**3GPP TSG-RAN WG4 Meeting #104b-e R4-22xxxxx**

Electronic Meeting, 10th-19th, Oct., 2022

**Agenda item:** 4.5.1

**Source:** Moderator (Intel)

**Title:** Email discussion summary for [104-bis-e][205] NR\_feMIMO\_RRM\_1

**Document for:** Information

# Introduction

This e-mail discussion summary captured the discussions for Rel-17 FeMIMO RRM Core requirement maintenance in 4.5.1 in RAN4 #104bis-e meeting.

In RAN4 104-e meeting, WF is approved.

* **WF on FeMIMO RRM impact for unified TCI** was approved in R4-2214481
* **WF on FeMIMO RRM requirements for inter-cell beam management** was approved inR4-2214482

Contact information

|  |  |  |
| --- | --- | --- |
| **Company** | **Name** | **Email address** |
| Moderator (Intel) | Li Hua | hua.li@intel.com |
| MediaTek | ChihKai Yang | ck.yang@mediatek.com |

# Topic #1: Unified TCI state (4.5.1.1)

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| [**R4-2215353**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2215353.zip) | Intel Corporation | **Proposal 1: UE don’t need to perform timing/frequency tracking for UL TCI state activation for both serving cell and cell with additional PCI.**  **Proposal 2: Keep the current clarification for DL TCI state switching in Joint TCI state switch in the specification.**  **Proposal 3: When SSB is indicated as PL-RS in UL TCI state for FR2, the total delay is:**   * **n+THARQ + 3ms + NM*\** (Tfirst\_target-PL-RS + Q\*Ttarget\_PL-RS + 2ms)**   **Where Q is the extended number of SSB resource number, Q is FFS.** |
| [**R4-2215591**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2215591.zip) | Apple | Active UL TCI state  ***Observation #1:*** *The UL TCI state provides the spatial TX filter to be used for UL transmission.*  ***Observation #2:*** *The UL timing is determined by the DL serving cell timing and not by the RS associated with active UL TCI state. The UL TCI state could be associated with DL-RS or SRS.*  ***Observation #3:*** *We don’t support two-TA in Rel-17, and irrespective of the associated DL-RS the UL timing would be the same*  ***Observation #4:*** *There is no restriction in RAN1/RAN2 specification that the active UL TCI list should be a subset of active DL TCI list.*  **Proposal #1: The UL timing is derived from the DL serving cell timing for DL-RS of UL TCI associated with serving cell or cell with different PCI.**  MAC CE based TCI state Switching delay requirements  **Proposal #2: When PL-RS in UL TCI state switch is SSB in FR2, longer delay is expected.**  TCI state list update delay  ***Observation #5:*** *Not defining requirements for unknown TCI state for TCI state list activation doesn’t mean that unknown TCI states are precluded.*  ***Observation #6****: Don’t see benefits of defining delay requirements when one or more TCI states are unknown in active TCI state list update, since the purpose is to capture delay requirements for MAC-CE+DCI based TCI state switch.*  **Proposal #3: It is sufficient to capture that longer delay applies if any TCI state is unknown in TCI state list update.** |
| [**R4-2215743**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2215743.zip) | Samsung | **Proposal 1: UE doesn’t need to track UL time/frequency for UL TCI state activation when DL-RS is associated with serving cell. UE doesn’t need to track UL time/frequency for UL TCI state activation when DL-RS is associated with non-serving cell in Rel-17.**  **Proposal 2: For MAC-CE based UL TCI state switching delay when SSB is indicated as PL-RS in UL TCI state for FR2, longer delay is expected.**  **Proposal 3: For unknown TCI state in the TCI state list, follow the agreements in last meeting and no requirements for unknown TCI state.** |
| [**R4-2215764**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2215764.zip) | MediaTek Inc. | **Observation 1: For joint TCI state switch, network does not know whether UE receives DL signal successfully till receiving ACK/NACK from UE.**  **Proposal 1: To remove the bracket for the following sentence in spec.**   * “For DL TCI state switching, [In case of joint TCI state switch, UE is not expected to receive on DL before UE completes the DL and UL TCI state switch.]”.   **Proposal 2: For the case when SSB is indicated as PL-RS, reuse the existing delay requirement of MAC CE based UL TCI state switch.**  **Proposal 3: For common TCI state, the same existing unified TCI state switch delay requirement can be shared to two different configuration approaches "simultaneousU-TCI-UpdateList1/2/3/4-r17" and "RefUnifiedTCIStateList".**  **Proposal 4: For MAC CE based TCI state list update, requirement is not applicable if unknown TCI state is included in the TCI state list.** |
| [**R4-2216280**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216280.zip) | Huawei, HiSilicon | ***Proposal 1: For UL TCI state, UE does not need to perform UL timing tracking according to source RS in the UL TCI state and the UL timing is derived from DL timing.***  ***Proposal 2: For UL TCI state switching, when source RS and PL-RS for target UL TCI state is the same SSB, beam sweeping shall be assumed for PL-RS measurement time in FR2.***  ***Proposal 3: For MAC-CE based UL TCI state switching, a longer UL TCI state switch delay is expected when a SSB is indicated as PL-RS in UL TCI state in FR2.***  ***Proposal 4: If no consensus can be achieved in RAN4, we suggest that there is no requirements when SSB is indicated as PL-RS in UL TCI state in FR2.*** |
| [**R4-2216360**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216360.zip) | vivo | **Observation 1 In R17 unified TCI, especially for the inter-cell BM scenario, the UL TCI only provides UL TX spatial filter information, and UL timing of the UE can be determined based on QCL-A/B/C information in the activated DL TCI(s).**  **Proposal 1 Adding some applicability rules on current RRM requirements for UL TCI switching based on option 2 would be adoptable to RAN4, i.e. RRM requirements for R17 UL TCI switching are only applicable when source RS in active UL TCI state is a subset of source RS in DL active TCI list.**  **Proposal 2 Remove the square bracket, i.e. confirm that ‘In case of joint TCI state switch, UE is not expected to receive on DL before UE completes the DL and UL TCI state switch.’**  **Observation 2 In legacy requirements, Rx beam sweeping is not specified for SSB-based measurements for time-frequency tracking and PL-RS update, no matter the SSB is configured for L1-RSRP/L1-SINR measurement or not, since the Rx beam for this SSB reception is already considered as known. For L1-RSRP measurements requirements, the Rx beam sweeping is considered for the worst case, and is not applicable to the case when a tighter requirement is applied.**  **Proposal 3 MAC-CE based UL TCI state switching delay requirements agreed in RAN4 101-bis-e can be applicable to the case when the PL-RS is the SSB which is configured for L1-RSRP measurements.**  **Observation 3 In R17, there is no clear evidence in RAN1/2 specs showing that, more than one CCs in one CC list can be configured as the ref CC for all other CCs in the list.**  **Proposal 4 No further spec change for TS 38.133 regarding the configuration of unifiedTCI-StateRef or simultaneousU-TCI-UpdateList1/2/3/4-r17 in common TCI state.**  **Observation 4 From RAN1/2 design, network may make decision on the set of TCIs to be activated without L1 measurement reporting.**  **Proposal 5 In R17 TCI state list update requirements, specify requirements for the case when not all activated TCIs are known by considering the worst case, i.e. assuming UE use one Rx beam at a time in FR2, and the RSs with the longest periodicity would be assumed for TL1-RSRP.** |
| [**R4-2216486**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216486.zip) | ZTE Corporation | **Proposal 1: Under mTRP scenario, it is possible that the source RS of UL TCI state is different with source RS of DL TCI state. But here it has been given that the source RS of UL TCI state is the DL RS associated with serving cell, so we support Option 1. The concern referred by Option 2 can be ignored.**  **Proposal 2: Option 1 is fine since which only referred in Rel-17. Further more, Option2 is reasonable for Rel-18.**  **Proposal 3: No matter whether UL TCI state switching completed or not, UE can receive DL by the target DL TCI state given that DL TCI state switching has been finished. So we suggest the bullet in square brackets can be ignored.**  **Proposal 4: For the case when SSB is indicated as PL-RS in UL TCI state for FR2, which means the source RS is the SSB or QCL-Ded with the SSB. It should be emphasized once more that beam alignment is the precondition based on previous agreements. So not additional Rx beam sweeping is necessary. We prefer Option 2. However to move forward, a compromised solution is needed, e.g. allowing a clear but not too long additional latency.**  **Proposal 5: No matter which type of signalling is used, we believe the requirement for common TCI state switching delay is applicable. So Option 1 is aligned with our thinking. But even without any additional clarification, it seems workable too.**  **Proposal 6: During the discussion in last meeting, it has been agreed that unknown TCI state(s) can be in the list. Referring to the detailed delay requirement, we prefer to provide exact requirement instead of uncertain “longer delay”.** |
| [**R4-2216596**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216596.zip) | Nokia, Nokia Shanghai Bell | 1. In DL TCI state switch delay, the UE is expected to receive as soon as the DL TCI state switch is completed. 2. For UL TCI state switch, the network is not aware of whether the PL-RS is maintained or not maintained at the UE in case the number of activated TCI states is greater than four. 3. Our understanding is that the UE can receive in DL when the DL TCI state switching is completed. Independently of the UL TCI state switch status. 4. For joint TCI state switch, if the UL TCI state switch delay exceeds the DL TCI state switch delay, the UE is required to receive in DL up to THARQ before it completes UL TCI state switch. 5. when SSB is indicated as PL-RS in UL TCI state for FR2,   **- The number of sample M will not always be fixed as 5 samples.**  **- If a UE performs both L1-RSRP measurements and PL-RS measurements on the same SSB, the number of samples used for L1-RSRP is counted for pathloss measurement.**   1. Up to Rel-16 the DL/UL relied on channel reciprocity. In Rel-17, decoupled DL and UL is possible. 2. There is no definition of active TCI state for UL.   A UE need to acquire and keep time and frequency tracking on the DL source RS associated to the UL TCI state t   1. *maxNumberActiveTCI-PerBWP* under *tci-StatePDSCH* should be about activated TCI-states with UE synchronization for both DL and UL. The current spec addresses about DL only. 2. o be allowed to transmit in UL. 3. Rel-17 active UL TCI state should be under time and frequency tracking. This means that active UL TCI list belongs to active DL TCI state list. Add the time and frequency tracking condition to the active TCI state for UL. |
| [**R4-2216817**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216817.zip) | Ericsson | **Proposal 1:** RAN4 to agree that UL TCI state needs to follow the time and frequency tracking of the DL-RS configured in the UL TCI state.  **Proposal 2**: RAN4 to agree that existing delay requirement of MAC CE based UL TCI state switch.  **Proposal 3:** RAN4 to define requirement per carrier without referring any of the IEs for common TCI state switching  **Proposal 4:** If all the TCIs in the active TCI state list are not known, upon receiving PDSCH carrying MAC-CE active TCI state list update at slot n, UE shall be able to receive PDCCH to schedule PDSCH with the new target TCI states at the first slot that is after n + + (THARQ + TL1-RSRP + Tfirst-SSB\_List + TSSB-proc) / *NR slot length****.*** |

