**3GPP TSG-RAN WG4 Meeting #104-eR4-22xxxxx**

**Electronic Meeting, 15 – 26 August, 2022**

**Agenda item:** 4.8

**Source:** Moderator (Huawei)

**Title:** Email discussion summary for [104-e][201] Maintenance\_R15\_R16\_RRM

**Document for:** Information

# Introduction

The scope of this email discussion includes the following agenda items:

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| 4.5 RRM requirements [WI code]  4.5.1 RRM core requirements (38.133/36.133) [WI code]  4.5.2 RRM performance requirements (38.133/36.133) |

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It is appreciated that the delegates for this topic put their contact information in the table below.

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Note:

1. Please add your contact information in above table once you make comments on this email thread.
2. If multiple delegates from the same company make comments on single email thread, please add you name as suffix after company name when make comments i.e. Company A (XX, XX)

# Topic #1: Rel-15 NR RRM maintenance

## Companies’ contributions summary

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| **T-doc** | **Company** | **Proposals / Observations** |
| Core part | | |
| [**R4-2211836**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211836.zip) | Apple | CR  The scheduling restriction shall be revised for the case when the symbol after SSB is not DL symbol, and 2 symbols after SSB would have scheduling restriction. |
| [**R4-2211855**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211855.zip) | Apple | CR  Added exception rule to scheduling restriction in FR1 for L3 measurement when UE receives system update through paging. |
| [**R4-2211913**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211913.zip) | Apple | CR  Add “otherwise” back to make restriction applies when repetition is ON. |
| [**R4-2212253**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212253.zip) | ZTE Corporation | CR  Specify that N\_TA\_offset is specified in clause 7.1.2 instead of 7.1.2.2. |
| [**R4-2212922**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212922.zip) | Huawei, HiSilicon | CR (36133)  Interruption length for SSB-less SCell and SCell without SMTC configuration are updated with x = number of consecutive slots which contains all SSBs indicated by ssb-PositionsInBurst |
| [**R4-2212925**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212925.zip) | Huawei, HiSilicon | CR (38133)  Interruption length for SSB-less SCell and SCell without SMTC configuration are updated with x = number of consecutive slots which contains all SSBs indicated by ssb-PositionsInBurst |
| [**R4-2213934**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213934.zip) | Ericsson | CR  T∆ definition is corrected so that consistent wording will be present across all the HO scenarios |
| [**R4-2213935**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213935.zip) | Ericsson | CR  1st change:  Interruption requirements are corrected to consider the SSB less SCell activation scenario.  When the SCell activation delay requirement contains both Tuncertainty\_MAC +TFineTiming, and TFirstSSB\_MAX,interruption requirement is clarified.  2nd change:  adding TReport as 0 in TL1-RSRP, measure |
| Perf part | | |
| [**R4-2211541**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211541.zip) | Anritsu Corporation | CR   1. Change SR.3.1 TDD 🡪 SR.3.3 TDD, CR.3.1 TDD 🡪 CR.3.2 TDD, and CCR.3.1 TDD 🡪 CCR.3.7 TDD in Table A.5.6.3.3.2-1 and Table A.5.6.3.4.2-1 2. Changed “CSI-RS SCS” 🡪 “SSB SCS” in Table A.5.6.3.3.1-1 and Table A.5.6.3.4.1-1. |
| [**R4-2211544**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211544.zip) | Anritsu Corporation | CR   * For the FR2 SS-RSRP Inter frequency relative accuracy in Table 10.1.5.1.2-1, refer to accuracy relaxation Ginter when the pair of cells are configured by inter frequency. * For the FR2 SS-RSRP relative accuracy test requirement in Tables A.5.7.1.2.3-2 and A.7.7.1.2.3-2, Note 5 and 6 are reworded. * Specify parameter Ginter in new clause B.2.1.5.2 * Specify parameter D in new clause B.2.1.5.3 |
| [**R4-2211608**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211608.zip) | Rohde & Schwarz | CR  Change 1: In CSI-RS.3.2 TDD for SCS=120kHz (Table A.3.14.2-3) Offset changed from 8 to 16.  Change 2: In TCs A.5.6.1.3 / A.5.6.1.4 for the CSI-RS parameters of PSCell clarification “resource #0” added (to CSI-RS.3.2 TDD). |
| [**R4-2211669**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211669.zip) | CATT | CR  Fix the misalignments in parameter setting. |
| [**R4-2211887**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211887.zip) | Apple | **Proposal 1: two options to address testability issue for FR2 inter-frequency RSRP accuracy**  **Option 1: add A.5.7.1.3 and A.7.7.1.3 in A.3.13A to allow UE not to pass the tests.**  **Option 2: update the criteria for selecting FR1/LTE+FR2 test with OTA testability problem approved in RAN4#100e:**  **Proposal 2: add additional margins E=[3]dB to the upper bound for FR2 inter-frequency relative RSRP accuracy test requirements** |
| [**R4-2211888**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211888.zip) | Apple | CR  Update test applicability in A.3.13A to allow UE skip A.5.7.1.3 and A.7.7.1.3. |
| [**R4-2212251**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212251.zip) | ZTE Corporation | CR  Specify the correct values to replace TBD, and correct the wrong reference numbers. |
| [**R4-2212288**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212288.zip) | CMCC | CR  Modify the Cell 2 to Cell 1 in Figure A.6.5.1.7.1-1  Delete the wording “During time durations T1, T2 and T3, the UE shall transmit uplink signal at least in all subframes configured for CSI transmission on Cell 1” to align with other RLM OOS test requirements |
| [**R4-2212522**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212522.zip) | MediaTek Inc. | CR  Instruction to release measurement gap is included in the RRC message to add PSCell. |
| [**R4-2212529**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212529.zip) | MediaTek Inc. | CR  Remove redundant sentence in R17 to align with R15/R16 requirement. |
| [**R4-2212928**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212928.zip) | Huawei, HiSilicon | CR  1. Unimplemented changes in agreed CR R4-2204844 are resubmitted.  2. Notes is added to test configuration tables of CA test cases to indicate that PCC/SCC can choose its test configuration independently. |
| [**R4-2212931**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212931.zip) | Huawei, HiSilicon | CR   1. Cell re-selection TCs    1. Editorial changes.    2. Es/Iot is changed to Es/Iot at BB to align with other FR2 TCs. Value of Es/Iot at BB is re-calculated.    3. Note 5 is added.    4. Io in Table A.7.1.1.2.2-3 is corrected.    5. SS-RSRP in Table A.7.1.1.2.2-3 is corrected. 2. TCI state switching TCs    1. replace TCI.State.0 with TCI.State.2    2. replace TCI.State.1 with TCI.State.3    3. update TRS configuration to align with TCI configuration. |

## Open issues summary

Note: Only issues proposed in discussion papers are listed in this section. For other issues proposed via CR, please provide comments to the CR directly in section 1.3.1 and 1.3.2.

### Sub-topic 1-1: Applicability of FR1+FR2 test

#### Issue 1-1-1: Applicability of the test considering FR1+FR2 testability

* Proposals
  + Option 1 (Apple)
    - add A.5.7.1.3 and A.7.7.1.3 in A.3.13A to allow UE not to pass the tests

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| --- | --- |
| A.5.7.1.3 | EN-DC inter-frequency measurement accuracy with FR1 serving cell and FR2 target cell |
| A.7.7.1.3 | SA inter-frequency measurement accuracy with FR1 serving cell and FR2 target cell |

* + Option 2 (Apple)
    - update the criteria for selecting FR1/LTE+FR2 test with OTA testability problem approved in RAN4#100e

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| --- |
| 4.1 Criteria for selecting FR1/LTE+FR2 test with OTA testability problem  * Except for accuracy test, FR1/LTE+FR2 test has OTA testability problem if at least one of the following criteria is met:   + Tests where any requirement is tested for FR1/LTE,   + Tests where UE receives any DL message (e.g. RRC/DCI/MAC-CE configuration message/command etc) on FR1/LTE between the starting point and ending point of the test, and   + Tests where UE transmits any UL signal (e.g. measurement report, ACK/NACK, CSI etc) b on FR1/LTE between the starting point and ending point of the test. |

* Recommended WF
  + Discuss the options

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| --- | --- |
| **Company** | **Comments** |
| vivo | Option 2 is fine. |
| Apple | Fine with either option 1 or 2. |
| Ericsson | We are fine with option 2. |
| Huawei | We are fine with option 1. For option 2, we don’t fully understanding the intention. Does it means no testability problem for accuracy test at all? |
| Nokia | We have a preference for option 1. |

### Sub-topic 1-2: Margin in relative accuracy for FR2 inter-frequency RSRP tests

Moderator’s Note: the following additional margins for the relative accuracy have been discussed in companies’ contributions

* D: margin due to mis-alignment between fine beam and rough beam
* Ginter: margin due to different antenna gain on different bands
* E: margin due to difference between Y’ and Z’
  + Y’: actual gain difference between fine and rough beam at peak direction
  + Z’: actual gain difference between fine and rough beam at spherical coverage direction

In RAN4#103-e, the agreements are as follow.

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| **Issue 1-1-1: whether to add Ginter when two cells are in same band**   * Add Ginter = [3] dB also when two cells are in same band, for both upper bound and lower bound   **Issue 1-1-2: whether to add E to the upper bound**   * FFS whether to add E to the upper bound   + Option 1: Yes, E=[3]dB   + Option 2: No   **Issue 1-1-3: whether to modify the test procedure to compensate the relaxation margins**   * RAN4 not modify the test procedure to compensate the relaxation margins for Rel-15   **Issue 1-1-4: margin for the lower bound when two cells are in same band**   * For intra-band case, at lower bound, add margin D ([5.5]dB) + Ginter ([3]dB) |

#### Issue 1-2-1: Whether to add E to the upper bound

* Proposals
  + Option 1 (Apple)
    - add additional margins E=[3]dB to the upper bound for FR2 inter-frequency relative RSRP accuracy test requirements
* Recommended WF
  + Check if option 1 is agreeable

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| **Company** | **Comments** |
| Apple | Support option 1. |
| MediaTek | Support option 1. |
| Huawei | Support option 1. |

## Comments to the CRs

Cat-A draftCRs are not listed for comments.

