**3GPP TSG-RAN WG4 Meeting #94-e R4-20xxxxx**

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

**Agenda item:** 6.8.3, 6.8.4,6.8.5

**Source:** Moderator (ZTE Corporation)

**Title:** Email discussion for RAN4#94e\_#77\_NR\_NewRAT\_Conformance\_BS\_Part\_2

**Document for:** Information

# Introduction

Scope of this email discussion is listed in Table 1.

In this meeting following open issues will be discussed

**Topic 1:** **TC updates for TS38.141-1/38.141-2**

**Topic 2: PHY Data generation for test model and**

**Topic 3: OSTP calculation**

**Topic 4:** **OBUE** **Cat B option 2 for n7 and n38 and removal of n65 in R15**

**Topic 5: Correlation between wanted signal and in-band emission**

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

* 1st round: Topics listed above with numbers
* 2nd round: TBA

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| --- | --- | --- | --- | --- |
| **#** | **Email title** | **WI** | **Topic areas** | **AI** |
| 77 | RAN4#94e\_#77\_NR\_NewRAT\_Conformance\_BS\_Part\_2 | NR\_newRAT-Perf | * TC updates for TS38.141-1/38.141-2 * PHY Data generatioin for test model * OSTP calculation * OBUE Cat B option 2 for n7 and n38 and removal of n65 in R15 * Correlation between wanted signal and in-band emission | 6.8.3, 6.8.4, 6.8.5 |

# Topic #1: TC updates for TS38.141-1 and TS38.141-2

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| **[R4-2000666](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_e/Docs/R4-2000666.zip)** | Nokia, Nokia Shanghai Bell | Title:CR to TR 38.141-1: Corrections on generation of test configurations  Proposal 1:  1) For NRTC1 power allocation, set the power spectral density of each carrier to the same level only be used for testing BS supporting CA only operation (D.15), and set the power of each carrier to the same level for testing BS supporting multiple carriers (D.16), as in E-UTRA ETC1.  2) For NRTC4 generation, use Maximum number of supported carriers in multi-band operation (D.18) for carrier placement in each supported operating band (2nd bullet).  3) For NRTC4 generation, use Total maximum number of supported carriers (D.19) to compare to the calculated sum of the maximum number of supported carriers of each supported operating band (last bullet). |
| R4-2000667 | Nokia, Nokia Shanghai Bell | Title:CR to TR 38.141-1: Corrections on generation of test configurations |
| **[R4-2000668](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_e/Docs/R4-2000668.zip)** | Nokia, Nokia Shanghai Bell | Title :CR to TR 38.141-2: Corrections on generation of test configurations  Proposal :  ) For power allocation for all test configurations except NRTC2, set the power of each carrier to the same level, and use rated transmitter TRP,Prated,t,TRP (D.38) instead of rated carrier TRP,PRated,c,TRP (D.37) for the total radiated power.  2) For NRTC1 generation, points to (D.60) instead of (D.59) for inter-band CA bands declared to be supported by the beam.  3) For NRTC2 power allocation, remove the condition of CA-only operation (D.20).  4) For NRTC4, change the term ‘active electronic components(s)’ to ‘active RF components’ to match the definition of ‘multi-band RIB’.  5) For NRTC5 power allocation, change the ‘EIPR’ to ‘TRP’, and clarify the declared rated TRP as the rated carrier OTA BS power, PRated,c,TRP (D.37). |
| R4-2000669 | Nokia, Nokia Shanghai Bell | CR to TR 38.141-2: Corrections on generation of test configurations |
| R4-2000679 | Nokia, Nokia Shanghai Bell | CR to TR 38.141-1: Corrections on generation of test configurations |
| R4-2000680 | Nokia, Nokia Shanghai Bell | CR to TR 38.141-1: Corrections on generation of test configurations |
| R4-2000681 | Nokia, Nokia Shanghai Bell | CR to TR 38.141-2: Corrections on generation of test configurations |
| R4-2000682 | Nokia, Nokia Shanghai Bell | CR to TR 38.141-2: Corrections on generation of test configurations |

## 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: TC updates for TS38.141-1

*Sub-topic description:*

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

**Issue 1-1: TC updates for TS38.141-1**

* Proposals

1) For NRTC1 power allocation, set the power spectral density of each carrier to the same level only be used for testing BS supporting CA only operation (D.15), and set the power of each carrier to the same level for testing BS supporting multiple carriers (D.16), as in E-UTRA ETC1.

