**3GPP TSG-RAN WG4 Meeting # 95 R4-200xxxx**

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

**Agenda item:** 4.7

**Source:** Moderator (Futurewei)

**Title:** Email discussion summary for [95e][303] NR\_NewRAT\_Conformance\_BS

**Document for:** Information

# Introduction

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

*Summary\_303\_1st round preliminary draft*

*This email discussion captures AI 4.7 Base station conformance.*

*The following is a breakdown of the TDocs*

|  |  |  |  |
| --- | --- | --- | --- |
|  | *Endorsed CRs* | *New CRs* | *Discussion* |
| *Rel 15* | *18* | *16* | *4* |
| *Rel 16* | *18* | *11* |  |

*The organization mostly follows the agenda*

*Issue 1-x : 4.7.1 - General [NR\_newRAT-Perf]*

*5 papers, 1 issue*

*Issue 2-x: 4.7.3-1 - eAAS specifications [NR\_newRAT-Perf/Core]*

*23 papers, 8 issues*

*Issue 3-x: 4.7.3.2 - MSR specifications [NR\_newRAT-Perf/Core]*

*5 papers, 2 issues*

*Issue 4-x: 4.7.3.3 - NR conformance testing specifications [NR\_newRAT-Perf] (New CRs, topics)*

*10 papers, 4 issues*

*Issue 5-x: 4.7.3.3 - NR conformance testing specifications [NR\_newRAT-Perf] (Endorsed CRs)*

*12 papers, 3 issues*

*Issue 6-x: 4.7.3.3 and 4.7.5 (38.141-2) [NR\_newRAT-Perf] (all contributions target 38.141-2)*

*12 papers, 6 issues*

# Topic #1: Section 4.7.1 EVM equalizer calculation

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

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2007439 | Keysight Technologies, Rohde & Schwarz | Title: Detail information on Clarification on EVM equalizer calculation for NR BS conformance testing  While these example uses TM2 and currently defined problematic test models are TM2 and 2a, TE venders prefer to make definition future proof and more generic, not to be specific to TM2. So that TE venders prefer not to make text to describe this is specific to TM2/2a only.  Propose modification to add clarification of use of moving average calculation for equalizer. Otherwise it could possibly create poor EVM result on TM2 and 2a. |
| R4-2007481 | Nokia, Nokia Shanghai Bell | Title: Discussion on EVM equalization for NR BS  It is not clear from the proposed modification how the moving average window size is reduced for DM-RS subcarriers at or near the edge of a set of contiguously allocated RBs. Also, it is not clear whether the allocated RBs at the channel bandwidth edges should be handled the same way as other allocated RBs inside the channel bandwidth. Moreover, the dominant interference on the received signal in the measurement equipment in both conducted and radiated cases is AWGN, and it is well-known that averaging n AWGN samples will reduce the noise variances by a factor of n. Therefore, reducing moving average window size will lead to less accurate equalizer coefficient estimation because of the increase in AWGN variance comparing to window size of 19.  In this contribution, we discuss further EVM equalization for NR BS. We have made following observations:  ***Observation 1: Less accurate equalizer coefficient estimation with smaller average window size because of the increase in AWGN variance comparing to window size of 19.***  ***Observation 2: When analysing solution, the focus should be made on single PRB test models.*** |
| R4-2007436 | Keysight Technologies, Rohde & Schwarz | Title: CR to 38.104: Annex B and C clarification on equlisation calculation (B.6, C.6)  In Annex section describing equlisation, clarification needed where to apply exceptional case of moving average calculation. Current text which originally copied from LTE specification describes exceptional case at or near the edge of the channel. The same needs to be applied for the case at or near the edge of allocated resources because NR test model 2 doesn’t not have contiguously allocated reference signal subcarriers in the frequency domain. |
| R4-2007437 | Keysight Technologies, Rohde & Schwarz | Title: CR to 38.141-1: Annex H clarification on equlisation calculation (H.6)  See R4-2007436 |
| R4-2007438 | Keysight Technologies, Rohde & Schwarz | Title: CR to 38.141-2: Annex L clarification on equlisation calculation (L.6)  See R4-2007436 |

## Open issues summary

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

### Sub-topic 1-1

*The WF in R4-2005604 “WF on EVM equalizer calculation for NR BS”, Keysight and Rohde & Schwarz*

* *Proposal 1; Further discuss and finalize wording modification in next RAN#4 meeting (RAN4#95-e)*

*Interested companies are encouraged to provide further comment and feedback.*

* *Proposal 2; TE venders are to provide clarification on calculation detail.*

*[Due to the size, figures from R4-2007439 presented here]*

A screenshot of a computer screen

Description automatically generated

Fig 4. EVM measurement result (value in red circle) following current description **without** modified averaging proposed in this document. (sample data is with TM2 with 100MHz BW)

A screenshot of a video game

Description automatically generated

Fig 5. EVM measurement result (value in red circle) **with** modified averaging proposed in this document. (sample data is with TM2 with 100MHz BW)

