**3GPP TSG-RAN WG4 Meeting #94-e draft R4-2002513**

**Electronic Meeting, Feb.24th – Mar.6th 2020**

**Agenda item:** 8.19

**Source:** Moderator (Huawei)

**Title:** Email discussion summary for RAN4#94e\_#84\_OTA\_BS\_testing

**Document for:** Information

# Introduction

This is the email discussion summary for RAN4#94e\_#84\_OTA\_BS\_testing on OTA BS testing WI, with the following topics covered:

* Topic 1: general issues
* Topic 2: Measurement uncertainty derivation
* Topic 3: Text proposals to the TR 37.941

Conclusion of the first round should aim to decide if these TPs can be agreed or need to be revised.

# Topic #1: general issues

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2001806 | Huawei | Work-plan for the OTA BS testing WIThis contribution provides description of the work-plan for the TR creation.  |
| R4-2001807 | Huawei | Skeleton for TR 37.941 on OTA BS testing, Rel-15This contribution is for approval. |
| R4-2001823 | Huawei | Big TP for TR 37.941, Rel-15This is the placeholder for the final version of the OTA BS testing TR for Rel-15, which is to be drafted based on the skeleton and TPs submitted and agreed during this e-meeting. |

## Open issues summary

### Sub-topic 1-1

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| R&S | Question for clarification regarding the Work Plan in R4-2001806: it is expected to continue working for PWS and add more test cases, so the MU tables and values have to be added to the corresponding sections. Is it group opinion this can be handled in upcoming meetings and only TR 37.941 needs to be updated? |
| Huawei | Please let me clarify the above question on the work-plan: basically the answer shall to this question is: yes. TR 37.941 shall be the place to capture additional PWS test cases. Related content from the legacy TRs will be voided (this was not done this meeting as the new TR is still not agreed, so there was not good motivation to remove any technical content from legacy TRs). Initially, it was planned to do cleanup of the legacy TRs once the TR 37.941 is in mature draft stage.  |

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2001807 | Moderator: Skeleton for agreement. |
| ZTE: For 11 and 12, I assume there is no need to differentiate in-band and out-of-band TRP measurement at least in this CR. One concern is as currently discussed 23.6--24GHz is in-band for band n258 but out-of-band for band n257.Huawei: to address ZTE comment: the structure reflects the technical agreements and the content of the legacy TRs. Same for the MU values which differ. So it is not clear how those two sections could be merged now. For sake of progress, it is suggested to shift this discussion to particular TP for section 11 and 12, and not to block the skeleton.  |
| R4-2001823 | Moderator: placeholder for the TPs to be agreed during this e-meeting. To be revised.  |

## Summary for 1st round

### Open issues

### CRs/TPs

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| R4-2001806 |  noted |
| R4-2001807 | Approved |
| R4-2001823 | Revised in R4-2002430  |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| R4-2002430 | e-mail approval |

# Topic #2: Measurement uncertainty derivation

This topic is focused on the Excel spreadsheets for the MU and TT derivation for multiple requirements types. Those Excel spreadsheets are inputs to the related TP captured in topic #3.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2001699 | Huawei | OTA BS testing Tx FR1 MU calculation tablesThis contribution provides an Excel spreadsheet for the Tx FR1 MU values derivation, including corrections of errors and inconsistencies. This contribution if for Approval. |
| R4-2001700 | Huawei | OTA BS testing Tx FR2 MU calculation tablesThis contribution provides an Excel spreadsheet for the Tx FR2 MU values derivation, including corrections of errors and inconsistencies. This contribution if for Approval. |
| R4-2001701 | Huawei | OTA BS testing RX FR1 MU calculation tablesThis contribution provides an Excel spreadsheet for the Rx FR1 MU values derivation, including corrections of errors and inconsistencies. This contribution if for Approval. |
| R4-2001702 | Huawei | OTA BS testing FR1 co-location MU calculation tablesThis contribution provides an Excel spreadsheet for the Rx FR1 MU values derivation, including corrections of errors and inconsistencies. This contribution if for Approval. |

