**3GPP TSG-RAN WG4 Meeting # 96-e-Bis R4-2012718**

**Electronic Meeting, 17 – 28 August, 2020**

**Agenda item:**  4.4.1

**Source:** Moderator (Ericsson)

**Title:** Email discussion summary for [96e][302] NR\_maintenance\_RF\_BS

**Document for:** Information

# Introduction

The BS RF core spec TS 38.104 is stable in Rel-15 and Rel-16 and there are few contributions in this area. Contributions were submitted within the following Topics:

1. EESS protection
2. Introduction of new BS capability set in AAS specs
3. Other maintenance
4. CEPT/ECC recommendation for receiver parameters

Topic #1 to #3 include CRs for corrections, while topic #4 is only for discussion.

# Topic #1: EESS protection (23.6 – 24 GHz)

## Companies’ contributions summary (CRs)

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| **T-doc number** | **Company** | **Title / Proposal** |
| R4-2010762R4-2010763 | NEC | **CR to TS 38.104: OTA receiver spurious requirements for EESS protection**Summary of change: It is made clear that additional OTA receiver spurious requirements may be applied. |
| R4-2010764R4-2010765 | NEC | **CR to 38.141-2: Additional requirements for EESS protection (rel-15)**Summary of change: It is made clear that additional OTA receiver spurious requirements may be applied.Deleted the TT values for OTA OBUE and OTA TX spurious for EESS protection in the table for FR1, and added them in the table for FR2. |

## Companies views’ collection for 1st round

### CRs/TPs comments collection

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| **CR/TP number** | **Comments collection** |
| R4-2010763R4-2010765 | **Moderator:** These two are Cat A CRs and should not have been submitted in advance of the meeting. We will at this time only take comments on the two Cat F CRs. |
| R4-2010762 | Nokia: It remains unclear where the addition OTA receiver spurious emission requirements refer to as there is no separate clause for those. Could use “the following requirement may be applied for protection of EESS and for BS operating in frequency range….” |
| **Ericsson:** Additional requirements in general are not mandatory, since they apply regionally. The specific limits for EESS are however global and can be stated as a mandatory requirement. The cover page should be updated accordingly, while the body of the CR is correct. |
| Huawei: it was observed that for FR2 section 10.7.3 in this CR the additional (regional/optional) requirements are addressed, while for FR1 in clause 10.7.2 they are not, i.e. for FR1 there is no sentence pointing to Additional requirements in 9.7.5.2.4 (additional requirements or FR1 Tx spur). Even though this may be seen as out of scope of this CR, it is suggested to add similar statement to 10.7.2. Otherwise, we can provide related CR next meeting for FR1 alignment.  |
| NEC: Thanks Nokia, Ericsson, and Huawei for comments. I would like to accept comments by Nokia. To Ericsson, I think we can regard EESS protection as additional requirements. Otherwise, we shall modify the text in tx spurious, etc. Ok to update cover page.To Huawei, do we also need to address protection of the BS receiver and co-location with other BS? How about conducted requirements? In RAN4#94e-bis, clarification of the applicable period of OBUE and TX spurious emissions requirements was discussed. I understand current spec is based on option C in "summary for 1st round".*Option C: Assume without clarification that Tx spurious apply for Tx ON and OFF. Add EESS limits to Tx Spurious and OBUE only. Add a reference in Rx spurious section to Tx spurious for the additional limits (not specifically EESS).*I think we need discussion on this issue. |
| R4-2010764 | Nokia: It remains unclear where the addition OTA receiver spurious emission requirements refer to as there is no separate clause for those. Could use “the following requirement may be applied for protection of EESS and for BS operating in frequency range….” Moreover, in Annex C.1 the TT table error does not exist in rel-16 specification. |
| **Ericsson:** The first statement about “additional requirements” may be ambiguous here, since the clause contains a mix of the general test requirements and the “additional” requirements, in this case only EESS protection. Strictly speaking, this CR is not needed, except fo the TT correction in Annex C.1. |
| Huawei: similar comment as for the core spec above: Rx spur FR2 section 7.7.5.2 indicates the additional (EESS only) requirement and the same happens for the Tx spur FR2 section in 6.7.5.4.5.2. However, for the Rx spur FR1 requirement does not mention additional requirements (it would be expected to refer to 6.7.5.4.5.1 for Additional Tx spur for FR1). Either we fix it together in this CR, or we can provide related CR next meeting for FR1 alignment. |
| NEC: To Nokia, we accept the commentsTo: Ericsson, we think CR is needed. We see “may” in tx spurious but “shall” in rx spurious for EESS protection. Inconsistency shall be resolved.To: Huawei, we propose to discuss the issue in the next meeting. |