**Issue 1-1: Equalizer calculation for PDSCH with freq gaps**

* Proposals
  + discuss results and possibly revise CRs to ensure modifications capture intent of the TE vendors
  + If (possibly revised) wording of CRs is acceptable, approve CRs
* Observations:
  + No Rel. 16 mirror CRs provided for 38.104, 38.141-1, 38.141-2

## Companies views’ collection for 1st round

### Open issues

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| **Company** | **Comments** |
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### 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** |
| R4-2007436 | Title: CR to 38.104: Annex B and C clarification on equlisation calculation (B.6, C.6) |
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| R4-2007437 | Title CR to 38.141-1: Annex H clarification on equlisation calculation (H.6) |
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| R4-2007438 | Title: CR to 38.141-2: Annex L clarification on equlisation calculation (L.6) |
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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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| **Sub-topic** | **Status summary** |
| 1-1 |  |

*Recommendations on WF/LS assignment*

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|  | **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*

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
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## 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** |
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# Topic #2: Section 4.7.3.1 eAAS specifications

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

## Companies’ contributions summary

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| **Issue** | **T-doc number** | **Company** | **Proposals / Observations** |
| 2-1 | R4-2006093 | Nokia, Nokia Shanghai Bell | Title CR to TS 37.145-2: Corrections on generation of test configurations  1) The symbol “Prated,t,TRP“ is defined as “Rated transmitter TRP declared per RIB” in clause 3.2 but not included in clause 4.10.  2) For power allocation for all test configurations except ACTR4 and ATCR6, it is stated that “For all other requirements ensure the total radiated power is PRated,c,TRP (see table 4.10-2, D11.6)”. It is not clear how to set the power of each carrier, and (D11.6) is declared as the rated carrier OTA BS power but not total radiated power per RIB. |
| 2-1 | R4-2006094 | Nokia, Nokia Shanghai Bell | Title: CR to TS 37.145-2: Corrections on generation of test configurations  Rel 16 |
|  |  |  |  |
| 2-2 | R4-2006459 | Ericsson, Nokia, Nokia Shanghai Bell | Title: TS 37.145-1: Corrections related to Foffset  There is no definition of values for Foffset,RAT as we see for MSR BS in 37.141  Throughout the document in many instances is used FOffset-RAT instead of Foffset, RAT. Furthermore the term FOffset, which is not defined, is used in at least two instances. |
| 2-2 | R4-2006462 | Ericsson, Nokia, Nokia Shanghai Bell | Title: TS 37.145-1: Corrections related to Foffset  (Rel. 16) |
| 2-2 | R4-2006460 | Ericsson, Nokia, Nokia Shanghai Bell | Title: TS 37.145-2: Corrections related to Foffset  There is no definition of values for Foffset,RAT as we see for MSR BS in 37.141  Throughout the document in many instances is used FOffset-RAT instead of Foffset, RAT. Furthermore the term FOffset, which is not defined, is used in at least two instances. |
| 2-2 | R4-2006463 | Ericsson, Nokia, Nokia Shanghai Bell | Title: TS 37.145-2: Corrections related to Foffset  (Rel 16) |
| 2-2 | R4-2006458 | Ericsson, Nokia, Nokia Shanghai Bell | Title: Corrections related to Foffset (from AI 4.7.3.2)  For TS37.141  The note on alignment with channel raster is confusing  FOffset-RAT is not defined in the symbols list |
| 2-2 | R4-2006461 | Ericsson, Nokia, Nokia Shanghai Bell | Title: Corrections related to Foffset (from AI 4.7.3.2)  Rel 16 |
|  |  |  |  |
| 2-3 | R4-2006915 | Ericsson | CR to TS 37.145-2: Additional information about alignment needed for TRP measurements in Annex F.1  The reason for alignment in TRP assessment is not described, and the necessary alignment between test object and measurement antenna is different for different methods. When making TRP measurements appropriate alignment is crucial.  Firstly, the measurement antenna needs to be aligned with the measurement surface, here a sphere, in order to correctly measure the entire TRP.  Secondly, in methods where an over-estimate of the TRP is the end result, careful angular alignment is needed in order to measure peak values in the main beams and the side lobe regions. The remaining TRP methods are designed to be independent of rotations of the angular grid, and hence angular alignment is not needed.  This CR aligns the AAS test specifcation with agreements made for NR test specification TS 38.141-2 at earlier meeting. |
| 2-3 | R4-2006916 | Ericsson | CR to TS 37.145-2: Additional information about alignment needed for TRP measurements in Annex F.1  Rel. 16 |
|  |  |  |  |
| 2-4 | R4-2007418 | ZTE | Title: CR to 37.145-1: Correction on interference level of receiver dynamic range requirement  In approved CR R4-1913772, some error (probably rounding) in receiver dynamic range requirement has been corrected, however this is not reflected in TS 37.145-1 spec, therefore propose to correct these errors. |
| 2-4 | R4-2007419 | ZTE | Title: CR to 37.145-1: Correction on interference level of receiver dynamic range requirement  Rel 16 |
| 2-4 | R4-2007420 | ZTE | Title: CR to 37.145-2: Correction on interference level of receiver dynamic range requirement  In approved CR R4-1913772, some error (probably rounding) in receiver dynamic range requirement has been corrected, however this is not reflected in TS 37.145-2 spec, therefore propose to correct these errors. |
| 2-4 | R4-2007421 | ZTE | Title: CR to 37.145-2: Correction on interference level of receiver dynamic range requirement  Rel 16 |
|  |  |  |  |
| 2-5 | R4-2007459 | Huawei | Title: CR to TS 37.105: removal of [], Rel-15  Referring to the RAN4#94-e-bis meeting arrangements and guidelines shared by RAN4 chairman, the following was provided:  • ITU submission requires no TBD or [] in core specification in the June version  Based on this, the AAS BS specification TS 37.105 was reviewed and it was found that it requires some corrections before the IMT submission.  This CR provides removal of outstanding [], with additional editorials corrections introduced. |
| 2-5 | R4-2007460 | Huawei | Title: CR to TS 37.105: removal of [], Rel-16  Rel. 16 |
|  |  |  |  |
| 2-6 | R4-2007470 | Nokia, Nokia Shanghai Bell | Title: CR to 37.145-2 Corrections to OTA modulation quality test Rel-15  Currently in AAS specification with NR introduced, for OTA modulation quality test there is description for NR test that is not align with single RAT NR specification TS 38.141-2 (for BS type 1-O).  The difference is that NR single RAT specification, EVM tests are performed accroding description in procedure in sub-cluase 6.6.3.4.2 where only highest supported modulation is tested. While in AAS specification all modulations need to be tested for EVM.  This CR introduces corrections to AAS specification TS 37.145-2 with introduction of reference directly to NR single RAT specification to avoid different approach in AAS and NR specification in term of test that are required.  It should be noted, that similar approach is also used in MSR specification 37.141, where direct reference to singla RAT NR specification is done |
| 2-6 | R4-2007471 | Nokia, Nokia Shanghai Bell | Title: CR to 37.145-2 Corrections to OTA modulation quality test Rel-16  Rel 16 |
|  |  |  |  |
| 2-7 | R4-2008013 | Nokia, Nokia Shanghai Bell | Title: CR to TS 37.145-2: Correcting the reference angular step equations (Annex F.2.2)  The upper limit of 15 degrees is missing in the reference angular step equations for ULA in Annex F.2.2. |
| 2-7 | R4-2008015 | Nokia, Nokia Shanghai Bell | Title: CR to TS 37.145-2: Correcting the reference angular step equations (Annex F.2.2)  Rel. 16 |
| 2-7 | R4-2008043 | Nokia, Nokia Shanghai Bell | CR to TS 38.141-2: Correcting the reference angular step equations (Annex I.2.2) (from A1 4.7.3.3)  The upper limit of 15 degrees is missing in the reference angular step equations for ULA in Annex I.2.2. |
| 2-7 | R4-2008055 | Nokia, Nokia Shanghai Bell | CR to TS 38.141-2: Correcting the reference angular step equations (Annex I.2.2) (from A1 4.7.3.3)  Rel 16 |
|  |  |  |  |
| 2-8 | R4-2007916 | Huawei | Discussion on out of band CLTA maximum height (from A1 4.7.3.3)  This paper highlights and issue which has been identified whilst trying to carry out compliance testing of the co-location requirements when the co-location band is significantly lower than the operating band of the antenna under test. The following observations have been made:  **Observation 1:** The current CLTA definition describes “impossible” antennas for some operating bands  **Observation 2:** If a CLTA is not available as a product then it is not describing a valid co-location scenario  **Observation 3:** It is unlikely that the coupling between 2 very different height antennas is greater than 2 antennas of similar size.  With the following proposal  **Proposal 1:** The CLTA description is modified to allow a practical implementation when different operating bands require vastly different height antennas.  Two examples of a means to cap the out of band CLTA height have been suggested, companies view on this issue and how to rectify it would be appreciated. |