## Open issues summary

## Companies views’ collection for 1st round

### Open issues

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2001699 | Ericsson: Can we round the values to 2 decimal places? I doubt the accuracy of the work is having more than that. |
| Keysight: There is an error in spreadsheet. Corrected version is uploaded with “Keysight” name appended in name. where correction done is yellow highlighted. Which is EIRP tab K55 which referred by K68, and summary tab H5 column. |
| R&S: Regarding PWS, 4.2-6GHz MU values have not been analyzed yet, so they should be kept between [] and left for further modification in upcoming meetings. This should apply at least for MU terms unique to PWS: QZ ripple DUT / cal antenna, longitudinal position uncertainty, field repeatability and system non-linearity.In addition, System non-linearity term should be kept still between [] for all frequencies since final analysis and agreement is pending.Combined standard uncertainty and expanded uncertainty should be also kept [] until the values mentioned above are finalized. |
| R4-2001700 | Ericsson: The distribution is different in each table. i.e. Rectangular vs. Rect. Can this be aligned for consistency? |
|  |
| R4-2001701 | Ericsson: Under “TE” tab there is a co-location table, this should belong with co-location MU Excel sheet. |
| R&S: Regarding PWS and as done for Tx FR1 in R4-2001699, frequency flatness should be moved from Calibration Measurement to DUT measurement section.Similar to Tx FR1 in R4-2001699, 4.2-6GHz MU values for PWS have not been analyzed yet, so they should be kept between [] and left for further modification in upcoming meetings. This should apply at least for MU terms unique to PWS: QZ ripple DUT / cal antenna, longitudinal position uncertainty, field repeatability and system non-linearity.In addition, System non-linearity term should be kept still between [] for all frequencies since final analysis and agreement is pending.Combined standard uncertainty and expanded uncertainty should be also kept [] until the values mentioned above are finalized. |
| Nokia: TE sheet contains ACLR/OBUE rows which are not for RX. |
| R4-2001702 |  |

## Summary for 1st round

### Open issues

### CRs/TPs

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| R4-2001699 | Revised in R4-2002431  |
| R4-2001700 | Revised in R4-2002432  |
| R4-2001701 | Revised in R4-2002433  |
| R4-2001702 | Approved  |

## Discussion on 2nd round (if applicable)

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2002431, R4-2002432 | Nokia: In Revised in R4-2002431, all MU values for FR1 absolute ACLR and OBUE MU should be kept in [] for further checking.  |
| Huawei: the intention of the spreadsheets was to ensure that all the values were consistent and the calculations were all correct before we copy into the TR. In excel the values can be controlled so that changing a particular error value is changed consistently through all tables.  Hence when we copy them into the TR we can be 99% sure that there are no errors.Once the tables are copied into the TR then the ability for all this cross checking is lost and it has to be done manually and it is very easy for errors to creep in (as we have seen)This goes somewhat beyond jut the ACLR-abs and the OBUE as they share most of their error sources with the other CATR measurements, so if we expect changes to the values then we either have to; (a)  change the errors in all the effected measurements or (b) define a new error source which is particular to the ACLR-abs and OBUE.Until we know the results of Nokia’s checking then it’s not easy to say what the correct course of action is.Copying the tables into the TR is just a editing exercise albeit a lengthy one, so I would prefer to get the tables approved before that is done, as once the TR is drafted and approved the excel files really become historical. |
| Nokia: We understand that it takes a lot of work and time in preparing the Excel documents and your preference is to get the Excel documents approved first. Unfortunately, we need a bit more time for checking. Can we ask to come back at the next meeting for the OTA BS testing Tx FR1 and FR2 only? This option will also let other companies who want to perform checking according to some comments in “Email discussion summary for RAN4#94e\_#84\_OTA\_BS\_testing” (revision of R4-2002375). If this option is not acceptable and moving forward, the rest of the MUs can be approved except for CATR ones (which probably need to be removed). |
| Huawei: I think there is some pressure on time for this TR, but I understand if you need time to check. The plan was to transfer the tables to the TR for the next meeting on the understanding that they have been approved this meeting. I have been circulating the spreadsheets between meetings, if we continue to do that we could perhaps incorporate any changes (or not changes) you request in between meetings (interested companies could check) and I could still prepare the TP’s for the next meeting. This way we would avoid losing any time. We don’t need to formally approve the excel between meetings just have some idea that they are acceptable so that I can draft the TR’s feeling somewhat confident that the numbers are ok. We can then do the formal approvals next meeting (possibly the excel at the start of the meeting and the TP’s at the end?) |
| Nokia: Your suggestions sounds like a good compromise.  |

