**3GPP TSG-RAN WG4 Meeting # 97-e R4-200XXXX**

**Electronic Meeting, 2 – 13 Nov., 2020**

**Agenda item:** 7.19.5

**Source:** Apple

**Title:** Email discussion summary for [97e][204] R16\_NR\_RRM\_maintenance

**Document for:** Information

# Introduction

In this email thread, R16 NR RRM maintenance in 7.19.5 will be discussed

# Topic #1: R16 IDLE/INACTIVE RRM requirement with SMTC2-LP

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2014280**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014280.zip) | Apple | Proposal 1: the SMTC2-LP shall be captured in the corresponding baseline RRM requirements of IDLE/INACTIVE mode without R16 features (e.g. NR-U, HST and power saving). Proposal 2: The applicability of SMTC2-LP in corresponding IDLE/INACTIVE RRM requirement for NR-U, HST or power saving is FFS in RAN4. |
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## Open issues summary

Issue 1-1: The SMTC2-LP shall be captured in the corresponding baseline RRM requirements of IDLE/INACTIVE

Option 1: Yes

Option 2: No

Issue 1-2: The applicability of SMTC2-LP in corresponding IDLE/INACTIVE RRM requirement for NR-U, HST or power saving is FFS in RAN4.

Option 1: Yes, the applicability issue can be FFS

Option 2: No. SMTC2-LP related IDLE/INACTIVE RRM requirement should not apply to NR-U, HST or power saving

## Companies views’ collection for 1st round

### Open issues

Moderator: Please add your comments to sub-topic 1-1 and 1-2 here. Instead, you can directly comment to CR draft.

|  |  |
| --- | --- |
| **Company** | **Comments** |
| MTK | Issue 1-1: Need more discussion. SMTC2-LP has impact on legacy UE IDLE behavior/performance. We have a bit concern to capture it in the core requirement spec. On the other hand, this proposal was not agreed in last RP meeting. It means companies do not have consensus on its urgency. In that case, we are not sure if RAN4 has to introduce it in Rel-16.Issue 1-2: pending on the conclusion of Issue 1-1. |
| Ericsson | Issue 1-1 : We would be OK to specify SMTC2-LP requirements in principle in R16 (or R17 if R16 is not feasible). When the signaling wqs introduced by RAN2 they had a discussion on legacy UEs (meaning UEs that do not understand the SMTC2-LP IE) and in our view they were fully aware of possible legacy issues when they specified it. At any rate, since legacy UEs already exist and are in the field, there is nothng we can do in RAN4 rel16 (or rel17) requirements to address any possible legacy issue. Issue 1-2 : We agree that we should start the discussion on RRM requirements without NR-U, HST or power saving. Depending on the conclusion for that case we can then analyse whether it would be straightforward to use the agreed approach also for the newer R16 functionalities in idle mode. So this corresponds to option 1 with an additional agreement that the first phase of the work doesn’t include NR-U, HST or power saving, |
| Apple | Issue 1-1: this SMTC2-LP has been specified in RAN2 in R16 and we think this is a fundamental timing configuration that UE needs to consider during the IDLE/INACTIVE measurement; e.g. for the paging interruption requirement, the target cell SMTC has been used for the interruption length requirement, but if the target cell is configured in the PCI list of SMTC2-LP2, we shall apply this interruption requirement based on SMTC2-LP accordingly. In the last RAN plenary meeting, we received some comments from companies that this feature is too small to discuss in new WI, and some companies suggested to discuss it in TEI, that’s why we propose it here. Issue 1-2: We do not want to discuss the complicated case at the beginning (mixed SMTC2-LP with other R16 features), so we propose to start with the baseline case. |
| vivo | Issue 1-1: we understand the intention however we are not clear on the impact on legacy UE. For example when higher layer signals SMTC2-LP whereas a legacy UE cannot interpret it. Does it mean a legacy UE always follows its corresponding legacy requirement. Issue 1-2: Depending on the outcome of issue 1-1. If the outcome of issue 1-1 is yes, then we prefer option 2 for issue 1-2.  |
| OPPO | Issue 1-1: We are also not sure if RAN4 has to introduce this feature in Rel-16 as it was introduced in last RP meeting. Maybe we can further discuss the feasibility at this stage.Issue 1-2: Depending on the outcome of issue 1-1. |

### CRs/TPs comments collection

Moderator: Please add comments to CR drafts here.