### CRs for the Core part

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| **CR/TP number** | **Comments collection** |
| R4-2211836 (Apple) | Draft CR on scheduling restriction for FR2 R15 |
| QC: We see that the identified issue is valid. However, we would like to not keep adding scheduling restriction rules to RAN4 spec. If there is a way to say “UE is expected to receive downlink signals until at least the first slot after SSB block,” we think the issue may be resolved by additionally referring to RAN1 spec.  vivo: The change is not clear enough to us. Since the symbols after SSB are for GP, as depicted in the figure, no scheduling is expected on GP symbols.  Apple: Thanks QC and vivo for the comments, and we would like to further clarify our understanding:  To QC: we think this is still an issue related with scheduling restriction, because it’s a constant time span in which UE cannot use for UL transmission regardless of how network configures the guard symbol. In previous scheduling restriction, the 1 symbol margin before and after SSB is because of the cell phase time misalignment and propagation delay difference; however, if the Rx-Tx transition is needed after SSB, another 7us for Rx-Tx transition margin shall be considered, and therefore there is ~10us (3us time misalignment + 7us Rx-Tx transition) time span in which UE cannot use for transmission. This ~10us is a constant margin needs to be considered regardless of guard symbol configuration, as long as the symbol after SSB is not DL. In FR2 120kHz case, ~10us time span will impact two symbols after SSB, and thus we propose to extend scheduling restriction to 2 symbols for UL transmission if the symbol after SSB is not DL.  To vivo: the figure is just one of the examples and the guard symbol configuration is flexible from network. However, as clarified above, this ~10us is a constant margin needs to be considered regardless of guard symbol configuration, as long as the symbol after SSB is not DL. The logic is completely same as previous scheduling restriction, i.e., to reflect the constant margin in the scheduling restriction (previous constant margin is 3us, and now for this case is 10us).  Ericsson: We think this is a valid issue, but we need time to further check the detail.  Huawei: We agree with the analysis and support the CR to make clarification. The exact wording may need more discussion, e.g. the current wording says UE is not expected to transmit on 2 data symbol after each consecutive SSB symbols, it may be interpreted as symbol#12 in the figure in the cover sheet can still be used for transmission (the last SSB symbol is symbol #9). Maybe we could say If the symbol after SSB is not DL symbol and number of GP symbols is 2, UE is not expected to transmit on the first UL symbol after the GP. We are open to other suggestions.  Nokia: This needs more discussion. We understand that this would just mean that the UE cannot be expected to detect/measure that particular neighbour cell under these conditions. We prefer keeping current requirements. |
| R4-2211855 (Apple) | Draft CR on scheduling restrictions for L3 measurements in FR1 (Rel-15) |
| QC: Agree that UE should attempt to decode PBCH for SI update. However, we are not sure if this is not stated anywhere in 3GPP spec. To us, even without the CR, UE behavior may be clear although different companies may have different interpretations on “is not expected to”.  Apple: In Rel-15 we introduced this prioritization of PDCCH/PDSCH carrying SI update through paging over SSB for measurement in FR2 only when multiplexing patterns 2 or 3 are used. Since only TDD bands are supported in FR2, with synchronous operation there wouldn’t be an issue with multiplexing pattern 1, as SSB wouldn’t overlap with PDCCH/PDSCH carrying RMSI. In FR1 only multiplexing pattern 1 is used, and PDCCH/PDSCH carrying RMSI could overlap with SSB for measurements in case in FDD when deriveSSB\_IndexFromCell is not enabled. We believe that this prioritization in FR1 was overlooked and not discussed in Rel-15 and we propose to add it now.  Apple2: We will correct the units in the revision to 2 slots. And also add units to the scheduling restriction part for FR2.  Ericsson: We would like to have it clarified why '2 symbols' are used in the condition. From our understanding, it should be 2 slots in legacy requirement. Could the proponent company further check it?  Huawei: As Apple mentioned, it should be 2 slots instead of 2 symbols. Otherwise, the CR is fine.  Nokia: We are wondering if this change is really needed? It is addressing a corner case from our point of view. At least it seems not to be an essential change for Rel15. |
| R4-2211913 (Apple) | Maintenance CR on scheduling restriction on L1-RSRP measurement (R17) |
| Ericsson: OK  Nokia: CR is agreeable. |
| R4-2212253 (ZTE) | [draft CR] R15 Maintenance for 38133 Core |
| Moderator: Cat-F CR for R16 due to difference between R15 and R16 specs. |
| ZTE: OK, thanks for the suggestion, then we’ll have Cat F for R15, Cat F for R16 and Cat A for R17. Can the moderator help to advise to the chair to update TDoc reservation?  Ericsson: OK  Moderator: After further checking, it seems the change itself is same across releases, so there is no need to have Cat-F CR for Rel-16. Sorry for the confusion.  Nokia: This change is not needed for Rel-15 as this is not seen as being an essential change. Can be agreed for Rel-17. |
| R4-2212922 (Huawei) | Correction to NR SCell interruption requirements 36.133\_r15 |
| QC: In principle, we agree that the interruption length should still be more than 1 or 0.5ms for intra-band scenario because UE may still need to reconfigure RF chain and so on. On the other hand, we are not very much in favor of relying on “ssb-PositionsInBurst” because it may leave too short period to the UE. We instead would like to use a hardcoded value as x, e.g. 2ms which is still a bit shorter than half of full SSB-burst length while leaving sufficient time for the RF reconfiguration.  vivo: We understand the intention, but the wording is not accurate enough. It should be all the slots between first slot and last slot contains SSB. In addition, we don’t think half frame is needed for SMTC.  Apple: for the interruption to LTE, the existing interruption length is in unit of subframe or ms, but new introduced ‘x’ can be a non-integer value. Need to consider round x to number of subframes or integer number of milliseconds.  Ericsson: Ok with the CR.  Huawei:  Thanks very much for all companies providing comments.  To QC: We want to clarify that RF retuning time is not included in the “x ms” we discuss here. According to 36.133/38.133, the interruption requirements for intra-band SCell addition/activation is defined as RF retuning time + AGC time. Where  1) RF retuning time: which is 0.5ms for SCell activation and 1ms for addition. We still needs this time;  2) the time for AGC, which equals to the longest SMTC duration among the active serving cells in the same band as the SCell to be activated/added. What we discuss here is how to determine “SMTC duration” (i.e. X ms we mentioned in CR) for a SCell which actually transmits SSB but doesn’t provide SMTC configuration.  To Vivo: We share the same understanding. We emphasize SSB half-frame only to clarify that the assumed “SMTC duration” covers the SSB in one SSB burst and cannot span multiple SSB burst periods. as shown in the following figure.    I can revise the wording to “…the number of consecutive subframes containing all SSBs transmitted by the SCell in an SSB burst…”, do you Okay with the wording?  To Apple: Yes, Thank you very much for the reminding. I forgot this is the interruption requirements for LTE victim Cells.  I’m fine to revise the wording in R4-2212922 to “…is x ms, where x = the number of consecutive subframes which contains all SSBs transmitted by the SCell being added/activated in an SSB burst”. Do you Okay with the wording?  Nokia: Change is agreeable |
| R4-2212925 (Huawei) | Correction to NR SCell interruption requirements 38.133\_r15 |
| QC: The same comment as R4-2212922.  Apple: similar comment as for 2922, e.g., if 30kHz SCell is being-activated and 15kHz SCell is victim, do we need to consider to round x (e.g., x=3\*0.5=1.5ms) to the integer slot number of victim Scell?  Ericsson: Fine with the CR. To be consistent, we added Tx value in our CR. This CR provides SMTC duration to calculate interruption length, and our CR provides interruption window stop time.  Huawei:  Thanks very much for all companies providing comments.  To QC: Same as R4-2212922  To Apple: In my personal understanding CCs of intra-band CA are most likely to use same data SCS in practical. But I see your concern that specs don’t not exclude the possibility of mix numerology for intra-band CA. I think it would be better to round up to integer subframes for simplify.  I’ll revise the wording to “…is x subframes, where x is the number of consecutive subframes which contains all SSBs transmitted by the SCell being added/activated in an SSB burst”. Do you Okay with the wording?  Nokia: Change is agreeable |
| R4-2213934 (Ericsson) | Clarification on fine timing requirements for known and unknown cell in HO in FR1 |
| Apple: fine with the CR. But in section 6.1.1.2.2 of this CR, there is one redundant sentence as following, and it shall be deleted.    Nokia: It is not essential change from my POV, Is it necessary? |
| R4-2213935 (Ericsson) | SCell activation maintenance in Rel-15 |
| Apple: fine with the CR  Nokia: Change is agreeable. The problem is also in Rel-16&R17. But we found no Cat-A CR for Rel-16 & Rel-17. Suggest to have Cat-A for R16 & R17. |