## Summary on 2nd round (if applicable)

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| R4-2002431 | To be noted |
| R4-2002432 | To be noted |
| R4-2002433 | To be agreed |

# Topic #3: Text proposals to the TR 37.941

TPs to TR 37.941 are captured in this topic.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2001808 | Huawei | TP to the TR 37.941: Scope |
| R4-2001809 | Huawei | TP to the TR 37.941: general sections (2, 3) |
| R4-2001810 | Huawei | TP to the TR 37.941: Coordinate system (4) |
| R4-2001811 | Huawei | TP to the TR 37.941: conformance testing framework (5) |
| R4-2001812 | Huawei | TP to the TR 37.941: measurement types (6) |
| R4-2001813 | Huawei | TP to the TR 37.941: OTA measurement systems (7) |
| R4-2001814 | Huawei | TP to the TR 37.941: measurement systems calibration (8) |
| R4-2001815 | Huawei | TP to the TR 37.941: TX directional requirements (9) |
| R4-2001816 | Huawei | TP to the TR 37.941: RX directional requirements (10) |
| R4-2001817 | Huawei | TP to the TR 37.941: In-band TRP requirements (11) |
| R4-2001818 | Huawei | TP to the TR 37.941: Out-of-band TRP requirements (12) |
| R4-2001703 | Huawei | TP to TR 37.941 : Colocation MU value derivation sub-clause updates (7.8, 8.8, 13) |
| R4-2001819 | Huawei | TP to the TR 37.941: Out-of-band blocking requirements (14) |
| R4-2001820 | Huawei | TP to the TR 37.941: Demodulation performance requirements (15) |
| R4-2001715 | ZTE | TP to OTA BS TR on EMC (16) |
| R4-2001821 | Huawei | TP to the TR 37.941: EMC requirements (16) |
| R4-2001704 | Huawei | TP to TR 37.941: Summary clauses 17 and 18 |
| R4-2001698 | Huawei | TP to TR 37.941: Test uncertainty annexes (A, B, C) |
| R4-2001822 | Huawei | TP to the TR 37.941: annex D, E, F |
| R4-2001705 | Huawei | TP to TR 37.9xx: Tx MU value derivation sub-clause updates.This contribution provides MU tables based on the Excel spreadsheets and on top of the TPs above. This contribution will have to be revised during the meeting to add all the other missing MU tables into the TP, once the source MU Excel spreadsheets are agreed first.  |

## Open issues summary

### Sub-topic 2-1: EMC requirements

**Issue 2-1: Select the baseline TP for the EMC requirements**

* Proposals
	+ Option 1: Use R4-2001715 from ZTE as the baseline
	+ Option 2: Use R4-2001821 from Huawei as the baseline
* Recommended WF
	+ For the worksplit purposes, it is proposed to follow Option 1.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
|  **Company** | **Comments** |
| ZTE | Sub topic 1-1: The proposal are quite similar and either paper needs some correction on terminology issue.  |
| Huawei:  | For the worksplit purposes, it is proposed to use ZTE TP as baseline, as both TPs are similar.  |

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2001808 | Ericsson: BS type 1-H is missing and needs to be included:* *BS type 1-O* in single RAT NR operation in FR1, as specified in NR BS radiated testing specification TS 38.141-2 [6],
* *BS type 1-H in single RAT NR …*
* *BS type 2-O* in single RAT NR operation in FR2, as specified in NR BS radiated testing specification TS 38.141-2 [6].

