meeting, we would like to take this opportunity to further clarify the text (i.e. not to give impression that the RC is actually the only test method considered now) - revision is proposed. We will share proposed revision ASAP.- as it needs to be revised anyway: there are deletions of the text which was introduced in this CR - this shall be cleaned up. - Huawei comments from previous meeting were not fully addressed: section 9.2.2 already exists but it is marked with Track Changes.- CatB CR not allowed to Rel-15. Shall be Cat. F. Please check with MCC if in doubt about this. |
| ZTE: We can take the revision. |
| Nokia, Nokia Shanghai Bell: OK |
| R4-2007549 | Moderator: Need to add Ericsson as co-source |
| Ericsson: It would be important to clarify that the RC applies only when no spatial exclusion is considered as was done in R4-2007547. |
| Huawei: - as commented last meeting, we would like to take this opportunity to further clarify the text (i.e. not to give impression that the RC is actually the only test method considered now) - revision is proposed. We will share proposed revision ASAP.- as it needs to be revised anyway: there are deletions of the text which was introduced in this CR - this shall be cleaned up. - CatB CR not allowed to Rel-15. Shall be Cat. F. Please check with MCC if in doubt about this.  |
| ZTE: We can take the revision. |
| Nokia, Nokia Shanghai Bell: OK |

## 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:*No agreement can be reached in 1st round.*Candidate options:**Recommendations for 2nd round:*Try to work on a WF to see what can be agreed.The WF should at least allocate companies concern on:1, Work item related issue as what release and which WID it should belongs to.2, How to choose the highest emission mode3, How to interpret the one-product result to all kinds of base station.4. Clearly outline the methodology that is used to decide on the number of TC which is a good representative.5. An analysis of the amount of test time reduction and complexity.  |
| **Sub-topic#2** | *Tentative agreements:*To agree the addition of field strength test method with further clarification on the test site validation.*Candidate options:**Recommendations for 2nd round:*Note the discussion paper and focus on the CR revision. |

*Suggestion on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title**  | **Assigned Company,****WF or LS lead** |
| #1 | WF on MSR base station TC reduction. | Ericsson |

### 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**  |
| R4-2007059 | Revised |
| R4-2007450 | Revised |
| R4-2007547 | Revised |
| R4-2007549 | 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

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2007054 | Ericsson | Proposal 1: The applicable requirements for EMC conducted emissions of IAB nodes are the ones defined for NR BS in TS 38.113.Proposal 2: The radiated emission requirements defined for IAB should reuse the ones defined for NR BS.Proposal 3: For OTA IAB nodes the same principle applied for the radiated emissions (the radiated emission is covered by radiated spurious emission requirement in TS 38.104 [6], conforming to the test requirement in TS 38.141-2 [7]) and reflected in TS 38.113 [11] shall be applied.Proposal 4: Frequency range for the application of RI testing shall go from 80 Mhz to 6GHz.Proposal 5: For Radiated Immunity test, the BS requirements should be applied to each enclosure while the tests should be linked at each time.  |
| R4-2007538 | ZTE Corporation | Proposal 1: Apply BS radiated emission requirement to “one enclosure TDM IAB”.Proposal 2: For FDM and SDM IAB-node with only one enclosure, radiated emission should be tested with combined requirement as shown in table 3.Proposal 3: Apply BS radiated emission requirement to each enclosure for different enclosure case and disregarding the duplex model.With the above proposals, it can be seen that a combined limit applies for one enclosure FDM/SDM IAB, and for other cases, BS radiated emission requirement apply to each enclosure of the IAB. |
| R4-2007539 | ZTE Corporation | Proposal 1: BS RI test level is applicable to all cases of IAB nodes.Proposal 2: The principle of choosing exclusion band is as for MT, use the delta foob of MT in the RF specification while for DU, use the delta foob of DU in the RF specification.Proposal 3: RI exclusion band should be chosen of the wider one of DU and MT.Proposal 4: For different enclosure case, RI exclusion band is chosen for DU and MT respectively.Based on the proposals above, it can be concluded as:-For one enclosure case, use 3V/m requirement from 80MHz--6000MHz and the exclusion band is chosen as the wider one of DU and MT. -For different enclosure case, use 3V/m requirement from 80MHz--6000MHz and the exclusion band is chosen respectively for DU and MT-The principle of choosing exclusion band is as for MT, use the delta foob of MT in the RF specification while for DU, use the delta foob of DU in the RF specification. |
| R4-2007540 | ZTE Corporation | Observation 1:Many differences of EMC core requirement will occur for IAB-node when comparing to base station. Observation 2: The IAB EMC core requirement will differ from different duplex.Observation 3: The IAB node EMC requirement will differ from enclosure perspective. Observation 4: There are a lot of potential difference for test set-up and configuration as well as performance criteria for an IAB-node.Proposal 1: To have a new TS for IAB EMC. |

