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

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

**Agenda item:** 6.8.2

**Source:** Moderator (FUTUREWEI)

**Title:** Email discussion summary for RAN4#94e\_#76\_NR\_NewRAT\_Conformance\_BS\_Part\_1

**Document for:** Information

# Introduction

This moderator document summarizes the contributions presented in 6.8.2.2 and 6.8.2.3. In addition, the several contributions from 6.8.4 and 6.8.5 are being treated here due to similarity of contributions in 6.8.2.3. Please see subtopic 2-5.

There are two categories of contributions.

* Editorial CRs
  + Unless the issues for the editorial CRs are substantial, these CRs could be agreed after the first round.
* Technical issues
  + Extreme conditions
  + Capability sets and test configurations
  + foffset discussion

# Topic #1: Editorial changes for MSR specifications (6.8.2.2)

* Editorial CRs
* discussion paper about change in TC for CS17 (rel 15/16) and TC for CS18 (rel 16)

## Companies’ contributions summary

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| --- | --- | --- | --- |
| **T-doc number** | **Company** | **Specification, subclause, Release** | **Proposals / Observations** |
| R4-2000898 | CMCC | 37.141 6.4.1 15.9 | CR  The definiton of Tx transient period in TS 37.104 was updated and agreed at RAN4 #93 in R4-1915479 with necessary illustration of NR. The same change needs to be applied in TS 37.141 accordingly. |
| R4-2000899 | CMCC | 37.141 6.4.1 16.4 | Mirror CR |
| R4-2001200 | Ericsson | discussion | Possible issues for CS17 (Rel-15 and 16) and CS18 (Rel-16)  CS18: if NB-IoT not present, a second GSM carrier is placed. Problem is cannot perform test LTE ACLR requirement. Proposed solution is to TC21  CS17: problem is unable to test NR and LTE ACLR simultaneously with TC22 – can only test one or the other |
| R4-2001201 | Ericsson | 37.141 5.1 15.9 | ACLR related tests can’t be done with specified applicable TCs for CS17: only NR or LTE ACLR could be tested  Changed TC22 to TC21 |
| R4-2001201 | Ericsson | 37.141 5.1 16.4 | ACLR related tests can’t be done with specified applicable TCs for CS17: only NR or LTE ACLR could be tested  Changed TC22 to TC21  - CS18: when NB-IoT is not supported, a GSM carrier would then be placed on both side of the block. |
| R4-2001685 | Ericsson | 38.141-2 7.7.5.1 15.4 | Rel 15 CR implementation issue (R4-1916151)  Table 7.7.5.1-1 “-42.8 + X dBm” was not changed to “-30 + X dBm” |

## Open issues summary

### Sub-topic 1-1

*Complete the editorial change in 37.104 by adding figure references and updating figure captions. The proposals mirror the changes in 37.104 [R4-1915479]*

* Proposals: Mirror the changes in 37.104 [R4-1915479]
* Recommended WF
  + Accept/reject CRs R4-2000898 and R4-2000899

### Sub-topic 1-2

1. *CS17: change TC22 to TC21 for CS17 (rel 15 and rel 16) for MSR ACLR*
2. *CS18: change TC21a to TC21 for CS18 (rel 16) for MSR ACLR*

* Proposals a): CS17: change TC22 to TC21 for CS17 (rel 15 and rel 16)
* Proposals b): CS18: change TC21a to TC21 for CS18 (rel 16)
* Recommended WF
  + [moderator note] The rel 16 CR captures (a) and (b) while the rel 15 CR captures (a). To make progress, (a) and (b) are discussed individually.
  + Determine whether the basis for proposal a) is acceptable and then evaluate CR (primarily R4-2001200)
  + Determine whether the basis for proposal b) is acceptable and then evaluate CR (primarily R4-2001201)

### Sub-topic 1-3

*Correct the CR implementation oversight in 38.141-2 Table 7.7.5.1-1 rel 15*

* Proposals: *Correct the CR implementation oversight in 38.141-2 Table 7.7.5.1-1 rel 15*
* Recommended WF
  + [moderator note]: suggestion is moving paper to AI 6.8.2.3 because AI 6.8.2.2 is MSR
  + Accept/reject CR R4-2001685

## Companies views’ collection for 1st round

### Open issues

*[moderator note] each sub-topic 1.2 item (CS) seem to require discussion as it changes capability sets.*

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| **Company** | **Comments** |
| Nokia | Sub topic 1-2: Typo 'testin' on cover pages of R4-2001201 and R4-2001202. |