## Summary for 1st round

There seems to be general consensus that the changes proposed in the CRs should go forward. The CRs should be revised for the second round, taking the following aspects into account:

* Clarify the preamble for “additional requirements” in 10.7.3 of the 38.104 CR and in 7.7.5 of the 38.141-2 CR (Nokia).
* Align cover page with proposed changes (Ericsson).

The issue pointed out by Huawei on FR1 is an open issue for discussion and is listed below for further discussion.

### Open issues

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|  | **Open issue/Status summary**  |
| **Sub-topic#1-1** | **Update of FR1 requirements with a similar sentence on “additional requirements”**There are a few options for how to solve this:* Option 0: No change for FR1 needed.
* Option 1: Update FR1 also in this CR.
* Option 2: Update FR1 with a CR to coming meeting, after further discussions.
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### CRs/TPs

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| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| R4-2010762R4-2010764 | To be **revised**. |
| R4-2010763R4-2010765 | To be **revised**.(The Category A CRs will also need to be revised, since they are already submitted.)NOTE: These CRs are presently marked “return to” but will need to be revised if the revised Rel‑15 CRs are agreeable. |

## Discussion on 2nd round (if applicable)

### Open issues

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| **Company** | **Comments** |
| Ericsson | Sub topic 1-1: Option 2 is preferred.It is correct as pointed out that there is no reference to additional requirements for FR1 from the Rx spurious requirement. Companies should consider this further until next RAN4. |
| NEC | Sub topic 1-1: Option 2 |
| XXX | Sub topic 1-1:  |

### CRs/TPs comments collection

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| **CR/TP number** | **Comments collection** |
| R4-2012580 | Ericsson: The present sentence refereeing to the requirement is confusing, since it says both “may apply” and “shall”. Since the full requirement is expressed with “shall” in the Tx section (9.7.5.3.3), it is sufficient to say “may apply” and have a reference to 9.7.5.3.3. |
| Company B |
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| R4-2012581 | Ericsson: The present sentence refereeing to the requirement is confusing, since it says both “may apply” and “shall”. This can be fixed by splitting the sentence and have the “shall” part as a separate paragraph. |
| Company B |
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## 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”* |

# Topic #2: Introduction of new BS capability set in AAS specs

Three CRs are submitted, proposing how to add new BS capability set in the AAS core and conformance specifications. This was not done in the Rel-16 Work Item MSR\_GSM\_UTRA\_LTE\_NR-Core (now closed).

The issue is quite complex and was therefore put as its own topic here.

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Title / Proposals** |
| R4-2011261 | Huawei | **CR to TS 37.105: Introduction of new BS capability set for NR+EUTRA+UTRA, Rel-16**Summary of change:- 6.6.5.2.2, 6.6.5.2.3: conducted OBUE applicability table introduced for Band Category 1, 2, 3; table headers updated- 7.4.2.1: conducted general blocking table updated - 7.7.2.1: conducted Tx IMD table updated- 10.5.2.1: OTA general blocking table updated- 10.8.2.1: OTA Tx IMD table updated |
| R4-2011262 | Huawei | **CR to TS 37.145-1: Introduction of new BS capability set for NR+EUTRA+UTRA, Rel-16**Summary of changes:- 4.9: introduction of CSA3B for UTRA, EUTRA, NR multi-RAT case.- 4.11.2.8.1.2 (ATC5a): applicabiltiy table updated with new CS- 4.11.2.8.2 (ATC5b): MSR changes reflected. Applicabiltiy table updated with new CS- 4.11.2.9, 4.11.2.10 (ATC6, ANTC6): MSR changes reflected. Power allocation section updated. - 4.11.2.13, 4.11.2.14 (ATC8, ANTC8): new section for UTRA, E-UTRA and NR multi-RAT operation- 5.2: Test configuration applicability table updated with nes CSA3B test case - 6.6.5.5.2, 6.6.5.5.3: conducted OBUE applicability table introduced for Band Category 1, 2, 3; table headers updated- 7.4.5.1.1: general blocking table updated - 7.7.5.1.1: Tx IMD table updated |
| R4-2011263 | Huawei | **CR to TS 37.145-2: Introduction of new BS capability set for NR+EUTRA+UTRA, Rel-16**Summary of changes:- 4.9: introduction of RCSA3B for UTRA, EUTRA, NR multi-RAT case.- 4.11.2.8.1.2 (ATCR5): applicability table updated with new CS- 4.11.2.8.2 (ATCR5b): MSR changes reflected. Applicabiltiy table updated with new CS- 4.11.2.9, 4.11.2.10 (ATCR7, ANTCR7): MSR changes reflected. Power allocation section updated. - 4.11.2.13, 4.11.2.14 (ATCR9, ANTCR9): new section for UTRA, E-UTRA and NR multi-RAT operation- 5.2: Test configuration applicability table updated with nes RCSA3B test case - 6.6.5.5.2, 6.6.5.5.3: conducted OBUE applicability table introduced for Band Category 1, 2, 3; table headers updated- 7.8.5.1.1: Tx IMD table updated |