## Open issues summary

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

### Sub-topic 2-1 Test configuration

*Sub-topic description:*

*R4-2006093 [R4-2006094] generation of test configurations was endorsed in RAN4#94B R4-2005603*

**Issue 2-1:**

* Proposals
  + Agree to CR

### Sub-topic 2-2 Corrections related to Foffset

*Sub-topic description*

*Foffset was discussed over the last two meetings*

**Issue 2-2:**

*R4-2006459 [R4-2006462] Foffset was endorsed in RAN4#94B R4-2005470 for TS37.145-1*

*R4-2006460 [R4-2006463] Foffset was endorsed in RAN4#94B R4-2005471 for TS37.145-2*

*R4-2006458 [R4-2006461] Foffset was endorsed in RAN4#94B R4-2003970 for TS37.141. Moved to this agenda*

* Proposals
  + Agree to CR R4-2006459
  + Agree to CR R4-2006460
  + Agree to CR R4-2006458

### Sub-topic 2-3 alignment needed for TRP measurements

*Sub-topic description*

*R4-2006915 [R4-2006094] endorsed in RAN4#94B R4-2005518*

**Issue 2-3:**

* Proposals
  + Agree to CR R4-2006915

### Sub-topic 2-4 Correction on interference level of receiver dynamic range requirement

*Sub-topic description*

*R4-1913772 (for TS38.104) provided correction to values in several tables. The corresponding tables in TS37.145-1 and TS37.145-2 were not updated.*