2) For NRTC4 generation, use Maximum number of supported carriers in multi-band operation (D.18) for carrier placement in each supported operating band (2nd bullet).

3) For NRTC4 generation, use Total maximum number of supported carriers (D.19) to compare to the calculated sum of the maximum number of supported carriers of each supported operating band (last bullet).

### Sub-topic 1-2: TC updates for TS38.141-2

*Sub-topic description*

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

**Issue 1-2:**

* Proposals

1. For power allocation for all test configurations except NRTC2, set the power of each carrier to the same level, and use rated transmitter TRP,Prated,t,TRP (D.38) instead of rated carrier TRP,PRated,c,TRP (D.37) for the total radiated power.

2) For NRTC1 generation, points to (D.60) instead of (D.59) for inter-band CA bands declared to be supported by the beam.

3) For NRTC2 power allocation, remove the condition of CA-only operation (D.20).

4) For NRTC4, change the term ‘active electronic components(s)’ to ‘active RF components’ to match the definition of ‘multi-band RIB’.

5) For NRTC5 power allocation, change the ‘EIPR’ to ‘TRP’, and clarify the declared rated TRP as the rated carrier OTA BS power, PRated,c,TRP (D.37).

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| ZTE | Sub topic 1-1:  The number of carriers of each supported *operating band* shall be the declared maximum number of supported carriers in multi-band operation (D.18)  I think it should be D.17 for each operating band I think instead of multiple band , otherwise the maximum supported carrier per band is the same as maximum supported carrier in multi-band.  If the sum of the maximum number of supported carriers in multi-band operation (D.18) is larger than the declared total maximum number of supported carriers of the BS (D.19), repeat the steps above for test configurations where in each test configuration the number of carriers of one of the operating band shall be reduced so that the total number of supported carriers is not exceeded and vice versa.  I think the original one is also correct, why we need to remove band combination or each supported band for multi-band operation.  Sub topic 1-2: it’s fine for all updates. |
| Nokia | Sub topic 1-1 (reply to ZTE comments):  For LTE, we have in TS 36.141 clause 4.6.8.  For all BS:  - Maximum number of supported carriers within each band;  - for contiguous spectrum operation  - for non-contiguous spectrum operation  For multi-band BS:  - Total number of supported carriers for the declared band combinations of the BS  - Maximum number of supported carriers per band in multi-band operation  So there are two declarations for multi-band operation, one for CA and one for multi-band. Hence if we apply the same concept for NR, then D.17 is for all BS, while D.18 and D.28 are for multi-band BS, hope this clarifies.  ZTE: clarification for D.18 of per band is needed, other part is fine for me :) |
| Ericsson | |  | | --- | | Sub-topic 1-1: CR is not correct:  - Power: As it would anyway be same 5 MHz (or 20 MHz) signals used to build the TC, equal PSD or equal power is the same result. This would be usefuel when considering LTE 1.4Mhz or GSM, but not with NR.  - Multi-band: D.17 should be replaced by D.18, ok.  But following changes are not correct. First, the "the sum of the maximum number of supported carriers of each supported operating bands in multi-band operation ", is not meaningful. Second, D.18 is always lower or equal to D.19, so it could never be larger... | | Nokia: Power, we are adding NB-IoT operation in NR in-band in TS 38.141-1 now, so it is time to align TS 38.141-1 with 36.141 and 37.141. Also my understanding is D.18 is for eachoperating band, so the sum of D.18 for multi-band can be larger than D.19.   |  | | --- | | Sub-topic 1-2: This CR is not correct:  - D.59 should be replaced with D.60, that's ok  - But other changes are not ok: the power set on each carrier should be indeed according to the declared one (D.37) and not shared euqally in between all carriers as it is proposed.  This is also aligned with 37.145-2 | | Nokia: The existing statement says total power (not on each carrier) is set to D.37, ‘For all other requirements ensure the total radiated power is set to rated carrier TRP PRated,c,TRP(D.37)’. Also BS manufacturers should have the flexibility to declare lower output power per carrier for multi-carrier operation, right? | | |

### CRs/TPs comments collection

*Major close-to-finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| **[R4-2000666](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_e/Docs/R4-2000666.zip)** | Company A: |
| Company B: |
|  |
| **[R4-2000668](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_e/Docs/R4-2000668.zip)** | 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.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

*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*

|  |  |
| --- | --- |
| **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”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #2: PHY data generation for test model