### 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.*

*[moderator note] CRs R4-2001200 and R4-2001201 are listed as an open issue above and should be discussed in previous section.*

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| **CR/TP number** | **Comments collection** |
| R4-2000898 (R4-2000899) | Ericsson: good to align with 37.104, but we should add NB-IoT in figure 6.4.2-1 |
| ZTE: it’s fine to add the NR transient period figure |
|  |
| R4-2001685 | Ericsson: ok |
| ZTE: okay |
| NEC: support |
|  |
| R4-2001200, R4-2001201 | Huawei: ACLR is defined as single RAT requirements.  Shall we also use single RAT TC? We would like to also check other CS, and make the changes consistently. |
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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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| --- | --- |
|  | **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*

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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*

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

# Topic #2: NR conformance testing specifications (6.8.2.3)

* Editorial CRs
  + Unless the issues for the editorial CRs are substantial, these CRs could be agreed after the first round.
* Technical issues
  + Extreme conditions (contributions R4-2001829 & R4-2001828 are also treated here)
  + foffset discussion

## Companies’ contributions summary

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Company** | **Specification, subclause, Release** | **Proposals / Observations** |
| R4-2000662 | Nokia, Nokia Shanghai Bell | 38.141-1 9 subclauses 15.4 | The symbol ‘Prated’ is used in a few places instead of the defined symbol ‘Prated’. |
| R4-2000663 | Nokia, Nokia Shanghai Bell | 38.141-1 9 subclauses 16.2 | Mirror CR |
| R4-2000664 | Nokia, Nokia Shanghai Bell | 38.141-2 11 subclauses 15.4 | The symbol ‘Prated’ is used in a few places instead of the defined symbol ‘Prated’.  Other editorial changes (double periods, repeated “in”, |
| R4-2000665 | Nokia, Nokia Shanghai Bell | 38.141-2 11 subclauses 16.2 | Mirror CR |
| R4-2001681 | Nokia, Nokia Shanghai Bell | 38.141-1 many clauses 15.4 | Add subclause referencing to 4.9.2.2 in test models (3 instances)  Add symbol OSTP (~7 instances)  Ensure symbols carrying PDCCH not used in measurement |
| R4-2001682 | Nokia, Nokia Shanghai Bell | 38.141-1 many clauses 16.2 | Mirror CR |
| R4-2001683 | Nokia, Nokia Shanghai Bell | 38.141-2 6.4.3 15.4 | Ensure symbols carrying PDCCH not used in measurement  Editorial change (double period, spacing)  Change reference to Annex I from F |
| R4-2001684 | Nokia, Nokia Shanghai Bell | 38.141-2 6.4.3 16.2 | Mirror CR |
| R4-2001907 | Ericsson | discussion | Foffset definitions   |  |  | | --- | --- | | 36.141 | Need to add the note regarding alignment to channel raster | | 37.141 | Correct the note regarding alignment to channel raster. Final text to be agreed offline. | | 37.145-x | Add table with definition of values Foffset-RAT  Replace Foffset-RAT  Correct the note to align with 37.141 | | 38.141-x | Add definition Foffset  Add table with the value for Foffset  Correct the note to align with 37.141 | |
| R4-2001909 | Ericsson | 38.141-2 7.8.5.1 16.2 | Swap the values of 25 and 30 in Table 7.8.5.1-1. Note correct order is used in v15.4. |
| R4-2001908 | Ericsson | Discussion | This is a continuation of the topic introduced in R4-1915281  Proposal 1: In order to avoid sending a package of CRs for many specs, and eventually from different companies, we propose to hold the discussion offline until an agreement is reached. The topic shall be discussed under BS Specification Cleanups agenda item. Former AAS BS email list can be used for communication.  Proposal 2: Align the BS output power testing under extreme conditions in all relevant specifications so that it is clear that only one test configuration and channel/BS RF BW shall be considered under all 4 combinations of extreme power supply and extreme temperatures, as indicated in mentioned annexes. The final wording to be included in the specifications has to be agreed offline by interested partners. |
| R4-2001910 | Ericsson | 38.141-1 6.2.4.1 15.4 | Added reference to annex B.5 Wording changes to accompanying paragraph  Revision of R4-1915754 |
| R4-2001911 | Ericsson | 38.141-1 6.2.4.1 16.2 | Mirror CR |
| R4-2001912 | Ericsson | 38.141-2 6.2.4.1 15.4 | Added reference to annex B.5 Wording changes to accompanying paragraph (similar to R4-2001910)  Revision of R4-1915751 |
| R4-2001913 | Ericsson |  | Mirror CR |
| R4-2001828 (moved from AI 6.8.4) | Huawei | 38.141-1 many subclauses 15.4 | During previous meeting it was observed that the applicability of the extreme conditions testing can be mis-interpreted and related corrections were proposed, but not agreed  - 4.1.2.1: MU sentence on the Normal test conditions assumption (in case of TS 38.141-2 specification, the MU differs for Normal and Extreme, so this sentence is also added in TS 38.141-1 for consistency).  - 4.8.2: Applicability table update with the test conditions information  - 6.1.1, 6.1.2, 7.1, 8.1.1: clarification on the default being the Normal test conditions.  - 6.2.4.1: EIRP test initial conditions corrected based on the text from legacy specifications.  - 7.2.4.1: EIS test initial conditions corrected based on the text from legacy specifications  - Removal of redundant and repeated information on the Normal test conditions repeated for all the Tx, Rx, and demod tests.  - C.0: clarification on the TT applicability for Normal and Extreme tests. |
| R4-2001830 (moved from AI 6.8.4) | Huawei | 38.141-1 16.2 | Mirror CR |
| R4-2001829 (moved from AI 6.8.5) | Huawei | 38.141-2 many subclauses 15.4 | - 4.1.2.1: MU sentence on the Normal test conditions assumption  - 4.8.1: Applicability table update with the test conditions information  - 6.1, 7.1, 8.1.0: clarification on the default being the Normal test conditions.  - 6.2.3: adding missing statement to complete the extreme testing case.  - 6.2.4.1: EIRP test initial conditions corrected based on the text from legacy specifications.  - C.0: clarification on the TT applicability for Normal and Extreme tests.  - Removal of redundant and repeated information on the Normal test conditions repeated for all the Tx, Rx, and demod tests.  - Editorials |
| R4-2001831 (moved from AI 6.8.5) | Huawei | 38.141-2 16.2 | Mirror CR |