*CR R4-2007418 [R4-2007419] and R4-2007420 [R4-2007421] are those changes*

**Issue 2-4:**

* Proposals
  + Reject CRs
  + Approve CRs
  + Modify CRs

### Sub-topic 2-5 removal of []

ITU submission requires no TBD or [] in core specification in the June version. Based on this, the AAS BS specification TS 37.105 was reviewed and it was found that it requires some corrections before the IMT submission. CR R4-2007459 [R4-2007460] captures the changes

**Issue 2-5:**

* Proposals
  + Reject CR
  + Modify CR
  + Approve CR

### Sub-topic 2-6 OTA modulation quality test

The difference is that NR single RAT specification, EVM tests are performed accroding description in procedure in sub-cluase 6.6.3.4.2 where only highest supported modulation is tested. While in AAS specification all modulations need to be tested for EVM. CR R4-2007470 [R4-2007471]

**Issue 2-5:**

* Proposals
  + Reject CR
  + Modify CR
  + Approve CR

### Sub-topic 2-7 Correcting the reference angular step equations

*R4-2008013 [R4-2008015] were endorsed in RAN4#94B R4-2004463*

*R4-2008043 [R4-2008055] were endorsed in RAN4#94B R4-**2004500 (AI 4.7.3.3)*

**Issue 2-7**

* Proposals
  + Agree to CR R4-2008013
  + Agree to CR R4-2008043

### Sub-topic 2-8 CLTA maximum height

Moved form 4.7.3.3. An issue which has been identified whilst trying to carry out compliance testing of the co-location requirements when the co-location band is significantly lower than the operating band of the antenna under test

**Issue 2-8**

* Possible WF
  + Discuss whether this is CLTA is an issue
  + Discuss possible solutions once there is an agreement on the problem
* Recommendation
  + TBA

## Companies views’ collection for 1st round

### Open issues

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| **Company** | **Comments** |
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### 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** |
| Issue 2-1 R4-2006093 | Company A |
| Company B |
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| Issue 2-2 R4-2006459 | Company A |
| Company B |
|  |
| Issue 2-2 R4-2006460 | Company A |
| Company B |
|  |
| Issue 2-2 R4-2006458 | Company A |
| Company B |
|  |
| Issue 2-3 R4-2006915 | Company A |
| Company B |
|  |
| Issue 2-4 R4-2007418 | Company A |
| Company B |
|  |
| Issue 2-4 R4-2007420 | Company A |
| Company B |
|  |
| Issue 2-5 R4-2007459 | Company A |
| Company B |
|  |
| Issue 2-6 R4-2007470 | Company A |
| Company B |
|  |
| Issue 2-7 R4-2008013 | Company A |
| Company B |
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| Issue 2-7 R4-2008043 | Company A |
| Company B |
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## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

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| **Subtopic** | **Status summary** |
| **2-1** |  |
| **2-2** |  |
| **2-3** |  |
| **2-4** |  |
| **2-5** |  |
| **2-6** |  |
| **2-7** |  |
| **2-8** |  |

*Suggestion on WF/LS assignment*

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

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

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
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## Discussion on 2nd round (if applicable)

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| **Company** | **Comments** |
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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** |
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# Topic #3: Section 4.7.3.2 MSR specifications

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

## Companies’ contributions summary

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| **Topic** | **T-doc number** | **Company** | **Proposals / Observations** |
|  | ~~R4-2007468~~ | ~~Nokia, Nokia Shanghai Bell~~ | ~~CR to 37.141 Rel-15 Corrections of references in Modulation quality test for NB-IoT~~ |
|  | ~~R4-2007469~~ | ~~Nokia, Nokia Shanghai Bell~~ | ~~CR to 37.141 Rel-16 Corrections of references in Modulation quality test for NB-IoT~~ |
| 3-1 | R4-2007500 | Ericsson | Title: TS 37.141 - Issues with TC applicabilities for CS17 and CS18  This contribution is an update of the contributions submitted for last RAN4#94-e and RAN4#94-e bis. Additional configurations for which there is a testing issue have been identified.  In this contribution, we highlighted two issues for CS17 and CS18 with the Test Configurations table currently specified in TS 37.141. The companion CRs [1] and [2] are submitted for endorsement. |
| 3-1 | R4-2007501 | Ericsson | Title: CR to TS 37.141 Rel-15 - Issues with TC applicabilities CS17  ACLR related tests can’t be done with specified applicable TCs for CS17: only NR or LTE ACLR could be tested |
| 3-1 | R4-2007502 | Ericsson | Title: CR to TS 37.141 Rel-16 - Issues with TC applicabilities CS17-CS18  ACLR related tests can’t be done with specified applicable TCs for  - CS17: only NR or LTE ACLR could be tested  - CS18: when NB-IoT is not supported, a GSM carrier would then be placed on both side of the block. |
|  |  |  |  |
| 3-2 | R4-2008062 | Nokia, Nokia Shanghai Bell | Title: CR to 37.141: Rel'15 corrections  For transmitter tests, the “edges” in generation of TC18 are not clear since the GSM carriers are placed adjacent to each other starting from the high Base Station RF Bandwidth edge.  During RAN4#93 (Reno) meeting, CR to 37.141 (R4-1914277) was agreed that updated sub-cluase 6.5.1.4.2 Procedure to modulation quality test. Changes in R4-1916083 updated references to single RAT test specification without updated steps. However, due to the clash with other CR agreed before (R4-1913770) for last bullet in step 2 of 6.5.1.4.2, references with steps 1 to 2 were not removed. This CR removes for NB-IoT carrier steps in references. |
| 3-2 | R4-2008063 | Nokia, Nokia Shanghai Bell | Title: CR to 37.141: Rel'16 corrections |