### CRs for the Perf part

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| **CR/TP number** | **Comments collection** |
| R4-2211541 (Anritsu) | Draft CR to FR2 NSA CSI-RS based L1-RSRP measurement |
| Ericsson: OK  Nokia: CR is agreeable. |
| R4-2211544 (Anritsu) | Correction on the FR2 inter-frequency relative RSRP accuracy |
| Huawei: For change#1, we think the note maybe no needed to mentioned “when the pair of cells are configured by inter frequency” as the table is for inter-frequency. We suggest to remove change#1.  Ericsson: OK |
| R4-2211608 (R&S) | Draft CR to TS 38.133: Corrections to NR RRM test cases (Rel 15) |
| Anritsu: OK  Ericsson:  Since CSI-RS.3.2 TDD is not only used by these test cases (A.5.6.1.3 and A.5.6.1.4), our concern is the impact to other cases using CSI-RS.3.2 TDD.  In A.5.6.1.3 and A.5.6.1.4, following update is made: use resource #0 only from CSI-RS.3.2 TDD. It is better to define new CSI-RS RMC like CSI-RS.3.5 TDD which contains one resource and has slot offset 6.  Nokia: CR is agreeable. |
| R4-2211669 (CATT) | Correction to FR2 cell re-selection test case |
| QC: The CR cover should be revised. The usage of dBm and dB are mixed. For examole, "-83.5dB-(-140dB) = 56.5 then..." Here -83.5dB should be changed to -83.5dBm. The same issues can be found in the cover sheet. |
| Huawei: The changes are overlapping with R4-2212931. Suggest to merge the changes into 2931.  Ericsson: OK  Nokia: Could CATT clarify why 7.5dB margin should be considered in this test case? From core requirements, the margin is 6.5dB for ranking based cell re-selection. |
| R4-2211888 (Apple) | draftCR on applicabiltiy for test Cases involving E-UTRA/FR1 and FR2 carriers (R15) |
| Ericsson: Somehow, I am not able to open the document. Can we come back in second round?  Nokia: it will depend on the conclusion of issue 1-1-1. |
| R4-2212251 (ZTE) | [draft CR] R16 Maintenance for 38133 test cases |
| Ericsson: OK  Nokia: CR is agreeable. |
| R4-2212288 (CMCC) | draftCR for test configuration and requirement correction of CSI-RS based RLM OOS test in NR SA |
| Anritsu: Change mark cannot be seen at the replaced figure A.6.5.1.7.1-1.  Ericsson: Need track change for figure in A.6.5.1.7.1-1 (Same comment as Anritsu).  Nokia: CR is agreeable. |
| R4-2212522 (MTK) | Draft CR on TC for known PSCell addition in R15 |
| R&S: Releasing the Meas Gap should not make PScell unknown. In fact, Meas Gap release will avoid extra Measurement Reports, so therefore it is beneficial to do it. Thus, we see the change as unnecessary. |
| Huawei: In existing test cases, the measure reporting, gap release and PSCell addition are all within T2 which is 1.5 second long. According to the definition of known PSCell, it seems the known cases can still hold. |
| MediaTek: thanks for the comment  To R&S and Huawei:  We agree with that the MG release can avoid extra measurement report. So, we do not remove “MG release” procedure in the test.  Besides, the reason why we think the PSCell may become unknown is provided as below.  According to the following core requirement (I take NR-DC as an example)   |  | | --- | | In FR1 and FR2, the PSCell is known if it has been meeting the following conditions:  - During the last 5 seconds before the reception of the PSCell configuration command:  - the UE has sent a valid measurement report for the PSCell being configured and  - One of the SSBs measured from the PSCell being configured remains detectable according to the cell identification conditions specified in clause 9.3.  - One of the SSBs measured from PSCell being configured also remains detectable during the PSCell configuration delay Tconfig\_PSCell according to the cell identification conditions specified in clause 9.3. |   To our understanding, the SSB from PSCell should continuously remain detectable before UE receives the PSCell configuration command. However, if the MG is release too early, UE cannot measure the SSB from PSCell. In that case, the detectable condition is no longer hold.  Ericsson:  Problem may be valid in certain T2 values. After releasing MG, if NW do not send PSCell addition within certain time, PSCell may not be known. This may happen if T2 is above 5sec. However, T2 value is 1.5s, our view is that cell becomes unknown after 5s of non-tracking? From that perspective issue may not exist at all. Can MTK clarify this?  Nokia: CR is not agreeable as the reasoning for change is not clear.  It states ‘For the known PSCell addition test case, the target PSCell shall be known in the whole test. However, the measure gap may release too early so that the target PSCell becomes unknown cell’. However, the known conditions does not mention anything about gaps.  It is not clear why following ‘PSCell addition and measurement gaps release shall be sent within the same RRC message to the UE during period T2 and the point in time at which the RRC message is received at the UE antenna connector defines the start of period T3.’ change is needed?  MediaTek:  To Ericsson:  Thanks for the comment.  To our understanding, the issue here is not how long the UE can regard SSB as detectable even if UE does not track the SSB. The key point here is the UE shall be able to measure the SSB during that 1.5s in test case. If UE cannot measure the SSB from PSCell, we do not think UE can still regard the SSB as detectable during that 1.5s. If the SSB is not detectable, the known condition is not met.  To Nokia:  We agree with you that the MG is not considered in known condition. The reason why we put the MG release and PSCell addition in the same RRC message is to avoid UE cannot measure the SSB from PSCell due to no MG configuration. |
| R4-2212529 (MTK) | Draft CR on TC for typo in SCell activation in R17 |
| QC: We think "after at least one CSI-RS transmission occasion for channel measurement and reporting" needs to be added, or the first sentence of the section "During T2 the UE shall … as defined in clause 8.3" can be merged with the first sentence of the section. |
| MediaTek:  To QC:  Thanks for the comment.  In fact, this is the CR to correct the mirror error between R15/R16/R17. So, we suggest to make it aligned in all release in this meeting and further change the wording in the next meeting if needed. |
| Ericsson: OK  Nokia: Editorial change, it is agreeable. |
| R4-2212928 (Huawei) | Correction to Rel-15 FR1 test cases\_r15 |
| Huawei: We noticed that there is typo in proposed changes. The highlighted part should be “NR 30 kHz SSB SCS, ≥40 MHz bandwidth, TDD duplex mode” We provide a revised version in :  https://www.3gpp.org/ftp/tsg\_ran/WG4\_Radio/TSGR4\_104-e/Inbox/Drafts/%5B104-e%5D%5B201%5D%20Maintenance\_R15\_R16\_RRM/Documents/1%20CR%20for%20R15%20core/R4-2212928%20Correction%20to%20Rel-15%20FR1%20test%20cases\_r15\_revised.docx    QC: Is the flexibility of configuration critical for testing? Most of the functionalities can be verified with the original configurations, and this flexibility may increase RAN5’s work load on specifying signaling and configuration combinations. Could Huawei point out what are the critical test cases that we want to verify with the newly proposed configurations? |
| R&S: In our view, changes of the test configuration have following issues (example Table A.4.5.2.3.1-1):   * + 1. The current and the new defined tables are not equivalent w.r.t. duplex mode. In the current one, PSCell and SCell have same duplex mode, in the new some of config are changed to mixed (example Config 3). If we want to increase the test coverage for mixed duplex mode, we prefer to add missing configs, rather than changing current ones.     2. The NR SCell settings for Config 4-6 are not defined and missing in the new tables. |
| Huawei: Thanks very much for QC and R&S’s comments.  To QC:  Sure, I'd like to explain our motivation. In RAN4, RRM TCs are defined in an BC-agnostic manner. However, TE and UE still needs to choose the BC on which the test is evaluated (see 38.533 annex E.1.4) before performing actual testing. In practical a UE can only support limited BCs. So if a UE only supports FDD+TDD BC and RAN4 RRM TCs only defines TDD+TDD/FDD+FDD test configuration, all CA RRM TCs will be unavailable to this UE. Clearly it is unfair to this UE since RAN4 RRM TCs shall not restrict UE implementations.  Actually, same issue has already happened in LTE. Take inter-frequency reselection TCs as an example. Although inter-frequency cell reselection requirements are defined in a duplex mode-agnostic manner, RAN4 still have defined 4 TCs to cover all possible 4 duplex mode combinations. In NR we don’t define separate TCs for different duplex mode but use separate test configurations instead.    And about the impact on RAN5, after analysis we identify following changes are needed in RAN5:   * Textual changes to 38.533, which is already covered by our RAN5 CRs submitted in RAN5#96 (R5-224542- R5-224544, R5-224546- R5-224548). * TT analysis for 15K+30K test configurations in 38.903. We plans to add them in Nov. meeting.   To R&S:   1. We want to clarify that we are not changing current test configurations, but to allow SpCell and SCell choosing different test configurations (as we mentioned in the newly-added note in test configuration table). There is no harm to current test configurations.  * For example, if we want to test the original config 1 (i.e. both SpCell and SCell using FDD,15kHz SCS, 10MHz CBW), then we still can let both SpCell and SCell to use test parameters corresponding to test configuration 1. On the other hand, we can let SpCell to use parameters for config 1 and let SCell to use parameters for config 2 if we want to test an FDD+TDD case.   The main consideration of our proposal is to minimize the impact on 38.133/38.533 and to accommodate future extensibility. We agree that adding a new test configuration for mixed duplex mode is certainly a possible solution. Actually, this is actually done in UL carrier reconfiguration TC 4.5.4.1/6.5.4.1 (This is also why we did not include these two TC in R4-2212928). However, our concern is, the approach of adding new test config is not conducive to future expansion.  For example, in Rel-16 RAN4 have designed simultaneous BWP switching on multiple CCs TCs (4.5.6.3.1/6.5.6.3.1). This TCs involve three CCs in total. If we want to add a test configuration for each possible duplex mode/SCS combination we need a total of 2\*3\*3\*3 = 54 test configurations for 4.5.6.3.1 and 3\*3\*3 = 27 for 6.5.6.3.1. Furthermore, if RAN4 considers it necessary to add a new duplex mode/SCS combination in the future, the number of test configurations in all CA TCs will increase exponentially. This is too much and can have a huge impact on the readability of the test cases.  Therefore, from the perspective of future extensibility, we think that allowing each CC to independently select its own test configuration is the best way we can think of.  It is because we don’t need to define config. 4/5/6 for NR SCell. The only difference between config 1/2/3 and 4/5/6 is the duplex mode of LTE PCell. For NR SCell we only need to consider NR configurations.  Ericsson:  We can agree with the problem. Problem is: In current test cases NR SpCell and NR SCell use the same duplex mode/SCS/CBW. This means that most of CA test cases are not applicable to FDD+TDD CA BCs or 15kHz + 30kHz CA BCs. It is necessary to extend CA TC to support the SpCC and SCC using different duplex+SCS combinations. To solve this note is added that PCC and SCC can choose duplex combination independently. However, we think which test case to use config 2 may be explicitly specified.  Nokia: For the changes in A.4.5.2.5 & A.4.5.2.6 it seems already clear from the test case (EN-DC). So it is not clear why these changes are necessary. |
| R4-2212931 (Huawei) | Correction to Rel-15 FR2 test cases\_r15 |
| Ericsson: Looks fine. |