## Open issues summary

### Sub-topic 1-1 Active UL TCI state

**Issue1-1-1 Whether UE need to track UL time/frequency for UL TCI state activation**

* Proposals:
  + Proposal 1(Intel, Apple, Samsung,, Huawei):
    - No
  + Proposal 2(vivo, ZTE):
    - Adding some applicability rules on current RRM requirements for UL TCI switching, i.e. RRM requirements for R17 UL TCI switching are only applicable when source RS in active UL TCI state is a subset of source RS in DL active TCI list.
  + Proposal 3(Ericsson):
    - UL TCI state needs to follow the time and frequency tracking of the DL-RS configured in the UL TCI state.
  + Proposal 3a(Nokia):
    - Rel-17 active UL TCI state should be under time and frequency tracking. This means that active UL TCI list belongs to active DL TCI state list. Add the time and frequency tracking condition to the active TCI state for UL.
* Recommended WF
  + Collect companies’ view for these proposals in 1st round

|  |  |
| --- | --- |
| **Company** | **Comments** |
| MediaTek | Prefer proposal 2 and 3a. For proposal 3, it seems UE may need to perform tracking additionally if the target UL TCI state is not in DL active TCI state list. |
| Ericsson | Looking at the below IE, our understanding is maximum number of DL and UL TCI across CC seems independent. Unless there is a maximum RS (including DL and UL TCI) UE need to track is specified, our understanding is they are independent. We are fine to check with RAN1 if companies have different understanding. We do not want to introduce additional restriction in RAN4 than what is specified in RAN1/2.  unifiedSeparateTCI-r17                      SEQUENCE{          maxConfiguredDL-TCI-r17                     ENUMERATED {n4, n8, n12, n16, n24, n32, n48, n64, n128},          maxConfiguredUL-TCI-r17                     ENUMERATED {n4, n8, n12, n16, n24, n32, n48, n64},          maxActivatedDL-TCIAcrossCC-r17              ENUMERATED {n1, n2, n4, n8, n16},          maxActivatedUL-TCIAcrossCC-r17              ENUMERATED {n1, n2, n4, n8, n16}      } OPTIONAL, |

### Sub-topic 1-2 MAC CE based TCI state Switching delay requirements

**Issue 1-2-1 Joint TCI switching delay requirement for DL TCI state switch**

* Proposals:
  + Proposal 1(Intel, MTK, vivo):
    - Remove the square bracket:

- In case of joint TCI state switch, UE is not expected to receive on DL before UE completes the DL and UL TCI state switch.

* + Proposal 2(Nokia):
    - For joint TCI state switch, if the UL TCI state switch delay exceeds the DL TCI state switch delay, the UE is required to receive in DL up to THARQ before it completes UL TCI state switch.
  + Proposal 3(ZTE):
    - No matter whether UL TCI state switching completed or not, UE can receive DL by the target DL TCI state given that DL TCI state switching has been finished. So we suggest the bullet in square brackets can be ignored.
* Recommended WF
  + Collect companies’ view for these proposals in 1st round

|  |  |
| --- | --- |
| **Company** | **Comments** |
| MediaTek | Support proposal 1. We do not see the need why UE is required to receive the DL signals if ACK/NACK feedback may not be transmitted on the UL channels successfully. To our understanding, network does not know whether the PDSCH is received by UE or not due to lack of ACK/NACK feedback. In that case, network will transmit the PDSCH again to the UE, and UE may need to receive it again until the UL TCI state switch is complete if we go with proposal 2 and 3. |
| Ericsson | Support proposal 1 as it is already agreed in previous meeting. |

**Issue 1-2-2 MAC-CE based UL TCI state switching delay when SSB is indicated as PL-RS in UL TCI state for FR2**

* Proposals
  + Proposal 1(Apple, Samsung, Huawei):
    - When PL-RS in UL TCI state switch is SSB in FR2, longer delay is expected.
  + Proposal 2(Huawei):
    - If no consensus can be achieved in RAN4, we suggest that there is no requirements when SSB is indicated as PL-RS in UL TCI state in FR2.
  + Proposal 3(Intel):
    - When SSB is indicated as PL-RS in UL TCI state for FR2, the total delay is:

- n+THARQ + 3ms + NM*\** (Tfirst\_target-PL-RS + Q\*Ttarget\_PL-RS + 2ms)

- Where Q is the extended number of SSB resource number, Q is FFS.

* + Proposal 4(MTK, vivo, Ericsson, ZTE):
    - Reuse the existing delay requirement of MAC CE based UL TCI state switch.
  + Proposal 5(Nokia):
    - The number of sample M will not always be fixed as 5 samples.
    - If a UE performs both L1-RSRP measurements and PL-RS measurements on the same SSB, the number of samples used for L1-RSRP is counted for pathloss measurement.
* Recommended WF
  + Collect companies’ view for these proposals in 1st round

|  |  |
| --- | --- |
| **Company** | **Comments** |
| MediaTek | Support proposal 4. |
| Ericsson | Support proposal 4. We do not understand the need for RX beam sweeping for all the pathloss samples. May be a clarification question. In case of PRACH, UE determine transmit power based on SSB received power. We do not think UE need to get 5 samples with RX beam sweeping for calculating TX power for PRACH transmission. We do not see the difference here w.r.t PRACH transmission. |

### Sub-topic 1-3 Common TCI state switching in CA case

**Issue 1-3-1 Common TCI state switching delay requirement**

* Proposals
  + Proposal 1(MTK):
    - For common TCI state, the same existing unified TCI state switch delay requirement can be shared to two different configuration approaches "simultaneousU-TCI-UpdateList1/2/3/4-r17" and "RefUnifiedTCIStateList".
  + Proposal 2(vivo):
    - No further spec change for TS 38.133 regarding the configuration of unifiedTCI-StateRef or simultaneousU-TCI-UpdateList1/2/3/4-r17 in common TCI state.
  + Proposal 3(ZTE):
    - No matter which type of signaling is used, we believe the requirement for common TCI state switching delay is applicable. So Option 1 is aligned with our thinking. But even without any additional clarification, it seems workable too. I.e. Define the requirement without differentiating the triggering signaling, e.g. unifiedTCI-StateRef or simultaneousU-TCI-UpdateList1/2/3/4-r17.
  + Proposal 4(Ericsson):
    - RAN4 to define requirement per carrier without referring any of the IEs for common TCI state switching
* Recommended WF
  + Collect companies’ view for these proposals in 1st round

|  |  |
| --- | --- |
| **Company** | **Comments** |
| MediaTek | We can compromise to proposal 2 and 3 which are the same. |
| Ericsson | Our intention of proposal 4 is that no spec change is needed. |

### Sub-topic 1-4 TCI state list update delay

**Issue 1-4-1 MAC CE based TCI state list update delay for unknown TCI state**

* Proposals
  + Proposal 1(Apple):
    - It is sufficient to capture that longer delay applies if any TCI state is unknown in TCI state list update.
  + Proposal 2(Samsung):
    - For unknown TCI state in the TCI state list, follow the agreements in last meeting and no requirements for unknown TCI state.
  + Proposal 3(MTK):
    - For MAC CE based TCI state list update, requirement is not applicable if unknown TCI state is included in the TCI state list.
  + Proposal 4(Ericsson):
    - If all the TCIs in the active TCI state list are not known, upon receiving PDSCH carrying MAC-CE active TCI state list update at slot n, UE shall be able to receive PDCCH to schedule PDSCH with the new target TCI states at the first slot that is after n + + (THARQ + TL1-RSRP + Tfirst-SSB\_List + TSSB-proc) / *NR slot length.*
  + Proposal 4a(vivo):
    - In R17 TCI state list update requirements, specify requirements for the case when not all activated TCIs are known by considering the worst case, i.e. assuming UE use one Rx beam at a time in FR2, and the RSs with the longest periodicity would be assumed for TL1-RSRP.
  + Proposal 4b(ZTE):
    - Referring to the detailed delay requirement, we prefer to provide exact requirement instead of uncertain “longer delay”.
* Recommended WF
  + Further discussion.

|  |  |
| --- | --- |
| **Company** | **Comments** |
| MediaTek | Support proposal 1, 2 and 3. |
| Ericsson | In RAN4 we specify longer delay is needed only when there is uncertainty in determining the exact delay. We do not think that is the case here. We should specify exact delay so that UE and NW behaviour clear. Exact delay can be discussed in the CR. |

## Companies views’ collection for 1st round

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| [**R4-2215592**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2215592.zip)  Apple | CR for unified TCI |
| MediaTek: Depending on the discussion of open issue |
|  |
| [**R4-2216281**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216281.zip)  Huawei, HiSilicon | CR on maintaining TCI state switching requirements for R17 unified TCI |
| MediaTek: Depending on the discussion of open issue |
|  |
| [**R4-2216361**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216361.zip)  vivo | CR on unified TCI in R17 feMIMO |
| MediaTek: Depending on the discussion of open issue |
|  |
| [**R4-2216818**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216818.zip)  Ericsson | CR on maintenance of unified TCI state switching requirements |
| MediaTek: Depending on the discussion of open issue |
|  |
|  |

## 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** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

## Discussion on 2nd round (if applicable)

# Topic #2: Inter-cell beam measurement (4.5.1.2)

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| [**R4-2215354**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2215354.zip) | Intel Corporation | **Proposal 1: Sharing factor is designed by two-step:**   * **Step 1: Consider the sharing between L1-RSRP and SMTC/MG for each cell respectively** * **Step 2: Consider L1-RSRP sharing between two cells on remaining occasions**   **Proposal 2: Sharing factor for serving cell and cell with different PCI are as follows:**  **For serving cell measurement:**  **- P = , if P1\*TSSB\_SC < P2\*TSSB\_CDP where P2 is defined in 9.13.4.1.**  **- P = 1\*P1, if P1\*TSSB\_SC > P2\*TSSB\_CDP where P2 is defined in 9.13.4.1**  **- P = 2\*P1, if P1\*TSSB\_SC = P2\*TSSB\_CDP where P2 is defined in 9.13.4.1.**  **For cell with different PCI:**  **- P = , if P2\*TSSB\_CDP < P1\*TSSB\_SC where P1 is defined in 9.5.4.1.**  **- P = 1\*P2, if P2\*TSSB\_CDP> P1\*TSSB\_SC where P1 is defined in 9.5.4.1.**  **- P = 2\*P2, if P1\*TSSB\_SC = P2\*TSSB\_CDP where P1 is defined in 9.5.4.1.**  **Proposal 3: Clarify that performance degradation is expected when overlapping happen in RAN4 spec.** |
| [**R4-2215593**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2215593.zip) | Apple | **Sharing factors**  ***Observation #1:*** *The tentatively agreed sharing factor design doesn’t impact existing L3 measurements and considers the occasions after considering SMTC and MG into account.*  **Proposal #1: Either confirm the tentatively agreed sharing factors in last meeting or define the sharing factors by considering the number of measurement occasions as:**   |  |  |  |  | | --- | --- | --- | --- | | **#** | **Scenario** | **P for Serving cell** | **P for cell with different PCI** | | 1 | TSSB,SC = TSSB,CDP < TSMTC or MGRP |  |  | | 2 | TSSB,SC < TSSB,CDP < TSMTC or MGRP  All occasions of SSB of SC collide with CDP, MG and/or SMTC |  |  | | 3 | TSSB,CDP < TSSB,SC ≤ TSMTC or MGRP  All occasions of SSB of SC collide with CDP, MG and/or SMTC |  |  | | 4 | TSSB,SC < TSSB,CDP < TSMTC or MGRP  Not all occasions of SSB of SC collide with CDP, MG and/or SMTC |  |  | | 5 | TSSB,CDP < TSSB,SC ≤ TSMTC or MGRP  Not all occasions of SSB of CDP collide with SC, MG and/or SMTC |  |  | | SSBSC1 is the number of SSB occasions of serving cell which are colliding with CDP but not colliding with MG or SMTC within time max(MGRP, SMTC)  SSBCDP1 is number of SSB occasions of CDP which are colliding with SC but not colliding with MG or SMTC within max(MGRP,SMTC)  SSBSC2 is the number of SSB occasions of serving cell which are not colliding with CDP, MG or SMTC within time max(MGRP, SMTC)  SSBCDP2 is number of SSB occasions of CDP which are not colliding with SC, MG or SMTC within max(MGRP,SMTC) | | | |   **Scheduling Restriction**  ***Observation #2:*** *The UE behaviour for inter-cell L1-RSRP measurement in dynamic TDD is captured in RAN1 specification.*  **Proposal #2: RAN4 need not discuss the scheduling restriction for dynamic TDD as its already captured in RAN1 specification.**  **Proposal #3: The existing scheduling restrictions defined for L1 measurements on serving cell are applicable when UE is receiving PDCCH/PDSCH from cell with different PCI and no further clarification is required in specification.**  **Applicability of ICBM feature**  ***Observation #3:*** *Without prior agreement, we don’t extend or define requirements for concurrent WIs in the same release.*  **Proposal #4: Do not extend the ICBM feature and/or requirements to other concurrent Rel-17 WIs**  ***Observation #4:*** *The cell with different PCI is nor a serving cell or serving CC, hence common TCI would not be applicable to it.*  **Proposal #5: Common TCI configurations do not include cell with different PCI configured for ICBM per RAN1/ RAN2 design. No further clarification is needed in RAN4.** |
| [**R4-2215744**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2215744.zip) | Samsung | **Proposal 1: Introduce scheduling restriction for dynamic TDD when L1-RSRP measurement on the cell with different PCI. It is enough to add the scheduling restriction on 1 symbol before SSB and one symbol after SSB.**  **Proposal 2: It is not needed to introduce scheduling restriction on non-serving cell.**  **Proposal 3: RAN4 not extend ICBM requirements for concurrent R17 WIs in Release 17. It can be postponed to further release.** |
| [**R4-2215765**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2215765.zip) | MediaTek Inc. | **Proposal 1: FR 2-2 is not applicable to R17 inter cell beam management.**  **Proposal 2: Introduce scheduling restriction for dynamic TDD on serving cell UL symbols which fully or partially (because of TA) overlaps with the SSB for L1-RSRP measurement on cell with different PCI.**  **Proposal 3: Whether to define the requirement of overlap between SSB and PDCCH/PDSCH in the same RE should wait for RAN1 conclusion.** |
| [**R4-2216282**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216282.zip) | Huawei, HiSilicon | ***Proposal 1: After punctured by L3 measurements, the sharing strategy between SC SSB and CDP SSB for L1-RSRP measurements can be defined as follows:***   * ***When the remaining SSB periodicity of SC is equal to the remaining SSB periodicity of CDP, the remaining L1-RSRP measurement opportunities are equally shared between SC SSB and CDP SSB.*** * ***When the remaining SSB periodicity of SC is shorter than the remaining SSB periodicity of CDP, the L1-RSRP measurements on SC SSB can be further punctured by L1-RSRP measurements on CDP SSB.*** * ***When the remaining SSB periodicity of SC is longer than the remaining SSB periodicity of CDP, the L1-RSRP measurements on CDP SSB can be further punctured by L1-RSRP measurements on SC SSB.***   ***Proposal 2: The sharing factors PSC and PCDP for inter-cell L1-RSRP measurements can be defined as option 1:***   * + Option 1:  |  |  |  |  | | --- | --- | --- | --- | | # | Scenario | PSC | PCDP | | 1 | T’SSB,SC = T’SSB,CDP | 2 | 2 | | 2 | T’SSB,SC < T’SSB,CDP |  | 1 | | 3 | T’SSB,CDP < T’SSB,SC | 1 |  |   ***Proposal 3: The measurement restrictions are applied between SC SSB for RLM/BFD/CBD and CDP SSB for L1-RSRP.***  ***Proposal 4: The measurement restrictions are applied between CDP SSB for BFD/CBD and SC SSB for L1-RSRP.*** |
| [**R4-2216362**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216362.zip) | vivo | **Proposal 1 Remove square brackets for L1 measurement sharing factor in TS 38.133.**  **Proposal 2 Do not introduce scheduling restriction for dynamic TDD when L1-RSRP measurement on cell with different PCI overlaps with serving cell UL slots. Clarify longer L1 measurement delay is expected for this case.**  **Proposal 3 Confirm that R17 requirements for inter-cell L1 measurements can be applicable to FR1 HST. The square brackets related to FR1 HST should be removed.**  **Proposal 4 Confirm that R17 requirements for inter-cell L1 measurements can be applicable to FR2 HST, with the assumption that only one active UE panel is used.**  **Proposal 5 Clarify in TS 38.133 that there is no R17 requirements when inter-cell L1 measurements and R17 enhance gap related features are configured simultaneously to one UE.**  **Proposal 6 RAN4 can revisit whether any clarification or update is needed in RAN4 spec when SSB and PDCCH/PDSCH are overlapped on the same RE** |
| [**R4-2216485**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216485.zip) | ZTE Corporation | **Observation 1: According to legacy requirement, both RRM measurement and L1-RSRP measurement are prioritized than DL/UL transmission. The difference between scheduling restriction since of RRM measurement and L1-RSRP measurement are whether adjacent symbol before and after SSB should be restricted.**  **Proposal 1: For the scheduling restriction due to L1-RSRP measurement on cell with different PCI, reusing the scheduling restriction due to L1-RSRP measurement on serving cell is fine. Whether the adjacent symbol before and after SSB should be restricted, which should be aligned with the specification for L1-RSRP measurement on serving cell.**  **Proposal 2: Given that the cell with different PCI also belongs to serving cell, which is a TRP of serving cell, so not need to introduce any additional scheduling restriction on the cell with different PCI. Directly reusing the scheduling restriction specified on serving cell since of L1-SINR measurement, BFD, CBD, RLM on serving cell is enough.**  **Proposal 3: To sum up, for all sub-bullets in Option 1, the following sub-bullets can be supported:**   * **For intra-band ICBM using common TCI configurations, different reference CCs in the same CC list between the serving cell and a cell with different PCI is not supported in R17. Same reference CC is applicable for serving cell and a cell with different PCI in a CC list. The serving cell and cell with different PCI in the reference CC are referenced by other serving cells and cells with different PCI respectively in the CC list.** * **For intra-band ICBM using common TCI configurations, requirements are defined for the case when SSB measurements for a cell with different PCI are only performed in the cell that has the same SSB frequency as the reference CC.** * **R17 ICBM feature is applicable to FR1 HST and FR2 HST. If RAN4 identifies any issue in applying HST related enhancements to ICBM related RRM requirements, RAN4 solve them in the R17 maintenance phase.** |
| [**R4-2216819**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216819.zip) | Ericsson | **Proposal 1: RAN4 to agree following sharing factor for CDP**   * **For FR1:**    + **PCDP= Ntotal\_CDP / Noutside\_MG\_CDP** * **For FR2:**   + **if Navailable,SSB\_CDP\_SMTC\_MG = 0,**      - **If measurement occasions of SSB CDP is also used for L3 measurements which are measured outside gap, then PCDP = Psharing SMTC \* Psharing SSB \* Ntotal\_CDP / Noutside\_MG\_CDP**     - **Else, PCDP = Psharing SSB \* Ntotal\_CDP / Noutside\_MG\_CDP**     - **Where, Psharing SSB = N, where N is the number overlapping SSB from different cells.**   + **If Navailable,SSB\_CDP\_SMTC\_MG ≠ 0**     - **PCDP = Psharing SSB \* Ntotal / Navailable,SSB\_CDP\_SMTC\_MG**   **Proposal 2: RAN4 to agree following sharing factor for SC**   * **For FR1:**    + **PSC= Ntotal\_SC / Noutside\_MG\_SC** * **For FR2:**   + **if Navailable,SSB\_SC\_SMTC\_MG = 0,**      - **If measurement occasions of SSB CDP is also used for L3 measurements which are measured outside gap, then PSC = Psharing SMTC \* Psharing SSB \* Ntotal\_SC / Noutside\_MG\_SC**     - **Else, PSC = Psharing SSB \* Ntotal\_SC / Noutside\_MG\_SC**     - **Where, Psharing SSB = N, where N is the number overlapping SSB from different cells.**   + **If Navailable,SSB\_SC\_SMTC\_MG ≠ 0**     - **PSC = Psharing SSB \* Ntotal\_SC / Navailable,SSB\_SC\_SMTC\_MG**   **Proposal 3: When SSB and PDCCH/PDSCH are overlapped on the same RE, whether any clarification is needed in RAN4 spec to be discussed under Demod agenda.** |

## Open issues summary

### Sub-topic 2-1: Sharing factor

**Issue 2-1-1: Sharing factor design**

* Proposals:
  + Proposal 1(Intel, Huawei, vivo):
    - Remove the bracket in the corresponding CR.
  + Proposal 1a(Apple):
    - Either confirm the tentatively agreed sharing factors in last meeting or define the sharing factors by considering the number of measurement occasions as:

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Scenario** | **P for Serving cell** | **P for cell with different PCI** |
| 1 | TSSB,SC = TSSB,CDP < TSMTC or MGRP |  |  |
| 2 | TSSB,SC < TSSB,CDP < TSMTC or MGRP  All occasions of SSB of SC collide with CDP, MG and/or SMTC |  |  |
| 3 | TSSB,CDP < TSSB,SC ≤ TSMTC or MGRP  All occasions of SSB of SC collide with CDP, MG and/or SMTC |  |  |
| 4 | TSSB,SC < TSSB,CDP < TSMTC or MGRP  Not all occasions of SSB of SC collide with CDP, MG and/or SMTC |  |  |
| 5 | TSSB,CDP < TSSB,SC ≤ TSMTC or MGRP  Not all occasions of SSB of CDP collide with SC, MG and/or SMTC |  |  |
| SSBSC1 is the number of SSB occasions of serving cell which are colliding with CDP but not colliding with MG or SMTC within time max(MGRP, SMTC)  SSBCDP1 is number of SSB occasions of CDP which are colliding with SC but not colliding with MG or SMTC within max(MGRP,SMTC)  SSBSC2 is the number of SSB occasions of serving cell which are not colliding with CDP, MG or SMTC within time max(MGRP, SMTC)  SSBCDP2 is number of SSB occasions of CDP which are not colliding with SC, MG or SMTC within max(MGRP,SMTC) | | | |

* + Proposal 2(Ericsson)：
    - RAN4 to agree following sharing factor for CDP
* For FR1:
  + PCDP= Ntotal\_CDP / Noutside\_MG\_CDP
* For FR2:
  + if Navailable,SSB\_CDP\_SMTC\_MG = 0,
    - If measurement occasions of SSB CDP is also used for L3 measurements which are measured outside gap, then PCDP = Psharing SMTC \* Psharing SSB \* Ntotal\_CDP / Noutside\_MG\_CDP
    - Else, PCDP = Psharing SSB \* Ntotal\_CDP / Noutside\_MG\_CDP
    - Where, Psharing SSB = N, where N is the number overlapping SSB from different cells.
  + If Navailable,SSB\_CDP\_SMTC\_MG ≠ 0
    - PCDP = Psharing SSB \* Ntotal / Navailable,SSB\_CDP\_SMTC\_MG
    - RAN4 to agree following sharing factor for SC
* For FR1:
  + PSC= Ntotal\_SC / Noutside\_MG\_SC
* For FR2:
  + if Navailable,SSB\_SC\_SMTC\_MG = 0,
    - If measurement occasions of SSB CDP is also used for L3 measurements which are measured outside gap, then PSC = Psharing SMTC \* Psharing SSB \* Ntotal\_SC / Noutside\_MG\_SC
    - Else, PSC = Psharing SSB \* Ntotal\_SC / Noutside\_MG\_SC
    - Where, Psharing SSB = N, where N is the number overlapping SSB from different cells.
  + If Navailable,SSB\_SC\_SMTC\_MG ≠ 0
    - PSC = Psharing SSB \* Ntotal\_SC / Navailable,SSB\_SC\_SMTC\_MG
* Recommended WF
  + Collect companies’ view for these proposals in 1st round

|  |  |
| --- | --- |
| **Company** | **Comments** |
| MediaTek | In general, we prefer proposal 2 but detail can be further discussed. For example, the Navailable,SSB\_CDP seems should be considered in the equation.  The reason why we prefer proposal 2 is because it has better forward compatibility. If we go with option 1 and 1a, the sharing factor would be very complicated if more than two cells are further considered. Note: in R18 L1/L2 mobility, more than two cells may be considered. |
| Ericsson | We support proposal 2. We also think that it is easy to read and understand the spec for proposal 2 and more forward compatible for L1/L2 mobility.  We are fine to discuss the details of the proposal 2. |

### Sub-topic 2-2: Scheduling Restriction

**Issue 2-2-1 Scheduling restriction for dynamic TDD**

* Proposals:
  + Proposal 1(Apple):
    - RAN4 need not discuss the scheduling restriction for dynamic TDD as its already captured in RAN1 specification.
  + Proposal 2(vivo):
    - Do not introduce scheduling restriction for dynamic TDD when L1-RSRP measurement on cell with different PCI overlaps with serving cell UL slots. Clarify longer L1 measurement delay is expected for this case.
  + Proposal 3(MTK):
    - Introduce scheduling restriction for dynamic TDD on serving cell UL symbols which fully or partially (because of TA) overlaps with the SSB for L1-RSRP measurement on cell with different PCI.
  + Proposal 3a(Samsung):
    - Introduce scheduling restriction for dynamic TDD when L1-RSRP measurement on the cell with different PCI. It is enough to add the scheduling restriction on 1 symbol before SSB and one symbol after SSB.
  + Proposal 3b(ZTE):
    - For the scheduling restriction due to L1-RSRP measurement on cell with different PCI, reusing the scheduling restriction due to L1-RSRP measurement on serving cell is fine. Whether the adjacent symbol before and after SSB should be restricted, which should be aligned with the specification for L1-RSRP measurement on serving cell.
* Recommended WF
  + Collect companies’ view for these proposals in 1st round

|  |  |
| --- | --- |
| **Company** | **Comments** |
| MediaTek | Prefer proposal 3. Some companies mention this has already defined in TS 38.213. But it is unclear to us. We are wondering what is the UE behaviour for the following two cases:   * if *dl-OrJoint-TCIStateList* is provided, and the SSB indicated by *ssb-PositionsInBurst* in *SSB-MTCAdditionalPCI* is overlapped with other UL channels/signals? * If SSB is configured by *ssb-PositionsInBurst* in *SSB-MTCAdditionalPCI* as QCL source for other RS (e.g. tracking RS) but not configured for L1 beam measurement/reporting?   Content in TS 38.213 is provided as below for reference.   |  | | --- | | For operation on a single carrier in unpaired spectrum, for a set of symbols of a slot indicated to a UE for reception of SS/PBCH blocks by *ssb-PositionsInBurst* in *SIB1* or by *ssb-PositionsInBurst* in *ServingCellConfigCommon* or, if the UE is not provided *dl-OrJoint-TCIStateList*,by *ssb-PositionsInBurst* in *SSB-MTCAdditionalPCI* associated to physical cell ID with active TCI states for PDCCH or PDSCH, or for a set of symbols of a slot corresponding to SS/PBCH blocks configured for L1 beam measurement/reporting, the UE does not transmit PUSCH, PUCCH, PRACH in the slot if a transmission would overlap with any symbol from the set of symbols and the UE does not transmit SRS in the set of symbols of the slot. The UE does not expect the set of symbols of the slot to be indicated as uplink by *tdd-UL-DL-ConfigurationCommon*, or *tdd-UL-DL-ConfigurationDedicated*, when provided to the UE. | |
| Ericsson | Prefer proposal 1. |

**Issue 2-2-2 Whether to define scheduling restriction for non-serving cell**

* Proposals:
  + Option 1(Apple, Samsung, ZTE):
    - No
* Recommended WF
  + Collect companies’ view for these proposals in 1st round

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Ericsson | Our understanding was it was already defined. |
|  |  |

### Sub-topic 2-3: Applicability of ICBM feature

**Issue 2-3-1: Applicability of ICBM feature**

* Proposals:
  + Proposal 1(Apple):
    - Do not extend the ICBM feature and/or requirements to other concurrent Rel-17 WIs
    - Common TCI configurations do not include cell with different PCI configured for ICBM per RAN1/ RAN2 design. No further clarification is needed in RAN4.
  + Proposal 1a (Samsung):
    - RAN4 not extend ICBM requirements for concurrent R17 WIs in Release 17. It can be postponed to further release.
  + Proposal 2(vivo):
    - Confirm that R17 requirements for inter-cell L1 measurements can be applicable to FR1 HST. The square brackets related to FR1 HST should be removed.
    - Confirm that R17 requirements for inter-cell L1 measurements can be applicable to FR2 HST, with the assumption that only one active UE panel is used.
    - Clarify in TS 38.133 that there is no R17 requirements when inter-cell L1 measurements and R17 enhance gap related features are configured simultaneously to one UE.
  + Proposal 3(ZTE):
    - For intra-band ICBM using common TCI configurations, different reference CCs in the same CC list between the serving cell and a cell with different PCI is not supported in R17. Same reference CC is applicable for serving cell and a cell with different PCI in a CC list. The serving cell and cell with different PCI in the reference CC are referenced by other serving cells and cells with different PCI respectively in the CC list.
    - For intra-band ICBM using common TCI configurations, requirements are defined for the case when SSB measurements for a cell with different PCI are only performed in the cell that has the same SSB frequency as the reference CC.
    - R17 ICBM feature is applicable to FR1 HST and FR2 HST. If RAN4 identifies any issue in applying HST related enhancements to ICBM related RRM requirements, RAN4 solve them in the R17 maintenance phase.
* Recommended WF
  + Collect companies’ view for these proposals in 1st round

|  |  |
| --- | --- |
| **Company** | **Comments** |
| MediaTek | Support proposal 1a. |
| Ericsson | Support proposal 1a. |

### Sub-topic 2-4: SSB and PDCCH/PDSCH are overlapped on the same RE

**Issue 2-4-1: Whether any clarification or update is needed in RAN4 spec when SSB and PDCCH/PDSCH are overlapped on the same RE**

* Proposals:
  + Proposal 1(MTK):
    - Whether to define the requirement of overlap between SSB and PDCCH/PDSCH in the same RE should wait for RAN1 conclusion.
  + Proposal 1a(vivo):
    - RAN4 can revisit whether any clarification or update is needed in RAN4 spec when SSB and PDCCH/PDSCH are overlapped on the same RE
  + Proposal 2(Intel):
    - Clarify that performance degradation is expected when overlapping happen in RAN4 spec.
  + Proposal 3(Ericsson):
    - When SSB and PDCCH/PDSCH are overlapped on the same RE, whether any clarification is needed in RAN4 spec to be discussed under Demod agenda.
* Recommended WF
  + Collect companies’ view for these proposals in 1st round

|  |  |
| --- | --- |
| **Company** | **Comments** |
| MediaTek | Support proposal 1. In the last meeting, RAN4 sends the LS to RAN1 to clarify the current status of TS 38.133. We can further discuss this issue if RAN1 does not define any requirement for it. |
| Ericsson | Proposal 1 and 3 are fine with us. |

### Sub-topic 2-5: Measurement restriction

**Issue 2-5-1: Measurement restriction for SSB based L1-RSRP**

* Proposals:
  + Proposal 1(Huawei):
    - The measurement restrictions are applied between SC SSB for RLM/BFD/CBD and CDP SSB for L1-RSRP.
    - The measurement restrictions are applied between CDP SSB for BFD/CBD and SC SSB for L1-RSRP.
* Recommended WF
  + Collect companies’ view for these proposals in 1st round

|  |  |
| --- | --- |
| **Company** | **Comments** |
| MediaTek | More discussion is needed.  We are not sure whether the CBD and BFD can be applied for CDP. The reason is because the CBD-RS should be included in *candidateBeamRSList1* according to TS 38.213. However, *candidateBeamRSList1* seems not applicable to CDP. |
| Ericsson | We are fine to further look into it. We would like to study the option of defining sharing factor too. |

### Sub-topic 2-6: Applicability of FR 2-2

**Issue 2-6-1: Applicability of FR 2-2**

* Proposals:
  + Proposal 1(MTK):
    - FR 2-2 is not applicable to R17 inter cell beam management.
* Recommended WF
  + Collect companies’ view for these proposals in 1st round

|  |  |
| --- | --- |
| **Company** | **Comments** |
| MediaTek | Support proposal 1.  We do not discuss any joint requirement between R17 inter cell BM and R17 FR2-2. |
| Ericsson | We would like to check RAN1 scope regarding this. |

## Companies views’ collection for 1st round

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| [**R4-2215594**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2215594.zip)  Apple | CR for inter-cell beam management |
| MediaTek: Depending on open issues. |
|  |
| [**R4-2215767**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2215767.zip)  MediaTek Inc. | CR on applicability of R17 inter cell beam management for FR2-2 |
| MediaTek: It is related to issue 2-6-1. Support this CR. |
|  |
| [**R4-2216283**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216283.zip)  Huawei, HiSilicon | CR on maintaining L1-RSRP measurement requirements for R17 inter-cell BM |
| MediaTek: Depending on open issues. |
|  |
| [**R4-2216363**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216363.zip)  vivo | CR on inter-cell beam managements in R17 feMIMO |
| MediaTek: Depending on open issues. |
|  |
| [**R4-2216820**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216820.zip)  Ericsson | Maintenance CR on inter-cell BM |
| MediaTek: Depending on open issues. |
|  |

## 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** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

## Discussion on 2nd round (if applicable)

# Topic #3: Other RRM requirements (4.5.1.3)

## Companies’ contributions summary

No.

## Open issues summary

No.

## Companies views’ collection for 1st round

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| [**R4-2215747**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2215747.zip)  Samsung | Correction on requirements for TRP specific link recovery procedures |
| MediaTek: OK |
| Ericsson: Ok |
|  |
| [**R4-2216487**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104bis-e/Docs/R4-2216487.zip)  ZTE Corporation | CR on SFN based RLM and LRP |
| MediaTek: OK  Ericsson: OK |
|  |

## 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** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

## Discussion on 2nd round (if applicable)

# Recommendations for Tdocs

## 1st round

**New tdocs**

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

**Existing tdocs**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tdoc number** | **Revised to** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-22xxxxx |  | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Notes:

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

## 2nd round

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tdoc number** | **Revised to** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-22xxxxx |  | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-22xxxxx |  | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-22xxxxx |  | LS on … | ZZZ | Agreeable, Revised, Noted |  |
|  |  |  |  |  |  |

Notes:

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