**3GPP TSG-RAN WG4 Meeting # 102-e R4-210XXXX**

**Electronic Meeting, Feb. 21- Mar. 03, 2022**

**Agenda item:** 4.1.4

**Source:** Moderator (Huawei)

**Title:** Email discussion summary for [102-e][302] NR\_Conformance\_Maintenance

**Document for:** Information

# 0 Introduction

The scope of this email discussion is to discuss the contributions submitted at agenda 4.1.4 on NR BS conformance maintenance.

* Topic #1: Sweep time setting for unwanted emission testing
* Topic #2: OBUE requirements clarification
* Topic #3: Test configuration for NC operation

# Topic #1: Sweep time setting for unwanted emission testing

## Companies’ contributions summary

(Cat A CRs are not listed)

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposal summary** |
| [R4-2203562](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203562.zip) | Anritsu Corporation | Sweep time setting of spectrum analyzer for BS unwanted emission TCs*Observation 1: There is a concern that sweep time may need to be increased with an order of 10 times depending on the target measurement uncertainty to fulfil.**Observation 2: A huge amount of discussion in the group is expected to derive appropriate sweep time / average setting per test case.**Observation 3: It is not practical to apply the fixed sweep time setting to all DUTs based on the worst case assumption.**Observation 4: Since the test tolerance is defined as zero with the unwanted emission tests, the DUT has already been designed to have some margin against the minimum requirements, taking into account of the measurement uncertainty.* *Observation 5: It is possible to carry out the unwanted emission tests with a shorter sweep time setting as far as the tightened test requirement is applied.**Proposal 1: The fixed sweep time setting is not defined in the conformance specification for the sake of avoiding unnecessary longer test time, and the actual test procedures are left to the test case implementation.**Proposal 2: Add a statement in the spec to judge each test result with a tightened test requirement which corresponds to the sweep time and its expected variance. The test shall be carried out again with the longer sweep time setting or longer average setting in case the obtained measurement results have exceeded the tightened test requirement.* |
| [R4-2203977](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203977.zip) | CATT | Discussion on sweep time for unwanted emission testingProposal 1: To adopt Option 3, the sweep time for a sample is a fix value of [40] us irrespective of the OFDM length. |
| [R4-2203978](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203978.zip) | CATT | draft CR for TS 38.141-1 On sweep time for unwanted emission testing (Rel-15) |
| [R4-2203981](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203981.zip) | CATT | draft CR for TS 38.141-2 On sweep time for unwanted emission testing (Rel-15) |
| [R4-2204435](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204435.zip) | NEC | Discussion on the sweep time for unwanted emission testingProposal: Keep current text for unwanted emission testing in BS conformance test specification, unless otherwise reasonable justifications are provided by the test equipment vendors to modify it. |
| [R4-2204711](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204711.zip) | Keysight Technologies UK Ltd | Setting Sweep Time Requirement on Measuring BS Conformance Unwanted Emission testing.Observation-1, There seems some misunderstanding in proposal about measured result of faster sweep time.Observation-2, Total measurement time of unwanted emission measurement takes longer and always the concern of user of test equipment/systemObservation-3, Most suitable measurement setting other than detection mode should be chosen based on device characteristic and test system characteristic. This is to maintain good balance between necessary SNR and measurement speed. Such adjustment should be done as preparation and calibration steps of test system.Observation-4, There are multiple method to mitigate larger variation in measured result which is from use of faster sweep on random signal power measurement.Observation-5, Defining minimum sweep time as proposal is too much of time penalty for everyone. Right adjustment could be done on case-by-case basis. Proposal, choose either one of following approach,* Leaving current text as is for allowing most appropriate setting on measurement parameters.
* Add some calibration preparation text in procedure of TS38.141 for leading towards correctly adjust measurement parameters. (Detection mode should be true RMS as already defined) This is for appropriate testing and test time optimization, and which is depending on characteristic of test system and characteristic of device under test. Also, to add note for when averaging method is used (calculate average of multiple measured results). For this case, TP is proposed as below.
 |
| [R4-2205149](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205149.zip) | Huawei, HiSilicon | Clarification for unwanted emission testing**Observation:** Considering 1 dB deviation for the power detection, 100 us average duration is a good trade-off and at least a symbol length is required.**Proposal 1:** it is proposed to include the clarification on average time duration for RMS detection in the conformance test procedure, as below.===for example for Transmitter spurious emissions in 38.141-1===2) Measurements shall use a measurement bandwidth in accordance to the conditions in clause 6.6.5.5. The measurement device characteristics shall be:- Detection mode: True RMS. The emission power should be averaged over an appropriate time duration to ensure the measurement is within the measurement uncertainty in Table 4.1.2.2-1. The time duration includes time duration spent on each sweep point and the averaging from multiple measured results for the sweep point if average trace is used.NOTE: The setting of the average time also depends on the input signal characteristics, e.g. at least a symbol length for each sweep point should be adopted to measure the mean power. |
| [R4-2205150](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205150.zip) | Huawei, HiSilicon | Draft CR to 38.141-1: Clarification for unwanted emission testing |
| [R4-2205153](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205153.zip) | Huawei, HiSilicon | Draft CR to 38.141-2: Clarification for unwanted emission testing |

## 1.2 Open issues summary

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

### 1.2.1 Sub-topic 1-1 –Sweep time setting for unwanted emission testing

**Issue 1-1-1: Sweep time setting for unwanted emission testing**

In RAN4#101-e meeting, RAN4 agreed to further analyse the appropriate time to get a stable test results for unwanted emissions in WF R4-2120636. From the contributions submitted for this meeting, it is observed that longer sweep time or longer average setting can reduce the variation of measurement results. Some contributions propose to set a minimum value to get a stable results, while some contributions raise the concern on a fixed value which may need huge amount of work and will take longer test time, and hence propose the fixed sweep time setting is not defined and propose to add some clarification statements to address the issue.