## Summary for 1st round

### Open issues

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

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

*Recommendations on WF/LS assignment*

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

### CRs/TPs

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

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

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

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

# Topic #2: Rel-16 NR RRM maintenance

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc** | **Company** | **Proposals / Observations** |
| [**R4-2212938**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212938.zip) | Huawei, HiSilicon | CR  The terminology "V2X SCH\_RP(SCH Es/Iot)" in NR SL requirements are changed to " S-SSB\_RP(S-SSB Es/Iot)". |
| [**R4-2212940**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212940.zip) | Huawei, HiSilicon | CR   1. A.9.1.2.2:    * Unit of Io is changed to dBm/18MHz (50RB) and dBm/40MHz (100 RB).    * syncTxThreshOoC is changed to -100dBm/SCS 2. A.9.1.3.1:    * Io is added to Table A.9.1.3.1.1-2, Wording of note 2 in Table A.9.1.3.1.1-2 is updated accordingly. 3. A.9.1.3.2:    * Io is added to Table A.9.1.3.2.1-2, Wording of note 2 in Table A.9.1.3.2.1-2 is updated accordingly.    * Editorial changes 4. A.9.1.4.1:    * Io is added to Table A.9.1.4.1.1-2.    * SL-RSSI is removed from Table A.9.1.4.1.1-2. Wording of note 2 in Table A.9.1.4.1.1-2 is updated accordingly. 5. A.9.1.4.2:    * Io is added to Table A.9.1.4.2.1-2. Wording of note 2 in Table A.9.1.4.2.1-2 is updated accordingly. 6. A.9.1.4.3:    * Io is added to Table A.9.1.4.3.1-2/3. Wording of note 2 in Table A.9.1.4.2.1-2/3 is updated accordingly.    * Noc, Es/Noc, SL-Thres-RSRP are updated. Derived values are updated accordingly. 7. A.9.1.5:    * Unit of Io is changed to dBm/18MHz (50RB) and dBm/40MHz (100 RB).    * PSSCH-RSRP is removed. Note is updated accordingly. |
| [**R4-2213472**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213472.zip) | Huawei, HiSilicon | CR  To modify the test requirements to allow ACK/NACK missing during V2X slidelink communication configuration. |
| [**R4-2213504**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213504.zip) | Huawei, HiSilicon | CR  Addcomponent NPCC\_CSIRS for PCC CSSF to the table for CSSF outside MG for NR SA, for FR2 inter-band CA case. |
| [**R4-2212085**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212085.zip) | MediaTek inc. | CR  Correct the measurement gap offset.   * For pattern #0 which has 40ms MGRP, the offset is revised to 39ms. * For pattern #4 which has 20ms MGRP, the offset is revised to 19ms. |
| [**R4-2212256**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212256.zip) | ZTE Corporation | CR  Specify the delay is related to “the completion of active spatial relation switch” rather than “the completion of active spatial relation”. |
| [**R4-2213467**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213467.zip) | Huawei, HiSilicon | ***Observation 1: The existing PL-RS switching delay requirements are applied when UE is not required to perform beam sweeping on the target PL-RS.***  ***Observation 2: In NR, there is no TCI state configuration for a SSB resource, which implies that there is no reference signal to provide QCL information of SSB.***  ***Observation 3: When a SSB resource indicated as PL-RS is also configured for L1-RSRP measurements, UE needs to perform beam sweeping on the SSB resource for both PL-RS measurements and L1-RSRP measurements.***  ***Proposal 1: When the target PL-RS is SSB and used for L1-RSRP measurements in FR2, either one of the following two options can be considered to define the PL-RS switching delay.***   * ***Option 1 (Preferred):***   + ***To clarify that longer PL-RS switching delay is expected, which can be captured in the note.*** * ***Option 2:***   + ***To define the PL-RS switching delay as 5\*TL1-RSRP\_SSB, where TL1-RSRP\_SSB is SSB based L1-RSRP measurement period with the assumption of M=1.*** |
| [**R4-2213468**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213468.zip) | Huawei, HiSilicon | CR   1. To clarify that longer application time is expected if in FR2 the target PL-RS is a SSB on which UE performs L1-RSRP measurements. |
| [**R4-2213470**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213470.zip) | Huawei, HiSilicon | CR  There are some issues in the L1-SINR measurement requirements and test cases, and BFD test cases.   1. The relative measurement tolerance are still within brackets in 10.1.28 2. In test configuration tables of A.5.7.6.\*, the L1-RSRP period shall be L1-SINR period 3. The Io level in A.5.7.6.2 is incorrect 4. The SSB\_RP in A.6.5.5.6 is incorrect |
| [**R4-2211668**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211668.zip) | CATT | CR  In RAN4#103-e meeting, draft CR of R4-2210975 is endorsed. The Cat-A draft CR is R4-2208163. But there is a typo of the number in Cat-A R4-2208163 of EN-DC HST FR1 L1-RSRP test case. |
| [**R4-2213041**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213041.zip) | vivo | CR   * Delete the case in which UE needs not to acquire the index of the SSB in measurement time in conditional handover requirement.   + For intra-frenquency measurement, delete Tidentify\_intra\_without\_index in measurment time in conditional handover requirement   + For inter-frenquency measurement, delete Tidentify\_inter\_without\_index in measurment time in conditional handover requirement |
| [**R4-2213043**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213043.zip) | vivo | CR   * Delete the case in which UE needs not to acquire the index of the SSB in measurement time in conditional PSCell change requirement.   + For intra-frenquency measurement, delete Tidentify\_intra\_without\_index in measurment time in conditional PSCell change requirement   + For inter-frenquency measurement, delete Tidentify\_inter\_without\_index in measurment time in conditional PSCell change requirement |
| [**R4-2212942**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212942.zip) | Huawei, HiSilicon | CR   1. CSI reporting configuration is added in DAPS HO test cases. 2. Test parameter tables are re-organized to improve readiability. 3. Test configuration 2 and 3 are removed from test parameters tables in 6.3.1.8/6.3.1.0 4. Unit of io in Table A.7.3.1.4.2-4 and A.7.3.1.5.2-4 is changed. 5. Editorial changes. |
| [**R4-2211715**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211715.zip) | CATT | CR  Clarify the starting point of PRS measurement period requirements for deferred MT-LR. |
| [**R4-2213046**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213046.zip) | vivo | CR   * Specified UE havaviour due to UE autonomous timing adjustment. * Editorial changes. |
| [**R4-2213497**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213497.zip) | Huawei, HiSilicon | **Proposal: For the event of periodic location in deferred MT-LR, requirements are defined assuming UE starts measurement after T, and update the start point of measurement period as follows.**   * **the timestarts from the first MG instance aligned with a DL PRS resource(s) in the assistance data after the associated event(s) occurs.** |
| [**R4-2213498**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213498.zip) | Huawei, HiSilicon | CR  1. Clarify the start point of PRS measurement period for deferred MT-LR with periodic locationm event. |
| [**R4-2211611**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211611.zip) | Rohde & Schwarz | CR  Change 1: In Table 10.1.23.2-1 removed square brackets and the undefined parameter (Note 7 related to voided)  Change 2: In test cases A.6.6.12, A.6.7.13.1, added SSB\_RP values and corrected several typos. |
| [**R4-2211716**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211716.zip) | CATT | CR  1. Remove the notation for group delay margin in RSTD and UE Rx-Tx time difference measurement accuracy requirements.  2. Separate the simulation accuracy and group delay margin  3. Remove the brackets. |
| [**R4-2211717**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211717.zip) | CATT | CR   1. Add EPREs of other channels (PSS/SSS/PBCH/PDCCH/PUSCH) which are the same as PRS symbols. 2. Correct the PRS power configurations and Io for some test cases. 3. Change PRS-RSRP to PRP to align the notation with section B.2.14. 4. For some FR2 test cases, change the OCNG pattern to align with the AOA setup and allocate the resources to the whole bandwidth. 5. Other corrections. |
| [**R4-2212195**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212195.zip) | Qualcomm Incorporated | CR  Correct the UE Rx-Tx group delay calibration margins. |
| [**R4-2213500**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213500.zip) | Huawei, HiSilicon | CR  1. Separate the group calibration margin from the BB estimation error, and capture them in separate tables.  2. Remove [] in the RSTD accuracy requirements. |
| [**R4-2213932**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213932.zip) | vivo | CR  • Removed unncessary core requirements.  • Revised accuracy requirements. |
| [**R4-2211932**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211932.zip) | CMCC | CR  The following text in 9.3.9.1 is removed.   |  | | --- | | MSSB\_index\_inter: For a UE supporting power class 1 or 5, MSSB\_index\_inter = 40 samples. For a vehicle mounted UE supporting power class 2, Mpss/sss\_sync\_inter = 24 samples. For a UE supporting power class 3, MSSB\_index\_inter = 24 samples. For a UE supporting power class 4, Mmeas\_period\_inter = 24 samples. | |
| [**R4-2213502**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213502.zip) | Huawei, HiSilicon | CR   1. Remove the following applicability condition for requirements for inter-frequency measurement without gap:   *the timing of SSBs across serving cell and inter-frequency neighbor cells are aligned* |
| [**R4-2213879**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2213879.zip) | ZTE Corporation | CR  Correct the which was wrongly written into . |
| [**R4-2212162**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212162.zip) | Qualcomm Ltd. | CR  Correct startPosition in A.3.24 from 0 to 5 for 15kHz SCS configuration. Change periodicityAndOffset-p to align with special slots. |
| [**R4-2211839**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211839.zip) | Apple | CR  Add inter-RAT NR RSSI/CO measurement without MG for the case when RSSI measurement bandwidth is fully within the active DL BWP of UE’s NR serving CC. The intra-frequency NR RSSI/CO measurement requirement from TS38.133 section 9.2A.7.1/2 can be reused. |
| [**R4-2212944**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212944.zip) | Huawei, HiSilicon | CR  According to the discussion in Rel-15 maintenance on SCell activation, the threshold to differentiate cases for known SCell activation is modified from measurement cycle to measurement period. The corresponding part shall be updated for NR-U accordingly. |
| [**R4-2212396**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212396.zip) | MediaTek inc. | CR  For the cases that FR1 PCell without CCA is in FDD, update the time offset between Scells (Cell 2 and Cell 3) with CCA in TDD band to be 3 ms. |
| [**R4-2212525**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212525.zip) | MediaTek Inc. | CR  Instruction to release measurement gap is included in the RRC message to add PSCell. |
| [**R4-2212946**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212946.zip) | Huawei, HiSilicon | CR  Change the measurement cycle in test case for SCell activation in NR-U from 320 ms to 640 ms. |
| [**R4-2211601**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2211601.zip) | Qualcomm, Inc. | CR  Correct Es/Iot to follow Es/Noc according to the syncOffsetIndicators configuration of SyncRef UE 1 and SyncRef UE 2. |
| [**R4-2212934**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212934.zip) | Huawei, HiSilicon | CR   1. Notes is added to test configuration tables of CA test cases to indicate that PCC/SCC can choose its test configuration independently. 2. The term “Tevaluate, NR” in TC 8.2.1.2 test prequirements is changed to “Tevaluate, NR\_HST” |
| [**R4-2212936**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_104-e/Docs/R4-2212936.zip) | Huawei, HiSilicon | CR   1. A.7.1.1.3 & A.7.1.1.4    1. Editorial changes.    2. BW and allocated RB configurations are added in test parameter tables    3. Es/Iot is changed to Es/Iot at BB.    4. Note 5 is added.    5. Io given in Table A.7.1.1.3.2-3/A.7.1.1.4.2-3 are corrected. 2. A.7.1.1.5 & A.7.1.1.6    1. Editorial changes.    2. BW and allocated RB configurations are added in test parameter tables    3. Es/Iot is changed to Es/Iot at BB.    4. Note 5 is added    5. Io given in Table A.7.1.1.3.2-3/A.7.1.1.4.2-3 are corrected.    6. Brackets in test parameter tables are removed. |
| **R4-2211587** | STMicroelectronics | CR  The default configuration parameters for test 1 have been updated such that the SRS periodicity becomes 10msec. |