## Open issues summary

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

### Sub-topic 3-1: Issues with TC applicabilities for CS17 and CS18

*Sub-topic description*

*In this contribution, we highlighted two issues for CS17 and CS18 with the Test Configurations table currently specified in TS 37.141. This issue has been brought up in several meeting.*

**Issue 3-1:**

* Proposals
  + Option 1: propose to use TC21 for CS17 and CS18 for ACLR testing only
* Recommended WF
  + TBA

### Sub-topic 3-2: clarification for generation of TC18

During CR to 37.141 (R4-1914277) was agreed that updated sub-cluase 6.5.1.4.2 Procedure to modulation quality test. Changes in R4-1916083 updated references to single RAT test specification without updated steps. However, due to the clash with other CR agreed before (R4-1913770) for last bullet in step 2 of 6.5.1.4.2, references with steps 1 to 2 were not removed. This CR removes for NB-IoT carrier steps in references.

**Issue 3-2**

* Proposals
  + Reject CR
  + Approve CR

## Companies views’ collection for 1st round

### Open issues

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| **Company** | **Comments** |
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### 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** |
| Issue 3-1 R4-2007501 | Company A |
| Company B |
|  |
| Issue 3-2 R4-2008062 | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

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| **Subtopic** | **Status summary** |
| 3-1 |  |
| 3-2 |  |

*Suggestion on WF/LS assignment*

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

### CRs/TPs

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

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
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## Discussion on 2nd round (if applicable)

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| **Company** | **Comments** |
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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*

*All contribution under this agenda should be noted.*

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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”* |
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# Topic #4: Section 4.7.3.3 NR conformance testing specifications (New CRs)

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

## Companies’ contributions summary

|  |  |  |  |
| --- | --- | --- | --- |
| **issue** | **T-doc number** | **Company** | **Proposals / Observations** |
| 4-1 | R4-2006095 | Nokia, Nokia Shanghai Bell, Ericsson | CR to TS 38.141-1: Corrections on generation of test configurations  1) The symbol “Foffset” is not defined but is used in the note in clause 4.7.1, the wordings of which is unclear.  2) For NRTC3 generation, the undefined symbol “FOffset“ is used in clause 4.7.5.1 for sub-blocks generation.  3) For NRTC4 generation, Maximum number of supported carriers per operating band (D.17) is used for carrier placement in each supported operating band (2nd bullet in clause 4.7.6.1), but Maximum number of supported carriers in multi-band operation (D.18) is used to calculate the sum of the maximum number of supported carriers of each supported operating band (last bullet in clause 4.7.6.1).  4) For NRTC4 generation, Total number of supported carriers for the declared band combinations (D.28) which may apply for *single-band connector(s)* according to Operating band combination support (D.27) is used to compare to the calculated sum of the maximum number of supported carriers of each supported operating band (last bullet in clause 4.7.6.1).  5) Some declared parameters are ambiguous, or even not relevant, which leads to confusion when declaring values or referring to those parameters. |
| 4-1 | R4-2006096 | Nokia, Nokia Shanghai Bell, Ericsson | CR to TS 38.141-1: Corrections on generation of test configurations  Rel 16 |
|  |  |  |  |
| 4-2 | R4-2007294 | NEC | CR to TS 38.141-1: MU and TT value tables  In the last meeting, NOTE is added in the TT value tables for transmitter and receiver requirements to clarify the applicability of the values. However, NOTE is still missing in the TT value tables for performance requirements and MU value tables. |
| 4-2 | R4-2007295 | NEC | CR to TS 38.141-1: MU and TT value tables  Rel 16 |
| 4-2 | R4-2007296 | NEC | CR to TS 38.141-2: MU and TT value tables |
| 4-2 | R4-2007297 | NEC | CR to TS 38.141-2: MU and TT value tables  Rel 16 |
|  |  |  |  |
| 4-3 | R4-2007298 | NEC | CR to TS 38.141-2: OTA receiver intermodulation interference signal type  In the table of interfering signals for intermodulation requirement, detail of 5MHz and 20MHz interference signals are described in Note 1 and 2, respectively. For BS CBW of 25MHz case, 20MHz interference signal is adopted but Note 1 is referenced. It is an erroneous reference and leads to confusion. |
| 4-3 | R4-2007299 | NEC | CR to TS 38.141-2: OTA receiver intermodulation interference signal type  Rel 16 |
|  |  |  |  |
| 4-4 | R4-2007472 | Nokia, Nokia Shanghai Bell | CR to 38.141-1 Rel-15 with correction to TPDR test procedure  This CR introduce correction to clause with Total power dynamic range test procedure related to test model that used. In sub-clause 6.3.3.4.1 Initial conditions it is describe that NR-FR1-TM3.1 should be used. However, specific test model that should be used is descibed in next sub-cluase 6.3.3.4.2 Procedure and it depends on highest modulation supported by BS. Thus this sentence in sub-clause 6.3.3.4.1 is misleading and should be removed. This sentence exist only in 38.141-1 specification and there is no in 38.141-2 spec. |
| 404 | R4-2007473 | Nokia, Nokia Shanghai Bell | CR to 38.141-1 Rel-16 with correction to TPDR test procedure  Rel 16 |