## Companies views’ collection for 1st round

### CRs/TPs comments collection

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| **CR/TP number** | **Comments collection** |
| R4-2011261R4-2011262R4-2011263 | **Moderator:**Corrections needed on the CR cover pages:* The related work items must all be for the same release, in this case Rel-16.
* This is maintenance CR for closed Rel-16 Work items and cannot be Category B.

CR body:* There should be no overlapping change marks. Please make sure to clean up any updated versions and only have single changes.
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| R4-2011261R4-2011262R4-2011263 | **Ericsson:** The AAS specs were never included as part of the work item MSR\_GSM\_UTRA\_LTE\_NR-Core/Perf. Inclusion of the new CS could however be reasonable, if the changes are straightforward and non-controversial, and can be completed in one meeting cycle.The CRs presented are quite complex, where in addition to the new CS and related applicability, there are four new test configurations and updates to a number of existing TCs, plus updates and new applicability tables for OBUE(UEM), blocking and IM requirements. They are also at the moment presented with overlapping change marks, which makes the review more complex.For this reason, Ericsson proposes that companies will have until the next RAN4 to form an opinion on the topic of introducing the new BS capability set for AAS BS. If agreeable, there would still be two meetings for preparing and agreeing on Category F CRs until November. |
| Huawei: as pointed by Ericsson above and indicated in the CR cover page, the AAS specs were not included in the MSR\_GSM\_UTRA\_LTE\_NR-Core/Perf WI. Still, it was found that the referred WI has impacted OBUE and blocking requirements, which affect the AAS BS specifications. Therefore it is seen necessary to update AAS specifications as well. The WI codes used may require corrections – this may need to be consulted with MCC as well.CR category: the motivation for CatB was that this is new feature for AAS spec, but I tend to agree with the comment that CatB shall not be used for the closed WI. Again, this may need to be consulted with MCC as well. For the “overlapping change marks”: this approach was used on purpose to show the reader how the final content of the CR was achieved. This was found important for tracing back the new text, especially in such large CR. In order to give companies more time to review such heavy CRs, we may also consider to seek for Endorsement of the (revised) CRs (instead of Agreement), and to provide the final Rel-16 version next meeting. This depends on the feedback from companies.  |
| M**oderator**: The previous moderator comment on the work item and category on the CR cover page already come from MCC, after checking the cover page with the secretary. The comment on overlapping change marks is also from MCC. |
| **Ericsson:** As pointed out by Huawei, there is indirect impact on the AAS specification already now through references. This will probably need a CR to fix, regardless of whether a new CS is added or not. |

## Summary for 1st round

### Open issues

The complexity of the changes presented in the CR were brought forward, plus the notion that the specifications impacted were not listed in the original Rel-16 work items (MSR\_GSM\_UTRA\_LTE\_NR-Core/Perf , now closed). Further discussion in the second round is encouraged before the CRs are presented for approval.