## Open issues summary

The open issue are summarized as:

* Radiated emission requirement
* Conducted emission requirement
* Radiated immunity requirement
* Radiated immunity exclusion band
* How to capture the IAB EMC requirement

### Sub-topic 3-1

*Sub-topic description:*

It is agreed in the RAN4#94-bis-e meeting as to discuss the EMC requirement of IAB in 4 cases with enclosure difference and multiplex difference. Hence the requirement is discussed separately and combined together in the last as some the requirements are the same for different cases.

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

**Issue 3-1: Radiated emission requirement for IAB**

* Proposals
	+ Option 1: a combined limit applies for one enclosure FDM/SDM IAB, and for other cases, BS radiated emission requirement apply to each enclosure of the IAB.
	+ Option 2: The radiated emission requirements defined for IAB should reuse the ones defined for NR BS
* Recommended WF
	+ To agree option 1 as it follows the general discussion method agreed in the WF in RAN4#94-bis-e and discuss all the situation fully.

**Issue 3-2: Radiated emission requirement for type 1-O IAB and type 2-O IAB**

* Proposals
	+ Option 1: For OTA IAB nodes the same principle applied for the radiated emissions (the radiated emission is covered by radiated spurious emission requirement in TS 38.104 [6], conforming to the test requirement in TS 38.141-2 [7]) and reflected in TS 38.113 [11] shall be applied.
* Recommended WF

### Sub-topic 3-2

*Sub-topic description*

The conducted emission requirements are quite converged as reuse BS requirements..

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

**Issue 3-3: Conducted emission for IAB**

* Proposals
	+ Option 1: Reuse the Base station requirement for IAB for conducted emission requirements
* Recommended WF
	+ To agree option 1

### Sub-topic 3-3

*Sub-topic description*

For the test requirements, both ZTE and Ericsson have submitted discussion papers and it is quite converged to reuse base station requirements for IAB.

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

**Issue 3-4: Radiated immunity test requirements**

* Proposals
	+ Option 1: use 3V/m requirement from 80MHz--6000MHz
* Recommended WF
	+ To agree option 1

### Sub-topic 3-4

*Sub-topic description*

The exclusion band is discussed in ZTE’s paper.

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

**Issue 3-5: Radiated immunity exclusion bands**

* Proposals
	+ Option 1:

-For one enclosure case, the exclusion band is chosen as the wider one of DU and MT.

-For different enclosure case, the exclusion band is chosen respectively for DU and MT

-The principle of choosing exclusion band is as for MT, use the delta foob of MT in the RF specification while for DU, use the delta foob of DU in the RF specification.

* Recommended WF
	+ To agree option 1

### Sub-topic 3-5

*Sub-topic description*

As this is the meeting before June plenary, it is recommended companies to have final conclusion of the method to capture the IAB requirement.