## Open issues summary

*Before e-Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable)*

### Sub-topic 4-1: Corrections on generation of test configurations

*Sub-topic description:*

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

*R4-2006095 (R4-2006096)*

**Issue 4-1-1 (D-10):**

* Proposals
  + Agree to remove D-10
  + Retain D-10

**Issue 4-1-2 (section 4.7.6.1):**

The changes in this section impact D17, D18, D19, D28. If this section is agreed, then the changes to the declarations can be agreed

* Proposals
  + Discuss the changes and then determine the changes to the declaration
* Determine the changes to the declarations after discussion
  + D-17
  + D-18
  + D-19
  + D-28
  + Note 2

**Issue 4-1-3 section 4.7.1 and 4.7.5.3:**

* Proposals
  + Agree to editorial changes (similar to R4-2006099)

### Sub-topic 4-2 MU and TT value tables

*Sub-topic description*

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

*R4-2007294 (R4-2007295) and R4-2007296 (R4-2007297)*

*Adding notes to clarify the applicability of the MU and TT*

**Issue 4-2**

* Proposal 1
  + Agree to table notes R4-2007294
  + Modify R4-2007294
  + reject
* Proposal 2
  + Agree to table notes R4-2007296
  + Modify R4-2007296
  + reject
* Recommended WF
  + TBA

### Sub-topic 4-3: OTA receiver intermodulation interference signal type

*Sub-topic description*

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

*R4-2007298 (R4-2007299)*

*Change the reference to a note*

**Issue 4-3:**

* Proposals
  + Agree *R4-2007298*
  + Reject
* Recommended

### Sub-topic 4-4 correction to TPDR test procedure

*Sub-topic description*

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

*R4-2007472 (R4-2007473)*

*Remove a possible referencing issue*

**Issue 4-4**

* Proposals
  + Agree *R4-2007472*
  + Reject
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

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| **Company** | **Comments** |
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### 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** |
| Issue 4-1 R4-2006095 |  |
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| Issue 4-2 R4-2007294 |  |
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| Issue 4-2 R4-2007296 |  |
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| Issue 4-3 R4-2007298 |  |
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| Issue 4-4 R4-2007472 |  |
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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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| **subtopic** | **Status summary** |
| **4-1** |  |
| **4-2** |  |
| **4-3** |  |
| **4-4** |  |

*Suggestion on WF/LS assignment*

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

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

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
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## Discussion on 2nd round (if applicable)

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| **Company** | **Comments** |
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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”* |
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# Topic #5: Section 4.7.3.3 NR conformance testing specifications (Endorsed CRs)