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|  | **Status summary**  |
| **Sub-topic#2-1** | **Proposal to include new CS and TCs in AAS core and conformance specifications*** Option 1: Approve revised versions of the CR at this RAN4 meeting, after resolving open issues.
* Option 2: Endorse or revised versions of the CRs and return to final CRs at coming meeting.
* Option 3: Return to the topic with new CRs at coming meeting.
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| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| R4-2011261R4-2011262R4-2011263 | To be **revised**. |

## Discussion on 2nd round (if applicable)

### Open issues

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| **Company** | **Comments** |
| Ericsson | Sub topic 2-1: Option 3 is preferred.The CRs are quite complex and the lack of feedback from companies could be a sign that it is difficult to have time for a proper review at this meeting. We propose to return to the topic at next RAN4. |
| XXX | Sub topic 2-1:  |

### CRs/TPs comments collection

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| **CR/TP number** | **Comments collection** |
| R4-2012582 | Company A |
| Company B |
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| R4-2012583 | Company A |
| Company B |
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| R4-2012584 | Company A |
| Company B |
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## 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”* |

# Topic #3: Other maintenance (CRs)

Topics covered by submitted CRs related to maintenance (Rel-15 & Rel-16):

* Clarification on calculation pf step frequencies in TR 38.817-02
* Correction of co-location requirement (core + conformance)
* NB-IoT bands (Band n26)

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Title / Proposals** |
| R4-2011186 | Nokia, Nokia Shanghai Bell | **CR to TS 38.817-02: Clarification on calculation of step frequencies for defining the Category B radiated Tx spurious emission limits in FR2**Summary of change:Clearly explain how to calculate the step frequencies for defining the Category B radiated Tx spurious emission limits in FR2 for future reference when the limits are applicable to other bands. |
| R4-2010178R4-2010179 | Ericsson | **CR to TS 38.104: Correction of co-location requirement table in subclause 7.5.3**Summary of change:The table heading for wanted power signal leval is corected to apply for WA, MR and LA BS. |
| R4-2010834 | Dish | **Correction to NB-IoT Bands with n26 (38.104)**Summary of change:Addition of n26 to the list of NR bands for NB-IoT. |

## Companies views’ collection for 1st round

### CRs/TPs comments collection

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| **CR/TP number** | **Comments collection** |
| R4-2011186 | **Ericsson:** While this change may not be completely necessary, we should give background calculations for all steps in 38.104 if we do it, including the steps in Table 10.7.3‑2 .That can either be done in the same clause, or perhaps in clause 10.7.3 of TR 38.817-02.Nokia response: We assume this comment is on R4-2011186 instead of R4-2010762, we are ok to include the background calculation for the steps in Table 10.7.3-2 of TS 38.104 in clause 10.7.3 of TR 38.817-02 in the revised CR. |
| Huawei: Step frequencies derivation seems good idea. The table heading to be corrected to meaningful text. Note 2 shall not be limited to step 3 and 4, as Wb is used for derivation of all the steps.Nokia response: Agree both points on the table heading and note, will correct in the revised CR. |
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## Summary for 1st round

### Open issues

R4-2011186 will need a revision to take the comments given into account. The other CRs are agreeable.

### CRs/TPs

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| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| R4-2011186 | To be **revised**. |
| R4-2010178R4-2010179 | Agreeable. |
| R4-2010834 | Agreeable. |

## Discussion on 2nd round (if applicable)

### CRs/TPs comments collection

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| **CR/TP number** | **Comments collection** |
| R4-2012585(rev ofR4-2011186) | **Ericsson:**As pointed out in the first round, the calculation for step frequencies for the additional bands in Table 10.7.3-2 of TS 38.104 (n258, n260 and n261) should also be demonstrated. This could be done as an additional table in 10.7.3, where the new text is added. |
| Company B |
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## Summary on 2nd round (if applicable)

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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”* |

# Topic #4: CEPT/ECC recommendation for receiver parameters

This concerns work ongoing in CEPT/ECC that may have future impact on 3GPP receiver requirements.

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Title/ Summary** |
| R4-2010326 | Ericsson | CEPT/ECC work on recommendation for receiver parametersSummary:The paper summarizes the ongoing work on receiver parameters in CEPT/ECC for European regulation, where presently a new recommendation is being drafted. |

## Companies views’ collection for 1st round

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## Summary for 1st round

No discussions. Interested companies are encouraged to contact the proponent.