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| **CR/TP number** | **Comments collection** |
| [**R4-2014281**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014281.zip)CR on R16 IDLE/INACTIVE RRM requirement with SMTC2-LP | MTK | In addition to our concern provided in Issue 1-1, there are some details to be clarified in this CR. It is a bit strange to directly apply SMTC2-LP once it is configured without checking whether the target cell is in the PC list or not. For examples, * If no cells in the PCI list was detected, should UE still follow SMTC2-LP?
* [Apple]: In this case, our preliminary understanding is UE shall not follow SMTC2-LP for the measurement until it identified a cell within this list. But we are also thinking what’s the difference to apply this SMTC2-LP in IDLE compared with smtc2 in connected mode. In connected mode, smtc2 is also configured with a PCI list and in the current requirement we just specified that if smct2 is configured we follow smtc2 but we did not check if the target cell is in smct2 PCI list or not.

[MTK] The UE behaviour different between IDLE and CONNECTED is* In CONNECTED measurement requirement, we have a note that in Table 9.2.5.1-1: “NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is the one used by the cell being identified” Therefore, UE does not really need to assume smtc2, if no cells in the PCI list was detected. Since smtc2 has a shorter periodicity, UE who follows smtc1 can still identify cells in the PCI list of smtc2.
* In IDLE, SMTC2-LP has a longer periodicity. UE who follows smtc1 may not be able to identify cells in PCI list of SMTC2-LP.
* If there are both cells in the PCI list and outside the PCI list were detected, which SMTC should UE follow?
* [Apple]: we shall discuss the requirement case by case for this scenario. For example, when in section 4.2.2.6 of paging interruption requirement, we have specific target cell to apply the requirement, so it shall follow the SMTC configuration of that particular cell.

[MTK] Thanks for the explanation. We have no problem introduce smtc2 in the paging interruption requirementNote that all IDLE requirements assume carrier specific SMTC. It somehow increases UE measurement complexity in IDLE mode when SMTC2-LP is considered. Therefore, we prefer to leave it to UE implementation issue.[Apple]:do not understand how it can be handled as implementation issue. For example, for paging interruption, for the target cell with SMTC2-LP it would cause more interruption than legacy SMTC case. Without such clarification, it would cause complexity and power consumption issue to UE in case network configure SMTC2-LP.[MTK] By “leave it to UE implementation”, we means that UE can choose to assume either smtc1 or SMTC2-LP based on whether a neighboring cell in the PCI list is detected. We do not need to mandate UE which smtc to follow.  |
| Ericsson | We have concern on the CR. To us the wording looks like the UE follows SMTC2-LP for all idle requirements, even cells that are not in the list of PCI for SMTC2-LP. So then there seems no incentive for NW to use the RAN2 feature. For example, if SMTC1=20ms and SMTC2-LP is 160ms and all cells use K=1.5 in requirements we might as well just configure SMTC=160ms and not bother with the R16 feature. This seems to be the implication of “If the high layer signalling of smtc2-LP is configured in TS 38.331 [2], the SMTC periodicity follows smtc2-LP; otherwise the SMTC periodicity follows smtc.”. I.e. Apple’s proposal is that there is just one SMTC from RAN4 requirements point of view for all cells, based on this sentence. |
| Apple | Replies to MTK questions inline MTK’s comments. |
| vivo | Need wait outcome of issue1-1. |
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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: Rel-16 MRTD/MTTD requirements for FR1 intra-band NCCA

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2015478**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015478.zip) | Huawei, Hsilicon | Proposal 1: It is suggested that define the MRTD/MTTD requirements of FR1 intra-band non-contiguous CA for non-co-located deployment.Proposal 2: For FR1 intra-band non-contiguous CA, 6us MRTD and7.6us MTTD could be defined as for non-co-located deployment. |
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## Open issues summary

Issue 2-1: Can new MRTD/MTTD requirements of FR1 intra-band non-contiguous CA be specified for non-co-located deployment?

Option 1: Yes

Option 2: No

Issue 2-2: If yes for issue 1-1, is 6us MRTD and7.6us MTTD agreeable for non-co-located deployment.

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Option 1: Yes

Option 2: other values

## Companies views’ collection for 1st round

### Open issues

Moderator: Please add your comments to sub-topic 2-1 and 2-2 here. Instead, you can directly comment to CR draft.

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| **Company** | **Comments** |
| MTK | Issue 2-1: Support Option 2 (No). This is a very basic synchronization assumption and is non-backward compatible. It should not be changed at this late Rel-16 stage. One potential impact of this change is reduced T2R and R2T switching time for TDD intra-band CA. |
| Ericsson | Issue 1-1 : Option 1 (Yes). In principle we think it would be useful to support non colocated deployments of non contiguous intraband CA in FR1. We have specific comment on the CR.Issue 2-2 : Option 2 (Other values). Our understanding is that the numbers for 6us/7.6us have been taken from the NR mobility enhancements WI. However we think it would be more suitable to look at MRTD/MTTD separately for this discussion. One difference is that handover is performed only at cell edge and the UE is jointly connected to source and target cell only until the source cell is released. The purpose of DAPS is only to reduce handover interruption and not to improve throughput. However CA can be used anywhere within a deployment, so we think that the MRTD/MTTD could be larger.  |
| Apple | Issue 2-1: support option. 2. Agree with MTK that this is a fundamental feature, which many UE capability and Rx architecture depends on.  |
| Huawei | Issue 1-1: support Option 1. RAN4 agreed with the assumption of co-located deployment for intra-band CA at the beginning of the discussion in Rel-15, which may consider only a few cases in the initial phase. However, since more intra-band CA configurations will be applied in Rel-16, it is not quite reasonable to limit the availability of actual services using the assumption of initial phase.Issues 2-2: even option 1 is our proposal, but we are open to discuss the other possible MRTD/MTTD values for non-co-located deployment. |
| Nokia | Issue 2-1: Can new MRTD/MTTD requirements of FR1 intra-band non-contiguous CA be specified for non-co-located deployment?It could be fine to define for FR1 intra-band NCCA for non-co-located deployment as it may be different from co-located deployment. Issue 2-2: If yes for issue 1-1, is 6us MRTD and7.6us MTTD agreeable for non-co-located deployment.It could be fine to be 6us for MRTD for FR1 intra-band NCCA for non-co-located deployment. Since the values is from the synchronous conditions for NR DAPS handover, maybe more discussion is needed. |
| OPPO | Issue 2-1: support option. 2. Share the similar concerns as MTK’s. |
| Qualcomm | Issue 2-1: Can new MRTD/MTTD requirements of FR1 intra-band non-contiguous CA be specified for non-co-located deployment?Share the same view as MTK. Need more discussion about whether and how much potential backward compatibility issues. |

### CRs/TPs comments collection

Moderator: Please add comments to CR drafts here.

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| **CR/TP number** | **Comments collection** |
| [**R4-2015479**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015479.zip)CR on MRTD/MTTD requirements for FR1 intra-band NCCA R16 | MTK | We have concern as explained in Issue 2-1. |
| Ericsson | As the CR has been currently drafted it removes the collocation restriction generally ie for both FR1 and FR2 CA, even though we have understood the intention of the proponents is only for FR1. Then we think MRTD/MTTD needs further discussion as indicated in issue 2-2.Furthermore, Current Note 1 in Table 7.6.4-1 states “In the case of different SCS on different CCs, if the receive time difference exceeds the cyclic prefix length of that SCS, demodulation performance degradation is expected for the first symbol of the slot.” If MRTD = 6 µs, as initially proposed, then MRTD > CP for SCS = 15 kHz. It is true that note 1 is for different SCS, but we think note 1 needs consideration as well, in any new CR pertaining to this area. |
| Apple | It is premature to discuss the CR. This CR can only be discussed providing option 1 in issue 2-1 is agreeable. |
| Huawei | We can update this CR based on the discussion in issues. |
| Nokia | CR can be come back when the open issues have conclusion. |
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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** |
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### 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*

|  |  |
| --- | --- |
| **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: Miscellaneous Rel-16 maintenance CRs

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2014378**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014378.zip) | MediaTek inc. | CR on TS38.133 for E-UTRAN – NR PSCell FR2 DL active BWP switch test case with FR2 SCell in non-DRX in synchronous EN-DC |
| [**R4-2014379**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014379.zip) | MediaTek inc. | CR on TS38.133 for SCell activation and deactivation delay test cases |
| [**R4-2014671**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014671.zip) | LG Electronics Inc. | Fine/rough beam assumption for CLI performance test cases |
| [**R4-2014796**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014796.zip) | OPPO | CR on interruption at EUTRA SRS carrier switching in 38.133(section 8.2.1.2.13) |
| [**R4-2015477**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015477.zip) | Huawei, HiSilicon | CR on maintaining L1-RSRP measurements test cases in TS38.133 R16 |
| [**R4-2015533**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015533.zip) | Huawei, HiSilicon | Update NR Frequency Band Groups to include Band n48 |
| [**R4-2015534**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015534.zip) | Huawei, HiSilicon | Update NR Frequency Band Groups to include Band n65 |
| [**R4-2015671**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015671.zip) | ZTE Corporation | [CR] NR Perf Maintenance R16 Cat F |
| [**R4-2015792**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015792.zip) | ZTE Corporation | [CR] Specify RRC processing delay in TCI state switching delay for R16 NR-U |
| [**R4-2015878**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015878.zip) | Nokia, Nokia Shanghai Bell | Correcting the range of Lmax=8 for unpaired spectrum |

## Open issues summary

Please make comments on listed CR in 3.3.2.

## Companies views’ collection for 1st round

### Open issues

Moderator: Please add your comments to sub-topic 1-1 and 1-2 here. Instead, you can directly comment to CR draft.

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| **Company** | **Comments** |
| XXX | Sub topic 1-1: Sub topic 1-2:….Others: |

### CRs/TPs comments collection

Moderator: Please add comments to CR drafts here.

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| **CR/TP number** | **Comments collection** |
| [**R4-2014378**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014378.zip)CR on TS38.133 for E-UTRAN – NR PSCell FR2 DL active BWP switch test case with FR2 SCell in non-DRX in synchronous EN-DC | Ericsson | OK |
| Apple | OK |
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| [**R4-2014379**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014379.zip)CR on TS38.133 for SCell activation and deactivation delay test cases | Ericsson | OK |
| Apple | OK |
|  |  |
|  |  |
| [**R4-2014671**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014671.zip)Fine/rough beam assumption for CLI performance test cases | Ericsson | OK |
| Apple | OK |
|  |  |
|  |  |
| [**R4-2014796**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2014796.zip)CR on interruption at EUTRA SRS carrier switching in 38.133(section 8.2.1.2.13) | MTK | The changes on table are fine. But adding “in FR1 or in FR2” after SCG seems a bit redundant and confusing. Does it means we exclude the case ‘in both FR1 and FR2’? We think the original wording is already general enough. |
| Ericsson | OK |
| Apple | OK |
| Huawei | The changes are fine. Category is A, and we don't find R15 CR |
| OPPO | To MTK: We think at least FR2 is missing in the old version. So the changes on the table and adding FR1+FR2 seems necessary.To Huawei: Thanks for pointing out this. As it is a Rel-16 feature, the Category should be revised to F. |
| [**R4-2015477**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015477.zip)CR on maintaining L1-RSRP measurements test cases in TS38.133 R16 | Ericsson | OK, looks like an earlier cat A CR was missed or not implemented |
| Apple | OK |
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| [**R4-2015533**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015533.zip)Update NR Frequency Band Groups to include Band n48 | Ericsson | OK |
| Apple | OK |
|  |  |
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| [**R4-2015534**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015534.zip)Update NR Frequency Band Groups to include Band n65 | Ericsson | OK |
| Apple | OK |
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| [**R4-2015671**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015671.zip)[CR] NR Perf Maintenance R16 Cat F | Ericsson | OK |
| Apple | OK |
|  |  |
|  |  |
| [**R4-2015792**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015792.zip)[CR] Specify RRC processing delay in TCI state switching delay for R16 NR-U | Ericsson | As commented in R15 CR (in #201 thread) there seems no need for this CR |
| Apple | OK |
| ZTE | To Ericsson: We also commented in thread #201 that we believe such a CR is necessary. We can discuss in more details during the 2nd round perhaps. |
|  |  |
| [**R4-2015878**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015878.zip)Correcting the range of Lmax=8 for unpaired spectrum | MTK | Same changes in R4-2014693 and R4-2014694. |
| Ericsson | Technically OK and we agree with MediaTek that there are other CRs in the meeting addressing the same issue so we need to decide which ones to go with. |
| Apple | OK |
| Huawei | Similar CR in thread 201 |

## 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*

|  |  |
| --- | --- |
| **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”* |