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

## Companies’ contributions summary

|  |  |  |  |
| --- | --- | --- | --- |
| **Issue** | **T-doc number** | **Company** | **Proposals / Observations** |
| 5-1 | R4-2006097 | Nokia, Nokia Shanghai Bell, Ericsson | Title CR to TS 38.141-1: Clarifications and corrections on extreme test environment  The wordings relating to extreme test environment are not aligned between the conducted and OTA tests, and some references to annexes are wrong.t |
| 5-1 | R4-2006098 | Nokia, Nokia Shanghai Bell, Ericsson | Title CR to TS 38.141-1: Clarifications and corrections on extreme test environment  Rel 16 |
| 5-1 | R4-2007442 | Huawei | Title CR to TS 38.141-2: Corrections for the extreme environment testing, Rel-15 (from AI 4.7.3.5)  During past meetings it was observed that the applicability of the extreme conditions testing can be mis-interpreted and related corrections were proposed, but not agreed.  During RAN4#94-e meeting this topic was discussed with the WF provided in R4-2002463 (Noted).  This CR clarifies the ambiguity of the extreme test conditions applicability in TS 38.141-2, based on the draftCR endorsed in R4-2005571. |
| 5-1 | R4-2007443 | Huawei | Title CR to TS 38.141-2: Corrections for the extreme environment testing, Rel-16 (from AI 4.7.3.5)  Rel 16 |
|  |  |  |  |
| 5-2 | R4-2006730 | Futurewei | CR 38.141-1 Rel15 4.9.2.3 corrections for random data generation  The feature for PN sequence generator was introduced. Some clarification on its operation are needed.  • The generator is initialized with a seed, not the sequence (the sequence is the output of the generator)  • The frequency of initialization is unclear. It seems the intent is to reset the generator at the start of frame. However, there appears to be conflicting requirements for the initialization.  Unclear what the word “this amount” refers to (PDSCH) |
| 5-2 | R4-2006731 | Futurewei | CR 38.141-1 Rel16 4.9.2.3 corrections for random data generation  Rel 16 |
| 5-2 | R4-2006732 | Futurewei | CR 38.141-2 Rel15 4.9.2.3 corrections for random data generation  The feature for PN sequence generator was introduced. Some clarfication on its operation are needed.  • The generator is initialized with a seed, not the sequence (the sequence is the output of the generator)  • The frequency of initialization is unclear. It seems the intent is to reset the generator at the start of frame. However, there appears to be conflicting requirements for the initialization.  Unclear what the word “this amount” refers to for PDSCH |
| 5-2 | R4-2006733 | Futurewei | CR 38.141-2 Rel16 4.9.2.3 corrections for random data generation  Rel 16 |
|  |  |  |  |
| 5-3 | R4-2006919 | Ericsson | Title: CR to TS 38.141-1: Correction to out-of-band blocking requirement is subclause 7.5  The out-of-band blocking requirement is based on a CW carrier interferer signal. The interferer signal characterisitics are descibed in the specification text. In current version a reference to Annex E is describing interferer signal modulation characterisitcs. Annex E describes the interferer signal in the case where a modulated signal is used, which is not applicable for out-of-band bclocking requirement. |
| 5-3 | R4-2006920 | Ericsson | Title: CR to TS 38.141-1: Correction to out-of-band blocking requirement is subclause 7.5  Rel 16 |
| 5-3 | R4-2006921 | Ericsson | Title: CR to TS 38.141-2: Correction to out-of-band blocking requirement in subclause 7.6 (from 4.7.3.5)  The out-of-band blocking requirement is based on a CW carrier interferer signal. The interferer signal characterisitics are descibed in the specification text. In current version a reference to Annex D is describing interferer signal modulation characterisitcs. Annex D describes the interferer signal in the case where a modulated signal is used, which is not applicable for out-of-band bclocking requirement. |
| 5-3 | R4-2006922 | Ericsson | Title: CR to TS 38.141-2: Correction to out-of-band blocking requirement in subclause 7.6  Rel 16 |

## Open issues summary

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

### Sub-topic 5-1 corrections on extreme test environment

*Sub-topic description*

*R4-2006097 [R4-2006098] alignment needed for TRP measurements in RAN4#94B R4-2005570*

*R4-2007442 [R4-2007443] alignment needed for TRP measurements in RAN4#94B R4-2005571 (4.7.3.5)*

**Issue 5-1:**

* Proposals
  + Agree to CR R4-2006097
  + Agree to CR R4-2007442

### Sub-topic 5-2 Correction to random data generation

*Sub-topic description*

*R4-2006730 [R4-2006731] alignment needed for TRP measurements in RAN4#94B R4-2004177*

*R4-2006732 [R4-2006733] alignment needed for TRP measurements in RAN4#94B* *R4-2004178*

**Issue 5-2:**

* Proposals
  + Agree to CR R4-2006730
  + Agree to CR R4-2006732

### Sub-topic 5-3 Corrections to out-of-band blocking requirement

*Sub-topic description*

*R4-2006919 [R4-2006920] alignment needed for TRP measurements in RAN4#94B R4-2003760*

*R4-2006921 [R4-2006922] alignment needed for TRP measurements in RAN4#94B R4-2003761 (4.7.3.5)*

**Issue 5-3:**

* Proposals
  + Agree to CR R4-2006919
  + Agree to CR R4-2006921

## Companies views’ collection for 1st round

### Open issues

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| --- | --- |
| **Company** | **Comments** |
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### 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** |
| Issue 5-1 R4-2006097 | Company A |
| Company B |
|  |
| Issue 5-1 R4-2007442 | Company A |
| Company B |
|  |
| Issue 5-2 R4-2006730 | Company A |
| Company B |
|  |
| Issue 5-2 R4-2006732 | Company A |
| Company B |
|  |
| Company B |
|  |
| Issue 5-3 R4-2006919 | Company A |
| Company B |
|  |
| Issue 5-3 R4-2006921 | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
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| **subtopic** | **Status summary** |
| 5-1 |  |
| 5-2 |  |
| 5-3 |  |

*Suggestion on WF/LS assignment*

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

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

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| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
|  |  |
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## Discussion on 2nd round (if applicable)

|  |  |
| --- | --- |
| **Company** | **Comments** |
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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*

|  |  |
| --- | --- |
| **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 #6: Sections 4.7.3.3 and 4.7.5 (38.141-2)