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2001171 | CATT | Discussion on random data content of physical channels for NR test models |
| **[R4-2001676](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_e/Docs/R4-2001676.zip)** | Nokia, Nokia Shanghai Bell | Discussion on data content for NR test models  Observation 1: Generation for NR test models should match physical layer design in RAN1 specifications.  Observation 2: Using “random” data instead of “all 0” may be beneficial for some of the test models, but it also increases test time and complexity for implementing PN. |
| **[R4-2001722](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_e/Docs/R4-2001722.zip)** | Ericsson | Random data content of physical channels for NR test modes  Proposal 1: random data has been proposed as a means to bring the NR TM for a more realistic waveform but also to provide amplitude statistics of the NR TM to be Rayleigh distributed.  Proposal: PN 23 for random data generation |
| **[R4-2001723](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_e/Docs/R4-2001723.zip)** | Ericsson | CR to TS 38.141-1: Random data content for NR BS Test Models |
| R4-2001724 | Ericsson | CR to TS 38.141-1: Random data content for NR BS Test Models |
| **[R4-2001725](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_e/Docs/R4-2001725.zip)** | Ericsson | CR to TS 38.141-2: Random data content for NR BS Test Models |
| R4-2001726 | Ericsson | CR to TS 38.141-2: Random data content for NR BS Test Models |
| **[R4-2001730](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_e/Docs/R4-2001730.zip)** | Futurewei | Scrambling and initialization for test models  Observation 1: it is possible to generate independent realizations over a measurement interval if an LFSR has length of at least 23 bits.  Observation 2: Cascading current scramblers initialized with different seeds may not improve the randomness of bits.  Observation 3: How the PN generator operates should be clarified (e.g., continuous, reinitialized with different seeds).  Proposal 1: If more realizations are needed, consider augmenting the RNTI with the slot number in the calculation of the initialization of the scrambling seed for PDSCH. |
| **[R4-2001805](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_e/Docs/R4-2001805.zip)** | Keysight Technologies UK Ltd | Study on NR Test Model signal characteristic by data content choice  Proposal1. Use CCDF curve as tool to evaluate data content of Test model.  Proposal2. Use random data rather All zero for test model data content.  Proposal3. Between PN23 and PN31, either PN sequence is good enough. And no further randomization study is not necessary.  Proposal4. No further study necessary for multiple CC case and cell ID.  Proposal5. Further study may be needed on TM2 if RAN4 sees concern on CCDF plot of TM2 |

## 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: PHY data generation for test model

**Issue 2-1: data generationt to solve the correlation between symbols**

* Proposals
  + Option 1: random data with PN23
  + Option 2: augmenting the RNTI with the slot number in the calculation of the initialization of the scrambling seed for PDSCH
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