## Open issues summary

### Sub-topic 2-1

*(38.141-1) Editorial change to replace “Rated” by “rated” in the symbol “PRated”.*

*(38.141-2) Editorial change to replace “Rated” by “rated” in the symbol “PRated”.*

* Proposals: *replace “Rated” by “rated” in the symbol “PRated” in 38.141-1*
* Proposals: *replace “Rated” by “rated” in the symbol “PRated” in 38.141-2*
* Recommended WF
  + Accept/reject CRs for 38.141-1: R4-2000662 and R4-2000663
  + Accept/reject CRs for 38.141-2: R4-2000664 and R4-2000665

### Sub-topic 2-2

*a) R4-2001681 [38.141-1] (test model clause referencing, not using PDCCH for EVM measurements, using abbreviation OSTP)*

*b) R4-2001683 [38.141-2] (clause referencing, restrictions for PDCCH usage in EVM measurements)*

* Proposals: *changes in 38.141-1*
* Proposals: *changes in 38.141-2*
* Recommended WF
  + Accept/reject CRs for 38.141-1: R4-2001681 and R4-2001682
  + Accept/reject CRs for 38.141-2: R4-2001683 and R4-2001684

### Sub-topic 2-3

*a) R4-2001907: examine the definition of Foffset*

* Proposals: *Should the definition of Foffset be reconsidered*
* Recommended WF
  + Determine if any (or all) definitions of Foffset are appropriate
    - Determine correct definition
  + If updates are needed, capture changes in CRs for next meeting

### Sub-topic 2-4

*R4-2001909: swap order of BWs*

* Proposals:
* Recommended WF
  + Accept/reject CR for 38.141-2: R4-2001909

### Sub-topic 2-5

*R4-2001908 + CRs R4-2001910-1913 and CRs R4-2001828-1831 discuss similar topics of extreme testing. R4-2001910 and R4-2001828 addresses subclause 6.2.4.1. However, R4-2001828 discussions possible impact to other clauses of the spec. The following table captures the differences between the 38.141-1 CRs R4-2001910 and R4-2001828.*

*[moderator note] A summary of non-editorial proposals is provided based on moderator’s interpretation of CR. Because it is possible the interpretation may be incorrect, any correction is appreciated. Blue color is CR R4-2001910 while purple color is CR R4-2001828.*