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

## Companies’ contributions summary

|  |  |  |  |
| --- | --- | --- | --- |
| **Issue** | **T-doc number** | **Company** | **Proposals / Observations** |
| 6-1 | R4-2006099 | Nokia, Nokia Shanghai Bell | CR to TS 38.141-2: Correction on frequency offset symbols in test configurations  *The symbol “Foffset” is not defined but is used in the note in clause 4.7.1, the wordings of which is unclear, and the incorrect symbols “FOffset\_high“ and “FOffset\_low“ are used in clause 4.7.2.4.1 for sub-blocks generation.* |
|  | R4-2006100 | Nokia, Nokia Shanghai Bell | CR to TS 38.141-2: Correction on frequency offset symbols in test configurations  Rel 16 |
|  |  |  |  |
| 6-2 | R4-2006101 | Nokia, Nokia Shanghai Bell | CR to TS 38.141-2: Correction on test procedure of OTA in-channel selectivity  The test procedure of OTA in-channel selectivity contains a phrase that asks to repeat the test for each supported NR channel BW, this is not consistent with the test procedures of conducted in-channel selectivity and other receiver OTA requirements. |
|  | R4-2006102 | Nokia, Nokia Shanghai Bell | CR to TS 38.141-2: Correction on test procedure of OTA in-channel selectivity  *Rel 16* |
|  |  |  |  |
| 6-3 | R4-2007313 | Huawei, HiSilicon | Title: NR FR2 test models for 16QAM  From the context of test procedure for EVM, “NR-FR2-TM3.1 with highest modulation order supported” means test model with 16 QAM or QPSK. However the 16 QAM or QPSK is not well defined in the corresponding test model. The draft CR was endorsed in R4-2005572. |
| 6-3 | R4-2007314 | Huawei, HiSilicon | Title: NR FR2 test models for 16QAM  Rel 16 |
|  |  |  |  |
| 6-4 | R4-2007315 | Huawei, HiSilicon | Title: CR for TS 38.141-2: Total power dynamic range  From the context of test procedure for total power dynamic range, “NR-FR2-TM2 with highest modulation order supported” means test model with 16 QAM or QPSK. However the 16 QAM or QPSK is not well defined in the corresponding test model. |
| 6-4 | R4-2007316 | Huawei, HiSilicon | Title: CR for TS 38.141-2: Total power dynamic range  Rel 16 |
|  |  |  |  |
| 6-5 | R4-2008041 | Nokia, Nokia Shanghai Bell | CR to TS 38.141-2: Adding spherical angle definitions to 3.2  The definition of the spherical angles () is missing in 3.2. |
| 6-5 | R4-2008042 | Nokia, Nokia Shanghai Bell | CR to TS 38.141-2: Adding spherical angle definitions to 3.2  Rel 16 |
|  |  |  |  |
| 6-6 | R4-2007503 | Ericsson, Nokia, Nokia Shanghai Bell | CR to TS 38.141-2 - Manufacturer declaration clarifications  Some declared parameters are ambiguous which leads to confusion when declaring values or referring to those parameters |
| 6-6 | R4-2007504 | Ericsson, Nokia, Nokia Shanghai Bell | CR to TS 38.141-2 - Manufacturer declaration clarifications  Rel 16 |

## Open issues summary

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

### Sub-topic 6-1 frequency offset symbols in test configurations (4.7.3.2)

*Sub-topic description:*

*R4-2006099 (R4-2006099) is from an endorsed CR (R4-2004946)*

**Issue 6-1:**

* Proposals
  + Agree CR R4-2006099

### Sub-topic 6-2 test procedure of OTA in-channel selectivity (4.7.3.2)

*Sub-topic description:*

*R4-2006101 (R4-2006102) is from an endorsed CR (R4-2003000)*

**Issue 6-2:**

* Proposals
  + Agree CR R4-2006101

### Sub-topic 6-3 NR FR2 test models for 16QAM

*Sub-topic description:*

*R4-2007313 (R4-2007314) is from an endorsed CR (R4-2005572)*

**Issue 6-3:**

* Proposals
  + Agree CR R4-2007313

### Sub-topic 6-4 Highest modulation order

In the last meeting, there was discussion about this topic

“NR-FR2-TM2 with highest modulation order supported” means test model with 16 QAM or QPSK. However the 16 QAM or QPSK is not well defined in the corresponding test model.

**Issue 6-4:**

* Proposals
  + Agree CR R4-2007315
  + Reject CR
  + Modify CR

### Sub-topic 6-5 Adding spherical angle definitions

*R4-2008041 (R4-2008042) is from an endorsed CR (R4-2005572)*

**Issue 6-5:**

* Proposals
  + Agree CR R4-2008041

### Sub-topic 6-6 Manufacturer declaration clarifications

*R4-2007503 (R4-2007504) is from an endorsed CR (R4-2005602)*

**Issue 6-6:**

* Proposals
  + Agree CR R4-2007503

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
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|  |  |

### 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** |
| Issue 6-1 R4-2006099 | Company A |
| Company B |
|  |
| Issue 6-2 R4-2006101 | Company A |
| Company B |
|  |
| Issue 6-3 R4-2007313 | Company A |
| Company B |
|  |
| Issue 6-4 R4-2007315 | Company A |
| Company B |
|  |
| Issue 6-5 R4-2007313 | Company A |
| Company B |
|  |
| Issue 6-5 R4-2007503 | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

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| **Subtopic** | **Status summary** |
| 6-1 |  |
| 6-2 |  |
| 6-3 |  |
| 6-4 |  |
| 6-5 |  |
| 6-6 |  |

*Suggestion on WF/LS assignment*

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

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

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
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## Discussion on 2nd round (if applicable)

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| **Company** | **Comments** |
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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*

|  |  |
| --- | --- |
| **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”* |