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| --- | --- |
| **Company** | **Comments** |
| ZTE | Sub topic 2-1: support option 1 with random data with PN23 as option 2 is not aligned with PHYspec. |
| Futurewei | Sub topic 2-1  To understand the implementation impact of option 1   * Can the polynomial for PN23 be provided? * What is the initialization seed? When is the PN generator initialized? Is the output of generator continuous across slots or reset each slot? Is there advancing such as by 1600 in NR? (How is synchronization of the generator ensured)   For option 2:   * The comment about alignment to Phy spec: The use of RNTI to classify the types of PDSCH is arbitrary. We chose to use 0, 1, 2 for all slots to keep the test model specification simple. We could have used RNTI=(0,1,2) for the first slot, (4, 5, 6) for the second slot, (8, 9, 10) for the third slot, etc. If we had done that, then this use of the RNTI is compliant with the PHY spec. The proposal is just a logical change of the RNTI used (basically add slot number to the RNTI with no other changes). There can be other ways to capture that statement. * If the decision is to change the number of test realizations, we should evaluate the implementation impacts. For example, implementing a PN generator is also non-compliant. |
| Nokia | Sub topic 2-1: Option 2 seems to be against RAN1 design, we think test models should be design according RAN1 specification even if this is for testing purpose only, also it is not sure what is benefit of this solution i.e. what is PAPR difference compare to “all zero’s” current design. For option 1 there are some benefits (PAPR limitation) of usage of PN for some test models, however there would be a trade-off additional test time and complexity using the PN compared to current “all zeros” data. If this option would be specified it is not enough to add PN23, also the PN polynomial need to be specified in specification. |
| Futurewei | Subtopic 2.1: Followup comment to Nokia:  The contribution R4-2001730 shows a performance difference to the “all zeros”. In addition a comparison to the PN23 is provided. The performance of PN23 and making the RNTI vary by slot number is quite similar.  The comment about RAN1 design is not correct. What is provided to RAN1 is an RNTI value, which is needed by the scrambler initialization. The RNTI value just changes each slot; thereby causing the realizations to be different each slot. |
| Nokia | Reply to Futurewei comment: Our understanding is that RNTI is unique for an UE and cannot be changed slot-by-slot in real implementation for the UE. |
| ZTE | PN23 could generate 2^23-1 bit in total is that right, assuming maximum channel bandwidth 273PRB for 100MHz, 30KHz and 10 slots, then maixmum REs could be 273\*12\*14\*10\*2=917280 which is still less than 2^23-1. |
| Keysight | For PN23 definition question, what we refer to is, ITU-T O.151 it’s available from ITU web. (free to download!!), please see section 2.2 for PN23. By the way, this definition itself doesn’t provide beginning or end of sequence because original intention is to be used repeatedly. But for those examples I’m providing uses sequence starting with 23 consecutive zero (note, this is inverted generator so shift register values are one) |
| Ericsson | Sub topic 2-1:  The polynomial is taken from ITU guidance: <https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-O.150-199605-I!!PDF-E&type=items>  Seed is all ones. Which is also taken from guidance in ITU for other PN sequences.  It should be continuous, as if it restarts at the beginning of every slot it does not solve the issue we saw in the scrambling code design raised in previous Nokia paper.  The proposed change of “c\_init” by using slot number (and RNTI) could work fine, but then we don’t use the standard (RAN1) scrambler and if one wants to retrieve the real bits transmitted in DL you must keep track of which scrambler was used. |
| ZTE | Sub topic 2-1: just purely technical clarification from my simulation experience in the past  Pros and Cons for option 1 and option 2  Option 1:  Pros : align with RAN1 spec and RNTI is unique  Cons: when calculating EVM per RE and average the whole frame, it maybe a bit more complicated as  EVM =Soft information after LDPC decoding before modulator hard decision -all REs QPSK information (different among REs due to random data generation) ;    Option 2:  Pros :when calculating EVM per RE and average the whole frame, it maybe easier as  EVM=Soft information after LDPC decoding before modulator hard decision -all REs QPSK information (unique with 1/sqrt(2)(1+1i)) ; TE don’t need to align with BS for data generation, but for RNTI generation.  Cons: not align with RAN1 spec i think. |
| Keysight | Regarding with Implementation complexity for TE, data payload content doesn’t matter at all for EVM measurement nor power measurement. Though if RNTI value is different per slot, it needs to be specified as defined. (this small difference though). Test time also shouldn’t change because of data payload difference either. |
| ZTE | To Keysight, if TE are fine with data generation at TE side, then we are also fine at BS side. |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| **[R4-2001723](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_e/Docs/R4-2001723.zip)** | ZTE: is that necessary to use the uniform distribution to describe PN23? |
| Futurewei: the implementation details are incomplete. |
| Nokia: More details is needed i.e. the PN polynomial need to be specified in specification. |
|  |
| **[R4-2001725](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_e/Docs/R4-2001725.zip)** | ZTE: the same comment as before. |
| Nokia: Same comment as above for 1723. |
|  |

## Summary for 1st round

### Open issues

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

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

*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** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #3: OSTP calculation

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| **[R4-2001677](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_e/Docs/R4-2001677.zip)** | Nokia, Nokia Shanghai Bell | CR to 38.141-1 updates for OSTP calculations  Proposal:  For OSTP formula *Nsym* as all OFDM symbols that carry PDSCH and not contain PDCCH, RS or SSB is included to formula:  */ Nsym* |
| R4-2001678 | Nokia, Nokia Shanghai Bell | CR to 38.141-1 updates for OSTP calculations |
| **[R4-2001679](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_e/Docs/R4-2001679.zip)** | Nokia, Nokia Shanghai Bell | CR to 38.141-2 updates for OSTP calculations  Proposal :  For OSTP formula *Nsym* as all OFDM symbols that carry PDSCH and not contain PDCCH, RS or SSB is included to formula:  */ Nsym* |
| R4-2001680 | Nokia, Nokia Shanghai Bell | CR to 38.141-2 updates for OSTP calculations |

## 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: OSTP calculation

**Issue 2-1: OSTP calculation**

* Proposals

For OSTP formula *Nsym* as all OFDM symbols that carry PDSCH and not contain PDCCH, RS or SSB is included to formula