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

**Issue 3-6: How to capture the IAB EMC requirement**

* Proposals
	+ Option 1: To have a new TS for IAB EMC requirement.
	+ Option 2: To capture the IAB EMC requirement in TS 38.113.
* Recommended WF
	+ To agree option 1.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Ericsson | Sub topic 3-1: On Radiated emission requirement our position is to use a limit the mode that produces the highest emission, this is one consideration that CISPR 32 also mentions. We do not think it will be easy to convince regulators about a potential relaxation in the limits, so it would be better to stay in a safe and well-known zone (the limits already defined for the BS). On the second issue (OTA), we think that the general agreement reached for OTA BS in NR can be extended to the IAB discussion.Sub topic 3-2: We agree with option 1, reusing the conducted emission requirements set for the BS.Sub topic 3-3: We agree with setting in 3 V/m the limit for Radiated Immunity testing. It is also discussed in our contribution that the frequency range should go from 80 MHz to 6000 MHz.Sub topic 3-4: We do not have for this meeting a formal position regarding the size of the exclusion band. We can come with a contribution next meeting.Sub topic 3-5: Looking at the convergence in reusing most of the BS requirements in the IAB context, we support the idea of extending the scope of TS 38.113 to cover IAB requirements.….Others: |
| Huawei | Sub topic 3-1: this is complex topic. We provide comments to ZTE contribution in 7538 here: - O1: this is good observation. Still, this shall be considered from the point of NOT potentially reducing the emissions in an artificial way (e.g. some RF Rx tests allow to turn off all the transmitters - but this is different topic of course). We need to have some basic agreements what are the potential "modes of operation" of the IAB. The SDM/TDB/FDM definitions are not included in the IAB TR so it is hard to make progress here. - test setup figure: before we introduce figure for the EMC emission testing lets have more discussion on the testability aspects - the current figure does not say much to be honest (e.g. consideration of two communications linkts, etc.) - maybe we shall re-open the discussion on teh core. vs testing issues to have some prioritization. - for the emissions requirements, it is highly suggested to wait for the conclusions from the RF room - this requirements was not concluded yet and there are some RF unwanted emissions contributions this meeting. - TDM IAB, FDM/SDM IAB: those terms are not defined in the TR so it is not clear what they are referring to.- for the single enclosure / multiple enclosures: as we commented previously this is not the preferred way forward. IAB TR 38.874, not TR 38.809 nor IAB WID does not mention such a breakdown, so it is unclear at this stage how we can introduce such split for the EMC topic itself. The TR 38.809 describes the IAB architecture (which we can try to reuse), but not the IAB enclosures. Referring to legacy BS EMC specs those were addressing multi-enclosure products with a dedicate section in the EMC spec in the following way copy-pasted below - of course it is clear that now we are analyzing more complex solution with two interfaces, but the below approach shall be considered for this discussion: TS 36.113, section 4.2.1: "4.2.1 Multiple enclosure BS solutionFor a BS with multiple enclosures, the BS part with Radio digital unit and the Radio unit may be tested separately. Communication link shall be set up in the same way as if they are in single BS enclosure. The Radio Digital unit and the Radio unit shall communicate over an interface enabling establishment of a communication link."- For sake of progress on the "enclosures": we are fine to proceed with a TP for those requirements which do not require such breakdown. For the others, we would like to continue the study and keep them as FFS outside TR.- For EMC emission requirements: for sake of alignment, we should wait for conclusions in the RF room.Sub topic 3-2 (newly added): don’t agree as this forces the reuse of TS 38.113, which is discussed in issue 3-6. And shall be concluded there first.Sub topic 3-3: agree.Sub topic 3-4: this seems to be the only option on the table and no confusion about it. OK.Sub topic 3-5: this is part of the conformance testing. We prefer more study.Sub topic 3-6: we see the same comments for number of meetings. We need to set the deadline for this discussion. Last meeting, two companies preferred to create a new spec. IAB is not a BS – it’s a new product. We tend to agree to have a new spec (some aspects will be reused from NR BS, but there are many new aspects to be included – merging with TS 38.113 is not see as straightforward solution.)- there are no real benefits of merging it to NR BS EMC in TS 38.113.- We can expect that the next step for IAB will be a "mobile IAB", which can make the situation even more complicated if we will stick to TS 38.113. - whatever the WF is, we shall finally make the decision as the timeline is concerned. - we tend to agree with ZTE proposal, unless some more arguments are brought to the discussion. |