Huawei: agree |
| ZTE: I assume the OTA AAS BS includes BS type 1-O and BS type2-O as stated “NOTE: For NR operation, an OTA AAS BS corresponds to an NR type 1-O BS” in the TS 37.145-2.Huawei: FR2 is not included in the AAS spec, therefore it only refers to BS type 1-O (and also 1-H actually).  |
| Nokia: While it is somewhat obvious from the TR name, the text in the scope section should say it covers the background information of test methods and radiated requirements, as currently it sounds like it covers the requirements itself. As this is targeted also towards external readership for which the 3GPP document types and purposes may not be known, it is better to be clear on this. Also first bullet under hybrid AAS is redundant. |
| Huawei: comments on wording to be addressed in the revision. |
| R4-2001809 | R&S: Theta and phi notation in clause 3.2 seems to be not consistent along different TPs. In this case for phi, *φ* should be replaced by *ϕ* |
| Nokia: contains errors highlighted by Word automatically. |
| Huawei: the whole concept of the coordinate system was reused from the legacy TRs. For the alignment of the angles and their notations, it is suggested to wait for the first draft of the TR to be compiled, and to run the cleanup for the whole technical report.Any editorial corrections will be addressed in revision of R4-2001823 (big TP). |
| R4-2001810 | R&S: Theta and phi notation in clause 4.1 seems to be not consistent along different TPs. In this case:* For theta, *Θ* should be replaced by *θ* all along the text.
* For phi, *Φ* should be replaced by *ϕ* at the end of the first paragraph.

In addition, coordinate system representation could be improved by using a figure similar to IEEE Std 149. This representation is also used in UE FR2 specifications: TR 38.810 clause C.1 or TS 38.101-2 clause J.1 and R&S has the sources for these 2 so they can be easily adapted. |
| Nokia: RAN4 has discussed the reference coordinate system before, and the decision was to use the one in TR 37.842 clause 7.1 instead of the one in TR38.810 annex C.1. Note that the vertical angles are 90 degree different between the two systems. |
| Ericsson: We would also like to align coordinate system with other industries. IEEE coordinate system is used in all antenna literature and would be strange if 3GPP (RAN4) has different from all others. Additionally, the TRP equations would not be correct if we use the declarations coordinate system. |
| Huawei: the whole concept of the coordinate system was reused from the legacy TRs. Therefore it is suggested that any corrections to the coordinate system are done via separate contributions from proponents. Besides, the coordinate system was discussed in the past extensively already. We also second Nokia comment above. We are reusing the existing description of the coordinate system. Please provide contribution to correct it, if needed.  |
| R4-2001811 | Ericsson: * As Figure 5.1-2 indicates, there is an “uncertainty budget format” this needs to be included and should not be removed as part of this work.