* Proposals:
	+ Proposal 1: The fixed sweep time setting is not defined in the conformance specification.
	+ Proposal 2: Add a statement in the spec to judge each test result with a tightened test requirement which corresponds to the sweep time and its expected variance. The test shall be carried out again with the longer sweep time setting or longer average setting in case the obtained measurement results have exceeded the tightened test requirement.
	+ Proposal 3: the sweep time for a sample is a fix value of [40] us irrespective of the OFDM length.
	+ Proposal 4: Keep current text for unwanted emission testing in BS conformance test specification.
	+ Proposal 5: Add some calibration preparation text in procedure of TS38.141 for leading towards correctly adjust measurement parameters and add note for when averaging method is used (calculate average of multiple measured results).
	+ Proposal 6: To include clarification that an appropriate time duration should be set to ensure the measurement is within the MU.
* Recommended WF
	+ Discuss on the proposals to address the issue.

**Issue 1-1-2: Comments collection for the draft CRs**

* Recommended WF
	+ Comments collection on 1st round discussion

## 1.3 Companies views’ collection for 1st round

### 1.3.1 Open issues

**Collection of comments:**

**Issue 1-1-1: Sweep time setting for unwanted emission testing**

|  |  |
| --- | --- |
| **Company** | **Comments**  |
| Company A | **Issue 1-1-1:** *Comment* |
|  |  |
|  |  |

**Issue 1-1-2: Comments collection for the draft CRs**

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| [R4-2203978](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203978.zip) |  |
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|  |
| [R4-2203981](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203981.zip) |  |
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| [R4-2205150](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205150.zip) |  |
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| [R4-2205153](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205153.zip) |  |
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## 1.4 Summary for 1st round

### 1.4.1CRs/TPs

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

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

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

## 1.5 Discussion on 2nd round (if applicable)

# 2 Topic #2: OBUE requirements clarification

In RAN4#101e, corrections of NOTE for OBUE requirement tables for NR specs were agreed. Similar corections are sumbmitted for MSR specs in this meeting.

## 2.1 Companies’ contributions summary

(Cat A CRs are not listed)

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposal summary** |
| R4-2204446 | NEC | Draft CR to 37.105: BS OBUE requirements clarification, rel-15Reason/Summary of change: In RAN4#101e, corrections of NOTE for OBUE requirement tables for NR specs were agreed. Similar corections are required for MSR specs. |
| R4-2204452 | NEC | Draft CR to 37.145-1: BS OBUE requirements clarification, rel-15Reason/Summary of change: In RAN4#101e, corrections of NOTE for OBUE requirement tables for NR specs were agreed. Similar corections are required for MSR specs. |
| R4-2204455 | NEC | Draft CR to 37.145-2: BS OBUE requirements clarification, rel-15Reason/Summary of change: In RAN4#101e, corrections of NOTE for OBUE requirement tables for NR specs were agreed. Similar corections are required for MSR specs. |

## 2.2 Companies views’ collection for 1st round

### 2.2.1 CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2204446 |  |
|  |
|  |
| R4-2204452 |  |
|  |
|  |
| R4-2204455 |  |
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## 2.3 Summary for 1st round

### 2.3.1CRs/TPs

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

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

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

## 2.4 Discussion on 2nd round (if applicable)

# 3 Topic #3: Test configuration for NC operation

The CR provides corrections to the test conguration for NC operation which are constructed with fixed number of carriers, which was discussed in RAN4#101-e and one company require more time to check.

## 3.1 Companies’ contributions summary

(Cat A CRs are not listed)

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposal summary** |
| R4-2205159 | Huawei, HiSilicon | Correction on the test configuration for NC operation 37.141 R16Reason/Summary of change: Existing NTC3 is constructed with fixed two carriers to reflect high PSD scenarios. The test with total number of supported carriers may not be required, but wider CBW and/or more carrier may be placed to reach the rated total output power. NTC21 has the similar issue |
| R4-2205161 | Huawei, HiSilicon | Correction on the test configuration for NC operation 37.145-1 R16Reason/Summary of change: Existing ANTC3 and ANTC6 are constructed with fixed two carriers to reflect high PSD scenarios. The test with total number of supported carriers may not be required, but wider CBW and/or more carrier may be placed to reach the rated total output power. ANTC8 has similar issue |
| R4-2205163 | Huawei, HiSilicon | Correction on the test configuration for NC operation 37.145-2 R16Reason/Summary of change: ANTC3, ANTC7 and ANTC9 are constructed with fixed two carriers to reflect high PSD scenarios. The test with total number of supported carriers is not required which need to corrected. |

## 3.2 Companies views’ collection for 1st round

### 3.2.1 CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2205159 |  |
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| R4-2205161 |  |
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| R4-2205163 |  |
|  |
|  |

## 3.3 Summary for 1st round

### 3.3.1CRs/TPs

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

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

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

## 3.4 Discussion on 2nd round (if applicable)

# 4 Recommendations for Tdocs

## 4.1 1st round

**New tdocs**

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

**Existing tdocs**

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

Notes:

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

## 4.2 2nd round

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

Notes:

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

# Annex

Contact information

|  |  |  |
| --- | --- | --- |
| **Company** | **Name** | **Email address** |
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Note:

1. Please add your contact information in above table once you make comments on this email thread.
2. If multiple delegates from the same company make comments on single email thread, please add you name as suffix after company name when make comments i.e. Company A (XX, XX)