## Open issues summary

Note: Only issues proposed in discussion papers are listed in this section. For other issues proposed via CR, please provide comments to the CR directly in section 2.3.1 and 2.3.2.

### Sub-topic 2-1: eMIMO

#### Issue 2-1-1: FR2 PL-RS switching delay when the target PL-RS is SSB and used for L1-RSRP measurements

* Proposals
  + Option 1 (HW)
    - To clarify that longer PL-RS switching delay is expected, which can be captured in the note.
  + Option 2 (HW)
    - To define the PL-RS switching delay as 5\*TL1-RSRP\_SSB, where TL1-RSRP\_SSB is SSB based L1-RSRP measurement period with the assumption of M=1.
* Recommended WF
  + Discuss the options

|  |  |
| --- | --- |
| **Company** | **Comments** |
| vivo | Do not see the need for option 1 and option 2.  When SSB is used for time-frequency sync in the DL TCI switching, and the same SSB (i.e. with the same SSB index) is configured for L1 RSRP measurement, we are not sure whether scaling factor is also needed in DL TCI switching? May proponent clarify? |
| Apple | We agree with the necessity for this update. We are fine with either adding a Note or capturing the delay to account for Rx beam refinement time for SSB based measurement. Slight preference to update the note. |
| Ericsson | Issue 2-1-1: FR2 PL-RS switching delay when the target PL-RS is SSB and used for L1-RSRP measurements Ericsson: We do not agree. The same is being discussed in Rel-17. We suggest applying the conclusion of the Rel-17 discussion here also. |
| Huawei | We prefer option 1, but option is also fine to us. Due to no TCI state configuration for SSB, UE needs to perform beam sweeping on SSB for obtaining best Rx beam information for SSB based measurements in FR2, including L1-RSRP measurements and PL-RS measurements. However, the existing PL-RS switch delay does not allow beam sweeping on SSB for PL-RS measurements. Hence, it needs to be clarified that longer delay ie needed. |
| Nokia | We have same comment as in last meeting and this issue is discussed also in feMIMO. We believe the eMIMO and feMIMO discussion is a package discussion that need to be handled together.  Hence, we don’t see much gain in trying to agree Rel-16 issue without accounting the Rel-17 discussion. |
| MediaTek | Same view as Ericsson and vivo. |

### Sub-topic 2-2: Positioning

#### Issue 2-2-1: Start of measurement period for deferred MT-LR

* Proposals
  + Option 1 (HW)
    - For the event of periodic location in deferred MT-LR, update the start point of measurement period as:
      * the timestarts from the first MG instance aligned with a DL PRS resource(s) in the assistance data after the associated event(s) occurs.
* Recommended WF
  + Check if option 1 is agreeable

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| **Company** | **Comments** |
| CATT (Qiuge) | Fine with option 1. |
| Qualcomm | We support the compromise that was discussed in RAN4#103-e:  For deferred MT-LR with “Periodic Location” as defined in clause 4.1a.5.1 [TS 23.273], the UE shall finish the measurements by time where is the time when “Periodic Location” event occurs. The requirements apply when the time T is known by the UE no later than , where .  From 23.273 4.1a.5:  Periodic Location: An event where a defined periodic timer expires in the UE and activates a location report. If a periodic event is detected by the UE but an event report cannot be sent (e.g. because the UE cannot access the network temporarily), a report shall be sent later when possible and the periodic timer for the next event shall then be started. The reporting duration for periodic location shall equal the requested number of reports multiplied by the periodic interval even when reports are delayed.  Periodic deferred MT-LR is similar to LPP periodic reporting from feature point of view. For periodic LPP reporting, there exists requirements and test cases for GNSS (e.g., 36.171, 38.171). In these test cases (37.571-1), the UE is expected to report the GNSS measurements when the periodic timer expires, and not start measurements when the periodic timer expires.  This is supported by LPP *CommonIEsProvideLocationInformation*:   |  | | --- | | ***locationError***  This field shall be included if and only if a location estimate and measurements are not included in the LPP PDU. The field includes information concerning the reason for the lack of location information. The *LocationFailureCause* '*periodicLocationMeasurementsNotAvailable*' shall be used by the target device if periodic location reporting was requested, but no measurements or location estimate are available when *the reportingInterval* expired. | |
| vivo | We think it is not necessary to specify starting point or ending point for periodic location report. As long as UE finishes the measurements during the periodic interval, UE can report the measurements periodically. |
| Ericsson | OK. |
| Huawei | Our preference is option 1.  One reason is that the requirements will be aligned as other events, so both the spec and UE implementation can be simplified. Another reason is that if we follow the suggestion from QC or vivo above, the exact time when UE would complete the measurement is ambiguous, e.g. UE may complete the measurement long time before T, while with option 1 the UE requirements would be clear. It is also noted that RAN4 measurement period requirements are only minimum requirements, and UE is allowed to complete the measurement faster than the required measurement period, so option 1 does not prevent UE to start measurement before T. |
| Nokia | We support option 1. |

## Comments to the CRs

Cat-A draftCRs are not listed for comments.