*Huawei: figure 5.1-2 was included in 1811 so this information is captured, but that figure requires some updates (e.g. there are some f-ranges captured instead of a general appraoch) – that figure was captured in the initial submission so there are no issues for now.* * Point 9: needs to be updated to make it general for all requirements
* Point 10: since the scope for this TR is broader than TS, we need to reformulate to say "in order to demonstrate the way a budget should be defined", remove reference to the TS to make it broader. It is also a description for external use.
 |
| Nokia: not sure where removed text comes from. |
| Huawei: re-wording suggestions can be addressed in revision. Figure 5.1-2 was not removed – not sure what was meant by this comment. Bullet 9 and 10 to be reworded. For the comment on text source: this was explained in the work-plan in R4-2001806, i.e. once you undelete the deleted text, the source of the text shows up (in this case TR 37.843). |
| R4-2001812 | Ericsson: For directional requirements we could also add a EIRP definition related to power density to be general. Regarding directional requirements, some information on RX directional requirements is missing; e.g. reference direction, RoAoA, OSDD, etc. |
| ZTE: For 6.3.2.5 EMC emission is mentioned. I think the TRP for OTA AAS BS radiated spurious emission covers EMC radiated emission needs to be pointed out so that no confusion for the other EIRP EMC emission. |
| Nokia: not sure where removed text comes from.Huawei: this was explained in the work-plan in R4-2001806, i.e. once you undelete the deleted text, the source of the text shows up. |
| Huawei: wording corrections from Ericsson and ZTE to be addressed in the revision.  |
| R4-2001813 | ZTE: For figure 7.2.1-2, there are two figures. I think it is better to explain one is for co-location RX test. |
| MVG: section 7.5.2.1 - this limitation does not apply to OTA EVM measurements but to the OTA RX directional requirements such as ACS, Blocking, RX intermodulation and Dynamic Range. Basically, for all the tests where a wanted signal and interfering signals must be considered (section 10.3). Proposal: Add a new section as section 7.5.2.x with title: OTA RX directional requirements and copy that limitation |
| Ericsson: We should keep both limitations; this is still relevant but maybe have 2 different sections? One for TX limitations and one for RX limitations? |
| R&S: There is a typo on clause 7.6.2, inherited from TR 37.843 that we didn’t spotted, where it should say “section” instead of “clause”.It just seems like a general correction from the technical editor when implementing the CR, but it doesn’t apply in this case.  |
| Nokia: not sure where removed text comes from.Huawei: this was explained in the work-plan in R4-2001806, i.e. once you undelete the deleted text, the source of the text shows up. I will not repeat the same comment in all the rows below.  |
| Huawei: wording corrections from ZTE to be addressed in revision. The NFTR limitation case seems to be clarified by MVG, but the exact wording to be addressed in revision, also considering Ericsson feedback. Remaining editorial issues are suggested to be addressed in big TP (revision of R4-2001823), once the first TR draft is compiled.  |
| R4-2001814 | Ericsson: 1D CATR calibration is missing. For the general chamber, we may need calibrations for co-location requirementsHuawei: it was missing it the legacy TRs as well, so it shall be provided as a separate contribution.  |
| Ericsson: Yes, can we have editors note to that effect? |
| Nokia: not sure where removed text comes from.Huawei: same as in above tdocs. Will not repeat this in the rest of this table.  |
| Huawei: editor’s note will be added to all empty sections (including the one for 1D calibration) in the big TP as rapporteur’s task.  |
| R4-2001815 | Ericsson: EIRP = EIRPp1 + EIRPp2 then should be calculated and is missing in some procedures |
| Nokia: not sure where removed text comes from. |
| Huawei: agree. Good to align the polarization related equation and wording.  |
| R4-2001816 | Nokia: not sure where removed text comes from. |
|  |
| R4-2001817 | Ericsson: For RC test method, if change EUT to BS, then need to also update/change the equations. Otherwise there is an introduction of an uncertainty to the description. Rather here keep EUT for now at least in RC test method, we can update this later |