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| Clause | General observations |
| 4.1.2.1 | Statement to capture that MU values are generally for normal test conditions |
| 4.8.2 | Modification of table 4.8.2-1 captures which test is applicable for normal and extreme test condition |
| 6.1.1, 6.1.2, 7.1, 8.1.1 | State test is performed under normal test conditions |
| 6.2.4.1 | [moderator] red color used to indicate differences, light orange color to indicate moves  R4-2001828  Test environments:  - Normal (see annex B.2): All required tests are to be performed under Normal test conditions.  - Extreme (see annex B.3): In addition to the Normal test conditions, a single test shall be performed under extreme power supply conditions as defined in annex B.5. In this case, it is sufficient to test on a single combination of one NR-ARFCN, one *Base Station RF Bandwidth* position and with only one applicable test configuration defined in subclauses 4.7 and 4.8.  NOTE: Tests under extreme power supply also test extreme temperature.  RF channels to be tested for single carrier (see subclause 4.9.1): B, M and T;  *Base Station RF Bandwidth* positions to be tested for multi-carrier and/or CA (see subclause 4.9.1):  - BRFBW, MRFBW and TRFBW for *single-band connector(s)*  - BRFBW\_T'RFBW and B'RFBW\_TRFBW for *multi-band connector(s)*  R4-2001910  Test environment:  - Normal, see annex B.2,  - Extreme, see annexes B.3 and B.5  RF channels to be tested for single carrier: B, M and T; see clause 4.9.1  *Base Station RF Bandwidth* positions to be tested for multi-carrier and/or CA:  - BRFBW, MRFBW and TRFBW for *single-band connector(s)*, see clause 4.9.1.  - BRFBW\_T'RFBW and B'RFBW\_TRFBW for *multi-band connector(s)*, see clause 4.9.1.  In the case of extreme test environment, the testing shall be performed under extreme power supply conditions as defined in Annex B.5. In this case, it is sufficient to consider only one NR-ARFCN or one *Base Station RF bandwidth* position, with only one applicable test configuration defined in clauses 4.7 and 4.8.  NOTE: Tests under extreme power supply also test extreme temperatures. |
| 6.3.3.4.1, 6.4.2.4.1, 6.5.3.4.1, 6.5.4.4.1, 6.6.2.4.1, 6.6.3.4.1, 6.6.4.4.1, 6.6.5.4.1, 6.7.4.1, 7.3.4.1, 7.4.1.4.1, 7.4.2.4.1, 7.5.4.1, 7.6.4.1, 7.7.4.1, 7.8.4.1, 8.2.1.4.1, 8.2.2.4.1, 8.2.3.4.1, 8.3.1.4.1, 8.3.2.1.4.1, 8.3.3.1.4.1, 8.3.3.2.4.1, 8.3.4.4.1, 8.3.6.1.1.4.1, 8.3.6.1.2.4.1, 8.4.1.4.1 | Removal of condition of test environment |
| 7.2.3 | State test conditions |
| 7.2.4.1 | Similar to change in 6.2.4.1 |
| C.0, C.2 | Add condition of test tolerance |

* Proposals:
  + It seems that the two CRs are similar in spirit for subclause 6.2.4.1
  + To what extent should the modifications be applied.
* Recommended WF
  + Get agreement on one specification (e.g. 38.141-1)
    - The changes in 6.2.4.1 seem similar. Is it possible to harmonize the wording?
    - Should subclause 7.2.4.1 be modified (it seems similar to 6.2.4.1)?
    - Should the test tolerance table differentiate between normal and extreme test conditions?
    - For maintenance purposes, should one sentence stating most tests are performed using normal conditions?
  + Once agreement on one spec is achieved, the other spec can be addressed
  + [open question] Are other specifications impacted?

## Companies views’ collection for 1st round

### Open issues

[moderator note] sub-topics 2-3 and 2-5 seem to require most discussion.