### CRs for V2X

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| **CR/TP number** | **Comments collection** |
| R4-2212938 (Huawei) | Correction to NR sidelink core requirements\_r16 |
| vivo: Change is fine.  Ericsson: OK |
| R4-2212940 (Huawei) | Correction to NR sidelink test cases\_r16 |
| QC:  1. For syncTxThreshOoC change, the margin to PSBCH in T2 is too small to accommodate the accuracy margin of 4.5dB. To change syncTxThreshOoC, corresponding PSBCH changes are needed  2. Io changes for S-SSB reception cases: based on the derivation of SL Tx timing error, the S-SSB reception BW is 20RB or entire BW? Could Huawei clarify why entire BW is neede to receive s-SSB?  3. For A.9.1.4.3 change, we suggest to only increase high RSRP to -77.5dBm, which provides additional 3.5dB margin for Io between -50dBm to -70dBm case. The rest configurations can be kept the same, as all those active UEs are within -70dBm Io limitation  Ericsson: OK  Huawei:  To QC,  Thanks very much for the comments.  1. Yes, we fully agree that S-SSB power level in T2 should be changed accordingly to leave enough margin. However, maybe we don’t need to do it in RAN4 specs. Actually, in this meeting we have also submitted TT analysis for TC 9.1.2.2 in RAN5. In TT analysis we have already lowered Noc level by 4.55dB in T2. This gives a total margin of 4.5-3+4.55 = 6.05dB >PSBCH-RSRP accuracy (4.5dB). You can check R5-224525 and R5-224510 for more details. So, this issue is already solved in RAN5. We can keep PSBCH-RSRP level unchanged in 38.133.  2. According to 38.214, UE can only perform SL transmission/reception in resource pool while the slots used for S-SSB transmission are excluded from resource pool.    As a result, the Io in SSB slots are fully contributed by S-SSB EPRE and artificial noise EPRE. So the Io is calculated on the 11 RBs occupied by S-SSB.  In my personal opinion, it doesn't make a fundamental difference whether the Io unit is dBm/Ch BW (specifically, dBm/18 MHz for 20MHz CBW or dBm/36MHz for 40MHz CBW) or dBm/S-SSB BW. As mentioned above, there is no SL signals/channels other than S-SSB transmitted on the S-SSB slots. Therefore, the IO calculated on the Ch BW is exactly the same as the Io calculated on the S-SSB BW. Considering dBm/Ch BW is the unit commonly used in RRM TCs. I would recommend sticking with dBm/Ch BW for consistency  3. Yes, I agree letting low/mid/high RSRP SL UEs fall in different Io ranges is a good idea. Thanks very much for the reminding. Then I’m fine with only increasing high RSRP by 3.5dB. Then I’ll undo all changes to 9.1.4.3 in revision except:  - raising high RSRP by 3.5dB;  - adding Io according to original value of low/mid RSRP, Noc and modified high RSRP. |
| R4-2213472 (Huawei) | DraftCR on maintaining interruption test cases for NR V2X R16 |
| QC: The RRC configuration is done in T2, why we still have interruption in T3?  Ericsson: OK  Huawei: The interruption requirements will be verified during T3.  “*The test system will count the missed ACK/NACKs during T3 to verify the allowed interruptions during V2X sidelink communication*”  QC: To Huawei: thank you for the clarification, this address our comment and we can support the CR. |

### CRs for L3 CSI-RS

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| **CR/TP number** | **Comments collection** |
| R4-2213504 (Huawei) | CR on CSI-RS measurement requirements R16 |
| Ericsson: ok  Nokia: CR is agreeable. Same is used in EN-DC. |
| R4-2212085 (MTK) | CR on TS38.133 for TC of CSI-RS inter-freq measurement R16 |
| QC: CSI-RS has period of 20ms and offset 10ms, the current gap offset of 9ms should be able to cover it, why we need this change?  QC: Have an offline discussion with MTK, the concern is resolved and we can support this CR.  Ericsson: ok  Nokia: The intention is fine to ensure RS within gaps. But the proposed gapoffset = 39ms which is the last slot before SFN boundary, while the SSB is the first slot after SFN boundary. It does not solve the issue? |

### CRs for eMIMO

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| **CR/TP number** | **Comments collection** |
| R4-2212256 (ZTE) | [draft CR] R16 Maintenance for 38133 Core |
| Ericsson: OK  Huawei: OK with this CR.  Nokia: CR is agreeable |
| R4-2213468 (Huawei) | DraftCR on maintaining PL-RS switching delay requirements R16 |
| Ericsson: CR to capture their proposal in R4-2213467. It depends on the conclusion.  Nokia: CR is not agreeable.  We believe this CR is related to the discussion paper R4-2213467. Hence, there is a need to agree on combined Rel-16 and Rel-17 discussion related to PL-RS before any CR can be agreed. |
| R4-2213470 (Huawei) | DraftCR on correction of eMIMO test cases R16 |
| Ericsson: In tables A.5.7.6.2.2-2 and A.5.7.6.2.2-3, Io for SSB#2 and CSI-RS#2 is changed due to RSRP=-91dBm/SCS and Noc=-91dBm/SCS (SCS=120kHz)?  If so, the correction is fine.  Huawei:  to Ericsson: yes, that is the correct understanding.  Nokia: CR is agreeable. |

### CRs for HST

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| **CR/TP number** | **Comments collection** |
| R4-2211668 (CATT) | Draft CR on HST FR1 L1-RSRP test case |
| Apple: fine with the CR  Ericsson: OK  Nokia: CR is agreeable. |

### CRs for eMobility

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| **CR/TP number** | **Comments collection** |
| R4-2213041 (vivo) | Draft CR to TS 38.133 Correction to conditional handover requirements(Rel-16) |
| MTK: We understand the intention. But for FR2, there is no Tidentify\_intra\_with\_index. And for inter-frequency, what if SBI reading is not configured?  To MTK:  For Q1:  We agree with this observation. And we will reflect the following changes in the revised version:  *For intra-frequency handover, the measurement time delay measured without Time To Trigger (TTT) and L3 filtering shall be less than Tidentify intra with index* ***(for FR1 FDD)*** *or Tidentify\_intra\_without\_index* ***(for FR1 TDD and FR2)*** *defined in clause 9.2.5.1 or clause 9.2.6.2.*  For Q2:  When the conditional measurement event of CPA is triggered, the conditional PSCell addition would be directly initiated. UE is not required to report SSB based RRM measurement result related to MO for CPA. In other word, even when SBI reading is configured, it will not be reported to NW. Therefore, no matter SBI reading is configured or not, there is no impact for CPA.  Ericsson: Does this mean known cell condition is not supported in conditional HO and UE always have to perform cell search even if the cell is known to UE. UE may be configured with target CHO cell based on some previous measurement report from UE to NW. We do not think this case can be excluded and therefore we do not agree with the CR yet.  We see this as like this, if UE need to perform SSB detection, UE do not have to anyway meet the without detection requirements.  Huawei: CHO command only will indicate the list of candidate cells for PCell. UE usually will reuse the existing L3 RRM measurements results for CHO. L3 RRM measurements are based MO configuration and can be indicated either with or without SSB index detection. So, we see no need to remove the case for “without SSB index detection”.  Nokia: Question for clarification: Can the network configuration include whether Index reading is used or not? |
| R4-2213043 (vivo) | Draft CR to TS 38.133 Correction to conditional PSCell change requirements(Rel-16) |
| MTK: same view as for R4-2213041  To MTK: same comment as the above.  Ericsson: Similar comment as above (R4-2213041).  Huawei: same comments as R4-2213041.  Nokia: same comments as R4-2213041  Question for clarification: Can the network configuration include whether Index reading is used or not? |
| R4-2212942 (Huawei) | Correction to DAPS HO test cases\_r16 |
| QC: Is it necessary to remove TDD test configs from the intra-freq asynchronous DAPS HO test? Cell phase sync requirement of 3us is at the BS antenna, while the difference between sync vs. async DAPS HO is based on MRTD. Is it an issue for TE to have different cell sync and MRTD in the test case? If we need to remove those configs from the intra-freq asynchronous DAPS HO test maybe they could be added to the intra-band inter-freq asynchronous DAPS HO test?  § |
| Ericsson:  Ericsson:  The CR contains 5 changes:  1. CSI reporting configuration is added in DAPS HO test cases.  2. Test parameter tables are re-organized to improve readiability.  3. Test configuration 2 and 3 are removed from test parameters tables in 6.3.1.8/6.3.1.0  4. In 6.3.1.10 config 2 and 3 are referred to in test parameter table..  5. Unit of io in Table A.7.3.1.4.2-4 and A.7.3.1.5.2-4 is changed.  Changes 1, 2 and 5 ar OK. We have comments regarding changes 3 and 4.  The requested change is for DAPS FR1 and intra frequency (with TDD).  For intra frequency and TDD it is correct that cell phase sync is 3 µs.  From 38.133, see extract below marked in yellow i.e. IF it meets the MRTD of 6 µs (TAE+Delta RF prop < 6 µs) then it is synchronous otherwise it is asynchronous.  If one assumes MRTD of 6 µs is always met then it will always be synchronous and no asynchronous would exist BUT this then means the delta RF prop ALWAYS needs to be less than 3us i.e. ~900m and this cannot always be “assumed” and it would be a prerequisite and restriction for intra frequency DAPS to work for TDD (in general there has been a wish to allow flexibility wrt delta RF propagation) and cannot see any such restriction mentioned in 38.133. So it is not correct to say that “…there does not exist any async DAPS HO case for TDD” (intra frequency). RF propagation is part of MRTD.  === TS 38.133 === 6.1.3.2 NR FR1 - NR FR1 DAPS Handover The requirements in this clause are applicable to both intra-frequency and inter-frequency handovers from NR FR1 cell to NR FR1 cell. A DAPS handover is intra-frequency if the centre frequency of the SSB of the source cell and the centre frequency of the SSB of the target cell are the same, and the subcarrier spacing of the two SSBs are also the same.  Note: For intra-frequency DAPS handover, no requirement applies if active DL and UL BWP of target cell is not confined within the active DL and UL BWP of the source cell respectively.  Note: For inter-frequency DAPS handover, no requirement applies if the BWP of target cell is overlaped with the BWP of source cell in frequency domain.  An FR1 DAPS handover is synchronous if it meets the conditions in table 6.1.3.2-1, otherwise it is asynchronous  Table 6.1.3.2-1: Sync conditions for FR1 DAPS handover   |  |  |  | | --- | --- | --- | | Type of handover | Maximum receive timing difference between source and target cell (µs) for sync DAPS handover | Maximum transmit timing difference between source and target cell (µs) for sync DAPS handover | | Intra-frequencyNote 1,2,3 | 6µs | 7.6 µs | | Intra-band inter-frequency Note 1,2,3 | 6µs | 7.6 µs | | Inter-band inter-frequency | 33 µs | 34.6 µs | | Note 1: For synchonous DAPS handover, 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. For asynchronous DAPS handover, if the receive time difference exceeds the cyclic prefix length of that SCS, interruptions may occur depending on UE implementation. The duration and frequency of occurrence of such interruptions is not specified.  Note 2: For DAPS handover on a TDD band, after starting RACH procedure, a UE is not required to transmit in the uplink to any of source and target cells earlier than NRX-TX after the end of the last received downlink symbol from any of source and target cells in the same TDD band where NRX-TX=25600Tc.  Note 3: For DAPS handover on a TDD band, after starting RACH procedure, a UE is not required to receive in the downlink from any of source and target cells earlier than NTX-RX after the end of the last transmitted uplink symbol to any of source and target cells in the same TDD band where NTX-RX=25600Tc. | | |   === ===  Huawei:  To QC,  Thanks very much for the comments. From the aspect of conductive test, TE and DUT are directly connected by cables and the timing difference caused by transmission via cables is negligible. As a result there is no such a cases that TE has different cell sync and MRTD.  Furthermore, after checking we’ve found that RAN4 had discussed this issue before and had agreed to remove TDD async DAPS TCs in RAN4#96e (R4-2012270). |

### CRs for POS

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| **CR/TP number** | **Comments collection** |
| R4-2211715 (CATT) | Draft CR on R16 NR positioning measurement period requirements |
| QC: Depends on the outcome of issue 2-2-1.  Ericsson: OK  Nokia: In our view, the additional clarification “for periodic or triggered location events” is not needed, as the text in 38.133 already refers to clause 4.1a.5.1 [TS 23.273]. The concurrent CR from Huawei in R4-2213498 is preferred. |
| R4-2213046 (vivo) | Draft CR to 38.133 correction to NR positioning measurement requirements |
| CATT (Qiuge): The first change seems not needed since it is duplicated with the previous sentence that “The UE Rx-Tx time difference measurement accuracy for all measured DL PRS resourcesshall be fulfilled according to the accuracy requirements specified in clause 10.1.25.”  QC: The change seems to be according to previous agreement, but UL timing will likely change as a result of serving cell change and there may be a delay caused by the serving cell change. In other scenarios where UL timing changes due to external factors (not UE autonomous) RAN4 agreed to restart measurements. Shouldn’t that be the case here too? At the very least we should add “The measurement period can be longer.”  vivo: To CATT, it would be depending on how the accuracy requirements are interpreted. In Clause 10.1.25, accuracy shall not apply under certain conditions. The change is focusing on the cases when accuracy doesn’t apply.  To QC: I think the comment is about the second change. This change is core part requirements and was captured in the performance requirements. So, it is moved from clause 10.1.25 to core part. Since UE continues the measurements, the measurement period is not changed.  Ericsson: First change is not OK: Note: The UE is not required to report UE Rx-Tx time difference measurement results when the measurement accuracy requirements in clause 10.1.25 do not apply. No need to forbid the UE from reporting.  The 2nd change is OK. Agree with vivo that this has been in accuracy part and moved to the core part which makes sense. This is related to other vivo CR in R4-2213932 on performance part, which has been updated.  Nokia: We have concerns with the first change in 9.9.4.4, as this UE behaviour to drop measurements for reporting has not been specified neither for RSTD nor PRS-RSRP. The second change in 9.9.4.5 is fine. |
| R4-2213498 (Huawei) | CR on PRS meausurement period R16 |
| CATT (Qiuge): overlapped with R4-2211715  QC: Depends on the outcome of issue 2-2-1.  vivo: Depending on issue 2-2-1.  Ericsson: In principle same as in CATT CR in 1715. They don't add event or periodic like CATT did, meaning it applies to both.  Nokia: The CR is agreeable. |
| R4-2211611 (R&S) | Draft CR to TS 38.133: Corrections to NR RSTD requirements and test cases (Rel 16) |
| QC:   * Change 1 should be merged with Huawei’s R4-2213500 and with CATT’s R4-2211716. However, the margin Δ=TBD cannot be voided without agreement in RAN4. Given the current agreements, Δ= 0 for single PFL and Δ=TBD for dual PFL. * Change 2:   a. Some changes overlap with R4-2211717.  b. In Table A.6.6.12.1.1-2, PRS.1.2 FR for test config 2 may not be a typo. We believe the intention was to test a different PRS reference configuration.  c. Why is this change needed? Cell 2: 03  d. In Table A.6.6.12.1.1-4 there is the following note: Note 1: OCNG shall be used such that active cells (all, except Cell 3 in T3) are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols other than those in the subframes with transmitted PRS.  - The note was copied verbatim from LTE test cases. For NR, it should say “slots” instead of “subframes.”  - It should be confirmed and clarified that Io values in the table are for symbols where PRS is transmitted (without OCNG).  - Tabulated Io values may need to be revised.  e. Note1 above should also apply to test A.6.7.13.1.2.  Ericsson: In principle CR is OK but is related to CRs on margins from CATT/QC/HW in 11716, 12195 and 13500. So we should wait until the margins in accuracy are settled for RSTD/UE Rx-Tx.  Huawei: on Change #1 we have same comment as QC that Δ=TBD should not be removed. It is for calibration error between two PFLs and that has not been discussed in RAN4 yet.  Nokia: We do not agree with the changes. The CR should take into account latest inputs on margin definition and test parameter updates contributed by other vendors. |
| R4-2211716 (CATT) | Draft CR on R16 NR positioning measurement accuracy requirements |
| Anritsu: Overlap with R4-2212195  QC:   * Change1 should be merged with Huawei’s R4-2213500 and with R&S’s R4-2211611. * Change 2: OK * Change 3: Prefer CR R4-2212195.   R&S:  Conflicting with R4-2211611 for Table 10.1.23.2-1. However, the main scope of R4-2211611 was to finalize the RSTD accuracy requirements. We are open to accept also values proposed in R4-2211716.  Ericsson: The approach is not correct for UE Rx-Tx since margin depends on MIN BWs of PRS and SRS. There is an overlapping CR from Qualcomm in 12195 which uses a more correct approach that we prefer. However, we prefer HW’s CR on RSTD in 13500 is better, but the delta needs to be removed there if that CR is agreed. Furthermore, there is no point to state that margin is due to BB and group calibration which are implementation issues.  Huawei:  We prefer to have separate tables for calibration error as in R4-2213500 and R4-2212195 so that it can be more easily updated to other values when we have enhanced requirements with TEG in Rel-17.  Nokia: We prefer the approach taken by other vendors to have separate tables for margins. |
| R4-2211717 (CATT) | Draft CR on R16 NR positioning test cases |
| QC:   * Change 1:   a. Some changes overlap with R4-2211611.  b. See comments about OCNG and Io under R4-2211611.  c. Why change PRS Es/Iot in Table A.6.6.13.1.1-3?  d. Why delete SS-RSRP in Table A.6.6.13.1.1-3 and Table A.6.6.13.2.1-3?  e. Add SS-RSRP in Table A.6.6.14.1.1-3 and Table A.6.6.14.2.1-3   * Change 2:   a. Same comments about OCNG and Io under R4-2211611 should apply to measurement accuracy tests.  b. Why is .PRS Es/Noc changed in Table A.6.7.13.1.1-2 ?  c. Fix PRS Es/Iot in Table A.6.7.14.1.2-2 and Table A.6.7.15.1.2-2.  d. Measurement gap config is missing in RSTD tests   * Change 3:   a. Fix PRS Es/Noc in Table A.7.6.9.1.1-4  b. Fix Io in Table A.7.6.9.2.1-3. It should be the same value.  c. Fix PRS Es/Noc in Table A.7.6.9.21.1-4   * Change 4:   a. Same comments about OCNG and Io under R4-2211611 should apply to measurement accuracy tests.  b. Why change PRS Es/Noc in Table A.7.7.10.1.1-3?  c. Fix PRS Es/Iot in Table A.7.7.11.1.2-3 and Table A.7.7.12.1.2-1.  R&S:  Conflicting with R4-2211611 for power configurations, example in Table A.6.6.12.1.1-4. In R4-2211611, we propose SSB power to be better than PRS power, in order to have better connection stability, but in R4-2211717, both SSB and PRS are at same level.  Ericsson: The approach is not correct for UE Rx-Tx since margin depends on MIN BWs of PRS and SRS. There is an overlapping CR from Qualcomm in 12195 which uses a more correct approach that we prefer. Furthermore, there is no point to state that margin is due to BB and group calibration which are implementation issue. |
| R4-2212195 (Qualcomm) | DraftCR - Correction of margins for UE Rx-Tx accuracy requirements |
| Anritsu: Overlap with R4-2211716.  CATT (Qiuge): 1) We have another approach as shown R4-2211716. In this paper, the unit of PRS bandwidth for simulation accuracy (defined as number of PRBs in Table 10.1.25.2-1) and for margin (defined as MHz in Table 10.1.25.2-5) are different which may cause confusion.  Ericsson: OK  Nokia: The *Editor’s note: In accuracy tables δ is margin and is FFS* can be removed. |
| R4-2213500 (Huawei) | CR on accuracy requirements for positioning measurement R16 |
| CATT (Qiuge): 1) Same comments as for R4-2212195 that the unit for PRS bandwidth for X and Z are different.  2) Δ in Table 10.1.23.2-1 to 10.1.23.2-4 should be removed.  QC:   * Agree with this CR in the way it captures the accuracy requirements, with a separate table for GD margin. * Question: Tables 10.1.23.2-5 and 10.1.23.2-6 apply to single PFL only, correct?   R&S:  Requirements shall be finalized, i.e. square brackets and Δ, otherwise RAN5 cannot complete the TCs. With this regard, conflicting with R4-2211611.  Ericsson: Ok except the delta needs to be removed since we have accuracy as X+Y+Z  Huawei:  To CATT, agree that it is better to align the unit of the BB error and the calibration error.  To CATT, R&S and Ericsson: on Δ in Table 10.1.23.2-1 to 10.1.23.2-4, as commented for R4-2211611, it is for calibration error between two PFLs, and RAN4 should discuss the exact values instead of simply removing it.  To QC: yes, Tables 10.1.23.2-5 and 10.1.23.2-6 apply to single PFL only, and we have Δ for dual PFL. We are open if you see any further clarification is needed.  Nokia: CR is agreeable. |
| R4-2213932 (vivo) | Draft CR to TS 38.133: Correction to NR UE Rx-Tx time difference measurement accuracy requirements |
| Ericsson: This update is OK but this CR should only be agreed if corresponding core part in 13046 (2nd change) is agreed.  Nokia: CR is agreeable. |

### CRs for RRM Enhancement

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| **CR/TP number** | **Comments collection** |
| R4-2211932 (CMCC) | draftCR on inter-frequency measurement without MG |
| QC: conflict with 3502  vivo: Tidentify\_inter\_without\_index would apply for the TDD cases. However, there should be other cases, e.g., FDD, SSB index detection is needed. Thus, the requirements for SSB index detection should not be removed.  Apple: may merge with 3502. MSSB\_index\_inter is only used for FR2 carrier, so it must be TDD case, we agree to remove it.  Ericsson: OK.  Nokia: In general, fine with the reason for change but this reasoning is applicable only for FR2? For FR1 isn’t there still a need for Index reading?  Also suggest to correct the editorial at the same time.  CMCC:  To vivo and Nokia: this change is only for FR2 (only TDD case). For FR1, considering FDD case, there is need for index reading, which is already specified in Table 9.3.9.1-3 |
| R4-2213502 (Huawei) | CR on inter-frequency measurement without MG R16 |
| QC: conflict with 1932  Apple: may merge with 1932  Ericsson: OK  Huawei:  To QC and Apple, after further checking, it seems 1932 and 3502 are not overlapping with each other.  Nokia: In general, fine with less restrictions but would this then mean UE need to read the Index or do we expect that the UE can still deduce the Index from the serving cell (on another carrier)?  Huawei:  To Nokia, we understand the remaining condition “SFN and frame boundary across serving cell and inter-frequency neighbour cells is aligned” is sufficient for UE to deduce SBI of neighbor cell on an inter-frequency carrier. It is also noted that based on the current spec the condition “SFN and frame boundary across serving cell and inter-frequency neighbour cells is aligned” is only applicable for TDD, so for FDD we still need the SBI reading time as specified in Table 9.3.9.1-3 (for FR1). |
| R4-2213879 (ZTE) | Draft CR on Link Recovery Procedures for TS38.133 R16 |
| Apple: fine with the CR  Ericsson: OK  Nokia: CR is agreeable.  MediaTek: Disagree with CR.  According to TS 38.213, the BFD-RS may not be configured. The BFD-RS can be determined by implicit manner to perform beam failure detection.  Clause 6 in TS 38.213   |  | | --- | | If the UE is not provided by *failureDetectionResourcesToAddModList* for a BWP of the serving cell, the UE determines the set to include periodic CSI-RS resource configuration indexes with same values as the RS indexes in the RS sets indicated by *TCI-State* or *DLorJointTCIState* for respective CORESETs that the UE uses for monitoring PDCCH. |   Besides, according to RAN4 #94b WF (R4-2005335), we have following agreement:   |  | | --- | | **Topic #2: SCell Beam Failure Recovery**  Issue 2-1-3: UE behaviour with no CBD-RS configured  Agreement: UE is not required to perform BFD and CBD for a SCell which is not configured with CBD-RS resources. |   That’s why we have the following sentence in TS 38.133  “UE is not required to perform beam failure detection on a SCell on which  is not configured.” |
| R4-2212162 (Qualcomm) | CR: SRS carrier switching configuration correction |
| Fine with the CR but still need to align with the discussion on thread #208.  Ericsson: OK  Nokia: The change is fine. But the CR is not based on the latest 38.133 v16.12.0, some part has already agreed in last meeting and captured in the latest R16 version. |

### CRs for NR-U

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| **CR/TP number** | **Comments collection** |
| R4-2211839 (Apple) | Draft CR on inter-RAT NR-U RSSI and CO measurement without MG in TS36.133 R16 |
| QC: In our understanding, inter-RAT measurements refer to the case when a UE on one active carrier has to perform measurements on another inter-RAT carrier. However, in this case, the NR carrier is active, so does this scenario even qualify as inter-RAT scenario? |
| MTK: In our understanding, the inter-RAT measurement should be with gap. Thus the inter-RAT without MG doesn’t not exist in the previous discussion. |
| Apple: thanks QC and MTK for the comments.  To QC: In EN-DC, if LTE PCell configure NR-U RSSI MO on a NR frequency-layer, it’s defined as inter-RAT measurement, however, this inter-RAT carrier could be a NR serving carrier in SCG. An existing example can be found in section 8.17.4 of TS36.133 for inter-RAT NR cell measurement in EN-DC mode:  Text  Description automatically generated  To MTK: the existing cell measurement, e.g., in section 8.17.4 of TS36.133, has already reflected such measurement like an intra-frequency measurement (if SSB is inside active BWP then no MG is needed), as shown in the above screen shot.  Ericsson: OK  Nokia: In principle, we agree to include the requirements for inter-frequency RSSI measurements without gaps and the technical part seems OK. However, the style needs checking (font size is wrong), and there are typos: iner-RAT -> inter-RAT. Minor revisions are needed. |
| R4-2212944 (Huawei) | Draft CR on maintenance on SCell activation in NR-U Rel-16 |
| Ericsson: OK  Nokia: We need to evaluate if this change can be directly applicable to NR-U or not, since in NR-U the number of LBT failures modify the measurement period of the SCell. Discussion is needed to evaluate whether we should add or not the CCA failures to the 2400 ms value |
| R4-2212396 (MTK) | CR on TS38.133 NR-U test cases for time offset between cells with CCA in TDD bands |
| Moderator: Title in the Tdoc list is wrong  Ericsson: There seems to be a typo in this CR, it should be 3us. If that is the case, then CR is acceptable.  Nokia: We do not agree with this change. In NR-U, deriveSSBindex-FromCell is optional. So the cells can be sync or async. There is no reason to change the test configuration. |
| R4-2212525 (MTK) | Draft CR on TC for known PSCell addition for CCA in R16 |
| MediaTek: agree with the CR. Please refer to our comment for R4-2212522. Thanks  Ericsson: We have question for clarification before it can be agreed. T2 value here is function of CCA. Does it have chance to become unknown within T2?  Nokia: share the same comments as R4-2212522 in R15 perf. Copied comments in R4-2212522 as below:  Not agreeable as the reasoning for change is not clear.  It states ‘For the known PSCell addition test case, the target PSCell shall be known in the whole test. However, the measure gap may release too early so that the target PSCell becomes unknown cell’. However, the known conditions does not mention anything about gaps.  It is not clear why following ‘PSCell addition and measurement gaps release shall be sent within the same RRC message to the UE during period T2 and the point in time at which the RRC message is received at the UE antenna connector defines the start of period T3.’ change is needed? |
| R4-2212946 (Huawei) | Draft CR on test cases of SCell activation in NR-U Rel-16 |
| Ericsson: OK.  Nokia: The intention is fine. However it will depend on the conclusion of R4-2212944 for core part requirements. |

### CRs for TEI

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| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2211601 (QC) | CR: Corrections on LTE V2X Resource Selection Test |
| Ericsson: OK. But the information in coverage page does not reflect to actual changes "Correct Es/Iot to follow Es/Noc according to the syncOffsetIndicators configuration of SyncRef UE 1 and SyncRef UE 2.". Otherwise OK.  Nokia: The CR is agreeable.  To Ericsson:  We change the change summary as follows:  In T3, for SyncRef UE 1:  Es/Iot = Es/Noc = 0dB  and for SyncRef UE 2:  Es/Iot = Es/Noc = 3dB |
| R4-2212934 (Huawei) | Correction to Rel-16 FR1 test cases\_r16 |
| Huawei: We noticed that there is typo in proposed changes. The highlighted part should be “NR 30 kHz SSB SCS, ≥40 MHz bandwidth, TDD duplex mode” We provide a revised version in :  https://www.3gpp.org/ftp/tsg\_ran/WG4\_Radio/TSGR4\_104-e/Inbox/Drafts/%5B104-e%5D%5B201%5D%20Maintenance\_R15\_R16\_RRM/Documents/1%20CR%20for%20R15%20core/R4-2212934%20Correction%20to%20Rel-16%20FR1%20test%20cases\_r16\_revised.docx    QC: The comments on 2928 apply to this CR.  Ericsson:  We can agree with the problem. Problem is: In current test cases NR SpCell and NR SCell use the same duplex mode/SCS/CBW. This means that most of CA test cases are not applicable to FDD+TDD CA BCs or 15kHz + 30kHz CA BCs. It is necessary to extend CA TC to support the SpCC and SCC using different duplex + SCS combinations. To solve this note is added that PCC and SCC can choose duplex combination independently. However, we think which test case to use config 2 may be explicitly specified.  Huawei: Thanks very much for comments.  To QC: Same response as R4-2212928. |
| R4-2212936 (Huawei) | Correction to Rel-16 FR2 test cases\_r16 |
| Ericsson: OK |
| R4-2211587 (STMicroelectronics) | Correction of Configuration Parameters for Test 1 in Test Case A.7.1.11 |
| Moderator: CR is reserved as Cat-A.  Nokia: The CRs are technically all ok.  There is only an issue on the CR category, as CR category for Rel-13 should not be A, but F and Cat-A CRs should be then for later releases.  Now with R4-2210985 for Rel-17 being a Cat-F CR, we probably have to assign Cat-A to all earlier releases to avoid a new CR number. But a note should then be included by MCC in the CR history for this CR. Alternative is to assign a new CR number for Rel-13 Cat-F CR and then to have Cat-A CRs for Rel-14 to Rel-16 in this meeting. |

## 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”* |

# 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 |  |
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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 |  |
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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