| MVG: In section 11.3.4.2.2 replace "relative ACLR" with "absolute ACLR". This is based on the discussion we had few days ago for the ACLR MUs. In fact, in table 11.3.4.3-1 "relative" has been already replaced with "absolute". |
| Nokia: not sure where removed text comes from. |
| Huawei: For the EUT vs. BS: we need to keep it consistent across the whole spec so we prefer to fix those equations in revision (clearly there shall be not extra uncertainty here). ACLR section to be corrected based on MVG comment.  |
| R4-2001818 | Ericsson: If the calibration section is referenced for the test methods. Care needs to be taken to ensure that the calibration set up needs to also be calibrated for the whole frequency region – not just the wanted signal. |
| Nokia: not sure where removed text comes from. |
| Huawei: for the calibration comment: probably this is something worth checking, and also comparing to the TS text. TP to be revised.  |
| R4-2001703 | Ericsson: some places the “CLTA” is referenced, and some places “co-location test antenna” text is used, maybe we can use one or the other throughout the text rather than both.Huawei: this is better to fix once the whole TR is compiled as multiple TPs may be impacted by this.  |
| ZTE: The “general chamber” term is used in subclause 13.2,2 and some other hw’s TP while “general OTA chamber” is used in this subclause 7.8. Need some alignment on the terminology.Huawei: this is editorial correction and it should say “general chamber” basically.  |
| Nokia: contains some untracked changes; not sure where removed text comes from. |
| Huawei: CLTA wording and untracked changes (i.e. text from legacy TR) to be fixed for clarity in the revision. |
| R4-2001819 | Ericsson: description on how you calibrate the chamber to secure that OOB interferer is correct at the text object, its not a regular calibration perhaps an editorial note as a place holder |
| Nokia: FR2 summary table is missing in 14.3; not sure where removed text comes from, as TR is currently empty. |
| Huawei: to be revised to clarify the calibration procedure. All the FR1 and FR2 summary tables were planned to be addressed by separate TP, once the Excel spreadsheets are agreed this meeting.  |
| R4-2001820 | Nokia: not sure where removed text comes from. |
|  |
| R4-2001715 | Huawei: - there is related Huawei contribution in R4-2001821. - section 16.1 and 16.3 seems not to be needed for the purpose of this TR. - it is not visible which text from legacy NR TR was not incorporated into this TP (refer to the approach in R4-2001821)- text is NR-specific, while we need to consider also the AAS BS (refer to the approach in R4-2001821) |
| Nokia: not sure where removed text comes from. |
| Huawei: see sub-topic 1-1 |
| R4-2001821 | ZTE: This paper is quite similar with ZTE proposed in 1715. The EMC port definition figure need to align the terminology to avoid BS type. |
| Nokia: not sure where removed text comes from. |
| Huawei: see sub-topic 1-1 |
| R4-2001704 | Nokia: RAN4 agreed that TR should not contain repeated contents from the TS. |
| Huawei: this was supposed to be a summary of all the values in the TR, not as the repetition of the TS. This shall be used as the cross-check tables for all calculations. With this clarification, it is proposed to agree on the TP (subject to any values corrections, if any). |
| R4-2001698 | Ericsson: * Regarding the yellow highlighted text. This can be removed if we do not use it. However, as the majority of the descriptions relate to the TE it should be placed with the common TE description – this was missed when the discussion on the TE uncertainty came to. For example A5-7 should move to be in associated section of the common TE uncertainty.
* Reference to Internal TR in (A2-13)
* The background for having different MU for EIRP pointing error for BS power and TRP, is that for BS power and some TRP requirements pointing error is low, while for some emission methods pointing error can be very large. This should be captured somewhere.
 |
| Nokia: ACLR/OBUE MU are changed; propose to remove some unused MU elements; contains many untracked changes. |
| Huawei: revision assigned to address the above comments.  |
| R4-2001822 |  |
|  |
| R4-2001705 | Nokia: not sure where removed text comes from. |
|  |

## Summary for 1st round

### Open issues

### CRs/TPs

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| R4-2001808 | Revised in R4-2002434  |
| R4-2001809 | Return to |
| R4-2001810 | Return to |
| R4-2001811 | Revised in R4-2002435  |
| R4-2001812 | Revised in R4-2002436  |
| R4-2001813 | Revised in R4-2002437  |
| R4-2001814 | Agreeable: editor’s note will be added to all empty sections (including the one for 1D calibration) in the big TP.Approved |
| R4-2001815 | Revised in R4-2002438  |
| R4-2001816 | Approved  |
| R4-2001817 | Revised in R4-2002439  |
| R4-2001818 | Revised in R4-2002440  |
| R4-2001703 | Revised in R4-2002442  |
| R4-2001819 | Revised in R4-2002441  |
| R4-2001820 | Approved  |
| R4-2001715 | Revised in R4-2002443  |
| R4-2001821 | noted |
| R4-2001704 | Agreeable: there was comment that this content is repeated from TS. The content of this TP was supposed to be a summary of all the values in the TR, not as the repetition of the TS. This shall be used as the cross-check tables for all calculations. With this clarification, it is proposed to agree on the TP (subject to any values corrections, if any).Approved |
| R4-2001698 | Revised in R4-2002444  |
| R4-2001822 | Approved  |
| R4-2001705 | Approved  |

## Discussion on 2nd round (if applicable)

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2001810 | Ericsson: Regarding 1809, 1810, we are fine with the moderator decision to have first stable working draft before we fix these technical issues – 90 degree difference between coordinate systems for TRP method section; however, we would request to have an editor’s note in the section if this is the decision to come back with separate TP for this.   |
| Huawei: Coordinate system: if you insist, the editors note can be added (even though the final TR shall not have those) e.g. in the revision of R4-2001812 (measurement types including TRP), or R4-2001823 (big TP) -I don’t see any issue here. All the feedback has been recorded in the summary, which was uploaded by the deadline provided by RAN4 leadership (i.e. before your recent comments – that’s why they are not there). Still, it shall be clarified that there was no decision taken to modify the coordinate system so the proponents need to provide motivation why the modification is required. |
| Ericsson: As there was some issue with adding the coordinate system to the existing contribution that was strictly taken from the donor TRs/TSs.  However, we feel that as this is a tight deadline for this WI and the external TR is used for complete technical background which will be referenced in many foreas it’s important to have both the declaration coordinate system but also the coordinate system used for conformance.  Therefore, we have provided separate contribution on this and would appreciate if chairman (@Haijie Qiu) can issue a t-doc number.The draft contribution can be found in the OTA BS Testing folder; draft R4-20xxx TP coordinate system\_Ericsson\_R&S. |
| Huawei: to address the comments, it is proposed to capture appropriate Editor’s notes in R4-2001823 (big TP, under construction) and to fix this issue during next meeting. Please note, that the proposed coordinate system is basically reused from the existing TRs. With this, I hope to Agree on 1808 and 1809. The proposal from Ericsson and R&S is appreciated, but the group basically needs time to look into this, compare it to the existing TRs and TSs, etc. if there is an issue, lets fix it. But first we need to understand what the issue really is. I would like to suggest to follow the rules provided by RAN4 leadership before the e-meeting for the tdocs submission. ” |
| Ericsson: Regarding the coordinate system.  I think for this meeting we are not ready to agree the TP as it is without considerations we have provided in our draft contribution.  Although the coordinate system is reused from existing TRs, it’s only suited for declaration requirements but other aspects such as TRP methods use the IEEE coordinate system, which we have provided in separate TP.  Without this the TR is incomplete for coordinate system section. |
| Huawei: your contribution will not work without 1809 and 1810 being agreed first. So I struggle to see how you want to proceed. The TR was shared few weeks before the meeting with all the content included and now you are trying to change the legacy content with a late contribution which is dependent on the legacy coordinate system. If there is consensus in the group to change it – we will do it. But for now that draft contribution did not even got a tdoc number. I am not sure how to proceed here.  |
| Ericsson: Regarding the coordinate system.  Actually it was missed during first round of review and was thanks to R&S which brought this up.  Yes, I agree our draft does not have any tdoc number due to the way of working for this e-meeting.  But the only reason for that is simply because the changes you did not want to make on top of your TP.  It would be the most idea actually if you take the input from the document we have put together into 1809/1810. |
| Huawei: Let me clarify one thing for the coordinate system:“*But the only reason for that is simply because the changes you did not want to make on top of your TP.*”What you are proposing is not an editorial change and it is not RAN4 consensus as of now to make any modifications to the reference coordinate system. It is not about what I want.The reference coordinate system from 1810 is the same as in TS 38.141-2 or TS 37.145-2. TS 38.141-2 (as well as TS 371.45-2) currently captures TWO coordinate systems: the reference coordinate system and the TRP-one (which unfortunately differ by 90 deg shift).  cid:image002.png@01D5F289.8F93FF20Figure 4.14-1: Reference coordinate systemcid:image004.jpg@01D5F289.8F93FF20Figure I2.2-1: Dimensions of a radiation source: depth (d), width (w) and height (h) – from TRP sectionThe same will happen in TR. So before we correct anything in TR, we need RAN4 agreement how this would be done across TS and TR, if needed. As you can imagine, such proposed modification to TR will ripple to the TS and impact all the OTA BS products, including those on market. We need to analyze this and understand the problem and potential consequences (of agreeing or not).  |
| Nokia: It maybe good to clarify the following statement:           “TS 38.141-2 (as well as TS 371.45-2) currently captures TWO coordinate systems: the reference coordinate system and the TRP-one (which unfortunately differ by 90 deg shift).”  The reference coordinate system (Section 4.14, TS 38.141-2) and the one used in Annex I, TS 38.141-2 belong to the spherical coordinate system. The only difference between the two is in the upper and lower angles of $θ$ and $ϕ$.For the reference coordinate system:  $-180^{°} \leq ϕ\leq 180^{°}$ and $-90^{°}\leq θ\leq 90^{°}$         For Annex I:   $0^{°}\leq ϕ\leq 360^{°}$ and $0^{°}\leq θ\leq 180^{°}$ The TRP equations assume that $θ$ and $ϕ$ are ranging from 0 to 180 and 0 to 360, respectively. A simple way to deal with this difference is to shift the angles of the reference coordinate system by adding $90^{°}$ to $θ$ and $180^{°}$ to $ϕ. $ Other ways are also possible.For clarity, short text can be added to the TR at the next meeting.  |
| R4-2002434 | Nokia: Why MSR operation wordings in the bullet are different between hybrid ‘including NR operation’ and OTA ‘and/or NR’? |
| Huawei: this is based on the respective Scope sections from TS 37.145-2 and TS 38.141-2. |
| R4-2002435 | Ericsson: Shall this be captured with the MU calculation tables? I don’t see this change there.  Or if it shall be captured else where? If I have missed it kindly please let me know where it shall be found. |
| Huawei: I am not sure what you are trying to find. The only MU TP so far was already approved in R4-2001705 with the first set of MU tables captured.  |
| Ericsson: Regarding 1811, as we indicated prior to submission the uncertainty format tables were in the original TRs and even based on your figure for framework there is need to include this.  On top of which other specifications such as UE spec also capture this.  The figure itself is fine, and we have no objection to that, but rather the uncertainty budget formats for all associated MU tables should be included that is the concern. |
| R4-2002436 | Ericsson: Text has been added in version: draft R4-2002436 [ExtTR] TP measurement types\_Ericsson |
| Huawei: I think we have discussed that before the meeting already with the proposal not to capture some of that OSDD text, but I will look at it once more. At least it shall not belong to the “beam definition” section – I will put it into another subclause. Revision was uploaded. |
| R4-2002440 | Ericsson: I see this is now part of the general chamber section. Is that what this comment is referring to? Was the NOTE copied from spurious emissions section (12.4) section? |
| Huawei: the note was added in all applicable Calibration sections, for general chamber (12.2.2, 12.3.2), reverb (12.2.4), as well as CATR (12.4.2). The Note’s text is based on the TR 37.843 text. |
| R4-2002441 | Nokia: Still only have FR1 final values in 14.3, FR2 values should be added.  |
| Huawei: as already commented, this is planned to be fixed once the Excel spreadsheets are agreed. Also, there is related editor’s note already.  |

## Summary on 2nd round (if applicable)

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| R4-2002434 | To be agreed |
| R4-2001809 | To be noted |
| R4-2001810 | To be noted |
| R4-2002435 | Ericsson: comments about Uncertainty budget format tables were not captured. This can only be agreed if tables are added in the big CR (R4-2002430).  |
| R4-2002436 | To be agreed |
| R4-2002437 | To be agreed |
| R4-2002438 | To be agreed |
| R4-2002439 | To be agreed |
| R4-2002440 | To be agreed |
| R4-2002442 | To be agreed |
| R4-2002441 | To be agreed |
| R4-2002443 | To be agreed |
| R4-2002444 | To be agreed |