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| **Company** | **Comments** |
| Nokia | Sub topic 2-3: The note on channel raster alignment was intended for UTRAN 200kHz raster, so no need for it in 36 and 38 series.  Sub topic 2-5: Regarding Ericsson and Huawei CRs, main thing is to clarify this so that no ambiguity is left. The most clarity and alignment with least changes could be adopting the Ericsson changes to section 6.2 and consider adopting the applicability table from Huawei proposal. We do not see the need to modify other sections of the specification. |
| Ericsson | Sub topic 2-5: We would prefer a simpler change, that only focuses on the important part: to specify the test under extreme power supply instead of current formulation referring to extreme test environment. |
| ZTE | Sub-topic 2-1: it’s fine to correct the term.  Sub-topic 2-2: editorial corrections and fine about that.  Sub-topic 2-3: no strong opinion  Sub-topic 2-4: it’s fine to swap the BW  Sub-topic 2-5, I agree with Nokia’s suggestion that Ericsson changes to section 6.2 and consider adopting the applicability table from Huawei proposal. Please keep the normal and extreme in the test section as it’s easier for reading,otherwise we need to go back to the applicability table. |
| NEC | Sub topic 2-5: Prefer notation on extreme conditions as can be seen in TS38.141-2. That is, test in extreme conditions is mentioned in an additional paragraph starting with “In addition …” |
| Huawei | Sub-topic 2-3: agree to clarify this but as the proposal triggers multiple CRs across specifications and releases, we prefer to have agreements of the final CRs itself (instead of agreement on this document).  Sub-topic 2-4: track changes on cover page of CR.  Sub-topic 2-5: whichever approach selected, CRs require revision. Ericsson CR is missing corrections for the sensitivity section, as, well as clarification to the TT values applicability. With those modifications, there are other legacy specifications also affected as we were not referring to both annex B3 and B5 at the same time. |

### 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.*

*[moderator note] CRs R4-2001910-1913 and R4-2001828-1831 should be discussed first in the open issues.*

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| **CR/TP number** | **Comments collection** |
| R4-2000662  (R4-2000663) | Ericsson: ok |
| Huawei: ok |
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| R4-2000664 (R4-2000665) | Ericsson: ok |
| Huawei: ok |
|  |
| R4-2001681 (R4-2001682) | Ericsson: ok |
| Huawei: ok |
|  |
| R4-2001683 (R4-2001684) | Futurewei:   * Can you clarify which annex is referenced? Annex L (specifically L.5) is used for EVM (OSTP) procedures while annex I is used for TRP measurement procedures. Note if the reference to annex I is changed, the coversheet should be updated   Nokia: This is an error, of course reference should be to Annex L. Sorry for that (we have inconsistent between 141-1 and 141-2 annexes, thus it was mixed). Cover page is updated in revision uploaded to the folder for this thread #76.   * In R4-2001681, changes to define OSTP in the test models such as “Total power dynamic range (lower OFDM symbol TX power limit (OSTP) at min power)” were made. Should similar changes be made to subclauses 4.9.2.2.2 and 4.9.2.2.3?   Nokia: I am not sure if I understood question, both 4.9.2.2.2 and 4.9.2.2.3 include the same update. Please double check CR or clarify question. |
| ZTE:reference should be corrected, other editorial corrections are fine for us |
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| R4-2001909 | Company A |
| Company B |
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| R4-2001910  (R4-2001911) | Huawei: Ericsson CR is missing corrections for the sensitivity section, as, well as clarification to the TT values applicability (refer to the approach in part2 – this is for alignment purposes) - – refer to changes in 1828.  With those modifications, there are other legacy specifications also affected as we were not referring to both annex B3 and B5 at the same time. |
| Company B |
|  |
| R4-2001912  (R4-2001913) | Huawei:  Test purpose captures only Normal case, while shall capture also Extreme – refer to changes in 1829  Ericsson CR is missing clarification to the TT values applicability |
| Company B |
|  |
| R4-2001828 (R4-2001830) | Ericsson: MU is specific to the lab equipment and does not depend on test environment for the EUT. We would prefer a simpler change, that only focuses on the important part: to specify the test under extreme power supply instead of current formulation referring to extreme test environment. See proposal in 1910 and 1912 |
| NEC: Disagree to add a new column for test environment in table 4.8.2-1. Test environment is not a special element to be mentioned in the applicability table. It is same as we do not have columns for other test conditions, such as RF channels to be tested or BS RF bandwidth positions to be tested. |
| Huawei: the MU corrections were to align the approach with part2 and to clarify MU values applicability for Normal and Extreme. |
| R4-2001829 (R4-2001831) | Ericsson: MU is specific to the lab equipment and does not depend on test environment for the EUT. We would prefer a simpler change, that only focuses on the important part: to specify the test under extreme power supply instead of current formulation referring to extreme test environment. See proposal in 1910 and 1912 |
| Huawei: TT clearly differs for Normal and Extreme testing – the above MU comment is not valid here. |
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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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| --- | --- |
|  | **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** |
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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** |
| 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”* |