| ZTE | Subtopic 3-1: Thanks for the constructive comments. Issue 3-1: The discussion proposed by ZTE is based on the WF agreed in the last meeting. We provided full discussion on different scenarios or we say cases. Based on the comments received as well as some contribution, we think the following can be agreed although it is conformance issue.Two links at one test. (As Ericsson proposed the highest emission and Huawei commnet on the figure).Some further check issue as:1, FDM/SDM or TDM reference. This is in the WID of IAB as well as the IAB TR 38.874 but to be honest the definition is not there.2, RF requirement. We agree to wait for the RF requirement come out first before referring to it. Especially the OTA cases.3, Enclosure used in the TS. The enclosure used in TS 36.113 actually in our mind reflect what we want to treat these enclosure cases. Especially for different enclosure, “test separately” is our proposal. I heard that the deadline would be expanded so for specific requirement, we can wait for RF requirement to be finished first.Issue 3-2, As commented in issue 3-1, this principle need to be postponed until some clear RF requirement comes out.Subtopic 3-2: Seems quite converged with the WF.Subtopic 3-3: Seems quite converged with the WF.Subtopic 3-4: The exclusion band is treated as core part during NR study so we think better to consider this in IAB core, too. If companies can provide further comments within this meeting can help a lot.Subtopic 3-5: We agree with Huawei. For Ericsson, the feeling that re-using BS requirement for IAB is just because currently in this stage, what we can agree is some of the requirements to re-use BS requirement. However, there are still left as RE and RI requirement are under discussion and it seems reusing the BS requirement is not a proper way. Still no new argument from Ericsson to prevent the new TS request.For the timeline issue, we think this meeting is quite emergency to have conclusion. To make decision this meeting so that we can move on in the June planery and work can be prepared during June and July. Otherwise the conclusion will left to September than we cannot meet the core requirement timeline. Please Ericsson to show strong enough argument on this issue.  |
| Ericsson | On the RF requirement, we agree with waiting for a decision on the RF side. I understand that this topic, including OTA, is going to be covered in this meeting.Agree with conducted requirements as well as with the RI frequency range and interferer levels.Exclusion bands might be impacted by the architecture decisions. We have mentioned to prepare a contribution for the next meeting. So, we prefer to wait for now.To continue with the progress of the discussion, and considering the input shared by Huawei about future cases for IAB, we agree on creating a new spec for IAB EMC.Regarding the TPs, we think it would be possible to cosource the Tdocs based on a combined input that takes into account the observations shared by Huawei. |
| Nokia, Nokia Shanghai Bell | General remarks:Regarding single vs. multiple enclosures, our expectation is that RF specification will not differentiate between these implementation options as RF specification is agreed to be implementation agnostic. Currently TR 38.809 section 4.5 talks about HW entities, saying that the HW entities of IAB-MT and IAB-DU may be implemented as completely shared or completely separate, or something in between. It is also stated that it is important to consider both implementations so that both can be implemented if required.Therefore, we see that it is important that EMC specification will enable also the implementation option of completely separate HW entities, which using EMC terminology translates to separate enclosures.Sub-topic 3-1: Issue 3-1: Radiated emission requirement for IABRefer to the general remarks above. Further discussions are needed.Sub-topic 3-1: Issue 3-2: Radiated emission requirement for type 1-O IAB and type 2-O IABThe same principle as OTA AAS and NR BS. A question for clarification: How does this issue relate to Issue 3-1?Sub-topic 3-2: Issue 3-3: Conducted emission for IABIt is OK.Sub-topic 3-3: Issue 3-4: Radiated immunity test requirementsWhy there are no other options in the proposal?Sub-topic 3-4: Issue 3-5: Radiated immunity exclusion bandsRefer to the general remarks above. Further discussions are needed.Sub-topic 3-5: Issue 3-6: How to capture the IAB EMC requirementNo strong preference.  |

### 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.*

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| **CR/TP number** | **Comments collection** |
| R4-2007055 | Ericsson: This TP proposes to reach agreements on the radiated emission limits (reusing BS requirements) and the way to handle this requirement for OTA IAB. It also proposes a text on a potential agreement on how conducted emissions will be handled. |
| Huawei: - see all the comments to 7054. - we do not need to list requirements in the TR. Reference is sufficient. - there is large piece of text with the basic descriptions of the requirements - this is not needed in the TR. - there is no such thing as "BS limits " for the Emissions: those are rather SM.329 limits.- "According to this definition IAB-DU and IAB-MT requirements can be grouped within the modes of operation of an IAB node." are you proposing this or not? "can" is open ended. - the last sentence on the NR BS needs rewording - we need concrete conclusion on the EMC RE requirement for the IAB, not repeating on principles from NR BS. Revision is needed here. |
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| R4-2007056 | Ericsson: This TP proposes to reach agreements on the way immunity testing can be handled. We propose to use the frequency range 80 MHz – 6GHz radiated emission limits (reusing BS requirements) and the way to handle this requirement for OTA IAB. It also proposes a text on a potential agreement on how conducted emissions will be handled. |
| Huawei;- there is already an "EMC immunity requirements" section in the TR. Intention of this TR is to be clarified. - there is large piece of text with the basic descriptions of the requirements - this is not needed in the TR. |
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| R4-2007057 | Ericsson: This TP presents a summary of the potential agreements reached in the EMC IAB area,  |
| Huawei: - part of this TP is actually on Immunity requirements, which are already captured in the TR. Please reassure that there is no repetition. - if you want to compare UE and BS limits, please provide references, or some comparison table. - this is hanging paragraph (drafting rules) |
|  |
| R4-2007541 | Ericsson: Our main concern is on the definition of the Radiated Emission limits. We propose to reuse the BS existing ones. This TP does not include any mention on the way to handle OTA cases. |
| Huawei: - if possible, lets use the principle that the requirements itself are not defined in the TR (those belong to TS).- the TP is not the TR-style, e.g. it captures such statements (probably from the discussion paper): "Here the proposal is similar as our last meeting contribution[2]."- see comments to the discussion on the Emission requirements in 7538- TDM IAB, FDM/SDM IAB: those terms are not defined in the TR so it is not clear what they are referring to.- for the single enclosure / multiple enclosures: as we commented previously this is not the preferred way forward. IAB TR 38.874, not TR 38.809 nor IAB WID does not mention such a breakdown, so it is unclear at this stage how we can introduce such split for the EMC topic itself. The TR 38.809 describes the IAB architecture (which we can try to reuse), but not the IAB enclosures. Referring to legacy BS EMC specs those were addressing multi-enclosure products with a dedicate section in the EMC spec in the following way copy-pasted below - of course it is clear that now we are analyzing more complex solution with two interfaces, but the below approach shall be considered for this discussion: TS 36.113, section 4.2.1: "4.2.1 Multiple enclosure BS solutionFor a BS with multiple enclosures, the BS part with Radio digital unit and the Radio unit may be tested separately. Communication link shall be set up in the same way as if they are in single BS enclosure. The Radio Digital unit and the Radio unit shall communicate over an interface enabling establishment of a communication link."- For sake of progress on the "enclosures": we are fine to proceed with a TP for those requirements which do not require such breakdown. For the others, we would like to continue the study and keep them as FFS outside TR.- For EMC emission requirements: for sake of alignment, we should wait for conclusions in the RF room. |
|  |
| R4-2007542 | Ericsson: We agree on the RI frequency range and the interferer level. Still for discussion the analysis on the exclusion bands. |
| Huawei: - if possible, lets use the principle that the requirements itself are not defined in the TR (those belong to TS).- the TP is not the TR-style, e.g. it captures such statements (probably from the discussion paper): "Here the proposal is similar as our last meeting contribution[2]."- see comments to the discussion on the Immunity requirements in 7539- TDM IAB, FDM/SDM IAB: same comment as to 7541.- for the single enclosure / multiple enclosures: same comment as to 7541- test setup figure: before we introduce figure for the EMC RI testing lets have more discussion on the testability aspects (including the RF room) - the current figure does not say much to be honest (e.g. consideration of the exclusion zones, exclusion bands, consideration of two communications linkts, etc.) - maybe we shall re-open the discussion on teh core. vs testing issues to have some prioritization. - we would be ok with such starting point: "use 3V/m requirement from 80MHz--6000MHz and the exclusion band is FFS (conformance part)" |
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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****Radiated emission** | *Tentative agreements:*To wait and see the RF requirement outcome first and then discuss the EMC RE requirement.*Candidate options:**Recommendations for 2nd round:*To capture some agreements in the WF. |
| **Sub-topic#2****Type 1-O and 2-O IAB RE requirement** | *Tentative agreements:*To wait and see the RF requirement outcome first and then discuss the EMC RE requirement.*Candidate options:**Recommendations for 2nd round:*To capture some agreements in the WF. |
| **Sub-topic#3****Conducted requirement** | *Tentative agreements:*Agree to reuse the base station frame work.*Candidate options:**Recommendations for 2nd round:*Focus on the TP to TR. |
| **Sub-topic#4****RI requirement** | *Tentative agreements:*Agree to reuse 3V/m with 80--6000MHz range.*Candidate options:**Recommendations for 2nd round:*Some clarification is needed per Nokia’s comment.Focus on the TP to TR. |
| **Sub-topic#5****Exclusion band** | *Tentative agreements:*To be further discussed next meeting.*Candidate options:**Recommendations for 2nd round:*Note the discussion paper and further discuss next meeting |
| **Sub-topic#6****How to capture the IAB EMC requirement** | *Tentative agreements:*To have a new TS for IAB EMC requirement..*Candidate options:**Recommendations for 2nd round:*To capture this agreements in the WF. |

*Suggestion on WF/LS assignment*

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

### CRs/TPs

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

Moderator: For work split perspective, Ericsson to take the emission requirement while ZTE to take the immunity requirement TP to TR and note all the other papers.

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| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| R4-2007055 | Revised |
| R4-2007056 | Noted |
| R4-2007057 | Noted |
| R4-2007541 | Noted |
| R4-2007542 | 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*

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| **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”* |