*/ Nsym*

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| ZTE | Sub topic 3-1: fine to have the updates. |
| Futurewei | Sub-topic 3-1: the change is fine. This is just an editorial suggestion: use  Or put the change within the equation object (to keep the font sizes consistent) |
| Nokia | To Futurewei: Thanks for comment, revision with editorial edition will be in folder. |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| **[R4-2001677](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_e/Docs/R4-2001677.zip)** | Company A |
| Company B |
|  |
| **[R4-2001679](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_e/Docs/R4-2001679.zip)** | 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.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

*Suggestion on WF/LS assignment*

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

### CRs/TPs

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

|  |  |
| --- | --- |
| **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”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #4: OBUE Cat B option 2 for n7 and n38 and removal of n65 in R15

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2001824 | Huawei | Title:CR to TS 38.141-1: OBUE Cat. B Option 2 correction for n7, Rel-15  Proposal 1: addding n7 and n38 for OBUE Cat B option 2 for AAS BS according to ECC decision;  Proposal 2: Removal of n65 in R15 spec and capture n65 in R16 spec |
| R4-2001825 | Huawei | Title:CR to TS 38.141-1: OBUE Cat. B Option 2 correction for n7, Rel-16 |
| R4-2001826 | Huawei | Title: CR to TS 38.141-2: OBUE Cat. B Option 2 correction for n7 and n38, Rel-15, Cat F  Proposal 1: addding n7 and n38 for OBUE Cat B option 2 for AAS BS according to ECC decision;  Proposal 2: Removal of n65 in R15 spec and capture n65 in R16 spec |
| R4-2001827 | Huawei | Title: CR to TS 38.141-2: OBUE Cat. B Option 2 correction for n7 and n38, Rel-16, Cat A |

## 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 4-1 OBUE Cat B option 2 for n7 and n38 and removal of n65 in R15

**Issue 2-1: TBA**

* Proposals
  + addding n7 and n38 for OBUE Cat B option 2 for AAS BS according to ECC decision
  + Removal of n65 in R15 spec and capture n65 in R16 spec

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| ZTE | Sub topic 4-1: it’s fine to remove that n65 and add n7 and n38 into R15 spec. |
| Nokia | It is ok to align specs and correct. |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2001824 | ZTE: okay |
| NEC: Fine to remove n65 in R-15 and to add in Rel-16. It means R4-2001825 shall not be cat-A. Typo, add space between “n8” and “or”. |
|  |
| R4-2001826 | ZTE: okay |
| 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.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

*Suggestion on WF/LS assignment*

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

### CRs/TPs

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

|  |  |
| --- | --- |
| **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”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #5: Correlation between wanted signal and in-band emission

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2002042 | Nokia, Nokia Shanghai Bell | *Observation 1*: and in Equation (3) are independent Gaussian random values, while , and in Equation (2) provides the position of each array element in the Cartesian coordinate system. To avoid confusion, a different symbol could be used to represent the Gaussian random value.  *Question 1*: Is the correlation model assumed by Equation (3) realistic or only valid for some AAS BS implementation variants?  *Observation 2*: has only a real part which is constant.  *Observation 3*: When , the radiation pattern of the unwanted signal is identical to the wanted signal. As a result, the beam-based directions procedure can be applied without causing TRP estimation errors.  *Observation 4*: is a random complex number.  *Observation 5*: For = 0, it can be concluded that criteria (a)-(c) are not met based on the above analysis, which implies criterion (d) is also not met.  *Observation 6*: is a random complex number but the real part is composed of a constant and a random number.  *Observation 7*: For = 0.9, it can be concluded that criteria (b)-(c) are not met based on the above analysis, which implies criterion (d) is also not met. Consequently, the beam-based directions procedure cannot be used for computing TRP estimate.  *Observation 8*: is a random complex number but the real part is composed of constant and a random number similar to the case = 0.9. However, the constant is smaller as decreases.  *Observation 9*: For = 0.4, it can be concluded that criteria (b)-(c) are not met based on the above analysis, which implies criterion (d) is also not met. Consequently, the beam-based directions procedure cannot be used for computing TRP estimate. |

## 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

*Sub-topic description:*

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

**Issue 2-1: correlation between wanted signal and in-band emission**

* Observation: general relationship between the HPBW and signal correlation exist

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| ZTE | Sub topic 5-1: no strong opinions. |

### 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** |
| XXX | Company A |
| Company B |
|  |
| YYY | 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.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

*Suggestion on WF/LS assignment*

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

### CRs/TPs

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

|  |  |
| --- | --- |
| **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”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |