**3GPP TSG-RAN WG4 Meeting #109**

**Chicago, USA, November 13 - 17, 2023**

**Source: RAN4 Vice Chair (China Telecom)**

**Title: RAN4 #109 RRM session meeting report**

## 3A Topic Summary (pre-meeting)

This agenda item is only for at-meeting-generated content related to topic summary.

### 3A.2 RRM session topic summaries

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TDoc | Title | Source | Type | For | Abstract | Agenda item | TDoc Status | Decision |
| R4-2318157 | Topic summary for [109][201] Maintenance\_up\_to\_R16 | Moderator(Huawei) | other | Information | [109][200] RRM Session | 4.8 | reserved |  |
| R4-2318158 | Topic summary for [109][202] Maintenance\_R17\_R18 | Moderator (Apple) | other | Information | [109][200] RRM Session | 5.4 | reserved |  |
| R4-2318159 | Topic summary for [109][203] NR\_redcap | Modrator (Ericsson) | other | Information | [109][200] RRM Session | 5.4 | reserved |  |
| R4-2318160 | Topic summary for [109][204] LTE\_NBIOT\_eMTC\_NTN\_req | Moderator (MediaTek) | other | Information | [109][200] RRM Session | 6.4 | reserved |  |
| R4-2318161 | Topic summary for [109][205] NR\_ENDC\_ RF\_FR1\_enh2 | Moderator (NTT DoCoMo) | other | Information | [109][200] RRM Session | 8.3.4 | reserved |  |
| R4-2318162 | Topic summary for [109][206] FR2\_multiRx\_part1 | Moderator (Vivo) | other | Information | [109][200] RRM Session | 8.7.5 | reserved |  |
| R4-2318163 | Topic summary for [109][207] FR2\_multiRx\_part2 | Moderator (Ericsson) | other | Information | [109][200] RRM Session | 8.7.5 | reserved |  |
| R4-2318164 | Topic summary for [109][208] NR\_RRM\_enh3\_part1 | Moderator (Apple) | other | Information | [109][200] RRM Session | 8.8.6 | reserved |  |
| R4-2318165 | Topic summary for [109][209] NR\_RRM\_enh3\_part2 | Moderator (OPPO) | other | Information | [109][200] RRM Session | 8.8.6 | reserved |  |
| R4-2318166 | Topic summary for [109][210] NR\_MG\_enh2\_part1 | Moderator (MediaTek) | other | Information | [109][200] RRM Session | 8.9.6 | reserved |  |
| R4-2318167 | Topic summary for [109][211] NR\_MG\_enh2\_part2 | Moderator (Intel) | other | Information | [109][200] RRM Session | 8.9.6 | reserved |  |
| R4-2318168 | Topic summary for [109][212] NR\_BWP\_wor | Moderator (Vivo) | other | Information | [109][200] RRM Session | 8.10.3 | reserved |  |
| R4-2318169 | Topic summary for [109][213] NonCol\_intraB\_ENDC\_NR\_CA | Moderator (Huawei) | other | Information | [109][200] RRM Session | 8.11.5 | reserved |  |
| R4-2318170 | Topic summary for [109][214] NR\_HST\_FR2\_enh\_part1 | Moderator (Nokia) | other | Information | [109][200] RRM Session | 8.12.4 | reserved |  |
| R4-2318171 | Topic summary for [109][215] NR\_HST\_FR2\_enh\_part2 | Moderator (Samsung) | other | Information | [109][200] RRM Session | 8.12.4 | reserved |  |
| R4-2318172 | Topic summary for [109][216] NR\_ATG | Moderator (CMCC) | other | Information | [109][200] RRM Session | 8.13.9 | reserved |  |
| R4-2318173 | Topic summary for [109][217] NR\_FR1\_lessthan\_5MHz\_BW | Moderator (Nokia) | other | Information | [109][200] RRM Session | 8.14.7 | reserved |  |
| R4-2318174 | Topic summary for [109][218] FS\_NR\_LPWUS | Moderator (Vivo) | other | Information | [109][200] RRM Session | 8.20.5 | reserved |  |
| R4-2318175 | Topic summary for [109][219] NR\_pos\_enh2\_part1 | Moderator (Ericsson) | other | Information | [109][200] RRM Session | 8.22.4 | reserved |  |
| R4-2318176 | Topic summary for [109][220] NR\_pos\_enh2\_part2 | Moderator (CATT) | other | Information | [109][200] RRM Session | 8.22.4 | reserved |  |
| R4-2318177 | Topic summary for [109][221] NR\_pos\_enh2\_part3 | Moderator (Huawei) | other | Information | [109][200] RRM Session | 8.22.4 | reserved |  |
| R4-2318178 | Topic summary for [109][222] NR\_MC\_enh | Moderator (Huawei) | other | Information | [109][200] RRM Session | 8.23.5 | reserved |  |
| R4-2318179 | Topic summary for [109][223] NR\_Mob\_enh2\_part1 | Moderator (MediaTek) | other | Information | [109][200] RRM Session | 8.24.4 | reserved |  |
| R4-2318180 | Topic summary for [109][224] NR\_Mob\_enh2\_part2 | Moderator (Apple) | other | Information | [109][200] RRM Session | 8.24.4 | reserved |  |
| R4-2318181 | Topic summary for [109][225] NR\_DualTxRx\_MUSIM | Moderator (Vivo) | other | Information | [109][200] RRM Session | 8.25.4 | reserved |  |
| R4-2318182 | Topic summary for [109][226] NR\_NTN\_enh | Moderator (Qualcomm) | other | Information | [109][200] RRM Session | 8.26.9 | reserved |  |
| R4-2318183 | Topic summary for [109][227] NR\_netcon\_repeater | Moderator (ZTE) | other | Information | [109][200] RRM Session | 8.28.7 | reserved |  |
| R4-2318184 | Topic summary for [109][228] NR\_MIMO\_evo\_DL\_UL | Moderator (OPPO) | other | Information | [109][200] RRM Session | 8.29.5 | reserved |  |
| R4-2318185 | Topic summary for [109][229] NR\_SL\_enh2\_part1 | Moderator (LGE) | other | Information | [109][200] RRM Session | 8.30.6 | reserved |  |
| R4-2318186 | Topic summary for [109][230] NR\_SL\_enh2\_part2 | Moderator (OPPO) | other | Information | [109][200] RRM Session | 8.30.6 | reserved |  |
| R4-2318187 | Topic summary for [109][231] NR\_redcap\_enh | Modrator (Ericsson) | other | Information | [109][200] RRM Session | 8.31.3 | reserved |  |
| R4-2318188 | Topic summary for [109][232] NR\_SL\_relay\_enh | Moderator (LGE) | other | Information | [109][200] RRM Session | 8.32.3 | reserved |  |
| R4-2318189 | Topic summary for [109][233] NR\_mobile\_IAB | Moderator (Qualcomm) | other | Information | [109][200] RRM Session | 8.33.7 | reserved |  |
| R4-2318190 | Topic summary for [109][234] Netw\_Energy\_NR | Moderator (Huawei) | other | Information | [109][200] RRM Session | 8.34.6 | reserved |  |
| R4-2318191 | Topic summary for [109][235] IoT\_NTN\_enh | Moderator (MediaTek) | other | Information | [109][200] RRM Session | 9.6.7 | reserved |  |
| R4-2318192 | Topic summary for [109][236] Reply\_LS | Moderator (Apple) | other | Information | [109][200] RRM Session | 11.4 | reserved |  |

## 4 Up to Rel-16 maintenance for LTE and NR

**Guidance for maintenance agendas (AI 4, AI 5 and AI 6)**

The following guidance are provided for AI 4, AI5 and AI6:

- For maintenance agenda AI 4 (up to Rel-16), AI 5 (Rel-17) and AI 6 (Rel-18), formal CRs are expected and multiple formal CRs per company in the lowest agenda are allowed. For tracking the changes easily, it expected that one batch of CRs (Cat-F/A/…) will just cover a single topic/WI rather than multiple topics/WIs and Cat-F CR with corresponding Cat-A CRs needs be submitted under the same agenda.

- When submitting contributions to AI 4, AI 5 and AI 6, please add [WI\_code] in the beginning of titles for both discussion files and CRs to facilitate moderators and session chairs handling.

- When reserving the tdoc number, please use the correct WI code rather than simply using TEI and fill the column of “Related WIs” in your reservation spreadsheet. If you submit a CR with TEI as WI code, please inform session chair.

**Guidance from RAN4#109 meeting Arrangements and Guidelines**

* For all maintenance CRs,
  + Companies should submit the Cat-F CRs with the corresponding Cat-A CRs in the same agenda to ensure that the CRs can be easily tracked. If no Cat-A CRs were submitted in the same agenda, the CRs may just be endorsed or postponed.
  + For easily tracking the changes, it expected that one batch of CRs (Cat-F/A/…) should just cover a single topic rather than multiple topics.
  + When reserving tdoc number and submitting contributions, please add [WI\_code] in the beginning of titles for both discussion files and CRs to facilitate handling of moderators and session chairs

The following contributions are treated under email thread from another agenda item:

- The contribution R4-2320471 [TEI16] RRM requirements impact due to new BS signaling for inter-band EN-DC with overlapping bands will be covered in email thread [109][213] (under agenda item 8.11.3).

- The contribution R4-2319497 CR for MRTD/MTTD requirement for EN-DC/NE-DC (R16)will be covered in email thread [109][201] (under agenda item 4.4).

- The contribution R4-2319498 Discussion on left issues for MRTD-MTTD requirements in ENDC and NEDC will be covered in email thread [109][201] (under agenda item 4.4).

- The contribution R4-2320496 further discussion on MTTD/MRTD requirement for FDD-FDD inter-band EN-DC/NE-DC with overlapping DL frequency will be covered in email thread [109][201] (under agenda item 4.4).

- The contributions R4-2319864, R4-2319865, R4-2319866, R4-2319867, R4-2319868 will be cvoered in eamil thread [109][123] (under item item 8.1).

### 4.4 RRM requirements

#### NR\_newRAT

**R4-2318642 [NR\_newRAT] CR on NR-E-UTRAN HO requirement maintenance R15**

*Type: CR For: Agreement  
 38.133 v15.23.0 CR-3692 rev Cat: F (Rel-15)  
  
 Source: Apple*

**Decision:** The document was **not treated**.

**R4-2318643 [NR\_newRAT] CR on NR-E-UTRAN HO requirement maintenance R16**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3693 rev Cat: A (Rel-16)  
  
 Source: Apple*

**Decision:** The document was **not treated**.

**R4-2318644 [NR\_newRAT] CR on NR-E-UTRAN HO requirement maintenance R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3694 rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision:** The document was **not treated**.

**R4-2318645 [NR\_newRAT] CR on NR-E-UTRAN HO requirement maintenance R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3695 rev Cat: A (Rel-18)  
  
 Source: Apple*

**Decision:** The document was **not treated**.

**R4-2318699 CR on active TCI state list update delay - R15**

*Type: CR For: Agreement  
 38.133 v15.23.0 CR-3697 rev Cat: F (Rel-15)  
  
 Source: Apple*

**Decision: Revised to R4-2321400 (from R4-2318699).**

[**R4-2321400**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321400.zip) **CR on active TCI state list update delay - R15**

*Type: CR For: Agreement  
 38.133 v15.23.0 CR-3697 rev Cat: F (Rel-15)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2318700 CR on active TCI state list update delay - R16**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3698 rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Revised to R4-2321401 (from R4-2318700).**

[**R4-2321401**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321401.zip) **CR on active TCI state list update delay - R16**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3698 rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2318701 CR on active TCI state list update delay - R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3699 rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision: Revised to R4-2321402 (from R4-2318701).**

[**R4-2321402**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321402.zip) **CR on active TCI state list update delay - R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3699 rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2318702 CR on active TCI state list update delay - R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3700 rev Cat: F (Rel-18)  
  
 Source: Apple*

**Decision: Revised to R4-2321403 (from R4-2318702).**

[**R4-2321403**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321403.zip) **CR on active TCI state list update delay - R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3700 rev Cat: F (Rel-18)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2320568 [NR\_unlic-Core]: Modify the condition for gradual timing adjustment.**

*Type: CR For: Agreement  
 38.133 v15.23.0 CR-3867 rev Cat: F (Rel-15)  
  
 Source: ZTE*

**Decision:** The document was **not treated**.

**R4-2320569 [NR\_unlic-Core]: Modify the condition for gradual timing adjustment.**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3868 rev Cat: A (Rel-16)  
  
 Source: ZTE*

**Decision:** The document was **not treated**.

**R4-2320570 [NR\_unlic-Core]: Modify the condition for gradual timing adjustment.**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3869 rev Cat: A (Rel-17)  
  
 Source: ZTE*

**Decision:** The document was **not treated**.

**R4-2320571 [NR\_unlic-Core]: Modify the condition for gradual timing adjustment.**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3870 rev Cat: A (Rel-18)  
  
 Source: ZTE*

**Decision:** The document was **not treated**.

**R4-2319338 [NR\_newRAT-Perf] Correction to CORESET RMC and SS-RSRQ accuracy test cases\_R15**

*Type: CR For: Agreement  
 38.133 v15.23.0 CR-3743 rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon, Starpoint*

**Decision:** The document was **not treated**.

**R4-2319339 [NR\_newRAT-Perf] Correction to CORESET RMC and SS-RSRQ accuracy test cases\_R16**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3744 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

CAT.F due to some changes not covered in corresponding Rel-15 CR

**Decision:** The document was **not treated**.

**R4-2319340 [NR\_newRAT-Perf] Correction to CORESET RMC and SS-RSRQ accuracy test cases\_R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3745 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon, Starpoint*

**Decision:** The document was **not treated**.

**R4-2319341 [NR\_newRAT-Perf] Correction to CORESET RMC and SS-RSRQ accuracy test cases\_R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3746 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon, Starpoint*

**Decision:** The document was **not treated**.

**R4-2319554 [NR\_newRAT-Perf] CR of correction in TC A.6.5.5.4**

*Type: CR For: Agreement  
 38.133 v15.23.0 CR-3764 rev Cat: F (Rel-15)  
  
 Source: Samsung, Anritsu*

**Abstract:**

The CSI-RS\_RP level in TC A.6.5.5.4 is mistakenly put, and it cannot match the target SNR defined in these test csaes. It is suggested to align the level with similar test cases such as A.4.5.5.4 and A.4.5.5.7.

**Decision:** The document was **not treated**.

**R4-2320276 NR\_newRAT-Perf CR clarification on MAC-CE based TCI state switch delay**

*Type: CR For: Agreement  
 38.133 v15.23.0 CR-3823 rev Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Clarification of aligning test case with core requirements

**Decision:** The document was **not treated**.

**R4-2320277 NR\_newRAT-Perf CR clarification on MAC-CE based TCI state switch delay**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3824 rev Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Clarification of aligning test case with core requirements

**Decision:** The document was **not treated**.

**R4-2320278 NR\_newRAT-Perf CR clarification on MAC-CE based TCI state switch delay**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3825 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Clarification of aligning test case with core requirements

**Decision:** The document was **not treated**.

**R4-2320279 NR\_newRAT-Perf CR clarification on MAC-CE based TCI state switch delay**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3826 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Clarification of aligning test case with core requirements

**Decision:** The document was **not treated**.

**R4-2320708 [NR\_newRAT-Perf ] Correction on Control Channel RMCs (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3879 rev Cat: F (Rel-16)  
  
 Source: Keysight Technologies UK Ltd*

**Decision:** The document was **not treated**.

**R4-2320709 [NR\_newRAT-Perf ] Correction on Control Channel RMCs (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3880 rev Cat: A (Rel-17)  
  
 Source: Keysight Technologies UK Ltd*

**Decision:** The document was **not treated**.

**R4-2320711 [NR\_newRAT-Perf ] Correction on Control Channel RMCs (Rel-18)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3881 rev Cat: A (Rel-18)  
  
 Source: Keysight Technologies UK Ltd*

**Decision:** The document was **not treated**.

**R4-2320955 Removal of fading conditions in FR2 2 AoA RLM test cases (Cat-F Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.23.0 CR-3925 rev Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **not treated**.

**R4-2320956 Removal of fading conditions in FR2 2 AoA RLM test cases (Cat-A Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3926 rev Cat: A (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **not treated**.

**R4-2320957 Removal of fading conditions in FR2 2 AoA RLM test cases (Cat-A Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3927 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **not treated**.

**R4-2320958 Removal of fading conditions in FR2 2 AoA RLM test cases (Cat-A Rel-18)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3928 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **not treated**.

**R4-2319113 [NR\_newRAT-Perf, NR\_feMIMO-Perf] CR to FR1 Beam failure detection requirement**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3706 rev Cat: F (Rel-17)  
  
 Source: Anritsu Corporation*

**Decision:** The document was **not treated**.

**R4-2319114 [NR\_newRAT-Perf, NR\_feMIMO-Perf] CR to FR1 Beam failure detection requirement**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3707 rev Cat: A (Rel-18)  
  
 Source: Anritsu Corporation*

**Decision:** The document was **not treated**.

**R4-2320467 [NR\_newRAT-Perf] CR on updating the band combination configurations in performance part**

*Type: CR For: Agreement  
 38.133 v15.23.0 CR-3845 rev Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

[NR\_newRAT-Perf] CR on updating the band combination configurations in performance requirements

**Decision:** The document was **not treated**.

**R4-2320468 [NR\_newRAT-Perf] CR on updating the band combination configurations in performance requirements R16**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3846 rev Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

[NR\_newRAT-Perf] CR on updating the band combination configurations in performance requirements Cat-A R16

**Decision:** The document was **not treated**.

**R4-2320469 [NR\_newRAT-Perf] CR on updating the band combination configurations in performance requirements R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3847 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

[NR\_newRAT-Perf] CR on updating the band combination configurations in performance requirements Cat-A R17

**Decision:** The document was **not treated**.

**R4-2320470 [NR\_newRAT-Perf] CR on updating the band combination configurations in performance requirements R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3848 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

[NR\_newRAT-Perf] CR on updating the band combination configurations in performance requirements Cat-A R18

**Decision:** The document was **not treated**.

#### NB\_IOTenh2

**R4-2320751 [NB\_IOTenh2-Perf] CR to 36.133 for correcting errors on the PHR table for NB1 UEs**

*Type: CR For: Agreement  
 36.133 v15.20.0 CR-7269 rev Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320752 [NB\_IOTenh2-Perf] CR to 36.133 for correcting errors on the PHR table for NB1 UEs**

*Type: CR For: Agreement  
 36.133 v16.18.2 CR-7270 rev Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320753 [NB\_IOTenh2-Perf] CR to 36.133 for correcting errors on the PHR table for NB1 UEs**

*Type: CR For: Agreement  
 36.133 v17.11.2 CR-7271 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320754 [NB\_IOTenh2-Perf] CR to 36.133 for correcting errors on the PHR table for NB1 UEs**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7272 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

#### NR\_pos

**R4-2318345 CR on R16 positioning test cases**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3661 rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision:** The document was **not treated**.

**R4-2318346 CR on R16 positioning test case**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3662 rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision:** The document was **not treated**.

**R4-2318347 CR on R16 positioning test case**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3663 rev Cat: A (Rel-18)  
  
 Source: CATT*

**Decision:** The document was **not treated**.

#### NR\_RRM\_enh

**R4-2320873 Correction of measurement gap parameters for additional rel-16 mandatory gap patterns test case**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3899 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

R4-2314467 removed irrelevant sub-test(s) and phrases due to sub-test(s) defined for UE supporting per-FR gap (independentGapConfig) is not relevant as there is not FR2 cell at all in the sub-test(s).

**Decision:** The document was **not treated**.

**R4-2320441 [NR\_RRM\_enh-Core] CR on the SCell activation**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3842 rev Cat: F (Rel-16)  
  
 Source: ZTE*

**Decision:** The document was **not treated**.

**R4-2320442 [NR\_RRM\_Enh\_Core] CR on the SCell activation**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3843 rev Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Decision:** The document was **not treated**.

**R4-2320443 [NR\_RRM\_Enh\_Core] CR on the SCell activation**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3844 rev Cat: A (Rel-18)  
  
 Source: ZTE Corporation*

**Decision:** The document was **not treated**.

**R4-2320716 [NR\_RRM\_enh-Core] Discussion on Rel 16 no-gap reporting**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell, AT&T, BT plc, Vodafone*

**Decision: Noted.**

**R4-2320587 [NR\_RRM\_enh-Core] CR on the inter-frequency measurement without gap**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3871 rev Cat: F (Rel-16)  
  
 Source: ZTE, Ericsson*

**Decision:** The document was **not treated**.

**R4-2320717 [NR\_RRM\_enh-Core] CR Clarification of interruption behavior for interRAT measurements without gaps**

*Type: CR For: Agreement  
 36.133 v16.18.2 CR-7266 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320718 [NR\_RRM\_enh-Core] CR Clarification of interruption behavior for interRAT measurements without gaps**

*Type: CR For: Agreement  
 36.133 v17.11.2 CR-7267 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320719 [NR\_RRM\_enh-Core] CR Clarification of interruption behavior for interRAT measurements without gaps**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7268 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320720 [NR\_RRM\_enh-Core] CR Clarification of interruption behavior for measurements without gaps**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3884 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320721 [NR\_RRM\_enh-Core] CR Clarification of interruption behavior for measurements without gaps**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3885 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320722 [NR\_RRM\_enh-Core] CR Clarification of interruption behavior for measurements without gaps**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3886 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320723 LS measurements without gap**

*Type: LS out For: Approval  
 to RAN2  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This will be treated under email thread [134].

**Decision:** The document was **not treated**.

**R4-2318457 [NR\_RRM\_Enh-Perf] Maintenance perf part CR on event triggered reporting tests with additional mandatory gap pattern R16**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3669 rev Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Decision:** The document was **not treated**.

**R4-2318458 [NR\_RRM\_Enh-Perf] Maintenance perf part CR on event triggered reporting tests with additional mandatory gap pattern R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3670 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc.*

**Decision:** The document was **not treated**.

**R4-2318459 [NR\_RRM\_Enh-Perf] Maintenance perf part CR on event triggered reporting tests with additional mandatory gap pattern R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3671 rev Cat: A (Rel-18)  
  
 Source: MediaTek inc.*

**Decision:** The document was **not treated**.

**R4-2318567 [NR\_RRM\_enh-Perf] CR for Spatial relation info switch test requirements - Rel17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3677 rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision:** The document was **not treated**.

**R4-2318568 [NR\_RRM\_enh-Perf] CR for Spatial relation info switch test requirements - Rel18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3678 rev Cat: A (Rel-18)  
  
 Source: Apple*

**Decision:** The document was **not treated**.

**R4-2319342 [NR\_RRM\_Enh-Perf] Correction to CGI measurement test cases\_R16**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3747 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision:** The document was **not treated**.

**R4-2319343 [NR\_RRM\_Enh-Perf] Correction to CGI measurement test cases\_R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3748 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision:** The document was **not treated**.

**R4-2319344 [NR\_RRM\_Enh-Perf] Correction to CGI measurement test cases\_R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3749 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision:** The document was **not treated**.

**R4-2320168 [NR\_RRM\_Enh-Perf] CR on TCs for UE specific CBW change R16**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3819 rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision:** The document was **not treated**.

**R4-2320169 [NR\_RRM\_Enh-Perf] CR on TCs for UE specific CBW change R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3820 rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision:** The document was **not treated**.

**R4-2320170 [NR\_RRM\_Enh-Perf] CR on TCs for UE specific CBW change R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3821 rev Cat: A (Rel-18)  
  
 Source: Apple*

**Decision:** The document was **not treated**.

**R4-2320861 Corrections to NR Measurements with Autonomous Gaps**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3896 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320862 Corrections to NR Measurements with Autonomous Gaps**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3897 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320863 Corrections to NR Measurements with Autonomous Gaps**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3898 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

#### NR\_UE\_pow\_sav

**R4-2319209 Correction on measurements for UE configured with relaxed measurement criterion**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3735 rev Cat: F (Rel-16)  
  
 Source: Samsung*

**Decision:** The document was **not treated**.

**R4-2319210 Correction on measurements for UE configured with relaxed measurement criterion**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3736 rev Cat: F (Rel-17)  
  
 Source: Samsung*

**Abstract:**

R17 spec has additional modification than R16, so CatF is applied but not CatA

**Decision:** The document was **not treated**.

**R4-2319211 Correction on measurements for UE configured with relaxed measurement criterion**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3737 rev Cat: A (Rel-18)  
  
 Source: Samsung*

**Decision:** The document was **not treated**.

#### NR\_unlic

**R4-2319158 Draft CR on CSSF in NR-U**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3723 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

To update CSSF in NR-U

**Decision:** The document was **not treated**.

**R4-2319159 CR on CSSF in NRU**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3724 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

To update CSSF in NR-U

**Decision:** The document was **not treated**.

**R4-2319160 CR on CSSF in NRU**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3725 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

To update CSSF in NR-U

**Decision:** The document was **not treated**.

**R4-2320978 [NR\_unlic] EN-DC intra-frequency measurement test cases for NR-U – R16**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3930 rev Cat: F (Rel-16)  
  
 Source: Qualcomm*

**Decision:** The document was **not treated**.

**R4-2320979 [NR\_unlic] EN-DC intra-frequency measurement test cases for NR-U (R17)**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3931 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **not treated**.

**R4-2320980 [NR\_unlic] EN-DC intra-frequency measurement test cases for NR-U (R18)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3932 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **not treated**.

**R4-2321001 [NR\_unlic-Perf] HO test cases under CCA update**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3944 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

NR Cell SNR configuration during T3 period

**Decision:** The document was **not treated**.

#### NR\_Mob\_enh

**R4-2319161 Draft CR on inter-frequency measurement without gap in CHO**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3726 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

To include inter-freq wo gap in CHO

**Decision:** The document was **not treated**.

**R4-2319162 CR on CHO**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3727 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

To include inter-freq wo gap in CHO

**Decision:** The document was **not treated**.

**R4-2319163 CR on CHO**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3728 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

To include inter-freq wo gap in CHO

**Decision:** The document was **not treated**.

#### MTTD/MRTD

**R4-2318627 On MRTD/MTTD requirement for inter-band non-collocated EN-DC/NE-DC (R16)**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3687 rev Cat: F (Rel-16)  
  
 Source: Apple, OPPO*

**Decision:** The document was **not treated**.

**R4-2318628 On MRTD/MTTD requirement for inter-band non-collocated EN-DC/NE-DC (R17)**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3688 rev Cat: A (Rel-17)  
  
 Source: Apple,OPPO*

**Decision:** The document was **not treated**.

**R4-2318629 On MRTD/MTTD requirement for inter-band non-collocated EN-DC/NE-DC (R178)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3689 rev Cat: A (Rel-18)  
  
 Source: Apple,OPPO*

**Decision:** The document was **not treated**.

#### Other

**R4-2319172 [NR\_newRAT-Perf] CR of correction in TC A.6.5.5.4**

*Type: CR For: Agreement  
 38.133 v15.23.0 CR-3729 rev Cat: F (Rel-15)  
  
 Source: Samsung, Anritsu*

**Abstract:**

Parsing failed: The change request number wrong on CR cover for TDoc R4-2319172. Database value : 3729. CR cover value : 3792. 1. The CSI-RS\_RP level in TC A.6.5.5.4 is mistakenly put, and it cannot match the target SNR defined in these test csaes. It is

**Decision:** The document was **withdrawn**.

**R4-2319173 [NR\_newRAT-Perf] CR of correction in TC A.6.5.5.4**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3730 rev Cat: A (Rel-16)  
  
 Source: Samsung, Anritsu*

**Abstract:**

1. The CSI-RS\_RP level in TC A.6.5.5.4 is mistakenly put, and it cannot match the target SNR defined in these test csaes. It is suggested to align the level with similar test cases such as A.4.5.5.4 and A.4.5.5.7.

**Decision:** The document was **not treated**.

**R4-2319174 [NR\_newRAT-Perf] CR of correction in TC A.6.5.5.4**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3731 rev Cat: A (Rel-17)  
  
 Source: Samsung, Anritsu*

**Abstract:**

1. The CSI-RS\_RP level in TC A.6.5.5.4 is mistakenly put, and it cannot match the target SNR defined in these test csaes. It is suggested to align the level with similar test cases such as A.4.5.5.4 and A.4.5.5.7.

**Decision:** The document was **not treated**.

**R4-2319175 [NR\_newRAT-Perf] CR of correction in TC A.6.5.5.4**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3732 rev Cat: A (Rel-18)  
  
 Source: Samsung, Anritsu*

**Abstract:**

1. The CSI-RS\_RP level in TC A.6.5.5.4 is mistakenly put, and it cannot match the target SNR defined in these test csaes. It is suggested to align the level with similar test cases such as A.4.5.5.4 and A.4.5.5.7.

**Decision:** The document was **not treated**.

**R4-2320120 Correction of measurement gap parameters for additional rel-16 mandatory gap patterns test case**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3804 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Note: This was reserved for Rel-16, but the CR coversheet is for Rel17. R4-2314467 removed irrelevant sub-test(s) and phrases due to sub-test(s) defined for UE supporting per-FR gap (independentGapConfig) is not relevant as there is not FR2 cell at all in

**Decision:** The document was **withdrawn**.

**R4-2320121 Correction of measurement gap parameters for additional rel-16 mandatory gap patterns test case**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3805 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

R4-2314467 removed irrelevant sub-test(s) and phrases due to sub-test(s) defined for UE supporting per-FR gap (independentGapConfig) is not relevant as there is not FR2 cell at all in the sub-test(s).

**Decision:** The document was **not treated**.

**R4-2320122 Correction of measurement gap parameters for additional rel-16 mandatory gap patterns test case**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3806 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

R4-2314467 removed irrelevant sub-test(s) and phrases due to sub-test(s) defined for UE supporting per-FR gap (independentGapConfig) is not relevant as there is not FR2 cell at all in the sub-test(s).

**Decision:** The document was **not treated**.

**R4-2320275 Clarification on MAC-CE based TCI state switch delay**

*Type: discussion For: Approval  
 38.133 v CR- rev Cat: (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320436 [NR\_RRM\_enh\_Core] CR on the inter-frequency measurement without gap**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3837 rev Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

Note: Change request Work Item on the CR coversheet for TDoc R4-2320436 value is not spelled as in work plan it is on the CR coversheet NR\_RRM\_Enh\_Core.

**Decision:** The document was **withdrawn**.

**R4-2320437 [NR\_RRM\_enh-Core] CR on the inter-frequency measurement without gap**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3838 rev Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Decision:** The document was **not treated**.

**R4-2320438 [NR\_RRM\_enh-Core] CR on the inter-frequency measurement without gap**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3839 rev Cat: A (Rel-18)  
  
 Source: ZTE Corporation*

**Decision:** The document was **not treated**.

**R4-2320471 [TEI16] RRM requirements impact due to new BS signaling for inter-band EN-DC with overlapping bands**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

[TEI16] RRM requirements impact due to new BS signaling for inter-band EN-DC with overlapping bands. This will be handled under email thread [213].

**Decision: Noted.**

**R4-2320478 [NR\_unlic-Perf] HO test cases under CCA update**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3851 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

NR Cell SNR configuration during T3 period

**Decision:** The document was **withdrawn**.

**R4-2320479 [NR\_unlic-Perf] HO test cases under CCA update**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3852 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **not treated**.

**R4-2320480 [NR\_unlic-Perf HO test cases under CCA update**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3853 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **not treated**.

**R4-2320524 [NR\_RRM\_enh\_Core] CR on the SCell activation**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3857 rev Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

Note: Change request Work Item wrong on CR coversheet for TDoc R4-2320524 as it is value NR\_RRM\_enh\_Core which does not exist in work plan

**Decision:** The document was **withdrawn**.

**R4-2320525 [NR\_RRM\_enh\_Core] CR on the SCell activation**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3858 rev Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Decision:** The document was **not treated**.

**R4-2320526 [NR\_RRM\_enh\_Core] CR on the SCell activation**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3859 rev Cat: A (Rel-18)  
  
 Source: ZTE Corporation*

**Decision:** The document was **not treated**.

**R4-2320894 [NR\_unlic-Perf] HO test cases under CCA update**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3905 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

NR Cell SNR configuration during T3 period

**Decision:** The document was **withdrawn**.

**R4-2320936 [NR\_unlic] EN-DC intra-frequency measurement test cases for NR-U – R16**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3910 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

Note: The CR coversheet release is not Rel-16 on coversheet.

**Decision:** The document was **withdrawn**.

**R4-2320937 [NR\_unlic] EN-DC intra-frequency measurement test cases for NR-U – R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3911 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **withdrawn**.

**R4-2320938 [NR\_unlic] EN-DC intra-frequency measurement test cases for NR-U – R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3912 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **withdrawn**.

### 4.7 Rel-15/16 TEI

#### MTTD/MRTD

**R4-2319944 [TEI16]Discussion on MRTD/MTTD requirements for inter-band EN-DC with overlapping DL bands**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Abstract:**

Note: This contribution will be treated under [109][201] Maintenance\_up\_to\_R16.

**Decision: Noted.**

**R4-2319945 [TEI16]CR on MRTD/MTTD requirements for inter-band EN-DC with overlapping DL bands R16**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3785 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

Note: This contribution will be treated under [109][201] Maintenance\_up\_to\_R16.

**Decision:** The document was **not treated**.

**R4-2319946 [TEI16]CR on MRTD/MTTD requirements for inter-band EN-DC with overlapping DL bands R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3786 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

Note: This contribution will be treated under [109][201] Maintenance\_up\_to\_R16.

**Decision:** The document was **not treated**.

**R4-2319947 [TEI16]CR on MRTD/MTTD requirements for inter-band EN-DC with overlapping DL bands R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3787 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

Note: This contribution will be treated under [109][201] Maintenance\_up\_to\_R16.

**Decision:** The document was **not treated**.

### 4.8 Moderator summary and conclusions (for Agenda 4)

#### Topic: [109][201] Maintenance\_up\_to\_R16

**R4-2318157 Topic summary for [109][201] Maintenance\_up\_to\_R16**

*Type: other For: Information  
 Source: Moderator(Huawei)*

**Abstract:**

[109][200] RRM Session AI 4.4

**Decision: Noted.**

[**R4-2321338**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321338.zip) **Ad-hoc minutes on Maintenance\_up\_to\_R16**

*Type: other For: Approval  
 Source: Huawei*

**Decision: Return to.**

## 5 Rel-17 maintenance for LTE and NR

**Guidance for maintenance agendas (AI 4, AI 5 and AI 6)**

The following guidance are provided for AI 4, AI5 and AI6:

- For maintenance agenda AI 4 (up to Rel-16), AI 5 (Rel-17) and AI 6 (Rel-18), formal CRs are expected and multiple formal CRs per company in the lowest agenda are allowed. For tracking the changes easily, it expected that one batch of CRs (Cat-F/A/…) will just cover a single topic/WI rather than multiple topics/WIs and Cat-F CR with corresponding Cat-A CRs needs be submitted under the same agenda.

- When submitting contributions to AI 4, AI 5 and AI 6, please add [WI\_code] in the beginning of titles for both discussion files and CRs to facilitate moderators and session chairs handling.

- When reserving the tdoc number, please use the correct WI code rather than simply using TEI and fill the column of “Related WIs” in your reservation spreadsheet. If you submit a CR with TEI as WI code, please inform session chair.

The following contributions are treated under email thread from another agenda item:

- The contribution R4-2319427 [NR\_RF\_FR1-Core] Corrections to configured maximum power and MPR for serving cells of UL CA will be covered in email thread [109][149] (under agenda item 11.2.5).

- The contribution R4-2319429 [NR\_RF\_FR1\_Core] Correction to UE power classes for CA configurations for HPUE will be covered in email thread [109][149] (under agenda item 11.2.5).

### 5.2 Rel-17 non-spectrum related WI maintenance

#### 5.2.3 RRM requirements

##### NR\_UE\_pow\_sav\_enh

**R4-2319048 [NR\_UE\_pow\_sav\_enh-Core]Discussion on maintenance issues in R17 RLMBFD relaxation**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2318062 [NR\_UE\_pow\_sav\_enh] CR on RLM/BFD relaxation requirements R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3656 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc.*

**Decision:** The document was **not treated**.

**R4-2318063 CR on RLM/BFD relaxation requirements R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3657 rev Cat: A (Rel-18)  
  
 Source: MediaTek inc.*

**Decision:** The document was **not treated**.

**R4-2319948 [NR\_PowSav\_enh-Core]Discussion on maintaining issues for RLM/BFD relaxation requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319949 [NR\_UE\_pow\_sav\_enh-Core]CR on maintaining RLM/BFD relaxation requirements R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3788 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon, vivo.*

**Decision:** The document was **not treated**.

**R4-2319950 [NR\_UE\_pow\_sav\_enh-Core]CR on maintaining RLM/BFD relaxation requirements R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3789 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon, vivo*

**Decision:** The document was **not treated**.

**R4-2319828 [NR\_UE\_pow\_sav\_enh-Perf] CR to TS 38.133: Corrections to Enhanced Power Saving test cases (Rel 17)**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3778 rev Cat: F (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision:** The document was **not treated**.

**R4-2319829 [NR\_UE\_pow\_sav\_enh-Perf] CR to TS 38.133: Corrections to Enhanced Power Saving test cases (Rel 18)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3779 rev Cat: A (Rel-18)  
  
 Source: Rohde & Schwarz*

**Decision:** The document was **not treated**.

**R4-2320566 [ NR\_UE\_pow\_sav\_enh-Core]: Modify the IE for RLM.**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3865 rev Cat: F (Rel-17)  
  
 Source: ZTE*

**Decision:** The document was **not treated**.

**R4-2320567 [NR\_UE\_pow\_sav\_enh-Core]: Modify the IE for RLM**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3866 rev Cat: A (Rel-18)  
  
 Source: ZTE*

**Decision:** The document was **not treated**.

**R4-2320714 [NR\_UE\_pow\_sav\_enh-Perf] Update on Power saving enhancement test scenario (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3882 rev Cat: F (Rel-17)  
  
 Source: Keysight Technologies UK Ltd*

**Decision:** The document was **not treated**.

**R4-2320715 [NR\_UE\_pow\_sav\_enh-Perf] Update on Power saving enhancement test scenario (Rel-18)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3883 rev Cat: A (Rel-18)  
  
 Source: Keysight Technologies UK Ltd*

**Decision:** The document was **not treated**.

##### NR\_FeMIMO

**R4-2319951 [NR\_FeMIMO-Core]Discussion on RRM maintaining issues for NR FeMIMO**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319952 [NR\_FeMIMO-Core]CR on maintaining L1-RSRP requirements for inter-cell BM R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3790 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2321489 (from R4-2319952).**

[**R4-2321489**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321489.zip) **[NR\_FeMIMO-Core]CR on maintaining L1-RSRP requirements for inter-cell BM R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3790 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2319953 [NR\_FeMIMO-Core]CR on maintaining L1-RSRP requirements for inter-cell BM R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3791 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision:** The document was **not treated**.

**R4-2319954 [NR\_FeMIMO-Perf] Corrections to unified TCI states switching test cases R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3792 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision:** The document was **not treated**.

**R4-2319955 [NR\_FeMIMO-Perf]Corrections to unified TCI states switching test cases R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3793 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision:** The document was **not treated**.

**R4-2319176 [NR\_feMIMO-Perf] CR of correction in TC A.6.5.5.7**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3733 rev Cat: F (Rel-17)  
  
 Source: Samsung, Anritsu*

**Abstract:**

1. The CSI-RS\_RP level in TC A.6.5.5.7 is mistakenly put, and it cannot match the target SNR defined in these test csaes. It is suggested to align the level with similar test cases such as A.4.5.5.4 and A.4.5.5.7.

2. The SNR\_CSI-RS values are mistkenly pu

**Decision:** The document was **not treated**.

**R4-2319177 [NR\_feMIMO-Perf] CR of correction in TC A.6.5.5.7**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3734 rev Cat: A (Rel-18)  
  
 Source: Samsung, Anritsu*

**Abstract:**

1. The CSI-RS\_RP level in TC A.6.5.5.4 is mistakenly put, and it cannot match the target SNR defined in these test csaes. It is suggested to align the level with similar test cases such as A.4.5.5.4 and A.4.5.5.7.

**Decision:** The document was **not treated**.

##### [LTE\_NR\_DC\_enh2](https://portal.3gpp.org/desktopmodules/WorkItem/WorkItemDetails.aspx?workitemId=860149)

**R4-2319069 Discussion on PDCCH monitoring for SCG activation in R17**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2320280 LTE\_NR\_DC\_enh2-Core Aspects on Efficient activation/de-activation mechanism for one SCG**

*Type: discussion For: Approval  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320281 LTE\_NR\_DC\_enh2-Core CR corrections for SCG Activation and Deactivation Delay**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3827 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320282 LTE\_NR\_DC\_enh2-Core CR corrections for SCG Activation and Deactivation Delay**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3828 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320283 LTE\_NR\_DC\_enh2-Core Alignment of RAN4 requirements with RAN2 procedures**

*Type: discussion For: Approval  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320284 LTE\_NR\_DC\_enh2-Core CR correcting TCI state activation command at SCell activation**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3829 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320285 LTE\_NR\_DC\_enh2-Core CR correcting TCI state activation command at SCell activation**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3830 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320620 Discussion on Rel-17 RRM remaining issues**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution provide discussion for rel-17 remaining issues

**Decision: Noted.**

**R4-2318617 CR for missing test case of E-UTRAN – NR FR2 interruptions during measurements on deactivated NR PSCell - R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3679 rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision:** The document was **not treated**.

**R4-2318618 CR for missing test case of E-UTRAN – NR FR2 interruptions during measurements on deactivated NR PSCell - R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3680 rev Cat: A (Rel-18)  
  
 Source: Apple*

**Decision:** The document was **not treated**.

**R4-2318619 Maintenance CR for test caes - A.4.5.2.10 - R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3681 rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision:** The document was **not treated**.

**R4-2318620 Maintenance CR for test caes - A.4.5.2.10 - R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3682 rev Cat: A (Rel-18)  
  
 Source: Apple*

**Decision:** The document was **not treated**.

**R4-2319383 Correction to Fast SCell activation and PSCell activation tests**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3758 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2321466 (from R4-2319383).**

[**R4-2321466**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321466.zip) **Correction to Fast SCell activation and PSCell activation tests**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3758 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2319384 Correction to Fast SCell activation and PSCell activation tests**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3759 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision:** The document was **not treated**.

**R4-2320286 LS on alignment of RAN4 requirements with RAN2 procedures**

*Type: LS out For: Approval  
 to RAN2  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320287 LTE\_NR\_DC\_enh2-Core CR for correting removing Tidentify\_inter\_without\_index**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3831 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320288 LTE\_NR\_DC\_enh2-Core CR for correting removing Tidentify\_inter\_without\_index**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3832 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320619 CR to TS 38.133 on SCG activation and deactivaton test case**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3874 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR is to update the test case in TS 38.133

**Decision:** The document was **not treated**.

**R4-2320759 CR to TS 38.133 on scg activation and deactivation test case**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3891 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR is to update the test case in TS 38.133

**Decision:** The document was **not treated**.

**R4-2320953 Fast SCell Activation of SCell in FR2 inter-band (Cat-F Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3923 rev Cat: F (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **not treated**.

**R4-2320954 Fast SCell Activation of SCell in FR2 inter-band (Cat-A Rel-18)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3924 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **not treated**.

##### NR\_RRM\_enh2

**R4-2319347 [NR\_RRM\_enh2-Core] Discussion on maintenance for R17 RRM enhancement**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319348 [NR\_RRM\_enh2-Core] CR on PUCCH SCell activation with multiple SCells R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3752 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision:** The document was **not treated**.

**R4-2319349 [NR\_RRM\_enh2-Core] CR on PUCCH SCell activation with multiple SCells R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3753 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision:** The document was **not treated**.

##### NR\_NTN\_Solutions

**R4-2320746 [NR\_NTN\_Solutions-Perf] On timing considerations for NTN performance tests**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320747 [NR\_NTN\_solutions-Perf] CR to 38.133 on transmit timing test case for NTN**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3887 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320748 [NR\_NTN\_solutions-Perf] CR to 38.133 on transmit timing test case for NTN**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3888 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320749 [NR\_NTN\_solutions-Core] CR to 38.133 on Measurement Req. For NTN**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3889 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **withdrawn**.

**R4-2320750 [NR\_NTN\_solutions-Core] CR to 38.133 on Measurement Req. For NTN**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3890 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2319832 [NR\_NTN\_solutions-Perf] CR to TS 38.133: Corrections to NR NTN test cases (Rel 17)**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3782 rev Cat: F (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Revised to R4-2321488 (from R4-2319832).**

[**R4-2321488**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321488.zip) **[NR\_NTN\_solutions-Perf] CR to TS 38.133: Corrections to NR NTN test cases (Rel 17)**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3782 rev Cat: F (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Return to.**

**R4-2319833 [NR\_NTN\_solutions-Perf] CR to TS 38.133: Corrections to NR NTN test cases (Rel 18)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3783 rev Cat: A (Rel-18)  
  
 Source: Rohde & Schwarz*

**Decision:** The document was **not treated**.

**R4-2320556 [NR\_NTN\_solutions -Core]: Modify the condition for NTN gradual timing adjustment.**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3860 rev Cat: F (Rel-17)  
  
 Source: ZTE Corporation*

**Abstract:**

Note: Change request Work Item on CR coversheet for TDoc R4-2320556 has an extra space for value : NR\_NTN\_solutions -Core.

**Decision:** The document was **not treated**.

**R4-2320560 [NR\_NTN\_solutions -Core]: Modify the condition for NTN gradual timing adjustment.**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3861 rev Cat: A (Rel-18)  
  
 Source: ZTE Corporation*

**Abstract:**

Note: Change request Work Item on CR coversheet for TDoc R4-2320560 value have an extra space with value NR\_NTN\_solutions -Core.

**Decision:** The document was **not treated**.

**R4-2320889 [NR\_NTN\_solutions-Core] CR to 38.133 on Measurement Req. For NTN**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3904 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

##### NR\_pos\_enh

**R4-2318348 CR on R17 positioning test cases**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3664 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision:** The document was **not treated**.

**R4-2318349 CR on R17 positioning test case**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3665 rev Cat: A (Rel-18)  
  
 Source: CATT*

**Decision:** The document was **not treated**.

**R4-2320364 CR to 38.133 on PRS-RSRPP accuracy requirement**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3834 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Based on simulation summary document for PRS-RSRPP accuracy.

**Decision:** The document was **not treated**.

**R4-2320365 CR to 38.133 on PRS-RSRPP accuracy requirement**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3835 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Based on simulation summary document for PRS-RSRPP accuracy.

**Decision:** The document was **not treated**.

**R4-2320367 CR to 38.133 correction of PRS-RSRP measurement period requirement**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3836 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

PRS-RSRP measurement period requirement in v18.3.0 is not aligned with v17.11.0 of TS38.133.

**Decision:** The document was **revised to R4-2321022**.

**R4-2321022 CR to 38.133 correction of PRS-RSRP measurement period requirement**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3836 rev 1 Cat: F (Rel-18)  
  
 Source: Ericsson*

(Replaces R4-2320367)

**Abstract:**

PRS-RSRP measurement period requirement in v18.3.0 is not aligned with v17.11.0 of TS38.133.

**Decision:** The document was **not treated**.

**R4-2320563 [ NR\_pos\_enh-Core]:Modify positioning measurements related in RRC\_INACTIVE and RRC\_CONNECTED state.**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3862 rev Cat: F (Rel-17)  
  
 Source: ZTE*

**Decision:** The document was **not treated**.

**R4-2320564 [ NR\_pos\_enh-Core]:Modify positioning measurements related in RRC\_INACTIVE and RRC\_CONNECTED state.**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3863 rev Cat: A (Rel-18)  
  
 Source: ZTE*

**Decision:** The document was **not treated**.

**R4-2320565 [ NR\_pos\_enh-Core]: Modify positioning measurements related in RRC\_INACTIVE state.**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3864 rev Cat: F (Rel-17)  
  
 Source: ZTE*

**Decision:** The document was **not treated**.

**R4-2320697 [NR\_pos\_enh] TA validation requirements for positioning in RRC inactive state in Rel-17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3877 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The CR defines TA validation requirements for positioning measurements involving SRS transmission in RRC inactive state. TA validation is supported by RAN2 since Rel-17 (clause 5.26.2 in TS 38.321 and clause 5.7.17 in TS 38.331). However, the correspondin

**Decision:** The document was **not treated**.

##### NR\_MG\_enh

**R4-2318494 [NR\_MG\_enh-Core] Update on scheduling availability requirements for NCSG R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3673 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc, Qualcomm Incorporated*

**Decision: Revised to R4-2321363 (from R4-2318494).**

[**R4-2321363**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321363.zip) **[NR\_MG\_enh-Core] Update on scheduling availability requirements for NCSG R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3673 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc, Qualcomm Incorporated*

**Decision: Agreed.**

**R4-2318495 [NR\_MG\_enh-Core] Update on scheduling availability requirements for NCSG R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3674 rev Cat: A (Rel-18)  
  
 Source: MeidaTek inc., Qualcomm Incorporated*

**Decision:** The document was **not treated**.

**R4-2318496 [NR\_MG\_enh-Perf] Maintenance CR for MGE perf part R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3675 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc., Anritsu*

**Decision:** The document was **not treated**.

**R4-2318497 [NR\_MG\_enh-Perf] Maintenance CR for MGE perf part R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3676 rev Cat: A (Rel-18)  
  
 Source: MediaTek inc., Anritsu*

**Decision:** The document was **not treated**.

**R4-2319154 CR on ConMGs**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3719 rev Cat: F (Rel-17)  
  
 Source: Ericsson, ZTE*

**Abstract:**

To update the measurement requirement structure for ConMGs

**Decision: Revised to R4-2321364 (from R4-2319154).**

[**R4-2321364**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321364.zip) **CR on ConMGs**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3719 rev Cat: F (Rel-17)  
  
 Source: Ericsson, ZTE, MediaTek, Intel*

**Abstract:**

To update the measurement requirement structure for ConMGs

Ericsson, ZTE, MediaTek inc, Intel, Apple support the new structure.

QC, Nokia want to check whether to consider the new strucutre after lunch and inform other experts in reflector.

**Decision: Revised to R4-2321369 (from R4-2321364).**

[**R4-2321369**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321369.zip) **CR on ConMGs**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3719 rev Cat: F (Rel-17)  
  
 Source: Ericsson, ZTE, MediaTek, Intel*

**Abstract:**

To update the measurement requirement structure for ConMGs

Ericsson, ZTE, MediaTek inc, Intel, Apple support the new structure.

QC, Nokia want to check whether to consider the new strucutre after lunch and inform other experts in reflector.

**Decision: Return to.**

**R4-2319155 CR on ConMGs**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3720 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

To update the measurement requirement structure for ConMGs

**Decision:** The document was **withdrawn**.

**R4-2319156 Draft CR on ConMGs capability**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3721 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

To update the ConMGs capability wording alignment

**Decision:** The document was **not treated**.

**R4-2319157 CR on ConMGs capability**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3722 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

To update the ConMGs capability wording alignment

**Decision:** The document was **not treated**.

**R4-2319971 [NR\_MG\_enh-Core] CR on Rel-17 MGE requirements**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3795 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision:** The document was **not treated**.

**R4-2319972 [NR\_MG\_enh-Core] CR on Rel-17 MGE requirements R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3796 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision:** The document was **not treated**.

**R4-2320325 CR on ConMGs**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3833 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

To update the measurement requirement structure for ConMGs

**Decision:** The document was **not treated**.

**R4-2320439 [NR\_MG\_enh-Core] CR on the scheduling restriction of NCSG**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3840 rev Cat: F (Rel-17)  
  
 Source: ZTE*

**Decision:** The document was **not treated**.

**R4-2320440 [NR\_MG\_enh-Core] CR on the scheduling restriction of NCSG**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3841 rev Cat: A (Rel-18)  
  
 Source: ZTE Corporation*

**Decision:** The document was **not treated**.

##### NR\_HST\_FR1\_enh

**R4-2318944 [NR\_HST\_FR1\_enh] Inter-frequency measurement for NR FR1 HST**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3703 rev Cat: F (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **not treated**.

**R4-2318945 [NR\_HST\_FR1\_enh] Inter-frequency measurement for NR FR1 HST-R18mirror**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3704 rev Cat: A (Rel-18)  
  
 Source: Qualcomm, Inc.*

**Decision:** The document was **not treated**.

##### NR\_HST\_FR2

**R4-2319712 CR on relative angular offsets between 2 active probes for FR2 HST PC6**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3766 rev Cat: F (Rel-17)  
  
 Source: Samsung, Nokia, Nokia Shanghai Bell*

**Abstract:**

formal CR

**Decision: Revised to R4-2321350 (from R4-2319712).**

[**R4-2321350**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321350.zip) **CR on relative angular offsets between 2 active probes for FR2 HST PC6**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3766 rev Cat: F (Rel-17)  
  
 Source: Samsung, Nokia, Nokia Shanghai Bell*

**Abstract:**

formal CR

**Decision: Return to.**

**R4-2319713 CR on relative angular offsets between 2 active probes for FR2 HST PC6**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3767 rev Cat: A (Rel-18)  
  
 Source: Samsung, Nokia, Nokia Shanghai Bell*

**Abstract:**

formal CR

**Decision:** The document was **not treated**.

**R4-2319714 CR on RRM performance testing requirements for FR2 HST PC6 UE in TS 38.133 Annex B**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3768 rev Cat: F (Rel-17)  
  
 Source: Samsung, Nokia, Nokia Shanghai Bell*

**Abstract:**

formal CR

**Decision: Revised to R4-2321351 (from R4-2319714).**

[**R4-2321351**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321351.zip) **CR on RRM performance testing requirements for FR2 HST PC6 UE in TS 38.133 Annex B**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3768 rev Cat: F (Rel-17)  
  
 Source: Samsung, Nokia, Nokia Shanghai Bell*

**Abstract:**

formal CR

**Decision: Return to.**

**R4-2319715 CR on RRM performance testing requirements for FR2 HST PC6 UE in TS 38.133 Annex B**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3769 rev Cat: A (Rel-18)  
  
 Source: Samsung, Nokia, Nokia Shanghai Bell*

**Abstract:**

formal CR

**Decision:** The document was **not treated**.

**R4-2319796 Draft CR on Handover with PSCell from SA to EN-DC with target FR2 PSCell in A.7.3.1.6 and A.7.3.1.7**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3774 rev Cat: F (Rel-17)  
  
 Source: OPPO*

**Decision:** The document was **not treated**.

**R4-2319813 [NR\_HST\_FR2] CR for 38.133: Corrections in HST FR2 RRM requirements and test (Rel-17, Cat F)**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3775 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell, Samsung*

**Decision:** The document was **not treated**.

**R4-2319814 [NR\_HST\_FR2] CR for 38.133: Corrections in HST FR2 RRM requirements and test (Rel-18, Cat A)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3776 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell, Samsung*

**Decision:** The document was **not treated**.

##### NR\_IIOT\_URLLC\_enh

**R4-2319973 [NR\_IIOT\_URLLC\_enh-Perf] CR on performance requirements for PDC measurement**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3797 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision:** The document was **not treated**.

**R4-2319974 [NR\_IIOT\_URLLC\_enh-Perf] CR on performance requirements for PDC measurement R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3798 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision:** The document was **not treated**.

##### NR\_IAB\_enh

**R4-2320681 [NR\_IAB\_enh] Correction to IAB-MT TA adjustment accuracy requirements**

*Type: CR For: Agreement  
 38.174 v17.5.0 CR-0091 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

[NR\_IAB\_enh-Core] This CR explicitly lists SCSs for which the TA adjustment accuracy applies the for IAB-MT.

**Decision:** The document was **not treated**.

**R4-2320682 [NR\_IAB\_enh] Correction to IAB-MT TA adjustment accuracy requirements**

*Type: CR For: Agreement  
 38.174 v18.2.0 CR-0092 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

[NR\_IAB\_enh-Core] This CR explicitly lists SCSs for which the TA adjustment accuracy applies the for IAB-MT.

**Decision:** The document was **not treated**.

**R4-2320683 [NR\_IAB\_enh] Correction to applicable FR2 range in IAB-MT RRM performance requirements**

*Type: CR For: Agreement  
 38.174 v17.5.0 CR-0093 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

[NR\_IAB\_enh-Perf] This CR corrects the applicable FR2 range to FR2-1 in the RRM performance requirements for IAB-MT including test cases.

**Decision:** The document was **not treated**.

**R4-2320684 [NR\_IAB\_enh] Correction to applicable FR2 range in IAB-MT RRM performance requirements**

*Type: CR For: Agreement  
 38.174 v18.2.0 CR-0094 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

[NR\_IAB\_enh-Perf] This CR corrects the applicable FR2 range to FR2-1 in the RRM performance requirements for IAB-MT including test cases.

**Decision:** The document was **not treated**.

##### 5G\_V2X\_NRSL

**R4-2320687 [5G\_V2X\_NRSL] Draft CR on correction to interruption requirements in U2N relay operation under SL-DRX**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3875 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR clarifies that the interruption requirements due to SL-DRX operation/transitions in U2N relay apply only to the relay UE

**Decision: Revised to R4-2321475 (from R4-2320687).**

[**R4-2321475**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321475.zip) **[5G\_V2X\_NRSL] Draft CR on correction to interruption requirements in U2N relay operation under SL-DRX**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3875 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR clarifies that the interruption requirements due to SL-DRX operation/transitions in U2N relay apply only to the relay UE

**Decision: Return to.**

**R4-2320688 [5G\_V2X\_NRSL] Draft CR on correction to interruption requirements in U2N relay operation under SL-DRX**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3876 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR clarifies that the interruption requirements due to SL-DRX operation/transitions in U2N relay apply only to the relay UE

**Decision:** The document was **not treated**.

##### NB\_IOTenh4\_LTE\_eMTC6

**R4-2320755 [NB\_IOTenh4\_LTE\_eMTC6-Core] CR on 36.133 Fixing capability description for NB-IoT neighbor cell measurements in connected mode**

*Type: CR For: Agreement  
 36.133 v17.11.2 CR-7273 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320756 [NB\_IOTenh4\_LTE\_eMTC6-Core] CR on 36.133 Fixing capability description for NB-IoT neighbor cell measurements in connected mode**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7274 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

##### NR\_redcap

**R4-2319115 [NR\_redcap-Perf] CR to A.16.6.2.12 SSB and SMTC Config at Cell 2**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3708 rev Cat: F (Rel-17)  
  
 Source: Anritsu Corporation*

**Decision:** The document was **not treated**.

**R4-2319116 [NR\_redcap-Perf] CR to A.16.6.2.12 SSB and SMTC Config at Cell 2**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3709 rev Cat: A (Rel-18)  
  
 Source: Anritsu Corporation*

**Decision:** The document was **not treated**.

**R4-2319117 [NR\_redcap-Perf] CR to 16.5.3.1.2 and 16.5.3.2.2 Active BWP Switch TCs for RedCap**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3710 rev Cat: F (Rel-17)  
  
 Source: Anritsu Corporation*

**Decision:** The document was **not treated**.

**R4-2319118 [NR\_redcap-Perf] CR to 16.5.3.1.2 and 16.5.3.2.2 Active BWP Switch TCs for RedCap**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3711 rev Cat: A (Rel-18)  
  
 Source: Anritsu Corporation*

**Decision:** The document was **not treated**.

**R4-2319119 [NR\_redcap-Perf] CR to A.16.6.2.2, A.16.6.2.4, A.16.6.2.8 inter-frequency measurement with gap RedCap**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3712 rev Cat: F (Rel-17)  
  
 Source: Anritsu Corporation*

**Decision:** The document was **not treated**.

**R4-2319120 [NR\_redcap-Perf] CR to A.16.6.2.2, A.16.6.2.4, A.16.6.2.8 inter-frequency measurement with gap RedCap**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3713 rev Cat: A (Rel-18)  
  
 Source: Anritsu Corporation*

**Decision:** The document was **not treated**.

**R4-2319121 [NR\_redcap-Perf] CR to CSI-RS-based RLM for 2Rx RedCap**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3714 rev Cat: F (Rel-17)  
  
 Source: Anritsu Corporation*

**Decision:** The document was **not treated**.

**R4-2319122 [NR\_redcap-Perf] CR to CSI-RS-based RLM for 2Rx RedCap**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3715 rev Cat: A (Rel-18)  
  
 Source: Anritsu Corporation*

**Decision:** The document was **not treated**.

**R4-2319292 [NR\_redcap-Core] Disscussion on R17 RedCap RRM maintenance**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2319293 [NR\_redcap-Core] CR to Rel-17 TS 38.133: on NR RedCap HO**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3739 rev Cat: F (Rel-17)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2321479 (from R4-2319293).**

[**R4-2321479**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321479.zip) **[NR\_redcap-Core] CR to Rel-17 TS 38.133: on NR RedCap HO**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3739 rev Cat: F (Rel-17)  
  
 Source: ZTE Corporation*

**Decision: Return to.**

**R4-2319294 [NR\_redcap-Core] CR to Rel-18 TS 38.133: on NR RedCap HO**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3740 rev Cat: A (Rel-18)  
  
 Source: ZTE Corporation*

**Decision:** The document was **not treated**.

**R4-2319345 [NR\_redcap-Perf] Correction to FR1 RedCap test cases**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3750 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon, Starpoint*

**Decision:** The document was **not treated**.

**R4-2319346 [NR\_redcap-Perf] Correction to RedCap RMCs and test cases\_R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3751 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon, Starpoint*

**Decision:** The document was **not treated**.

**R4-2319830 [NR\_redcap-Perf] CR to TS 38.133: Corrections to RedCap test cases (Rel 17)**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3780 rev Cat: F (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision:** The document was **not treated**.

**R4-2319831 [NR\_redcap-Perf] CR to TS 38.133: Corrections to RedCap test cases (Rel 18)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3781 rev Cat: A (Rel-18)  
  
 Source: Rohde & Schwarz*

**Decision:** The document was **not treated**.

**R4-2319975 [NR\_redcap-Core] CR on INACTIVE requirements**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3799 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2321480 (from R4-2319975).**

[**R4-2321480**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321480.zip) **[NR\_redcap-Core] CR on INACTIVE requirements**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3799 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2319976 [NR\_redcap-Core] CR on INACTIVE requirements R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3800 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision:** The document was **not treated**.

**R4-2320135 Update to CG-SDT test cases for RedCap based on RAN5 feedback**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3812 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

RAN4 agreed to update the CG-SDT test cases based on RAN5 feedback in R5-235340). Similar changes were agreed for NR CG-SDT test cases (R4-2317398) which are used as reference for defining the RedCap test cases.

**Decision:** The document was **not treated**.

**R4-2320136 Update to CG-SDT test cases for RedCap based on RAN5 feedback**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3813 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

RAN4 agreed to update the CG-SDT test cases based on RAN5 feedback in R5-235340). Similar changes were agreed for NR CG-SDT test cases (R4-2317398) which are used as reference for defining the RedCap test cases.

**Decision:** The document was **not treated**.

**R4-2320481 [NR\_redcap-Perf] redCap HO test cases update**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3854 rev Cat: F (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

NR Cell SNR configuration during T3 period

**Decision:** The document was **withdrawn**.

**R4-2320482 [NR\_redcap-Perf] redCap HO test cases update**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3855 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **not treated**.

**R4-2320803 Corrections of SDT Test Case Parameters for RedCap**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3892 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2321484 (from R4-2320803).**

[**R4-2321484**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321484.zip) **Corrections of SDT Test Case Parameters for RedCap**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3892 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2320804 CR 38.133 Corrections of SDT Test Case Parameters for RedCap**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3893 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320859 Corrections to NR Measurements with Autonomous Gaps for RedCap**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3894 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320860 Corrections to NR Measurements with Autonomous Gaps for RedCap**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3895 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

**R4-2320874 DraftCR: L1-RSRP measurement for beam reporting accuracy**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3900 rev Cat: F (Rel-17)  
  
 Source: Ericsson, Huawei, HiSilicon*

**Abstract:**

Current specification contains placeholders for L1-RSRP measuremnet for beam reporting accuracy test cases. But the tests missing which are introduced in this CR.

**Decision:** The document was **not treated**.

**R4-2320875 Editorial corrections to rel-17 RedCap test cases**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3901 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Removal of squarebrackets in test cases. Similar changes were already made for Rel-17 spec at RAN4#108 meeting thus some values are without [ ] in Rel-17 spec but some are with [ ] in Rel-18 spec.

**Decision:** The document was **not treated**.

**R4-2320876 Correction of requirements and parameters for RedCap testing**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3902 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Correction of requirements and parameters for RedCap testing

**Decision: Revised to R4-2321485 (from R4-2320876).**

[**R4-2321485**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321485.zip) **Correction of requirements and parameters for RedCap testing**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3902 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Correction of requirements and parameters for RedCap testing

**Decision: Return to.**

**R4-2320877 Correction to relaxed RLM/BFD requirements**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3903 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR contains corrections to relaxed RLM/BFD requirements.

**Decision:** The document was **not treated**.

**R4-2320895 [NR\_redcap-Perf] redCap HO test cases update**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3906 rev Cat: F (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

NR Cell SNR configuration during T3 period

**Decision:** The document was **withdrawn**.

**R4-2320934 NR\_redcap-Perf Formal CR to Rel-17 TS 38.133: on RedCap Perf maintenance in TS 38.133**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3908 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2321486 (from R4-2320934).**

[**R4-2321486**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321486.zip) **NR\_redcap-Perf Formal CR to Rel-17 TS 38.133: on RedCap Perf maintenance in TS 38.133**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3908 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Return to.**

**R4-2320935 NR\_redcap-Perf Formal CR to Rel-18 TS 38.133: on RedCap Perf maintenance in TS 38.133**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3909 rev Cat: A (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2321487 (from R4-2320935).**

[**R4-2321487**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321487.zip) **NR\_redcap-Perf Formal CR to Rel-18 TS 38.133: on RedCap Perf maintenance in TS 38.133**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3909 rev Cat: A (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Return to.**

**R4-2320939 [NR\_redcap] RLM and BFD test cases in FR2 RedCap – R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3913 rev Cat: F (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

Note; The CR coversheet release is not Rel-17 on coversheet.

**Decision:** The document was **withdrawn**.

**R4-2320940 [NR\_redcap] RLM and BFD test cases in FR2 RedCap – R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3914 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **withdrawn**.

**R4-2320941 [NR\_redcap] High priority search with eDRX in IDLE mode – R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3915 rev Cat: F (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

Note: The CR coversheet does not have Rel-17 as release.

**Decision:** The document was **withdrawn**.

**R4-2320942 [NR\_redcap] High priority search with eDRX in IDLE mode – R17**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3916 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **withdrawn**.

**R4-2320943 [NR\_redcap] Correction CR for eDRX operation in IDLE mode – RedCap clauses (R17)**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3917 rev Cat: F (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

Note: The CR coversheet release should be Rel-17 but it is not on the coversheet.

**Decision:** The document was **withdrawn**.

**R4-2320944 [NR\_redcap] Correction CR for eDRX operation in IDLE mode – RedCap clauses (R18)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3918 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **withdrawn**.

**R4-2320945 [NR\_redcap] Correction CR for eDRX operation in IDLE mode – Non-RedCap clauses (R17)**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3919 rev Cat: F (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **withdrawn**.

**R4-2320946 [NR\_redcap] Correction CR for eDRX operation in IDLE mode – Non-RedCap clauses (R18)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3920 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **withdrawn**.

**R4-2320981 [NR\_redcap] RLM and BFD test cases in FR2 RedCap – R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3933 rev Cat: F (Rel-17)  
  
 Source: Qualcomm*

**Decision:** The document was **not treated**.

**R4-2320982 [NR\_redcap] RLM and BFD test cases in FR2 RedCap (R18)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3934 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **not treated**.

**R4-2320983 [NR\_redcap] High priority search with eDRX in IDLE mode – R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3935 rev Cat: F (Rel-17)  
  
 Source: Qualcomm*

**Decision: Revised to R4-2321481 (from R4-2320983).**

[**R4-2321481**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321481.zip) **[NR\_redcap] High priority search with eDRX in IDLE mode – R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3935 rev Cat: F (Rel-17)  
  
 Source: Qualcomm*

**Decision: Return to.**

**R4-2320984 [NR\_redcap] High priority search with eDRX in IDLE mode (R18)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3936 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **not treated**.

**R4-2320985 [NR\_redcap] Correction CR for eDRX operation in IDLE mode – RedCap clauses (R17)**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3937 rev Cat: F (Rel-17)  
  
 Source: Qualcomm*

**Decision: Revised to R4-2321482 (from R4-2320985).**

[**R4-2321482**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321482.zip) **[NR\_redcap] Correftion CR for eDRX operation in IDLE mode – RedCap clauses (R17)**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3937 rev Cat: F (Rel-17)  
  
 Source: Qualcomm*

**Decision: Return to.**

**R4-2320986 [NR\_redcap] Correction CR for eDRX operation in IDLE mode - RedCap clauses (R18)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3938 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **not treated**.

**R4-2320987 [NR\_redcap] Correction CR for eDRX operation in IDLE mode – Non-RedCap clauses (R17)**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3939 rev Cat: F (Rel-17)  
  
 Source: Qualcomm*

**Decision: Revised to R4-2321483 (from R4-2320987).**

[**R4-2321483**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321483.zip) **[NR\_redcap] Correction CR for eDRX operation in IDLE mode – Non-RedCap clauses (R17)**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3939 rev Cat: F (Rel-17)  
  
 Source: Qualcomm*

**Decision: Return to.**

**R4-2320988 [NR\_redcap] Correction CR for eDRX operation in IDLE mode - Non-RedCap clauses (R18)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3940 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision:** The document was **not treated**.

**R4-2321002 [NR\_redcap-Perf] redCap HO test cases update**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3945 rev Cat: F (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

NR Cell SNR configuration during T3 period

**Decision:** The document was **not treated**.

##### Other

**R4-2319461 [NR\_newRAT-Perf] Draft CR on FR1-FR2 test cases for HO with PSCell**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3771 rev Cat: F (Rel-17)  
  
 Source: OPPO*

**Decision:** The document was **withdrawn**.

**R4-2319462 [NR\_newRAT-Perf] Draft CR on FR1-FR2 test cases for HO with PSCell**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3772 rev Cat: A (Rel-18)  
  
 Source: OPPO*

**Decision:** The document was **not treated**.

**R4-2320130 DraftCR: L1-RSRP measurement for beam reporting accuracy**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3807 rev Cat: F (Rel-17)  
  
 Source: Ericsson, Huawei, HiSilicon*

**Abstract:**

Note: This is reserved for Rel-17 but the CR coversheet is Rel-18. Current specification contains placeholders for L1-RSRP measuremnet for beam reporting accuracy test cases. But the tests missing which are introduced in this CR.

**Decision:** The document was **withdrawn**.

**R4-2320131 DraftCR: L1-RSRP measurement for beam reporting accuracy**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3808 rev Cat: A (Rel-18)  
  
 Source: Ericsson, Huawei, HiSilicon*

**Abstract:**

Current specification contains placeholders for L1-RSRP measuremnet for beam reporting accuracy test cases. But the tests missing which are introduced in this CR.

**Decision:** The document was **not treated**.

**R4-2320132 Editorial corrections to rel-17 RedCap test cases**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3809 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Note: This CR was reserved for Rel-18, but the CR coversheet is for Rel-17. Removal of squarebrackets in test cases. Similar changes were already made for Rel-17 spec at RAN4#108 meeting thus some values are without [ ] in Rel-17 spec but some are with [

**Decision:** The document was **withdrawn**.

**R4-2320133 Correction of requirements and parameters for RedCap testing**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3810 rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Correction of requirements and parameters for RedCap testing

**Decision:** The document was **withdrawn**.

**R4-2320134 Correction of requirements and parameters for RedCap testing**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3811 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Correction of requirements and parameters for RedCap testing

**Decision:** The document was **not treated**.

**R4-2320144 Correction to relaxed RLM/BFD requirements**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3814 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Note: The reserved CR is for Rel-17 specification, but the CR coversheet is for Rel-18. This CR contains corrections to relaxed RLM/BFD requirements.

**Decision:** The document was **withdrawn**.

**R4-2320145 Correction to relaxed RLM/BFD requirements**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3815 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR contains corrections to relaxed RLM/BFD requirements.

**Decision:** The document was **not treated**.

**R4-2320618 CR to 38.133 for scg activation and deactivation test case**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3873 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR is to update the test case in TS 38.133

**Decision:** The document was **withdrawn**.

### 5.3 Rel-17 TEI

##### Inter-band synchronous EN-DC

**R4-2318630 Missing requriement for inter-band synchronous EN-DC**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3690 rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision:** The document was **not treated**.

##### eDRX INACTIVE requirements for non-Redcap UEs

**R4-2320589 CR on eDRX INACTIVE requirements for non-Redcap UEs**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3872 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc.*

**Decision:** The document was **not treated**.

**R4-2318065 CR on eDRX INACTIVE requirements for non-Redcap UEs**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3659 rev Cat: A (Rel-18)  
  
 Source: MediaTek inc.*

**Decision:** The document was **not treated**.

**R4-2318064 CR on eDRX INACTIVE requirements for non-Redcap UEs**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3658 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc.*

**Decision:** The document was **withdrawn**.

### 5.4 Moderator summary and conclusions (for Agenda 5)

#### Topic: [109][202] Maintenance\_R17\_R18

**R4-2318158 Topic summary for [109][202] Maintenance\_R17\_R18**

*Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

[109][200] RRM Session AI 5.2.3, 5.3, 6.2.3, 6.3

**Decision: Noted.**

[**R4-2321335**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321335.zip) **Ad-hoc minutes on [202] [203] [204] R17 and R18 Maintenance**

*Type: other For: Approval  
 Source: Apple*

**Decision: Return to.**

#### Topic: [109][203] NR\_redcap

**R4-2318159 Topic summary for [109][203] NR\_redcap**

*Type: other For: Information  
 Source: Modrator (Ericsson)*

**Abstract:**

[109][200] RRM Session AI 5.2.3

**Decision: Noted.**

## 6 Rel-18 maintenance for LTE and NR

**Guidance for maintenance agendas (AI 4, AI 5 and AI 6)**

The following guidance are provided for AI 4, AI5 and AI6:

- For maintenance agenda AI 4 (up to Rel-16), AI 5 (Rel-17) and AI 6 (Rel-18), formal CRs are expected and multiple formal CRs per company in the lowest agenda are allowed. For tracking the changes easily, it expected that one batch of CRs (Cat-F/A/…) will just cover a single topic/WI rather than multiple topics/WIs and Cat-F CR with corresponding Cat-A CRs needs be submitted under the same agenda.

- When submitting contributions to AI 4, AI 5 and AI 6, please add [WI\_code] in the beginning of titles for both discussion files and CRs to facilitate moderators and session chairs handling.

- When reserving the tdoc number, please use the correct WI code rather than simply using TEI and fill the column of “Related WIs” in your reservation spreadsheet. If you submit a CR with TEI as WI code, please inform session chair.

### 6.2 Rel-18 non-spectrum related WI maintenance

#### 6.2.4 Other dedicated Rel-18 Wis

##### 6.2.4.1 NB-IoT/eMTC core & perf. requirements for NTN

###### 6.2.4.1.3 RRM requirement

**R4-2318066 Discussion on RRM requirements maintenance for LTE NB-IoT/eMTC over NTN**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2318067 CR for UE transmit timing requirements for IoT NTN**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7250 rev Cat: F (Rel-18)  
  
 Source: MediaTek inc.*

**Decision:** The document was **not treated**.

**R4-2318068 CR for RLM for IoT NTN**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7251 rev Cat: F (Rel-18)  
  
 Source: MediaTek inc.*

**Decision:** The document was **not treated**.

**R4-2318069 CR on test case for Cell re-selection for IoT NTN**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7252 rev Cat: F (Rel-18)  
  
 Source: MediaTek inc.*

**Decision:** The document was **withdrawn**.

**R4-2318070 CR on test for Random access, timing and signalling characteristics for LTE NB-IoT/eMTC over NTN**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7253 rev Cat: F (Rel-18)  
  
 Source: MediaTek inc.*

**Decision:** The document was **withdrawn**.

**R4-2318071 CR on test case of channel quality reporting accuracy**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7254 rev Cat: F (Rel-18)  
  
 Source: MediaTek inc.*

**Decision:** The document was **withdrawn**.

**R4-2319350 Discussion on RRM requirements maintenance for IoT NTN**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319351 CR on maintenance of NB-IoT for IoT NTN**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7256 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2321467 (from R4-2319351).**

[**R4-2321467**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321467.zip) **CR on maintenance of NB-IoT for IoT NTN**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7256 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2319834 [LTE\_NBIoT\_eMTC\_NTN\_req-Perf] CR to TS 36.133: Corrections to IoT NTN test cases (Rel 18)**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7259 rev Cat: F (Rel-18)  
  
 Source: Rohde & Schwarz*

**Decision: Revised to R4-2321469 (from R4-2319834).**

[**R4-2321469**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321469.zip) **[LTE\_NBIoT\_eMTC\_NTN\_req-Perf] CR to TS 36.133: Corrections to IoT NTN test cases (Rel 18)**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7259 rev Cat: F (Rel-18)  
  
 Source: Rohde & Schwarz*

**Decision: Return to.**

**R4-2320137 Discussions on open issues of IoT NTN core and performance requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

The IoT NTN WI was completed but there are still some unresolved issues in the specification that need to be resolved. In this paper we discuss those open issues of core and performance part and provide our view.

**Decision: Noted.**

**R4-2320138 PHR reporting requirements for NB-IoT over NTN**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7260 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

CR to finalize the PHR reporting requirements.

**Decision: Revised to R4-2321470 (from R4-2320138).**

[**R4-2321470**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321470.zip) **PHR reporting requirements for NB-IoT over NTN**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7260 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

CR to finalize the PHR reporting requirements.

**Decision: Return to.**

**R4-2320139 Correction to IDLE mode Rel-18 IoT NTN requirements**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7261 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

CR related to the open issues in current specification.

**Decision: Revised to R4-2321468 (from R4-2320139).**

[**R4-2321468**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321468.zip) **Correction to IDLE mode Rel-18 IoT NTN requirements**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7261 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

CR related to the open issues in current specification.

**Decision: Return to.**

**R4-2320147 Correction to IoT NTN eMTC test cases**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7262 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR contains correction to use of RMCs in IoT NTN eMTC tests.

**Decision: Revised to R4-2321471 (from R4-2320147).**

[**R4-2321471**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321471.zip) **Correction to IoT NTN eMTC test cases**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7262 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR contains correction to use of RMCs in IoT NTN eMTC tests.

**Decision: Return to.**

**R4-2320590 CR on test case for Cell re-selection for IoT NTN**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7263 rev Cat: F (Rel-18)  
  
 Source: MediaTek inc.*

**Decision:** The document was **not treated**.

**R4-2320591 CR on test for Random access, timing and signalling characteristics for LTE NB-IoT/eMTC over NTN**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7264 rev Cat: F (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2321472 (from R4-2320591).**

[**R4-2321472**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321472.zip) **CR on test for Random access, timing and signalling characteristics for LTE NB-IoT/eMTC over NTN**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7264 rev Cat: F (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Return to.**

**R4-2320592 CR for test case of channel quality reporting accuracy**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7265 rev Cat: F (Rel-18)  
  
 Source: MediaTek inc.*

**Decision:** The document was **not treated**.

**R4-2320745 Discussion on current maintenance issues for NB-IoT over NTN**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

### 6.3 Rel-18 TEI

### 6.4 Moderator summary and conclusions

#### Topic: [109][204] LTE\_NBIOT\_eMTC\_NTN\_req

**R4-2318160 Topic summary for [109][204] LTE\_NBIOT\_eMTC\_NTN\_req**

*Type: other For: Information  
 Source: Moderator (MediaTek)*

**Abstract:**

[109][200] RRM Session AI 6.2.4.1.3

**Decision: Noted.**

## 8 Rel-18 on-going non-spectrum related work items and study items for NR

### 8.7 Requirement for NR FR2 multi-Rx chain DL reception

#### 8.7.2 RRM core requirements for simultaneous DL reception from different directions

**R4-2319040 Big CR to TS 38.133 for RRM requirements for NR FR2 multi-Rx chain DL reception**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3705 rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Return to.**

##### 8.7.2.1 General aspects

**R4-2318499 Discussion on feature list for multi-Rx UEs**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2318689 On general aspects for NR FR2 multi-Rx chain DL reception**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318690 Draft LS on associated UE capabilities for UE indication of FR2 multi-RX operation**

*Type: LS out For: Approval  
 to RAN2, RAN1  
 Source: Apple*

**Decision: Return to.**

**R4-2318851 Discussion on general aspects for Multi-RX**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: xiaomi*

**Decision: Noted.**

**R4-2319041 Remaining issues on general aspects for FR2 multi-Rx**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319272 On general aspects of multi-Rx**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319358 Discussion on general aspects for NR FR2 multi-Rx**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319463 On general aspects for FR2\_multiRX\_DL**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319724 Discussion on UE capability for Multi-Rx**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Samsung*

**Decision: Noted.**

**R4-2320424 Discussion on general aspects on RRM requirements for simultaneous DL reception from different directions**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2320461 On general aspects**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On general aspects on multi-rx

**Decision: Noted.**

##### 8.7.2.2 L1-RSRP measurement delay

**R4-2318691 On L1 measurements for NR FR2 multi-Rx chain DL reception**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318692 draft CR on L1 measurement**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2319042 Remaining issues on L1-RSRP measurement delay for FR2 multi-Rx**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319273 On multi-Rx L1-RSRP measurements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319274 Draft CR on multi-Rx L1-SINR requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2319464 On L1-RSRP measurement for FR2\_multiRX\_DL**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319722 Discussion on L1-RSRP measurement for Multi-Rx**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Samsung*

**Decision: Noted.**

**R4-2319956 Discussion on L1-RSRP measurements for R18 FR2 multi-Rx chain DL reception**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319957 DraftCR on L1-RSRP measurement requirements for FR2 multi-Rx enhancement**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320425 Discussion on L1-RSRP measurement requirements for simultaneous DL reception from different directions**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2320462 On L1-RSRP measurements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On L1-RSRP measurements on multi-rx

**Decision: Noted.**

##### 8.7.2.3 RLM and BFD/CBD requirements

**R4-2318693 On RLM and BFD/CBD for NR FR2 multi-Rx chain DL reception**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2319043 Remaining issues on RLM and BFD/CBD requirements for FR2 multi-Rx**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319275 On multi-Rx RLM, BFD and CBD requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319276 Draft CR on multi-Rx TRP-specific BFD requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2319465 On RLM and BFD CBD requirement for FR2\_multiRX\_DL**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319466 Draft CR for BFD&CBD related requirements of R18 multi-Rx DL(8.5 in 38.133)**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: OPPO*

**Decision: Return to.**

**R4-2320426 Discussion on RLM, BFD and CBD for simultaneous DL reception from different directions**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2320433 [NR\_FR2\_multiRX\_DL-Core] Draft CR on TRP specific link recovery for multi-Rx**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Return to.**

**R4-2320463 On RLM and beam management**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On RLM and beam management

**Decision: Noted.**

**R4-2320465 Draft CR on RLM requirements for UE with multi-rx chain in FR2**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR on RLM requirements for UE with multi-rx chain in FR2

**Decision: Return to.**

##### 8.7.2.4 Scheduling/measurement restrictions

**R4-2318500 Discussion on scheduling and measurement restriction for multi-Rx UEs**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2318653 On scheduling/measurement restrictions for multiple Rx chains**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2319044 Remaining issues on scheduling and measurement restrictions for FR2 multi-Rx**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319277 On multi-Rx scheduling and measurement restrictions**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319723 Discussion on measurement and scheduling restriction for Multi-Rx**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Samsung*

**Decision: Noted.**

**R4-2320428 Discussion on scheduling restriction and measurement restriction for simultaneous DL reception from different directions**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision:** The document was **withdrawn**.

**R4-2320760 Scheduling restriction and sharing factor for layer-3 measurements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss Scheduling restriction and sharing factor for layer-3 measurements

**Decision: Noted.**

##### 8.7.2.5 TCI state switching delay with dual TCI

**R4-2318694 On TCI state switching for NR FR2 multi-Rx chain DL reception**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318695 draft CR on DCI based TCI state switch and active TCI state list update**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2318852 Discussion on TCI activation for Multi-RX**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: xiaomi*

**Decision: Noted.**

**R4-2319045 Remaining issues on TCI state switch delay for FR2 multi-Rx**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319278 On multi-Rx TCI state switching requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319279 Draft CR on multi-Rx TCI state switching requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2319359 Discussion on TCI state switching delay with dual TCI for NR FR2 multi-Rx**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319360 Draft CR on TCI state switching requirements for FR2 multi-Rx chain DL reception**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2319467 On TCI state switching for FR2 multi-Rx DL**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2320761 On dual TCI state switch requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss On dual TCI state switch requirements

**Decision: Noted.**

**R4-2320762 MAC-CE based dual TCI state switch**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

MAC-CE based dual TCI state switch

**Decision:** The document was **withdrawn**.

##### 8.7.2.6 Receive timing difference between different directions

**R4-2318696 On Receive timing difference between different directions for NR FR2 multi-Rx chain DL reception**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318697 draft CR on capturing RTD < CP as a condition for multi-RX RRM requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2319046 Remaining issues on RTD requirements for FR2 multi-Rx**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2320427 Discussion on receiving time difference**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2320724 Discussion on Multi-RX RRM MRTD requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320725 Draft CR MRTD requirements for Multi Rx**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2320763 On extending GBBR L1-RSRP to RTD>CP**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss On dual TCI state switch requirements

**Decision: Noted.**

#### 8.7.3 RRM performance requirements

**R4-2318698 On RRM performance requirements for NR FR2 multi-Rx chain DL reception**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2319047 Discussion on performance requirements for FR2 multi-Rx**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319280 On multi-Rx performance requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319361 Discussion on performance requirements for FR2 multi-RX**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319468 Discussion on test cases for FR2 multi-Rx**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2320464 On RRM performance aspects**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On RRM performance aspects

**Decision: Noted.**

**R4-2320513 Discussion on performance requirements multi-Rx**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

#### 8.7.5 Moderator summary and conclusions

Topic: [109][206] FR2\_multiRx\_part1

**R4-2318162 Topic summary for [109][206] FR2\_multiRx\_part1**

*Type: other For: Information  
 Source: Moderator (Vivo)*

**Abstract:**

[109][200] RRM Session AI 8.7.2.1, 8.7.2.3, 8.7.2.4, 8.7.3

**Decision: Noted.**

[**R4-2321325**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321325.zip) **Ad-hoc minutes on NR FR2 multi-Rx chain WI**

*Type: other For: Approval  
 Source: vivo*

**Decision: Return to.**

**Online session (Monday Nov 13, 2023)**

**Issue 1-3-5: UE ~~behaviour~~ requirement when a condition becomes violated during a measurement**

* Proposals
  + Option 1a: (vivo, Apple, Xiaomi, OPPO)
    - When the side conditions are changed with a transition between multi-Rx operation and no multi-Rx operation, the corresponding multi-Rx requirement is not applicable, and no UE ~~behavior~~ requirement needs to be defined.
  + Option 2: (ZTE)
    - When the condition of multi-Rx becomes violated during measurement, at least UE can continue the on-going L1 measurement.
    - When the condition of multi-Rx becomes violated during measurement, the measurement/scheduling restriction relaxation is not allowed any more.
    - When the condition of multi-Rx becomes violated during measurement, whether the requirements of L1 measurement period should be relaxed, depending on the final identified L1 measurement period requirements. If fast beam sweeping is applied during L1 measurement, then the condition and implementation of fast beam sweeping would impact the decision.
* Recommended WF
  + Further discuss

Moderator: can we agree option 1a?

ZTE: it is convienced that such con dition does not happen frequently.

Nokia: Which requirement this is related. Also the condition needs to be considered.

E///: Transition is needed for beam sweeping.

Vivo: for beam sweeping factor reduction, UE indication is not so frequent.

Vivo: Agree with the following understanding, but not need to specify anything additionally.

For the enhancement/relaxation for scheduling/measurement restriction:

* + - When the side condition of multi-Rx becomes violated, the measurement/scheduling restriction relaxation is not allowed.

E///: how UE handle the samples?

QC: it is up to UE.

ZTE: we agree the issue from E/// is valid.

Apple: If we discuss the requirement and side condition one by one, it is quite time consuming.

Session Chair: Can we go with option 1a to close the WI on time?

* + - When the side conditions are changed with a transition between multi-Rx operation and no multi-Rx operation, the corresponding multi-Rx requirement is not applicable, and no UE ~~behavior~~ requirement needs to be defined.

Nokia:

When the side conditions are changed with a transition between multi-Rx operation and no multi-Rx operation, the corresponding multi-Rx requirement is not applicable, and legacy requirement applies.

OPPO: longer time is expected. The legacy requirement can apply when UE restarte the measurement.

ZTE: longer time than the multi-Rx or legacy requirement? It is confusing.

Nokia: For measurement restrciton, we already know the legacy requirement.

Session chair: can we agree:

For the enhancement/relaxation for scheduling/measurement restriction:

When the side conditions are changed with a transition between multi-Rx operation and no multi-Rx operation, the corresponding multi-Rx requirement is not applicable, and [the legacy requirement with single-Rx applies].

Apple: no legacy requirement is some condition.

Vivo: typically UE can combine the samples with multi-Rx and single-Rx. The legacy requirement is measurement period or accuracy requirement? Any additional agreement will limit UE implementation.

Nokia: both

Qualcomm: we are going to very detailed discussion. What’s the timing for UE to do this.

Apple: there is no legacy reuqiremnet for some case.

QC: if the side condition for the legacy requirement can be met, the legacy requirement applies.

Apple: the transition period needs to be considered.

Vivo: we don’t conclude in this meeting. Company can bring concret proposal for each requirement/side condition in the maintenance part.

For the enhancement/relaxation for scheduling/measurement restriction:

Option A: When the side conditions are changed with a transition between multi-Rx operation and no multi-Rx operation, the corresponding multi-Rx requirement is not applicable~~, and [the legacy requirement with single-Rx applies]~~.

~~The above agreement can be revisited for the cases with no legacy requirement.~~

Option B: When the side conditions are changed with a transition between multi-Rx operation and no multi-Rx operation, the corresponding multi-Rx requirement is not applicable, and no UE requirement needs to be defined.

Option C: When the side conditions are not fulfilled ~~changed with a transition between multi-Rx operation and no multi-Rx operation~~, the corresponding multi-Rx requirement is not applicable.

* if the side condition for the legacy requirement is fulfilled, the legacy requirement applies.

For the requirement defined in the WI excepting the requirement for beam sweeping factor reduction:

* When the side conditions are not fulfilled, the corresponding multi-Rx requirement is not applicable.
* Companies may bring concrete proposal on UE requirement in the transition period for each requirement/side condition in the maintenance part.

Check if the above requirement can be applied for beam sweeping factor reduction in the ad-hoc.

Topic: [109][207] FR2\_multiRx\_part2

**R4-2318163 Topic summary for [109][207] FR2\_multiRx\_part2**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

[109][200] RRM Session AI 8.7.2.2, 8.7.2.5, 8.7.2.6

**Decision: Noted.**

**Online session (Monday Nov 13, 2023)**

**Issue 1-2-1: Measurement period for L1-RSRP configured for GBBR**

**Background:**

For SSB based L1-RSRP measurements in FR2 the measurement period for GBBR defined as:

|  |  |
| --- | --- |
| Configuration | TL1-RSRP\_Measurement\_Period\_SSB (ms) |
| non-DRX | max(TReport, ceil(M\*P\*N)\*TSSB) |
| DRX cycle ≤ 320ms | max(TReport, ceil(1.5\*M\*P\*N)\*max(TDRX,TSSB)) |
| DRX cycle > 320ms | ceil(1.5\*M\*P\*N)\*TDRX |
| Note 1: TSSB = ssb-periodicityServingCell is the periodicity of the SSB-Index configured for L1-RSRP measurement. TDRX is the DRX cycle length. TReport is configured periodicity for reporting.  Note 2: N is FFS | |

* N is FFS
* Option 1: N = [reduceNumberRxBeam] for UE supporting faster beam sweeping under multi-Rx operations; otherwise N=8. (vivo, OPPO, QC, HW, ZTE, MTK, Samsung)
* Option 2: N = 8 + K, where K is the number of SSBs in each CMR set (Apple)
* FFS: For CSI-RS based L1-RSRP measurements in FR2, the existing L1-RSRP measurement period is reused when configured for GBBR.

**Issue 1-2-2 a: measurement period for SSB based L1-RSRP configured for GBBR**

* Proposals
  + option 1: N = [reduceNumberRxBeam] for UE supporting faster beam sweeping under multi-Rx operations; otherwise, N=8
  + option 2: N = 8 + K, where K is the number of SSBs in each CMR set
* Recommended WF
  + Further discussion is needed

Apple: GBBR is the prerequisite. With option 1, UE does not the report the L1-RSRP in a paired way. With option 2, UE have the chance to check the interference, and with the improved performance. We still have strong view on option 2.

Xiaomi: Option 1 and 2 are talking different aspects. Option 1 is to allow fast measurement. Option 2 means the extra sample is for interference. L1-RSRP measurement is considered here.

Huawei: For L1-RSRP measurement, we just measure the power of the signal.

QC: Option 1 can activate two panels, and do measurement simulatousely.

* + option 1: N = [reduceNumberRxBeam] for UE supporting faster beam sweeping under multi-Rx operations; otherwise, N=8 (Huawei, OPPO, ZTE, QC, vivo, Xiaomi, Samsung, Ericsson)
  + option 2: N = 8 + K, where K is the number of SSBs in each CMR set

Apple: we can compromiset to consider different UE capabilities for the two options:

* + option 1: N = [reduceNumberRxBeam] for UE supporting faster beam sweeping under multi-Rx operations; otherwise, N=8
  + option 2: N = 8
  + option 3: N = 8+K

E///: we already agreed to use single panel to do measurement.

Apple: enhancement for single-Rx is not in the scope of the WI.

ZTE: option 1 and 2 comes from different aspects.

Select one of the two alternatives in this meeting:

Alternative 1:

* + N = [reduceNumberRxBeam] for UE supporting faster beam sweeping under multi-Rx operations [for GBBR]; otherwise, N=8
    - Note: A new capability is considered here.
  + N = 8+K [if the new UE capability is not reported].

Alternative 2: N =8.

**Issue 1-2-2 b: measurement period for CSI-RS based L1-RSRP**

* Proposals
  + Option 1: For CSI-RS based L1-RSRP measurements in FR2, the existing L1-RSRP measurement period is reused when configured for GBBR.
  + Option 2: For CSI-RS + CSI-RS, it is proposed to set N = ceil(maxNumberRxBeam / K) + 1, where K is the number of CSI-RSs in each CMR set
* Recommended WF
  + Further discussion is needed

**Issue 1-2-3: Measurement period for non-GBBR (i.e., measurement period of L1-RSRP not configured for GBBR)**

Proposals

* + Option 1: Consider faster beam sweeping factor related enhancement
  + Option 2: Do not consider enhancement to measurement period of L1-RSRP not configured for GBBR
* Recommended WF
  + Need further discussion

**Sub-topic 1-3: Others**

**Issue 1-3-1: Shall L1-SINR requirements be defined for the multi-RX UE**

* Proposals
  + Option 1: Yes
    - Changes in non-group-based L1-RSRP measurement delay due to multi Rx operation are also considered for L1-SINR
  + Option 2: NO
* Recommended WF
  + Need further discussion

**Issue 1-3-2a: Measurement period for L1-SINR (based on conclusion of issue 1-3-1)**

* Proposals
  + Option 1: Consider faster beam sweeping factor related enhancement
  + Option 2: Enhanced features for multi-Rx such as fast beam sweeping, measurement restriction relaxation, scheduling restriction relaxation can also be used for legacy L1-SINR measurement
* Recommended WF
  + Need further discussion

**Issue 1-3-2b: Other enhancements for L1-SINR (based on conclusion of issue 1-3-1)**

* Proposals
  + Proposal 1: Enhanced features for multi-Rx such as fast beam sweeping, measurement restriction relaxation, scheduling restriction relaxation can also be used for legacy L1-SINR measurement
* Recommended WF
  + Need further discussion

### 8.8 Even Further RRM enhancement for NR and MR-DC

#### 8.8.1 General aspects

#### 8.8.2 RRM core requirements for FR2 SCell activation delay reduction

**R4-2318648 Draft Big CR to TS 38.133 on R18 SCell activation enhancement**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3696 rev Cat: B (Rel-18)  
  
 Source: Apple, OPPO*

**Decision: Revised to R4-2321361 (from R4-2318648).**

[**R4-2321361**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321361.zip) **Draft Big CR to TS 38.133 on R18 SCell activation enhancement**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3696 rev Cat: B (Rel-18)  
  
 Source: Apple, OPPO*

**Decision: For post-meeting email approval.**

**R4-2318649 Feature list comments summary for SCell activation enhancement**

*Type: discussion For: Information  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2321005 Discussion on the UE capability for FR2 SCell activation enhancement**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

##### 8.8.2.1 Enhancement for FR2 SCell activation

**R4-2318646 On enhancement for FR2 SCell activation**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2319004 Enhancement for FR2 SCell activation**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319006 corrections to draft BigCR on FR2 SCell activation enhancement**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Merged.**

**R4-2319049 Discussion on remaining issues of FR2 SCell activation delay reduction**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319050 draftCR on measurement reporting delay requirement for FR2 SCell activation delay reduction**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Revised to R4-2321355 (from R4-2319050).**

[**R4-2321355**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321355.zip) **draftCR on measurement reporting delay requirement for FR2 SCell activation delay reduction**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Return to.**

**R4-2319355 Discussion on FR2 SCell activation delay reduction**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319356 Draft CR on introduction on RRM requirements for multiple FR2 SCell activation**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2321356 (from R4-2319356).**

[**R4-2321356**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321356.zip) **Draft CR on introduction on RRM requirements for multiple FR2 SCell activation**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2319469 On general for R18 eFeRRM**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2320419 Remaining discussion on the enhancement of FR2 SCell activation**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2320435 [NR\_RRM\_enh3-Core] Draft CR on multi-SCell activation with L3 reporting**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2321357 (from R4-2320435).**

[**R4-2321357**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321357.zip) **[NR\_RRM\_enh3-Core] Draft CR on multi-SCell activation with L3 reporting**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Return to.**

**R4-2320483 Discussion on remaining issues on enhancements for FR2 Unknown SCell activation**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2320484 DraftCR update on L3 measurement reporting based enhancements.**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2321358 (from R4-2320484).**

[**R4-2321358**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321358.zip) **DraftCR update on L3 measurement reporting based enhancements.**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Return to.**

**R4-2320485 DraftCR update on L3 reporting requirement for unknown FR2 Scell activaiton**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Merged.**

**R4-2320519 Remaining discussion on the enhancement of FR2 SCell activation**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2320764 On FR2 SCell activation delay reduction**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss On FR2 SCell activation delay reduction

**Decision: Noted.**

**R4-2320765 On FR2 SCell activation delay reduction**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

On FR2 SCell activation delay reduction

**Decision: Revised to R4-2321359 (from R4-2320765).**

[**R4-2321359**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321359.zip) **On FR2 SCell activation delay reduction**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

On FR2 SCell activation delay reduction

**Decision: Return to.**

**R4-2321004 Discussion on FR2 SCell activation enhancement**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

##### 8.8.2.2 Other enhancements for FR2 SCell activation

**R4-2318647 On UE capability for FR2 SCell activation**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2319005 R18 enhancements for other SCell activation scenarios**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319007 draftCR on enhancement for PUCCH SCell activation**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2321360 (from R4-2319007).**

[**R4-2321360**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321360.zip) **draftCR on enhancement for PUCCH SCell activation**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2319099 Discussion on UE capability for enhancement for FR2 SCell activation**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319518 Discussion on other enhancements for FR2 SCell activation**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted.**

**R4-2320766 On UE capabilities of FR2 Scell activation delay**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss On UE capabilities of FR2 Scell activation delay

**Decision: Noted.**

#### 8.8.3 RRM core requirements for FR1-FR1 NR-DC

**R4-2318650 On RRM requirements for FR1-FR1 NR-DC**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2319470 On remaining issues of RRM requirements for FR1+FR1 NR-DC**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319471 Big CR for R18 RRM enhancement - FR1+FR1 NR-DC**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3762 rev Cat: B (Rel-18)  
  
 Source: OPPO.*

Session Chair: The content of the CR is agreeable, and to implement the changes based on the latest version of specification for the revision.

**Decision: Revised to R4-2321368 (from R4-2319471).**

[**R4-2321368**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321368.zip) **Big CR for R18 RRM enhancement - FR1+FR1 NR-DC**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3762 rev Cat: B (Rel-18)  
  
 Source: OPPO.*

The content of the CR is agreeable, and implement the changes based on the latest version of specification for the revision.

**Decision: Return to.**

**R4-2320472 discussion on SCG activation for FR1+FR1 NR-DC**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

discussion on SCG activation delay for FR1+FR1 NR-DC RRM requirements

**Decision: Noted.**

**R4-2320473 draftCR on SCG activation for FR1+FR1 NR-DC**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

draftCR on SCG activation for FR1+FR1 NR-DC

**Decision: Return to.**

**R4-2320625 Discussion on eFeRRM core part**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution provide discussion on remaining issue for FR1-FR1 NR-DC

**Decision: Noted.**

#### 8.8.4 RRM performance requirements for FR2 SCell activation delay reduction

**R4-2318651 On FR2 SCell activation performance part**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2319008 Performance aspects for FR2 SCell activation delay reduction**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319100 Discussion on performance requirements for FR2 SCell activation delay reduction**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319357 Discussion on performance requirements for FR2 SCell activation delay reduction**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319472 Discussion on test cases for FR2 SCell activation**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319519 Discussion on RRM performance requirements for FR2 SCell activation delay reduction**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted.**

**R4-2320430 Discussion on the performance requirements for FR2 SCell activation enhancements**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2320486 View on RRM performance requirements for FR2 Scell activaiton delay reduction**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2320767 RRM performance requirements for FR2 SCell activation delay reduction**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss RRM performance requirements for FR2 SCell activation delay reduction

**Decision: Noted.**

**R4-2321006 Discussion on the performance requirements for FR2 SCell activation enhancement**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

#### 8.8.5 RRM performance requirements for FR1-FR1 NR DC

**R4-2319066 Discussion on test cases for RRM requirements for FR1+FR1 NR-DC**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319473 Discussion on RRM test case design and work splitting for FR1+FR1 NR-DC**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2320474 discussion on test cases for FR1+FR1 NR-DC**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

discussion on test cases for FR1+FR1 NR-DC

**Decision: Noted.**

**R4-2320624 Discussion for eFeRRM performance test**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution provide view on eFeRRM test case discussion

**Decision: Noted.**

**R4-2320879 View on RRM performance requirements FR1+FR1**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

#### 8.8.6 Moderator summary and conclusions

Topic: [109][208] NR\_RRM\_enh3\_part1

**R4-2318164 Topic summary for [109][208] NR\_RRM\_enh3\_part1**

*Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

[109][200] RRM Session AI 8.8.1, 8.8.2, 8.8.4

**Decision: Noted.**

**Online session (Wednesday Nov 15, 2023)**

**Issue 1-1: delay requirement or time margin for “L3 measurement reporting after SCell activation command”?**

|  |
| --- |
| *Agreement in RAN4#108bis meeting R4-2317350*   * Agreements:   + UE is ready to report the L3 report after SCell activation command on *N +* *THARQ* + 3ms + 4 ms.     - Note: The uncertainty of available UL resource for L3 report is not counted.     - [4 ms is the processing time for preparing L3 report triggered by MAC CE.] * Agreement:   + *UE is not required to report L3-RSRP report after exceeding [Y]ms*     - *Where Y= THARQ + 3ms + [M]ms,*        * *M = 4ms + X1\*Tssb+X2\*Tssb, if UE indicates capability of using SSB periodicity instead of SMTC periodicity*       * *Otherwise, M = 4ms + X1\*Tsmtc+X2\*Tssb* |

* Option 1 (Nokia):
  + The time margin beyond which UE is not required to send the L3 report shall include the time for L1-RSRP report i.e. TL1-RSRP,report.
  + The value of M is set as the following:
    - *M = max (THARQ + 3ms +4ms, X1\*Tssb+X2\*Tssb+[* TL1-RSRP,report*])*, if UE indicates capability of using SSB periodicity instead of SMTC periodicity
    - Otherwise, *M = max (THARQ + 3ms +4ms, X1\*Tsmtc+X2\*Tssb +[TL1-RSRP,report])*
  + For FR1, *M = max (THARQ + 3ms +4ms, Trs+ TL1-RSRP,measure + [TL1-RSRP,report])*.
* Option 2 (vivo):
  + Confirm that 4ms is the processing time for preparing L3 report triggered by MAC CE, and remove the following in draft CR.
    - ‘UE is expected to report the L3 results no earlier than 7ms + THARQ after receiving the SCell activation command.’
* Option 3 (MTK):
  + - UE is not expected to report L3 measurement report during (THARQ + 3ms + 4ms).
* Recommended WF:
* Option 4 (Moderator):
  + UE is ready to report the L3 report after SCell activation command on *N +* *THARQ* + 3ms + 4 ms.
    - Note: The uncertainty of available UL resource for L3 report is not counted.
    - [4 ms is the processing time for preparing L3 report triggered by MAC CE.]

Agreement:

UE is ready to report the L3 results no later than 7ms + THARQ after receiving the SCell activation command

**o   The value of M is updated as the following:**

**o   For FR2,**

* + ***M = THARQ + 3ms + ~~max (4ms,~~X1\*Tssb+X2\*Tssb+[*TL1-RSRP,report*]~~)~~*, if UE indicates capability of using SSB periodicity instead of SMTC periodicity**
  + **Otherwise, *M = THARQ + 3ms +~~max (4ms,~~ X1\*Tsmtc+X2\*Tssb +[TL1-RSRP,report]~~)~~***

**o   For FR1,**

* + ***M = THARQ + 3ms + ~~max (4ms,~~Tssb+ Tssb+ [TL1-RSRP,report]~~)~~*, if UE indicates capability of using SSB periodicity instead of SMTC periodicity**
  + **Otherwise, *M = THARQ + 3ms +~~max (4ms,~~ Tsmtc+ Tssb+ [TL1-RSRP,report]~~)~~***

HW: agree with Apple. From UE ability perspective, not all the UEs need the 4ms time. The availability of UL grant can be considered additionally.

vivo: THARQ + 3ms is no RAN1 spec, no need to consider in RAN4 spec. For the 4ms, agree with Apple and Huawei.

QC: the option 4 does not mean UE will report during the maximum processing time. The availability of UL grant can be considered additionally. x

Apple: with TL1-RSRP,report added, we can still see the gain of the feature.

Apple: the TL1-RSRP,report impact the time UE hold the measurement results.

MTK: x1 cannot be 0.

Apple: we compare the gain with the legacy L1-RSRP.

Apple: some scenario can happen, but define the requirement in a simpler way.

Agreement:

UE is ready to report the L3 results no later than 7ms + THARQ after receiving the SCell activation command

**o   The value of M is updated as the following:**

**o   For FR2,**

* + ***M = THARQ + 3ms + ~~max (4ms,~~X1\*Tssb+X2\*Tssb+[*TL1-RSRP,report*]~~)~~*, if UE indicates capability of using SSB periodicity instead of SMTC periodicity**
  + **Otherwise, *M = THARQ + 3ms +~~max (4ms,~~ X1\*Tsmtc+X2\*Tssb +[TL1-RSRP,report]~~)~~***

**o   For FR1,**

* + ***M = THARQ + 3ms + ~~max (4ms,~~Tssb+ Tssb+ [TL1-RSRP,report]~~)~~*, if UE indicates capability of using SSB periodicity instead of SMTC periodicity**
  + **Otherwise, *M = THARQ + 3ms +~~max (4ms,~~ Tsmtc+ Tssb+ [TL1-RSRP,report]~~)~~***

**Issue 1-3: FR2 unknown PUCCH SCell activation enhancement**

* Option 1 (Apple, QC):
  + PL-RS measurement sample number in R18 FR2 unknown PUCCH SCell activation enhancement is same as R17 PUCCH SCell activation, i.e., 3\*Ttarget\_PL-RS.
* Option 2 (Nokia):
  + R18 enhancement solutions are applicable to PUCCH SCell activation by referring to the enhanced SCell activation delay in the new clause 8.3.x for UE configured with *[reportOnactivation]*.
  + If the UE indicates X2=0, the PL-RS measurement shall be skipped during PUCCH SCell activation.
* Recommended WF
  + TBA

Nokia: the intention is to reduce the time. Can UE use L3 result as PL-RS result?

QC: PL-RS for PUCCH acitvaiton. Prefer the legacy approach.

Apple: we understand the poisitons from network and UE sides. Option 2 is further enhancement. Use option 1 to close the WI?

HW: agree with Apple. PL-RS is to decide uplink Tx power. With option 2, the measurement results are that reliable.

Agreement:

* + PL-RS measurement sample number in R18 FR2 unknown PUCCH SCell activation enhancement is same as R17 PUCCH SCell activation, i.e., [3]\*Ttarget\_PL-RS.

**Issue 1-2: Whether SCell activation triggered L3 report is on one serving cell in same band or on all serving cells**

|  |  |  |
| --- | --- | --- |
| *RAN2 agreement in #123bis meeting:*  *Agreements:*  *1. If the network activates multiple Scells within same MAC CE the UE may send only one measurement report.*  *Previous agreement in RAN4 #107 R4-2310081*  *Issue 1-1-2: waiting RAN2 conclusions for when/how/what to report L3 measurement results for unknown FR2 SCell activation enhancement (previous issue 1-1-1, 1-1-2, 1-1-3, 1-1-4, 1-1-5 in R4-2306315), except the FFS for additional solution in issue 1-1-1*   * *Agreement:*   + *RAN4 to wait for RAN2 conclusion on triggering/configuration/reporting, and there is no need to have further discussion in RAN4.*   *Previous agreement in RAN4 #106bis R4-2306315*  *Issue 1-1-4: FFS on how to report L3 measurement result for unknown FR2 SCell activation enhancement*   * *Agreement:*    + *Send LS (R4-2306321) to let RAN2 to decide.*  |  |  | | --- | --- | | * *Technical enhancement goal: RAN4 had following agreements in RAN4 #106-bis-e meeting,*  |  | | --- | | * *Agreements (GTW, Monday Apr 17, 2023)*   + *UE needs to report the L3 measurement result after SCell activation command*   + *FFS if additional solutions should be considered. Decision on additional solutions need to be made no later that in RAN4 #107.* |  * *Action Request to RAN2: RAN4 requests RAN2 to design corresponding signaling for “report of L3 measurement result” after SCell activation command for unknown FR2 SCell activation enhancement, and it’s up to RAN2’s decision on which layer’s signaling shall be used.* | |

* Proposals
  + Option 1 (Apple, ZTE, Ericsson, QC): RAN4 to not discuss the RAN2 signalling design of L3 measurement report upon SCell activation command, i.e., whether L3 report is on one serving cell in same band or on all serving cells.
  + Option 2 (Nokia):
    - UE does not need to report L3 measurement resulting if UE has no valid measurement results for any of the SCells on the same FR2 band.
    - The SCell activation triggered L3 report is considered when determining known/unknown state in the same way as legacy L3 measurement reporting.
  + Option 3 (HW): RAN4 to discuss the following case:
    - When more than one servingCellMOs are configured within the same band and UE report multiple report upon receiving SCell activation command, whether UE should report multiple report if the report beams are different and how to configure the TCI for SCell activation.
* Recommended WF
  + [Moderator]: According to the previous agreements, this issue can be left to RAN2 for decision. Please companies double check if we really need to open further discussion in RAN4.

HW: ok with moderator. RAN2 is not aware of the issue.

Agreement: According to the previous agreements, this issue can be left to RAN2 for decision. Further discusision in RAN4 in maintenance part is not precluded.

**Agreement:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Need for the gNB to know if the feature is supported** | **Applicable to the capability signalling exchange between UEs (V2X WI only)”.** | **Consequence if the feature is not supported by the UE** | **Type**  **(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Capability interpretation for mixture of FDD/TDD and/or FR1/FR2** | **Note** | **Mandatory/Optional** |
| 31. NR\_RRM\_enh3 | 31-1 | Enhanced L3 measurement reporting for unknown SCell activation | Support of reporting valid L3 measurement results triggered by the SCell activation command |  | Yes | N/A | UE does not support reporting valid L3 measurement results triggered by SCell activation command | Per UE | No | No | N/A | UE is required to meet the shortened SCell activation delay requirement in TS38.133 [section 8.x.y] if the feature is supported, including single SCell activation, single PUCCH SCell activation, and multiple SCell activation with/without PUCCH SCell. | Optional with capability signaling |
| 31. NR\_RRM\_enh3 | 31-2 | Beam sweeping factor reduction for FR2 unknown SCell activation | 1. Support of reducing beam sweeping factor for cell detection if UE has full set (N=8) of beam sweeping during AGC settling part during FR2-1 unknown SCell activation procedure   Support of reducing beam sweeping factor for SSB based L1-RSRP measurement if UE has full set (N=8) of beam sweeping during AGC settling part during FR2-1 unknown SCell activation procedure |  | Yes | N/A | UE does not support beam sweeping factor reduction for cell detection during FR2-1 unknown SCell activation.  UE does not support beam sweeping factor reduction for SSB based L1-RSRP measurement during FR2-1 unknown SCell activation. | Per Band | TDD onl | FR2-1 only | N/A | UE is required to meet the shortened SCell activation delay requirement in TS38.133 [section 8.x.y] if the feature is supported.  Candidate values for beam sweeping reduction for cell detection during FR2-1 unknown SCell activation are 1,2,4, or 6. [Agreed in WF R4-2310081]  Candidate values for beam sweeping reduction for SSB based L1-RSRP measurement during FR2-1 unknown SCell activation are 0,1,2,3,4,5,6, or 7. [Agreed in WF R4-2310081] | Optional with capability signaling |
| 31. NR\_RRM\_enh3 | 31-3 | Shorter measurement interval for unknown SCell activation | (1) Support of using SSB periodicity instead of SMTC periodicity for the measurement interval during unknown SCell activation when the SMTC is only configured in measurement object for enhanced unknown SCell activation requirement.  (2) Support of performing L1-RSRP measurement in non-DRX mode even DRX is configured during unknown SCell activation |  | Yes | N/A | UE does not use SSB periodicity instead of SMTC periodicity for the measurement interval during unknown SCell activation when the SMTC is only configured in MO for enhanced unknown Scell activation requirement.  UE does not support performing L1-RSRP measurement in non-DRX mode even DRX is configured during unknown SCell activation | Per UE | No | No | N/A | UE is required to meet the shortened SCell activation delay requirement in TS38.133 [section 8.x.y] if the feature is supported. | Optional with capability signaling |

**Issue 2-1-1: UE capability of L3 report after SCell activation command**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Features** | **Index** | **Feature group** | **Type**  **(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** |
| 31. NR\_RRM\_enh3 | 31-1 | Enhanced L3 measurement report for unknown SCell activation | Option 1: Per UE (Apple, CTC, Ericsson, OPPO, MTK) | Option 1: No (Apple, MTK) | Option 1: No (Apple, CMCC, CTC, MTK)  Option 2: Yes (vivo) |

* Recommended WF
  + Agree on option1 for column “Type” and “Need of FDD/TDD differentiation”.
  + FFS on column “Need of FR1/FR2 differentiation”.

**Issue 2-2-1: UE capability of beam sweeping factor reduction** **for L3 and L1 (X1 and X2)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Features** | **Index** | **Feature group** | **Type**  **(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** |
| 31. NR\_RRM\_enh3 | 31-2 | Beam sweeping factor reduction for FR2 unknown SCell activation | Option 1: Per band (Apple, CTC, Ericsson, MTK, HW, OPPO)  Option 2: Per FS (i.e., per-band-per-BC) (vivo)  Option 3: Per UE (CMCC) | Option 1: TDD only (Apple, MTK) | Option 1: FR2 only (Apple, MTK) |

* Recommended WF
  + Agree on option1 for column “Need of FDD/TDD differentiation” and “Need of FR1/FR2 differentiation”.
  + FFS on column “Type”.

**Issue 2-3-1: UE capability of “using SSB periodicity instead of SMTC” and “perform L1-RSRP measurement in non-DRX mode even DRX is configured”**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Features** | **Index** | **Feature group** | **Type**  **(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** |
| 31. NR\_RRM\_enh3 | 31-3 | Other measurement enhancement for unknown SCell activation, including:  (1) Support of using SSB periodicity instead of SMTC periodicity during SCell activation  (2) Perform L1-RSRP measurements with the delay assuming non-DRX during SCell activation even DRX is configured | Option 1: Per UE (Apple, MTK)  Option 2: Per band (OPPO) | Option 1: No (Apple, CMCC, MTK) | Option 1: No (Apple, CMCC, MTK)  Option 2: Yes (vivo) |

* Recommended WF
  + [Moderator]: MTK R4-2321005 divided this UE capability into two separated capability FG31-3 “using SSB periodicity instead of SMTC” and FG31-4 “perform L1-RSRP measurement in non-DRX mode even DRX is configured”, but based on the following agreement in last meeting, moderator put these two features into one single FG31-3.
    - “using SSB periodicity instead of SMTC” and “perform L1-RSRP measurement in non-DRX mode even DRX is configured” shall be defined in one single feature group (FR) of feature list
  + Agree on option1 for column “Need of FDD/TDD differentiation”.
  + FFS on column “Type” and “Need of FR1/FR2 differentiation”.

**Issue 3-2-4: whether dedicated TC is needed for “Use SSB periodicity instead of SMTC periodicity” and “Performing L1-RSRP measurement is performed in non-DRX mode even DRX is configured”?**

* Option 1 (HW):
  + Yes, define dedicated test cases for following enhancement:
    - Use SSB periodicity instead of SMTC periodicity when the SMTC is only configured in MO for enhanced unknown FR2 Scell activation requirement
    - L1-RSRP measurement is performed in non-DRX mode even DRX is configured
* Option 2 (CTC, QC, MTK):
  + No, the enhancements that “use SSB periodicity instead of SMTC periodicity” and “performing L1-RSRP measurement is performed in non-DRX mode even DRX is configured” can be verified in TCs with “Rx beam sweeping factors reduction”.
* Option 3 (Apple, CTC):
  + Yes for FR1 and No for FR2. Feature of “Use SSB periodicity instead of SMTC periodicity” and “Performing L1-RSRP measurement in non-DRX mode even DRX is configured” can be verified in:
    - dedicated test cases for FR1 SCell activation;
    - test cases of “beam sweeping factors reduction” for FR2 SCell activation.
* Recommended WF
  + [Moderator]: Please companies check if option 3 could be a compromise because there is no beam sweeping factor reduction TC for FR1.

**Issue 3-2-5: NR operation mode for the TCs, e.g., EN-DC, NR-DC, NE-DC and SA**

* Option 1 (Apple):
  + Regarding the different NR operation modes (EN-DC, NR-DC, NR-CA etc.), UE only needs to pass test in one mode (e.g., EN-DC, or NR CA, or NR-DC) to verify this enhancement.
    - unknown SCell in FR1 for EN-DC with FG31-1
    - unknown SCell in FR1 for EN-DC with FG31-3
    - unknown SCell in FR2 for EN-DC with FG31-1
    - unknown SCell in FR2 for EN-DC with FG31-2 and FG31-3
    - unknown SCell in FR1 (FR1+FR1 NR CA) with FG31-1
    - unknown SCell in FR1 (FR1+FR1 NR CA) with FG31-3
    - unknown SCell in FR2 (FR1+FR2 NR CA) with FG31-1
    - unknown SCell in FR2 (FR1+FR2 NR CA) with FG31-2 and FG31-3
* Option 2 (CTC):
  + NR operation mode including NR SA, EN-DC, NR-DC for the TCs can be considered. However, if only one mode is considered, NR SA need to be prioritized.
* Option 3 (ZTE):
  + Multiple modes should be considered, including FR1 NR CA, FR2 NR CA, FR1+FR2 NR CA, FR1 EN/NR-DC, FR1+FR2 EN/NR-DC, FR2 NR-DC.
* Option 4 (Ericsson):
  + RAN4 to perform the tests for EN-DC, NR-DC and SA scenarios
* Option 5 (MTK): Use the following NR operation mode for the TCs
  + Unknown SCell in FR2 for EN-DC with the L3 reporting during activation
  + Unknown SCell in FR2 (FR1+FR2 NR CA) with the beam sweeping factor reduction

Note:

* FG31-1: L3 reporting during activation,
* FG31-2: beam sweeping factor reduction
* FG31-3: “Use SSB periodicity instead of SMTC periodicity” + “Performing L1-RSRP measurement in non-DRX mode even DRX is configured”.
* Recommended WF
  + TBA.

Topic: [109][209] NR\_RRM\_enh3\_part2

**R4-2318165 Topic summary for [109][209] NR\_RRM\_enh3\_part2**

*Type: other For: Information  
 Source: Moderator (OPPO)*

**Abstract:**

[109][200] RRM Session AI 8.8.3, 8.8.5

**Decision: Noted.**

**Online session (Wednesday Nov 15, 2023)**

**Issue 1-1: Side condition for RACH-less SCG activation/deactivation**

Proposal:

* Option 1 (Apple, OPPO): keep the legacy side condition for Tsearch. Further discuss the issue in R17 maintenance part, the agreement in R17 (if any) can be reused for R18 in maintenance stage.
* Option 2 (Ericsson, Nokia): Remove the 5 seconds time constraint for the known/unkown side conditions

|  |
| --- |
| **In FR1 and FR2, the PSCell is known if it has been meeting the following conditions:**  **-** ~~During the last 5 seconds before the~~ **Upon reception of the SCG activation command:**  **- the UE has sent a valid measurement report for the PSCell being activated and**  **- One of the SSBs measured from the PSCell being activated remains detectable according to the cell identification conditions specified in clause 9.3.**  **- One of the SSBs measured from PSCell being activated also remains detectable during the PSCell activation delay Tactivation\_time according to the cell identification conditions specified in clause 9.3.** |

Recommended WF:

* Can we compromise to option 1?
* If no consensus in this meeting, suggest to follow R17 requirements.

**Issue 1-2: Tsearch requirement for RACH-less PSCell activation**

Proposals:

* Option 1(Apple, OPPO): For RACH-less based PSCell activation, if RLM and BFD are configured and TCI state is known, Tsearch = 0 ms if the target cell is a known PSCell. There are no requirements if PSCell is unknown.
  + Option 1a (Apple): Instead of changing the core requirement, verify UE behavior in certain test environment to avoid UE to fallback to RACH based activation.
  + Option 1b (Ericsson): Update the current FR1-FR2 NR-DC SCG activation test case A.7.5.15 to garantee the UE performance.
  + Option 1c (OPPO): Further discuss the test case to verify the procedure to RACH-based and RACH-less SCG activation in RRM performance part.
* Option 2 (Nokia): For RACH-less based PSCell activation, if *bfd-and-RLM* is configured with value true and TCI state is known, Tsearch = 0 ms or if the PSCell is a known FR1 PScell, Tsearch = 0 ms. Otherwise, there are no requirements.

Recommended WF:

* Suggest to keep previous agreement that RAN4 only define requirements for cases when Target PSCell is known and TCI is known. RAN4 not to specify UE behaviour and requirements for unknown PScell.
* If needed, Nokia’s paper R4-2320472 is suggested for online discussion
  + One issue identified is that the current RAN4 known conditions breaks the feature for RACH-less activation as defined in RAN2.
  + Another issue identified is the condition which states that the PSCell being known, depends on a fixed time since an L3 measurement report was sent.



**Sub-topic 2: RACH-based basd SCG activation requirements for FR1-FR1 NR-DC**

**Issue 2-1: Tsearch for RACH-based PSCell activation**

Proposals:

* Option 1(Apple, OPPO): Not necessary to change the RACH based PSCell activation requirement in agreed CR R4-2310080, i.e.,

If the target cell is an unknown FR2 PSCell and Es/Iot ≥ -2 dB, then Tsearch = 24\* Trs ms. If the target cell is an unknown FR1 PSCell and Es/Iot ≥ -2 dB, then Tsearch =3\* Trs ms.

* Option 2 (Nokia):

For RACH based PSCell activation, if the target cell is a known NR FR1 PSCell, Tsearch = 0 ms. If the target cell is an unknown FR1 PSCell configured with bfd-and-RLM with value true and no RLM has occurred, then Tsearch = [1]\* Trs ms, otherwise if Es/Iot ≥ -2 dB, then Tsearch = 3\* Trs ms.

Recommended WF

* Can we keep original agreements? Option 1 is recommended.

**Issue 4-1: PDCCH monitoring for SCG activation**

Proposals:

* Option 1(Nokia): UE shall start monitoring PDCCH on the activated PSCell immediately after the SCG activation delay.

**R4-2319471, Big CR for R18 RRM enhancement - FR1+FR1 NR-DC**

R4-2319471 is based on draft big CR R4-2306329 endorsed in RAN4#106-bis-e and R4-2310080 endorsed in RAN4#107.

Online agreement in RAN4 #108bis:

* *No further discussion in this meeting. Moderator to re-submit the endorsed CR to the next meeting. The formal CR for NR\_RRM\_enh3\_part2 will be agreed in the next meeting.*

Agreement:

Agree the big CR in this meeting, and further dsicuss the issue in R17/18 maintenance and performance part.

### 8.9 Further enhancements on NR and MR-DC measurement gaps and measurements without gaps

#### 8.9.1 General aspects

**R4-2318330 Discussion on general issues for Rel-18 gap enhancement**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2319112 Rel-18 RAN4 UE feature list for enhancements on NR and MR-DC measurement gaps and measurements without gaps**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2319940 Feature list proposals for measurement gap enhancements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2320918 Discussion on feature list for MGE-2**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2320919 Big CR to TS 38.133 on Further enhancements on NR and MR-DC measurement gaps and measurements without gaps**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3907 rev Cat: B (Rel-18)  
  
 Source: MediaTek inc., Intel Corporation*

**Decision: Return to.**

**R4-2320920 Big CR to TS 36.133 on inter-RAT NR measurement without gap**

*Type: CR For: Agreement  
 36.133 v18.3.1 CR-7275 rev Cat: B (Rel-18)  
  
 Source: MediaTek inc., Intel Corporation*

**Decision: Return to.**

**R4-2320921 Draft CR for new abbreviation in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Return to.**

#### 8.9.2 RRM core requirements for pre-configured MGs, multiple concurrent MGs and NCSG

**R4-2319474 [NR\_MG\_enh2-Core] CR on CSSF for R18 MGE**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: OPPO*

**Decision: Return to.**

##### 8.9.2.1 Scope and general issues

##### 8.9.2.2 Case 1 requirements (Pre-configured MG and concurrent MG)

**R4-2318331 Discussion on case 1 requirements for combination of pre-MG and concurrent MGs**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318591 Discussion on case 1 requirements of R18 gap enhancement**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318854 Discussion on RRM requirements for combinations of pre-configured MGs and multiple concurrent MGs**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2319088 Discussion on Pre-MG MG and concurrent MG (case 1)**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319142 Discussion on PreMG and ConMGs**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the requirement for Pre-MG and ConMGs

**Decision: Noted.**

**R4-2319146 Draft CR on PreMG and ConMGs general**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This is the draft CR to capture the further agreements for Pre-MG and ConMGs

**Decision: Return to.**

**R4-2319248 Further consideration on remaining issues on case 1 requirements for Pre-MG and concurrent MGs**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319475 Discussion on case 1 requirements for Pre-MG and conMG**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319520 Discussion on Case 1 requirements for Pre-MG and concurrent MG**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted.**

**R4-2319977 Discussion on joint working of pre-MG and con-MG**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320420 Discussion on Case 1 RRM requirements**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2320520 Discussion on Case 1 RRM requirements**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision:** The document was **withdrawn**.

**R4-2320805 Discussion on Case 1 requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320904 On joint requirements for Rel-17 measurement gap enhancements - Case 1**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2320922 Discussion on case 1 requirements (Pre-configured MG and concurrent MG)**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Noted.**

##### 8.9.2.3 Case 2 requirements (NCSG and concurrent MG)

**R4-2318332 Discussion on case 2 requirements for combination of NCSG and concurrent MGs**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318592 Discussion on case 2 requirements of R18 gap enhancement**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2319089 Discussion on NCSG and concurrent MG (case 2)**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319143 Discussion on NCSG and ConMGs**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the requirement for NCSG and ConMGs

**Decision: Noted.**

**R4-2319249 Further consideration on remaining issues on case 2 requirements for concurrent MGs and NCSG**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319476 Discussion on case 2 requirementsn for NCSG and conMG**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319521 Discussion on Case 2 requirements for NCSG and concurrent MG**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted.**

**R4-2319978 Discussion on joint working of NCSG and con-MG**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320421 Discussion on Case 2 RRM requirements**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2320521 Discussion on Case 2 RRM requirements**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision:** The document was **withdrawn**.

**R4-2320806 Discussion on Case 2 requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320905 On joint requirements for Rel-17 measurement gap enhancements - Case 2**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2320923 Discussion on case 2 requirements (NCSG and concurrent MG)**

*Type: discussion For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2320924 Draft CR for NCSG with concurrent gaps**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Return to.**

#### 8.9.3 RRM core requirements for measurements without gaps

**R4-2319477 [NR\_MG\_enh2-Core] CR on CSSF for R18 measurement without gap**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: OPPO*

**Decision: Return to.**

##### 8.9.3.1 Measurement without gaps for UEs reporting NeedForGapsInfoNR

**R4-2318333 Discussion on RRM requirements for measurement without gaps for UEs reporting NeedForGapsInfoNR**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision:** The document was **withdrawn**.

**R4-2318593 Discussion on measurement without gaps for UEs reporting NeedForGapsInfoNR**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318863 Discussion on Measurement without gaps for UEs reporting NeedForGapsInfoNR**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2319087 DraftCR on intra-frequency measurement delay for NFG**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: CMCC*

**Decision: Return to.**

**R4-2319090 Discussion on measurements without gaps for UEs reporting NeedForGapsInfoNR**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319128 draftCR on interruption requirements for UE reporting NFG**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Intel Corporation*

**Decision: Return to.**

**R4-2319144 Discussion on NeedForGaps measurement**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the NeedForGaps measurement requirement

**Decision: Noted.**

**R4-2319147 Draft CR on NeedForGaps interruption**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This is the draft CR to further capture the agreements for Pre-MG and ConMGs

**Decision: Return to.**

**R4-2319250 Further consideration on remaining issues for measurement without gaps for UEs reporting NeedForGapsInfoNR**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319478 On measurement without gaps for UEs reporting NeedForGapsInfoNR**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319979 Discussion on requirements for NeedForGaps**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320422 Discussion on measurement without gaps for UEs reporting NeedForGapsInfoNR**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2320487 Remaining issues on Measurement without gaps for NFG**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2320488 DraftCR update on inter-freq measurements without gap requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Return to.**

**R4-2320522 Discussion on measurement without gaps for UEs reporting NeedForGapsInfoNR**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision:** The document was **withdrawn**.

**R4-2320731 Discussion on measurements without gaps**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320925 Discussion on measurement without gaps for UEs reporting NeedForGapsInfoNR**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Noted.**

##### 8.9.3.2 Inter-RAT measurement without gap

**R4-2318594 Discussion on R18 inter-RAT measurement without gap**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318595 CR for measurement delay for nogap-noncsg**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2318864 Discussion on Inter-RAT measurement without gap**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2318865 CR on introduction of interruprion requirements for inter-RAT NR measurement without gap (case a-1)**

*Type: draftCR For: Endorsement  
 36.133 v18.3.1 CR- rev Cat: F (Rel-18)  
  
 Source: Xiaomi*

**Decision: Return to.**

**R4-2319091 Discussion on inter-RAT measurements without gaps**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319127 Remaining issues from inter-RAT measurement without gap**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2319145 Discussion on Inter-RAT measurement without gap**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the inter-RAT measurement requirement

**Decision: Noted.**

**R4-2319150 LS on inter-RAT measurement without gap**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

The LS adds additional EMW values in RAN2

**Decision: Revised to R4-2321340 (from R4-2319150).**

[**R4-2321340**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321340.zip) **LS on inter-RAT measurement without gap**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

The LS adds additional EMW values in RAN2

**Decision: Revised to R4-2321345 (from R4-2321340).**

[**R4-2321345**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321345.zip) **LS on inter-RAT measurement without gap**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

The LS adds additional EMW values in RAN2

**Decision: Approved.**

**R4-2319251 Further consideration on remaining issues for inter-RAT measurement without gap**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319479 On RRM requirements for Inter-RAT measurement without gap**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319980 Discussion on inter-RAT MG-less measurement**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319981 draftCR on measurement period and scheduling restriction for inter-RAT NR measurement without gap**

*Type: draftCR For: Endorsement  
 36.133 v18.3.1 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2320423 Discussion on inter-RAT measurement without gaps**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2320434 [NR\_MG\_enh2-Core] Draft CR for measurement delay for nogap-noncsg for FDD**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Return to.**

**R4-2320489 Remaining issues on interRAT measurements without gaps**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2320523 Discussion on inter-RAT measurement without gaps**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision:** The document was **withdrawn**.

**R4-2320732 Discussion on interRAT measurements without gaps**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320926 Discussion on inter-RAT measurements**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Noted.**

#### 8.9.4 RRM performance requirements for pre-configured MGs, multiple concurrent MGs and NCSG

**R4-2318596 Discussion on performance requirement for case 1 and 2**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318855 Discussion on test cases for pre-configured MGs within concurrent MGs**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2319092 Discussion on RRM performance requirements for pre-configured MGs, multiple concurrent MGs and NCSG**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319148 Discussion on Pre-MG, Con-MGs and NCSG test cases**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the test case design for Pre-MG, NCSG and ConMGs

**Decision: Noted.**

**R4-2319522 Discussion on RRM performance requirements for pre-configured MGs, multiple concurrent MGs and NCSG**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted.**

**R4-2319982 Discussion on test cases for Case 1 and Case 2**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320431 Discussion on the performance requirements for the joint MG considerations**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2320807 Discussion on RRM performance requirements for Pre-MG, concurrent MG and NCSG**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320906 Scope of RRM performance requirements for pre-configured MGs, multiple concurrent MGs and NCSG**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2320927 Discussion on RRM performance requirements for pre-configured MGs, multiple concurrent MGs and NCSG**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Noted.**

#### 8.9.5 RRM performance requirements for measurements without gaps

**R4-2319093 Discussion on RRM performance requirements for measurements without gaps**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319129 Test cases list for measurements without gap**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2319149 Discussion on measurement without gap test cases**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the test case for measurement without gap

**Decision: Noted.**

**R4-2319983 Discussion on test cases for measurement without MG**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320490 View on RRM performance requirements for measurements without gaps**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2320733 Discussion on performance requirements for measurements without gaps**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320928 Discussion on RRM performance requirements for measurements without gaps**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Noted.**

#### 8.9.6 Moderator summary and conclusions

Topic: [109][210] NR\_MG\_enh2\_part1

**R4-2318166 Topic summary for [109][210] NR\_MG\_enh2\_part1**

*Type: other For: Information  
 Source: Moderator (MediaTek)*

**Abstract:**

[109][200] RRM Session AI 8.9.1, 8.9.2, 8.9.4

**Decision: Noted.**

[**R4-2321324**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321324.zip) **Ad-hoc minutes on R18 MGs enhancement WI**

*Type: other For: Approval  
 Source: MediaTek*

Session chiar: the following tentative agreement in the ad-hoc minutes is not applied.

* The scheduling restriction part of CR RR4-2320488 is agreeable.

**Decision: Approved.**

**Online session (Monday Nov 13, 2023)**

Sub-topic 4-2: UE behavior for deactivated SCell measurements with NCSG

*Sub-topic description: This sub-topic covers NCSG upon SCell activation issue in concurrent gap with NCSG.*

* Agreement from previous meetings:

|  |
| --- |
| **< Agreements from meeting RAN4#106-bis-e >**:   * UE behavior for deactivated SCell measurements with NCSG in Case 2 is FFS   + Option 1: Legacy UE behavior (i.e. UE measures the deactivated SCell outside of MG)   + Option 2: When the SCell is deactivated, the deactivated SCell’s MO will be measured within NCSG if the SMTC is partially or fully overlapped.   **< Agreements from online session >**:   * + Option 1:     - UE measures the deactivated SCell outside of MG   + Option 2:     - When the SCell is deactivated, the deactivated SCell’s MO will be measured within NCSG if the SMTC is partially or fully overlapped with NCSG.     - FFS whether a new indication shall be introduced enable support of NCSG for deactivated SCell only.   **< Agreement >**:   * **Align the understanding of Rel-17 UE behaviours**   + Only up to 1 NCSG can be configured. All activated Scell MOs are implicitly associated to the NCSG   + In the dynamic UE capability signalling, there is no separate indication for activated/deactivated serving cells. This implies UE only indicate the capability if it supports all scenarios, including     - deactivated Scell     - activated Scell but SSB not in active BWP   + Understanding to be clarified:     - Will all deactivated Scell be measured via NCSG regardless the UE capability report of intraFreq-needForNCSG? |

**Issue 4-2-1: [Rel-17] Will all deactivated Scell be measured via NCSG regardless the UE capability report of intraFreq-needForNCSG? (Clarify Rel-17 understanding)**

* Proposals
  + Option 1: Apple, MTK, OPPO,
    - No,
      * The deactivated SCell MO(s) are measured within NCSG if the UE reports ‘intraFreq-needForNCSG’ on the band(s) where the deactivated SCell MO(s) located in.
      * Otherwise, the deactivated SCell MO(s) are measured outside of MG with interruption.
  + Option 2: CATT, E///, ZTE, CMCC, HW, China Telecom, Nokia, vivo, [QC?]
    - The Rel-17 UE behavior is that when the SMTC of deactivated SCell is fully or partially overlapped with NCSG, the deactivated SCell is measured via NCSG regardless the UE capability report of intraFreq-needForNCSG.
  + Option 3: QC
    - In Rel-17, if the UE supports NCSG (ncsg-MeasGapNR-Patterns-r17 or ncsg-MeasGapPatterns-r17) and the network configures an NCSG supported by the UE:
      * A deactivated SCell is measured within NCSG if at least some of the SCell’s SMTC overlaps with NCSG occasions; otherwise, the deactivated SCell is measured outside of NCSG.
      * An activated SCell is measured within NCSG only if either the SCell’s SSB is outside the active DL BWP or the SCell’s SMTC fully overlaps with NCSG, and the UE signaled that the SCell can be measured with NCSG via needForGapNCSG-InfoNR; otherwise, the activated SCell is measured outside of NCSG, if possible.
* Recommended WF
  + Discuss the issue.

Ad-hoc chair: can we compromise to the case that

* For per-FR NCSG capable UE
* If the deactivated SCell is in the same FR with the NCSG, we follow Option 2
* If the deactivated SCell is in a different FR with the NCSG, we follow Option 1.
* For per-FR NCSG incapable UE, we follow Option 1~~2~~.

Apple: for Rel-17, the feature can only be supported per UE. It is possible that UE can support NCSG but not support NCSG for FR2.

Nokia: we prefer generic requirement, but not differentiate the scenario which will make network complicated.

MTK: when UE support NCSG, that is very generic capability.

QC: the scenario is not allowed in the spec.

* If the deactivated SCell is in a different FR with the NCSG, we follow Option 1.

Apple: UE support per FR gap in FR1, UE support NCSG in FR1 but not support NCSG in FR2.

* If the deactivated SCell is in a different FR in which the per FG NCSG is configured, we follow Option 1.

MTK:

* If the deactivated SCell is in a different FR in which the per FG NCSG is configured, NCSG is not used for the measurement.

Intel: why network configure NCSG but UE does not support.

Nokia: we want to have network controlled UE behaviour.

* For per-FR NCSG incapable UE (i.e., UE only per UE NCSG),
  + Follow Option 1: Apple, MTK, QC, vivo, OPPO
  + Follow option 2: E///, Nokia, ZTE, CATT, Huawei, CMCC

Companies not support the following: Apple

* For per-FR NCSG capable UE
  + If the deactivated SCell is in the same FR with the NCSG, we follow Option 2
  + If the deactivated SCell is in a different FR in which the per FG NCSG is configured, NCSG is not used for the measurement.

Intel: Continue discussion in the maintenance part.

Continue discussion Rel-17 Issue 4-2-1, 4-2-2 in maintenance part.

**Issue 4-2-2: [Rel-17] Whether a new UE capability is needed for the support of NCSG for deactivated SCell?**

* Proposals
  + Option 1: CATT, vivo, Nokia, ZTE
    - No
  + Option 2: Apple,
    - A new indication shall be introduced enable support of NCSG for deactivated SCell only.
* Recommended WF
  + Wait for the outcome of issue 4-2-1.

MTK: A new UE capability is needed for the support of NCSG for deactivated SCell for Rel-18.

Nokia: first discuss Rel-17.

Sub-topic 3-3: Other Rel-17 rules to be revisited

*Sub-topic description: This sub-topic covers NCSG upon SCell activation issue in concurrent gap with NCSG.*

*Open issues and candidate options before meeting:*

* Agreement from previous meetings:

|  |
| --- |
| **< Agreement >**:   * **New in Rel-18**   + When Type-2 MG and NCSG are both configured, some serving cell MOs may associated to the NCSG and some are not.     - Question 1: What is the expected UE behaviour (assume SMTC partially overlapped with NCSG)       * Option 1: skip gap association, all deactivated Scells are measured within NCSG. (This implies some new rule to override the existing gap association rule)       * Option 2: Still follow the gap association, i.e., (This implies we follow Rel-17 gap association rule)         + Deactivated Scell MO associated with NCSG is measured within NCSG         + Deactivated Scell MO not associated with NCSG is measured outside NCSG     - Question 2: Whether additional UE capability indication is needed |

**Issue 3-3-1: [Case 2] When the UE is configured with Concurrent gaps with NCSG, what is the potential changes to UE behaviour for NCSG upon SCell activation (in Rel-18)**

* Proposals
  + Option 1: MTK, ZTE, QC, vivo, OPPO, [Nokia?]
    - Still follow the gap association, i.e., (This implies we follow Rel-17 gap association rule)
      * Deactivated Scell MO associated with NCSG is measured within NCSG
      * Deactivated Scell MO not associated with NCSG is measured outside NCSG
  + Option 1a: ZTE
    - Based on the principle of reusing the gap association rule to determine in which MG the deactivated SCell MO would be performed, when the deactivated SCell switches to be activated, still reuse the R17 conditions to decide whether this SCell can be measured with the NCSG. That is, keep alignment with the understanding of R17 UE behaviours
  + Option 2: Huawei, China Telecom, CMCC, E///
    - When the SCell is deactivated, the deactivated SCell’s MO will be measured within NCSG if the SMTC is partially or fully overlapped with NCSG **regardless of gap association**.
  + Option 3: CATT,
    - The Rel-18 UE behavior (assume SMTC partially overlapped with NCSG) can follow the gap association, i.e., deactivated SCell MO associated with NCSG is measured within NCSG and the MO not associated with NCSG is measured outside NCSG.
* Recommended WF
  + Moderator suggests to wait until Rel-17 understanding is clarified of issue 4-2-1 in this thread.

Continue discussion Issue 3-3-1 in maintanence part.

Topic: [109][211] NR\_MG\_enh2\_part2

**R4-2318167 Topic summary for [109][211] NR\_MG\_enh2\_part2**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

[109][200] RRM Session AI 8.9.1, 8.9.3, 8.9.5

**Decision: Noted.**

**Online session (Monday Nov 13, 2023)**

**Issue 2-4-2: Effective measurement window Configuration**

* Background
  + Agreement

Table 1: Effective measurement window configuration and minimum available time

|  |  |  |  |
| --- | --- | --- | --- |
| Effective measurement window (EMW) Id | Measurement Duration (MD, ms) | Measurement Period  (MP, ms) | Minimum available time for inter-RAT LTE measurements during 480 ms period  (Tinter1, ms) |
| 0 | 5 | 40 | 60 |
| 1 | 5 | 80 | 30 |

**Issue 2-4-2a: New EMW configuration #2 and #3:**

Table 2

|  |  |  |  |
| --- | --- | --- | --- |
| **EMW Pattern Id** | **EMW Length (EMWL, ms)** | **EMW Repetition Period**  **(EMWRP, ms)** | **Minimum available time for inter-RAT measurements during 480 ms period**  **(Tinter1, ms)** |
| 2 | 2 | 40 | [24] |
| 3 | 2 | 80 | [12] |

* Proposals
  + Option 1: introduce the patterns in the table 2 and they are optional with UE capabilities.
    - Option 1a:introduce the patterns in the table 2 without UE capabilities.
  + Option 2: do not introduce any of them.
* Recommended WF
  + Agree on option 1.

Agreement:

Introduce the patterns in the following table and they are optional with UE capabilities. Further check whether the [] can be removed.

|  |  |  |  |
| --- | --- | --- | --- |
| **EMW Pattern Id** | **EMW Length (EMWL, ms)** | **EMW Repetition Period**  **(EMWRP, ms)** | **Minimum available time for inter-RAT measurements during 480 ms period**  **(Tinter1, ms)** |
| 2 | 2 | 40 | [24] |
| 3 | 2 | 80 | [12] |

**Issue 2-4-2b: New EMW configuration #4 and #5:**

Table 3

|  |  |  |  |
| --- | --- | --- | --- |
| **EMW Pattern Id** | **EMW Length (EMWL, ms)** | **EMW Repetition Period**  **(EMWRP, ms)** | **Minimum available time for inter-RAT measurements during 480 ms period**  **(Tinter1, ms)** |
| 4 | 5.5 | 40 | [60] |
| 5 | 5.5 | 80 | [30] |

* Proposals
  + Option 1: introduce the patterns in the table 2 and they are optional with UE capabilities.
    - Option 1a:introduce the patterns in the table 2 without UE capabilities.
  + Option 2: do not introduce any of them.
* Recommended WF
  + Agree on option 1.

Introduce the additional patterns in the following table:

|  |  |  |  |
| --- | --- | --- | --- |
| **EMW Pattern Id** | **EMW Length (EMWL, ms)** | **EMW Repetition Period**  **(EMWRP, ms)** | **Minimum available time for inter-RAT measurements during 480 ms period**  **(Tinter1, ms)** |
| 4 | 5.5 | 40 | [60] |
| 5 | 5.5 | 80 | [30] |

Further discuss UE capability signaling.

Agrement:

Add in RAN2 LS: UE is expected to be configured with only one pattern at one time.

**Issue 1-5-1: 1-to-1 mapping between NeedForGaps and NCSG capabilities**

* Proposals
  + Option 1: NeedForGaps and NCSG are not expected to be enabled for the same UE at the same time and there is No need to establish the mapping between UE’s indication for NeedForGaps and NCSG.
* Recommended WF
  + Agree on option 1.
  + Send an LS to RAN2 about RAN4 agreements.

~~Rel-18 NeedForInterruption and Rel-18 NCSG are not expected to be enabled for the same UE at the same time.~~

~~For Rel-18 UE requirement for NeedForInterruption and NCSG, NeedForInterruption and NCSG are not expected to be applied for the same UE on the same band at the same time.~~

**Issue 1-1-1: Tcycle definition on a certain configured carrier i: lower bound 80ms. (for interruption)**

* ***Background***
  + ***Tcycle is used for interruption requirements specification implementation.***
  + ***The UE is allowed to cause a certain interruption length every Tcycle period.***
  + ***Interruption requirements are specified per serving cell/per UE not per MO or per frequency layer.***
  + Agreements
    - Tcycle per MO/frequency layer is the same as UE measurement cycle.
  + Previous agreement: When MG is configured and overlapped with some of the SMTC occasions on carrier i, interruption is not allowed and all the measurements with interruptions are carried out within the configured MG.
* Proposals
  + Option 1: Tcycle,i = scaling factors \* max (80ms, SMTC period).
  + Option 2: Tcycle,i = max (80ms, scaling factors \* SMTC period).
  + Option 3: Tcycle = max(80ms, SMTCmin), where SMTCmin is smallest SMTC among multiple MO/frequency layers.
* Recommended WF
  + Discuss on following options:
  + Option 1 (Apple, E///, MTK, Nokia, ZTE, CATT, Xiaomi, CMCC, HW, vivo)
    - Tcycle,i = (CSSF outside gap ~~CSSFintra or CSSFinter~~) \* max (80ms, SMTC period).
      * This applies to the interruption cycle when MG is either not configured or not overlapped with any SMTC occasions on carrier i.
      * This applies when DRX is not configured.
    - Tcycle,i = (CSSF outside gap ~~CSSFintra or CSSFinter~~) \* max (80ms, SMTC period, DRX cycle).
      * This applies to the interruption cycle when MG is either not configured or not overlapped with any SMTC occasions on carrier i.
      * This applies when DRX is configured and DRX cycle is applied when interruption is allowed according to RAN4 conclusions. The scaling factor is a separate issue.
  + Option 2 (QC)
    - Tcycle = max(80ms, SMTCmin), where SMTCmin is smallest SMTC among multiple MO/frequency layers
      * This applies when DRX is not configured.
    - Tcycle = max(80ms, SMTCmin, DRXcycle)
      * This applies when DRX is configured and DRX cycle is applied when interruption is allowed according to RAN4 conclusions.
  + ~~Option 3~~
    - ~~Tcycle,i = (CSSFintra or CSSFinter) \* max (80ms, max(SMTC period, MGRP)).~~
      * ~~This applies to the interruption cycle when MG is configured and partially or fully overlapped with SMTC occasions on carrier i.~~
      * ~~This applies when DRX is not configured.~~

Tentative Agreement:

* + - Tcycle,i = (CSSF outside gap) \* max (80ms, SMTC period).
      * This applies to the interruption cycle when MG is either not configured or not overlapped with any SMTC occasions on carrier i.
      * This applies when DRX is not configured.

QC: The frequency layers with ~~and without~~ interupiton are counted for Tcycle.

**Issue 1-2-2: Total interruption ratio considering maximum 2L interruption caused every time UE carries out measurements**

* ***Background***
  + Proposals in the last meetings
    - Option 1: Sum among all possible maximum interruptions caused on applicable carriers during a pre-defined window, and
      * Specify the window length and calculate the exact maximum interruption length.
      * Total interruption ratio is the total sum divided by window length.
    - Option 2: Do not sum up but to consider the smallest Tcycle,i among all applicable carriers, and
    - Total interruption ratio is 2L divided by smallest Tcycle,i among all applicable carriers.
  + Agreement:
    - Take option 1 as baseline for CR drafting and go with option 2 if option 1 is not feasible from CR draft perspective.
* Proposals
  + Option 1: Total interruption ratio = where N is number of layers and L is single interruption length
  + Option 2: Total interruption ratio = , where
    - N is number of carriers which are measured with interruption,
    - M is total number of carriers which are measured outside MG, including carriers that are measured with and without interruption,
  + Option 3: Total interruption ratio is the sum of interruption ratio of individual frequency layers with interruption.
* Recommended WF
  + Discuss the candidate options.

**Issue 1-4-1: Interruption caused when DRX is configured larger than 320ms**

* Proposals
  + Option 1: No interruption is expected when DRX is configured larger than 320ms on the serving cell.
  + Option 2: Interruption is allowed, and it is according to Tcycle,i.
  + Option 3: No interruption is expected during DRX activity time, including DRX ON duration extended by inactivity-timer after each PDCCH reception.
* Recommended WF
  + Discussion needed.

**Issue 1-4-2: Interruption caused when DRX is configured smaller than 320ms**

* Proposals
  + Option 1: No interruption is expected when SMTC is during DRX-off and UE uses such SMTC to measure NFG measurements with interruption on a certain MO; otherwise interruption is allowed.
  + Option 2: Interruption is always allowed, and it is according to Tcycle,i.
  + Option 3: No interruption is expected during DRX activity time, including DRX ON duration extended by inactivity-timer after each PDCCH reception.
* Recommended WF
  + Discussion needed.

**Issue 2-2-1: Scheduling restriction due to mixed numerology for case b-2 when UE does not support crs-IM features**

* ***Background***
  + Companies claimed that there is no scenario for UE not supporting CRS-IM features to be configured for measurements on 15kHz LTE without gaps for case b-2.
  + Though even this is not correct configuration the UE is not guaranteed with undefined behaviour if no scheduling restriction is specified.
  + If this is not correct configuration, the UE is allowed to cause any interruption.
* Proposals
  + Option 1: The scheduling restriction shall be defined for inter-RAT LTE measurement case b-2 with mixed numerology, -- serving cell and target MO have mixed SCS and they are in the same band, and UE does not support mixed SCS between serving cell and target MO.
  + Option 2: RAN4 does not need to define scheduling restriction due to mixed numerology.
* Recommended WF
  + Reach consensus on whether it is correct configuration if network configures the UE to measure on 15kHz LTE for case b-2 ~~if the UE does not support CRS-IM features~~.
  + If so RAN4 agrees on option 1.
  + If not the UE behaviour is not specified.

Session chair: In RAN4 understanding, it is valid scenario that network configures the UE with 30kHz SCS NR to measure on 15kHz LTE for case b-2.

Agreement:

* No scheduling resctriction, with optional UE capability to support the mixed numerologies for case b-2. Othewise, the scheduling resctrction applies.
* Note: this is for non-DSS scenario.
* ~~Scheduling restriction for the UE supports CRS-IM features~~
* ~~Scheduling restriction for the UE deos not support CRS-IM features~~

**Issue 2-2-1a: Scheduling restriction due to mixed numerology for case b-2: when UE supports crs-IM features**

* Proposals
  + Option 1: If UE supports *crs-IM-nonDSS-30kHzSCS-r17* or *crs-IM-nonDSS-NWA-30kHzSCS-r17*, there should be no scheduling restriction for case b-2.
* Recommended WF
  + Agree on option 1.

### 8.10 Completion of specification support for bandwidth part operation without restriction in NR

**R4-2318481 Big CR to TS 38.133 on Completion of specification support for bandwidth part operation without restriction in NR**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3672 rev Cat: B (Rel-18)  
  
 Source: Vodafone, vivo*

**Decision:** The document was **withdrawn**.

**R4-2320252 Big CR to TS 38.133 on Completion of specification support for bandwidth part operation without restriction in NR**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3822 rev Cat: B (Rel-18)  
  
 Source: Vodafone, vivo*

**Decision: Return to.**

#### 8.10.1 General aspects

**R4-2318482 On general aspects for BWP Without Restriction**

*Type: discussion For: Decision  
 Source: Vodafone*

**Decision: Noted.**

**R4-2318930 General aspects on NR BWP without restrictions**

*Type: discussion For: Decision  
 Source: CMCC*

**Decision: Noted.**

**R4-2319036 On general aspects for BWP operation without restriction**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319037 LS on further RAN4 conclusions on BWP operation without restriction**

*Type: LS out For: Approval  
 to RAN2, cc RAN1  
 Source: vivo*

**Decision: Noted.**

**R4-2320009 Discussion on requirements for UE supporting multiple options**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320289 General Aspects on BWP\_wor**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320694 Further analysis of general aspects related to BWP operation without restriction**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper further analyzes the general aspects related to the BWP operation without restriction for different options

**Decision: Noted.**

#### 8.10.2 RRM core requirements

**R4-2318334 Discussion on the RRM core requirements for the support for bandwidth part operation without restriction**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318597 Discussion on RRM core requirements for bandwidth part operation without restriction**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318598 CR for UE supporting option B-1-1**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2318931 Discussion on RRM requirements of support for BWP operation without restriction**

*Type: discussion For: Decision  
 Source: CMCC*

**Decision: Noted.**

**R4-2319038 On RRM requirements for BWP operation without restriction**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319039 Draft CR on handover requirements for option C for BWP operation without restriction**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: vivo, Vodafone*

**Decision: Return to.**

**R4-2320010 Discussion on RRM requirements for BWP without restriction**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320011 draftCR on L1 measurement requirements for option C**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2320290 RRM Core requirements for BWP\_wor**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320695 Further analysis of requirements for BWP operation without restriction**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper further analyzes the requirements for BWP operation without restriction related to different options

**Decision: Noted.**

**R4-2320696 Draft CR on interruption for BWP operation without restriction for option B-1-2 in 36.133**

*Type: draftCR For: Endorsement  
 36.133 v18.3.1 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

The draftCR defines interruption requirements due to the BWP operation without restriction related to Option B-1-2 in EN-DC and NE-DC scenarios in TS 36.133

**Decision: Return to.**

**R4-2320931 Discussion on multiple options for BWP wor**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2320932 Draft CR for Option B-1-2 applicability conditions**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Return to.**

**R4-2320959 Impact of Option B-1-2**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2318335 Draft CR on interruption requirements for option B-1-2**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: CATT*

**Decision: Return to.**

#### 8.10.3 Moderator summary and conclusions

Topic: [109][212] NR\_BWP\_wor

**R4-2318168 Topic summary for [109][212] NR\_BWP\_wor**

*Type: other For: Information  
 Source: Moderator (Vivo)*

**Abstract:**

[109][200] RRM Session AI 8.10.2

**Decision: Noted.**

**Online session (Wednesday Nov 15, 2023)**

**Requirements for Option B-1-2**

**Issue 5-2a: Interruption length (in ms) for option B-1-2**

* Proposals
  + Option 1: (CATT, CMCC, Apple, vivo, Huawei, Ericsson)
    - Interruption length is 0.5ms for FR1 and 0.25ms for FR2.
  + Option 2: (Qualcomm)
    - Interruption length is larger than 0.5ms and smaller than 1ms.
* Recommended WF
  + Discuss issue 5-2c for interruption ratio requirements firstly, where there is package being proposed in which interruption length is included.

**Issue 5-2c: Interruption ratio requirements (package) for option B-1-2**

*In the previous RAN4 meeting, it was agreed to introduce interruption length and interruption ratio requirements for Option B-1-2.*

* Proposals
  + Option 1a: (CATT)
    - For option B-1-2, existing SSB based BM/RLM/BFD measurement requirements without gap can apply.
    - For option B-1-2, the interruption requirements can be defined based on HARQ ACK/NACK loss framework with a maximum missed ACK/NACK rate up to 0.5%.
    - And the length for each interruption shall not exceed the RF retuning time (0.5ms for FR1 and 0.25ms for FR2).
  + Option 1b: (CMCC)
    - The interruption requirements can be defined based on HARQ ACK/NACK loss framework with a maximum missed ACK/NACK rate up to 0.5%
  + Option 2a: (vivo)
    - For UE supporting option B-1-2, the probability of missed ACK/NACK is 1% for ALL RLM/BFM/BM(L1-RSRP/L1-SINR) measurements based on SSB outside active BWP.
  + Option 2b: (Nokia)
    - Interruption ratio shall not exceed [1.0]%. A lower interruption ratio is also agreeable.
  + Option 2c: (Ericsson)
    - The probability of missed ACK/NACK for a UE supporting Option B-1-2, due to interruptions caused by UE performing BM/RLM/BFD measurements based on SSB outside the active BWP, shall not exceed 1 %.
  + Option 3a: (Huawei)
    - For B-1-2, interruption ratio X% for each applicable serving cell is defined as
      * X%=interruption length \* 2 / L1 periodicity, where
        + interruption length is 0.5ms for FR1 and 0.25ms for FR2, and
        + L1 periodicity is defined as max(lower bound, SSB periodicity), FFS value of the lower bound
  + Option 3b: (Apple)
    - X%=interruption length \* 2 / L1-RS periodicity, where X% is the interruption ratio, interruption length is 0.5ms in FR1 and 0.25ms in FR2, and L1-RS periodicity is the periodicity of SSB configured for BM/RLM/BFD after taking scaling factor P into account.
  + Option 4: (MTK)
    - TCycle is used for interruption requirements specification implementation:
      * The UE is allowed to cause a certain interruption every TCycle period with a certain interruption ratio,
      * Interruption length (L) = 0.5 ms in FR1 and L = 0.25 ms in FR2;
      * 2L is needed for each TCycle;
      * Lower bound of TCycle = 40ms.
      * FFS whether the UE is required to Tx/Rx while measuring the SSB, if yes, FFS scheduling restrictions requirements.
    - Interruption ratio (x%) =
      * L1-RS periodicity: is the periodicity of SSB configured for BM/RLM/BFD after taking scaling factor P into account.
    - Interruption length requirements are defined in number of slots for option B-1-2.
  + Option 5: (Qualcomm)
    - Interruption length is larger than 0.5ms and smaller than 1ms.
    - Interruption ratio is not smaller than 1.25%, i.e.,
      * Y = 2\*X / L \* 100, where
        + X [ms] = interruption length to a victim cell due to L1 measurements on SSB outside active DL BWP.
        + L [ms] = L1 measurement period (which can be for RLM/BFD, CBD, and L1-RSRP/SINR measurements)
        + Y [%] = interruption ratio (to be defined by RAN4)
      * Y = 1.25% when L = 160ms and X = 1ms.
  + Option 6: (Apple)
    - RAN4 shall define interruption length for Option B-1-2 and shall not define interruption ration for the same option.
* Recommended WF
  + Further discuss.

Tentative Agreement:

Interruption ratio: RAN4 to define an upper band. Select one value in the range of [0.5%, 2.5%].

Option 1: With a lower bound for the L1 measurement period defined in RAN4.

Option 2: follow the existing spec for L1 measurement period, without additional change.

Example for option 1:

Option 1:

* + - Interruption ratio is not larger than the upper bound, i.e.,
      * Y = 2\*X / L \* 100, where
        + X [ms] = interruption length (in the unit of slot number) to a victim cell due to L1 measurements on SSB outside active DL BWP.
        + L [ms] = L1 measurement period (which can be for RLM/BFD, CBD, and L1-RSRP/SINR measurements), with a lower bound defined in RAN4.
        + Y [%] = interruption ratio

**Requirements for Option C**

**Issue 4-4: Tsearch in handover requirements for known inter-frequency cell**

* Proposals
  + Option 1: (vivo, CMCC, Ericsson)
    - For UE supporting option C, the handover requirements for known inter-frequency cell are specified as follows.
      * if the measured SSB is the target SSB for handover of the target cell, Tsearch = 0ms;
      * if the measured SSB and the target SSB for handover belong to the same NR target cell and fulfil the following conditions, Tsearch = Trs ms:
        + CD-SSB in initial DL BWP is the measured SSB and NCD-SSB in first active DL BWP is the target SSB for handover
        + NCD-SSB in DL BWP is the measured SSB and CD-SSB in initial DL BWP is the target SSB for handover
        + Both measured SSB and the target SSB for handover are NCD-SSB within different DL BWPs
  + Option 2: (Nokia)
    - Current handover requirements in section 6.1.1 for known inter-frequency cell, including Tsearch, applies for option C.
* Recommended WF
  + Further discuss.

**Agreement:**

Tsearch in handover requirements for known inter-frequency cell

* Reuse the requirements for RedCap, and update the wording when needed.

**Issue 4-5: Tsearch in handover requirements for other cases than known inter-frequency cell**

* Proposals
  + Option 1: (vivo, Ericsson)
    - For UE supporting option C, the handover requirements in terms of Tsearch for other cases than known inter-frequency cell are to reuse the requirements for RedCap UE with 2Rx.
  + Option 2: (Nokia)
    - Current handover requirements in section 6.1.1 for other cases than known inter-frequency cell, including Tsearch, applies for option C.
* Recommended WF
  + Agree on option 1.
    - Note: For other cases than known inter-frequency cell, current handover requirements in section 6.1.1 and the handover requirements for RedCap UE with 2Rx are the same in terms of Tsearch.

Agreement:

* + Agree on option 1.

**Sub-topic 1-1: Requirements for combined options**

**Issue 1-4: Requirements/UE behaviour for UE supporting both option B-1-1 and A**

* Proposals
  + Option 1a: (Vodafone, CMCC, Nokia, Apple, MTK, Ericsson)
    - For UE supporting both option B-1-1 and option A, UE shall perform L1 measurement according to network configuration, there is no need to define requirements/ UE behaviour.
  + Option 1b: (Huawei)
    - For UE supporting both option B-1-1 and A, if configured by NW, UE should perform L1 measurement on both CD-SSB outside active BWP and CSI-RS within active BWP. No additional requirements will be defined for such scenario.
  + Option 2: (vivo)
    - For UE supporting both option B-1-1 and A, if CSI-RS is configured within the active BWP for L1 measurements, then UE is NOT expected to perform RLM/BFD/BM based on CD-SSB outside active BWP.
    - It is clarified in the SSB based L1 measurement requirements that if UE supports both option B-1-1 and option A then the UE is not required to measure the SSB if it is outside active BWP.
  + Option 3: (CATT)
    - No need to define requirements for supporting multiple options.
* Recommended WF
  + Further discuss.

**Issue 1-5: Requirements/UE behaviour for UE supporting both option C and A**

* Proposals
  + Option 1a: (Vodafone, CMCC, Nokia, Apple, MTK, Ericsson)
    - For UE supporting both option C and option A, UE shall perform L1 measurement according to network configuration, there is no need to define requirements/ UE behaviour.
  + Option 1b: (vivo, Huawei)
    - For UE supporting both option C and A, both CSI-RS and NCD-SSB within the active BWP can be configured for L1 measurements. No additional requirements/UE behaviour is needed.
  + Option 2: (CATT)
    - No need to define requirements for supporting multiple options.
* Recommended WF
  + For UE supporting both option C and A, if configured by NW, UE should perform L1 measurement on both NCD-SSB within active BWP and CSI-RS within active BWP. No additional requirements/UE behaviour is needed.

**Issue 1-6: Reporting behaviour for UE supporting both option B-1-1 and B-1-2**

* Proposals
  + Option 1a: (Vodafone, Nokia)
    - A UE supporting both Option B-1-1 and Option B-1-2 shall NOT indicate support of option B-1-1 if interruptions occur due to supporting option B-1-2 in the other band(s) in the same band combination.
  + Option 1b: (vivo, CMCC, Apple)
    - A UE shall not indicate support of both option B-1-1 and option B-1-2 per BC.
  + Option 2: (Huawei)
    - RAN4 not to discuss reporting behaviour for UE supporting both option B-1-1 and B-1-2.
  + Option 3: (Ericsson)
    - No clarification is needed regarding UE behaviour regarding UE supporting both option B-1-1 and option B-1-2 per BC.
* Recommended WF
  + Further discuss.

**Issue 1-7: LS to RAN2 on RAN4 conclusions**

* Proposals
  + Option 1: (vivo)
    - LS to RAN2 on conclusion of issue 1-6 if necessary.
* Recommended WF
  + Further discuss.

**Issue 1-8: Requirements/UE behaviour for UE supporting both option C and B-1-1**

*For UE supporting both option B-1-1 and C, a scenario needs to be discussed is the case wherein UE active BWP does NOT contain neither CD-SSB nor NCD-SSB, shall UE measure CD-SSB or NCD-SSB?*

A screen shot of a cell phone

Description automatically generated

* Proposals
  + Option 1: (Apple)
    - for UE supporting both option B-1-1 and C, RAN4 shall discuss which SSB UE shall measure when active BWP does NOT contain neither CD-SSB nor NCD-SSB. Candidate solutions:
      * Option 1: Leave it to network control.
      * Option 2: UE always measures CD-SSB unless the active BWP contains NCD-SSB.
* Recommended WF
  + Further discuss.

### 8.11 Support of intra-band non-collocated EN-DC/NR-CA deployment

#### 8.11.2 RRM Core requirement

**R4-2318635 Remaining issue for RRM Core requriement**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318636 CR on RRM core requirement for NonCol\_intraB**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3691 rev Cat: F (Rel-18)  
  
 Source: Apple*

**Decision: Revised to R4-2321417 (from R4-2318636).**

[**R4-2321417**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321417.zip) **CR on RRM core requirement for NonCol\_intraB**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3691 rev Cat: F (Rel-18)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2319013 RRM requirements impact due to new BS signaling in intra-band non-collocated CA**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319014 draftCR on MRTD and interruption requirements due to BS signaling**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2319958 Discussion on the impacts of new BS signalling for intra-band non-collocated EN-DC/NR-CA deployment**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319959 DraftCR on maintaining Type 1/2 RRM requirements for inter-band EN-DC with overlapping DL bands R18**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2321418 (from R4-2319959).**

[**R4-2321418**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321418.zip) **DraftCR on maintaining Type 1/2 RRM requirements for inter-band EN-DC with overlapping DL bands R18**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2319960 DraftCR on maintaining Type 1/2 RRM requirements for intra-band non-collocated NR-CA R18**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2320612 Remaining RRM core requirement issues for intra-band non-collocated NR-CA and EN-DC**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

#### 8.11.3 RRM performance requirements

**R4-2318637 On interruption test case for non-collocated intra-band NRCA in FR1**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2319961 Discussion on RRM test cases for supporting intra-band non-collocated NR-CA**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319962 DraftCR on updating interruption test cases for FR1 NR intra-band CA**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2320475 discussion on test cases for non-collocated FR1 intra-band NR-CA**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

discussion on test cases for non-collocated FR1 intra-band NR-CA

**Decision: Noted.**

**R4-2320495 Interruption test case for intra-band non-collcoated NR CA**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3856 rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2320968 Interruption test case for intra-band non-collcoated NR CA**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3929 rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Return to.**

#### 8.11.5 Moderator summary and conclusions

Topic: [109][213] NonCol\_intraB\_ENDC\_NR\_CA

**R4-2318169 Topic summary for [109][213] NonCol\_intraB\_ENDC\_NR\_CA**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

[109][200] RRM Session AI 8.11.2, 8.11.3

**Decision: Noted.**

**Online session (Monday Nov 13, 2023)**

**Issue 1-1: how to implement new RRC signalling into RRM requirement for UE** **supporting [*intraBandNRCA-NonCollocated-r18*]**

* Option 1: (Apple, Nokia)
  + If the new BS signalling is not provided, Type 1 capability requirements are applied as default.
  + If the new BS signalling is provided, Type 2 capability requirements are applied.
* Option 2: (Huawei)
  + If the new BS signalling is not provided, Type 2 capability requirements are applied as default.
  + If the new BS signalling is provided, Type 1 capability requirements are applied.
* Option 3: (Samsung)
  + If the new BS signalling is indicated as [xxx], Type 2 capability requirements are applied.
  + If the new BS signalling is indicated as [yyy], Type 1 capability requirements are applied.
* Recommended WF
  + Continue discussion.

Agreement:

Follow the agreement in RAN2, and capture the RAN2 agreement (if reached) in RAN4 CR in this week.

**Issue 1-2: how to implement** **new RRC signalling into RRM requirement for R18 UE supporting *interBandMRDC-WithOverlapDL-Bands-r16***

* Option 1: (Apple, Huawei)
  + If UE does not support the new RRC signalling, Type 2 capability requirements are applied.
  + If UE supports the new RRC signalling and the new RRC signalling is not provided by network, Type 2 capability requirements are applied.
  + If UE supports the new RRC signalling and the new RRC signalling is provided by network, Type 1 capability requirements are applied.
* Option 2: (Samsung)
  + If the new BS signalling is indicated as [xxx], Type 2 capability requirements are applied.
  + If the new BS signalling is indicated as [yyy], Type 1 capability requirements are applied.
* Option 3: (Nokia)
  + the RRM requirements need to be adapted based on the new BS signaling only if UE indicates both the capability *interBandMRDC-WithOverlapDL-Bands-r16* and additionally [*SupportNewBSsignaling*].
* Recommended WF
  + Continue discussion.

Agreement:

how to implement new RRC signalling into RRM requirement for R18 UE supporting interBandMRDC-WithOverlapDL-Bands-r16

* Follow the agreement in RAN2, and capture the RAN2 agreement (if reached) in RAN4 CR in this week.
* Note: the RRM requirements need to be adapted based on the new BS signaling only if UE indicates both the capability *interBandMRDC-WithOverlapDL-Bands-r16* and additionally [*SupportNewBSsignaling*].

**Issue 1-3: the impacted RRM requirement for UE supporting [*intraBandNRCA-NonCollocated-r18*] due to new BS signalling**

* Option 1: (Apple R4-2318636)
  + MRTD/MTTD, interruption, SCell activation delay, BFD/CBD, scheduling restrictions and measurement restrictions requirements.
* Option 2: (Nokia)
  + MRTD/MTTD and interruption requirements.
* Option 3: (Huawei R4-2319960)
  + MRTD/MTTD, interruption, SCell activation delay, BFD/CBD requirements.
* Recommended WF
  + Continue discussion.

Moderator: option 1 is a full list.

QC: need to check SCell activation delay

HW: some clarification is needed.

Nokia: we are ok to look at SCell activation delay requirement. What’s the impact to BFD/CBD?

HW: some clarification is needed.

Samsung: only talk about the impact due to the new signalling.

Agreement:

The impacted RRM requirement applicability for UE supporting [intraBandNRCA-NonCollocated-r18] due to new BS signalling

* + MRTD/MTTD, interruption, [SCell activation delay, BFD/CBD, scheduling restrictions and measurement restrictions requirements.]

**Issue 1-4: the impacted RRM requirement for R18 UE supporting *interBandMRDC-WithOverlapDL-Bands-r16* due to new BS signalling**

* Option 1: (Nokia, Huawei R4-2319959)
  + MRTD/MTTD and interruption requirements.
* Recommended WF
  + Continue discussion.

Agreement:

The impacted RRM requirement applicability for UE supporting interBandMRDC-WithOverlapDL-Bands-r16 due to new BS signalling

* + MRTD/MTTD and interruption requirements.

### 8.12 Enhanced NR support for high speed train scenario in frequency range 2

#### 8.12.1 RRM core requirement maintenance

**R4-2319897 Big CR to specify RRM requirements on enhanced NR support for Rel-18 FR2 HST**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3784 rev Cat: F (Rel-18)  
  
 Source: Samsung*

**Abstract:**

formal CR

**Decision: Return to.**

##### 8.12.1.1 Simultaneous multi-panel operation for train roof-mounted FR2 high power devices

**R4-2318816 Multi-panel operation in HST FR2**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Multi-panel operation in HST FR2

**Decision: Noted.**

**R4-2318866 CR on HST Requirements for SSB based BFD**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Xiaomi*

**Decision: Return to.**

**R4-2319130 Maintenance CR on MRTD requirements for HST FR2 multi-panel Rx UE-s**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3716 rev Cat: F (Rel-18)  
  
 Source: Intel Corporation*

**Abstract:**

Note: Revision number on the CR coversheet for TDoc R4-2319130 is <Rev#>.

**Decision: Revised to R4-2321419 (from R4-2319130).**

[**R4-2321419**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321419.zip) **Maintenance CR on MRTD requirements for HST FR2 multi-panel Rx UE-s**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3716 rev Cat: F (Rel-18)  
  
 Source: Intel Corporation*

**Abstract:**

Note: Revision number on the CR coversheet for TDoc R4-2319130 is <Rev#>.

**Decision: Return to.**

**R4-2319817 On HST FR2 Enhanced Simultaneous Two-Panel Reception RRM Maintenance**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2321420 (from R4-2319817).**

[**R4-2321420**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321420.zip) **On HST FR2 Enhanced Simultaneous Two-Panel Reception RRM Maintenance**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2319963 CR on L1-RSRP requirements for R18 FR2 HST**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3794 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2320948 CR on RLM requirements for R18 FR2 HST**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3922 rev Cat: B (Rel-18)  
  
 Source: Qualcomm*

**Decision: Return to.**

**R4-2320990 CR on RLM requirements for R18 FR2 HST**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3942 rev Cat: B (Rel-18)  
  
 Source: Qualcomm*

**Decision: Revised to R4-2321421 (from R4-2320990).**

**[R4-2321421](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321421.zip) CR on RLM requirements for R18 FR2 HST**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3942 rev Cat: B (Rel-18)  
  
 Source: Qualcomm*

**Decision: Return to.**

##### 8.12.1.2 Intra-band carrier aggregation (CA) scenario

**R4-2318815 CA operation in HST FR2**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

CA operation in HST FR2

**Decision: Noted.**

**R4-2319378 Discussion on intra-band CA in FR2 eHST**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319379 Update on SCell activation for R18 FR2 HST CA**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3755 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2321422 (from R4-2319379).**

[**R4-2321422**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321422.zip) **Update on SCell activation for R18 FR2 HST CA**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3755 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2319716 Correction to FR2 HST inter-frequency measurement requirements in Idle mode**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Samsung*

**Decision: Merged.**

**R4-2319717 Discussion on feature list and CA remaining issues for Rel-18 FR2 HST**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2319818 On HST FR2 Intra-band carrier aggregation RRM Maintenance**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

##### 8.12.1.3 UL timing adjustment solutions

**R4-2318814 Reply LS on MAC-CE Based Indication for Cross-RRH TCI State Switch**

*Type: LS out For: Approval  
 to RAN2  
 Source: Ericsson*

**Abstract:**

Reply LS on MAC-CE Based Indication for Cross-RRH TCI State Switch

**Decision: Noted.**

[**R4-2321348**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321348.zip) **LS Reply to RAN2 on UL Timing Adjustment Solutions in HST FR2**

*Type: other For: Approval  
 to RAN2  
 Source: Nokia*

**Decision: Revised to R4-2321371 (from R4-2321348).**

[**R4-2321371**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321371.zip) **LS Reply to RAN2 on UL Timing Adjustment Solutions in HST FR2**

*Type: other For: Approval  
 to RAN2  
 Source: Nokia*

**Decision: Approved.**

**R4-2318817 UL timing adjustment solutions for HST FR2**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

UL timing adjustment solutions for HST FR2

**Decision: Noted.**

**R4-2319819 Draft LS Reply to RAN4 on UL Timing Adjustment Solutions in HST FR2**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319820 CR for 38.133: UL TX Timing and TCI State Switch Delay Requirements with New MAC CE (Rel-18, Cat C)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3777 rev Cat: C (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2319964 Discussion on UL timing adjustment for R18 FR2 HST**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 8.12.1.4 RRM aspects for tunnel deployment scenario

**R4-2319821 On UL Spatial Relation Swithing and Tunnel Deployment Maintenance**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision:** The document was **not treated**.

##### 8.12.1.5 Others

**R4-2319131 Maintenance CR on IDLE mode HST FR2 UE mobility**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3717 rev Cat: F (Rel-18)  
  
 Source: Intel Corporation*

**Abstract:**

Note: Revision number wrong on the CR coversheet for TDoc R4-231913 is <Rev#>.

**Decision: Revised to R4-2321423 (from R4-2319131).**

[**R4-2321423**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321423.zip) **Maintenance CR on IDLE mode HST FR2 UE mobility**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3717 rev Cat: F (Rel-18)  
  
 Source: Intel Corporation, Samsung*

**Abstract:**

Note: Revision number wrong on the CR coversheet for TDoc R4-231913 is <Rev#>.

**Decision: Return to.**

**R4-2319721 Discussion on MAC-CE based indication for Cross-RRH TCI state switch and Reply to LS**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Samsung*

**Decision: Noted.**

#### 8.12.2 RRM performance requirements

**R4-2318818 RRM performance requirements for HST FR2**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

RRM performance requirements for HST FR2

**Decision: Noted.**

**R4-2319132 Test cases list for HST FR2 UE multipanel simultaneous reception and CA**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2319720 Discussion on RRM test case for FR2 HST**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Samsung*

**Decision: Noted.**

**R4-2319822 On HST FR2 Enhanced RRM Performance Requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319965 Discussion on RRM performance for R18 FR2 HST**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

#### 8.12.4 Moderator summary and conclusions

Topic: [109][214] NR\_HST\_FR2\_enh\_part1

**R4-2318170 Topic summary for [109][214] NR\_HST\_FR2\_enh\_part1**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

[109][200] RRM Session AI 8.12.1

**Decision: Noted.**

[**R4-2321332**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321332.zip) **Ad-hoc minutes on NR\_HST\_FR2\_enh WI**

*Type: other For: Approval  
 Source: Samsung*

**Decision: Approved.**

QC: Rel-18 UE behaivour if the New MAC CE is not present with Option B, UE follow R17 behviour.

Capture the following in the RAN2 LS, and further refine the wording:

* Agreement: Explain both Option A and B in the reply LS:
  + Option A: Still follow RAN4’s existing agreement (for indication of “1” and “0”), and explanation of the necessity of “0”.
  + Option B: By following RAN2’s suggestion for simplified MAC CE design, by modifying the expected requirements for UE. And explain to RAN2 what we lose by using this simplified MAC CE:
    - **[MAC-CE indicates “1”**:
      * When *highSpeedLargeOneStepUL-TimingFR2-r17* is enabled for HST PC 6 UE supporting [*largeOneStepUL-timingFR2-r17*] capability, UE shall apply the one shot large timing adjustment specified in Clause 7.1.2.3 in TS 38.133 on the first UL transmission after TCI state switch without checking the DL timing difference threshold.]
    - **[New MAC CE is not present, but Rel-15 MAC CE is indicated:**
      * When *highSpeedLargeOneStepUL-TimingFR2-r17* is enabled for HST PC 6 UE supporting [*largeOneStepUL-timingFR2-r17*] capability, UE shall apply the one shot large timing adjustment specified in Clause 7.1.2.3 in TS 38.133 on the first UL transmission after TCI state switch with checking the DL timing difference threshold.]

Topic: [109][215] NR\_HST\_FR2\_enh\_part2

**R4-2318171 Topic summary for [109][215] NR\_HST\_FR2\_enh\_part2**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

[109][200] RRM Session AI 8.12.2

**Decision: Noted.**

[**R4-2321349**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321349.zip) **WF on NR\_HST\_FR2\_enh\_part2**

*Type: other For: Approval  
 Source: Samsung*

**Decision: Return to.**

### 8.13 Air-to-ground network for NR

#### 8.13.6 RRM core requirements

##### 8.13.6.1 General aspects

**R4-2318900 Big CR to TS 38.133 on Air-to-ground network for NR**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3702 rev Cat: F (Rel-18)  
  
 Source: CMCC*

**Decision: Revised to R4-2321365 (from R4-2318900).**

[**R4-2321365**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321365.zip) **Big CR to TS 38.133 on Air-to-ground network for NR**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3702 rev Cat: F (Rel-18)  
  
 Source: CMCC*

**Decision: For post-meeting email agreement.**

**R4-2318901 Discussion and the draft LS on UE features for NR ATG**

*Type: discussion For: Decision  
 Source: CMCC*

**Decision: Noted.**

**R4-2318902 TP to TR 38.876: RRM requirements for ATG network**

*Type: pCR For: Approval  
 38.876 v0.6.0 CR- rev Cat: (Rel-18)  
  
 Source: CMCC*

**Decision: Approved.**

##### 8.13.6.2 Mobility requirements

**R4-2320146 Corrections to the ATG IDLE/CONNECTED mode mobility requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR contains editorial corrections to the ATG IDLE/CONNECTED mode mobility requirements.

**Decision: Revised to R4-2321394 (from R4-2320146).**

**[R4-2321394](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321394.zip) Corrections to the ATG IDLE/CONNECTED mode mobility requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR contains editorial corrections to the ATG IDLE/CONNECTED mode mobility requirements.

**Decision: Return to.**

##### 8.13.6.3 Timing adjustments

**R4-2318903 Discussion on timing requirements maintenance for ATG**

*Type: discussion For: Decision  
 Source: CMCC*

**Decision: Noted.**

##### 8.13.6.4 Signaling characteristics

##### 8.13.6.5 Measurement requirements

**R4-2318317 Discussion on measurement requirements for Rel-18 ATG maintenance**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318318 CR on L3 measurement procedure requirements for ATG**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3660 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Merged.**

**R4-2319151 CR on measurement requirement in ATG**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3718 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR includes the measurement requirement for ATG

**Decision: Revised to R4-2321393 (from R4-2319151).**

**[R4-2321393](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321393.zip) CR on measurement requirement in ATG**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3718 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR includes the measurement requirement for ATG

**Decision: Return to.**

#### 8.13.7 RRM performance requirements

**R4-2318319 Discussion on RRM performance requirement for ATG**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318904 Discussion on RRM performance requirements for ATG**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319254 Discussion on RRM performance for ATG operation**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2319366 Discussion on performance requirements for ATG**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320129 Discussions on RRM performance requirements for ATG**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

RAN4 had initial discussions to identify the performance requirements for Rel-18 feature of air-to-ground [1]. A set of highlevel agreements on test configurations were made and a preliminary list of test cases were identified for further discussions, see

**Decision: Noted.**

**R4-2320418 Discussion on the performance requirements for ATG**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2320518 Discussion on the performance requirements for ATG**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision:** The document was **withdrawn**.

#### 8.13.9 Moderator summary and conclusions

Topic: [109][216] NR\_ATG

**R4-2318172 Topic summary for [109][216] NR\_ATG**

*Type: other For: Information  
 Source: Moderator (CMCC)*

**Abstract:**

[109][200] RRM Session AI 8.13.6, 8.13.7

**Decision: Noted.**

[**R4-2321333**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321333.zip) **Ad-hoc minutes on NR ATG**

*Type: other For: Approval  
 Source: CMCC*

**Additional agreement for Issue 2-4: GNSS setup**

* Agreement:

Positioning is provided via AT command for all test cases

**Decision: Approved.**

[**R4-2321391**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321391.zip) **WF on RRM requirements for NR ATG**

*Type: other For: Approval  
 Source: CMCC*

**Decision: Return to.**

[**R4-2321392**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321392.zip) **LS on Layer-1/2/3 ATG UE features and koffset mechanism**

*Type: other For: Approval  
To:RAN1, RAN2*

*Source: CMCC*

**Decision: Return to.**

**Issue 2-7: Neighbour cell configuration**

* Proposals
  + Option 1: For the TDD cell re-selection test and and intra/inter-frequency measurement test for UE with antenna array, choose some test cases to configure 2 neighbour cells. (CMCC, Ericsson)
* Recommended WF
  + To be discussed

QC: do we have 2 cells for FR2? We need time to check.

**Issue 2-4: GNSS setup**

* Agreement:

Positioning is provided via AT command for all test cases

Nokia: based on the discussion in NR NTN, we need to check with RAN5.

R&S: we don’t understand well the agreement. Does it mean positioning?

Nokia: Positioning is provided via AT command.

### 8.14 NR support for dedicated spectrum less than 5MHz for FR1

#### 8.14.4 RRM core requirement

[**R4-2321344**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321344.zip) **Summary of simulation results for RRM requirements for less than 5 MHz**

*Type: other For: Information  
 Source: Nokia*

**Decision: Return to.**

**R4-2318652 On remaining issues for spectrum less than 5MHz**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2319786 CR for 38.133 on RRM core requirements for NR support for dedicated spectrum less than 5MHz for FR1**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3773 rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Introduction of NR intra-frequency measurements for 3MHz channel bandwidth for TS 38.133

**Decision: Revised to R4-2321476 (from R4-2319786).**

[**R4-2321476**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321476.zip) **CR for 38.133 on RRM core requirements for NR support for dedicated spectrum less than 5MHz for FR1**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3773 rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Introduction of NR intra-frequency measurements for 3MHz channel bandwidth for TS 38.133

**Decision: Return to.**

**R4-2319787 Discussion on less than 5Mhz RRM core requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320012 Discussion on remaining issues in RRM requirements for less than 5MHz BW**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320013 draftCR on link recovery and intra-frequecy requirements for less than 5MHz**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2321477 (from R4-2320013).**

[**R4-2321477**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321477.zip) **draftCR on link recovery and intra-frequecy requirements for less than 5MHz**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2320768 On RRM requirements for < 5MHz**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss On RRM requirements for < 5MHz

**Decision: Noted.**

**R4-2320769 RRC connected state mobility**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

RRC connected state mobility

**Decision: Revised to R4-2321478 (from R4-2320769).**

[**R4-2321478**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321478.zip) **RRC connected state mobility**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

RRC connected state mobility

**Decision: Return to.**

**R4-2320770 Simulation results for SSB index and MIB reading**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Simulation results for SSB index and MIB reading

**Decision: Noted.**

**R4-2320929 Discussion on core part for FR1 less than 5MHz**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2321003 RRM requirements for NR less than 5MHz**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

#### 8.14.5 RRM performance requirements

**R4-2319788 Discussion on less than 5Mhz RRM performance part**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320014 Discussion on RRM performance requirements for less than 5MHz BW**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320771 On RRM performance requirements for < 5MHz**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss On RRM performance requirements for < 5MHz

**Decision: Noted.**

**R4-2320772 Simulation results for RLM (OOS/IS) and BFD for < 5MHz**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Simulation results for RLM (OOS/IS) and BFD for < 5MHz

**Decision: Noted.**

**R4-2320930 Discussion on performance part for FR1 less than 5MHz**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

#### 8.14.7 Moderator summary and conclusions

Topic: [109][217] NR\_FR1\_lessthan\_5MHz\_BW

**R4-2318173 Topic summary for [109][217] NR\_FR1\_lessthan\_5MHz\_BW**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

[109][200] RRM Session AI 8.14.4, 8.14.5

**Decision: Noted.**

[**R4-2321342**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321342.zip) **Coffee break discussion minutes on NR\_FR1\_lessthan\_5MHz\_BW WI**

*Type: other For: Approval  
 Source: Nokia*

**Decision: Approved.**

**Online session (Tuesday Nov 14, 2023)**

**Sub-topic 1-3** **Time to identify target NR cell for RRC connection re-establishment and RRC connection release with re-direction**

Sub-topic description:

In RAN4#108bis meeting RAN4 agreed following side conditions:

Agreement:

- Inter-frequency RRC connection re-establishment:

* Side conditions for NR is target cell detection for RRC connection re-establishment is Es/Iot≥-4 dB.

- Intra-frequency RRC connection re-establishment:

* Side conditions for NR is target cell detection for RRC connection re-establishment is Es/Iot≥-6 dB.

- RRC connection release with re-direction:

* Side conditions for NR target cell detection for RRC connection release with re-direction is Es/Iot≥-4 dB.

**Issue 1-3-1: Time to identify target NR intra-frequency cell for RRC connection re-establishment**

* Proposals
  + Option 1: Extend existing requirements by 3xTSMTC for the unknown intra-frequency cell.
  + Option 2: No other proposal
* Agreement
  + The time to identify an unknown target NR intra-frequency cell for RRC connection re-establishment, Tidentify\_intra\_NR as defined in Table 6.2.1.2.1-1, is extended with [1 or 2 or 3] xTSMTC where TSMTC is the periodicity of the SMTC occasion configured for the intra-frequency carrier.
  + Agree one value in [] in this meeting based on the simulation results.

E///: the simulation results are different. Depending on the SNR condition, less than 3 is needed.

* Extend existing requirements by [3] x TSMTC for the unknown intra-frequency cell. (QC, MTK, Apple)
* Extend existing requirements by [1] x TSMTC for the unknown intra-frequency cell. (E///)

**Issue 1-3-2: Time to identify target NR inter-frequency cell for RRC connection re-establishment**

* Proposals
  + Option 1: Extend existing requirements by 2xTSMTC for the unknown inter-frequency cell.
  + Option 2: No other proposal
* Agreement:
  + The time to identify an unknown target NR inter-frequency cell for RRC connection re-establishment, Tidentify\_inter\_NR, i as defined in Table 6.2.1.2.1-2, is extended with [1 or 2] xTSMTC, i where TSMTC, i is the periodicity of the SMTC occasion configured for the inter-frequency carrier.
  + Agree one value in [] in this meeting based on the simulation results.

**Issue 1-3-3: Time to identify target NR (inter-frequency) cell for RRC connection release with re-direction**

* Proposals
  + Option 1: Extend existing requirements by 2xTSMTC for the unknown inter-frequency cell.
  + Option 2: No other proposal
* Agreement:
  + The time to identify an unknown target NR inter-frequency cell for RRC connection release with re-direction, Tidentify-NR as defined in Table 6.2.3.2.1-1, is extended with [1 or 2] xTrs where Trs it is the periodicity of the SMTC occasion configured.
  + Agree one value in [] in this meeting based on the simulation results.

**Sub-topic 1-4 Applicability rule addition**

*Sub-topic description*

From RAN4#108bis WF:

Sub-topic 1-9 Applicability rule addition

Way forward:

For a UE which supports only less than 5MHz CBW, discuss whether to add applicability rule of existing requirements for each of the requirements applicable for the less than 5 MHz UE.

*Open issues and candidate options before meeting:*

**Issue 1-4: Add applicability rule of existing requirements for each of the requirements applicable for the less than 5 MHz UE:**

* Proposals
  + Option 1: Have applicability rule under each section supported by rel-18. (Nokia)
  + Option 2: New section referring to the applicable requirements for rel-18. (Ericsson, Nokia, Apple)
  + Option 3: only address the requirements impacted by < 5MHz (as done currently). (Nokia)
  + Option 4: No need to specify separate requirements or applicable rules for a UE that only supports less than 5MHz BW.
* Recommended WF
  + After discussions the issue is how to clarify which UE requirements are applicable for a UE which supports less than 5MHz. It was decided that for less than 5MHz BW no requirement related to CA would apply as the feature does not support CA in Rel-18. For this example, it should be clarified in the RAN4 specifications which requirements apply for less than 5MHz BW and hence also which do not apply.
  + Moderator suggest more offline discussions.

Session chair: Can we use option 2?

QC: CA requirements are defined for band combinations. If UE does not support a band combation including a less than 5Mhz band, UE does not support the corresponding RRM requirement as well. It is clear enough.

E///: Other requirement is not impacted. It is clear how to inteprete.

Apple: the current RRM requirement is band agnostic. Generic statement for less than 5Mhz band is neded.

QC: the existing UE can also support only one band.

QC: UE can support one band with less than 5MHz, but it does not mean UE does not support other bands/BCs.

Further discuss and down-select one option in this meeting:

* + Option 2: New section referring to the [non-applicable or] applicable requirements for rel-18.
  + Option 4: No need to specify separate requirements or applicable rules for a UE that supports less than 5MHz BW.

### 8.20 Study on low-power wake-up signal and receiver for NR

#### 8.20.4 Review of outcome of RAN1 studies related to RRM

**R4-2318398 Review of outcome of RAN1 studies related to RRM**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2318658 On LP-WUR based RRM**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2319246 On remaining issues for on LP-WUR RRM study**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319247 TP to TR 38.869 on RRM aspects for LP-WUR**

*Type: pCR For: Approval  
 38.869 v1.1.0 CR- rev Cat: (Rel-18)  
  
 Source: vivo*

**Decision: Revised to R4-2321341 (from R4-2319247).**

[**R4-2321341**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321341.zip) **TP to TR 38.869 on RRM aspects for LP-WUR**

*Type: pCR For: Approval  
 38.869 v1.1.0 CR- rev Cat: (Rel-18)  
  
 Source: vivo*

**Decision: Return to.**

**R4-2320016 Discussion on RRM related aspects for LP-WUR study**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320127 Discussions on RAN1 studies related to RRM for WUR**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

RAN4 is to review the outcome of RAN1 studies on serving cell RSRP/RSRQ measurements offloading to LP-WUR for IDLE/INACTIVE mode, for feasibility verification. In this contribution we discuss the above objective and provide view on the topic.

**Decision:** The document was **withdrawn**.

**R4-2320128 TP for TR 38.869 RRM for WUR**

*Type: pCR For: Approval  
 38.869 v1.1.1 CR- rev Cat: (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

We present our text proposal for capturing the RAN4 conclusion on RRM measurements for WUR in the TR 38.869.

**Decision: Merged**

**R4-2320291 Review of outcome of RAN1 studies related to RRM**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320432 Discussion on LR based RRM**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

#### 8.20.5 Moderator summary and conclusions

Topic: [109][218] FS\_NR\_LPWUS

**R4-2318174 Topic summary for [109][218] FS\_NR\_LPWUS**

*Type: other For: Information  
 Source: Moderator (Vivo)*

**Abstract:**

[109][200] RRM Session AI 8.20.4

**Decision: Noted.**

**Online session (Monday Nov 13, 2023)**

**Issue 1-1-2: SNR target X for serving cell measurement offloading**

*Agreement at RAN4 108bis:*

*RAN4 understands the determination of SNR target X of LP-WUR should consider at least the applicable coverage conditions of LP-WUR.*

* Proposals
  + P1: The following wording are suggested be considered besides previous agreement (vivo)
    - For the serving cell measurement offloading scenario, the determination of SNR target X of LP-WUR should consider at least the possibility that the LP-WUR/MR works at a higher operating point.
    - Alternatively since the serving cell measurement offloading functionality has already been determined to be supported, RAN4 can investigate the new side conditions for this functionality for LP-WUR directly.

*Recommendations: Discuss whether to further update wording of previous agreement based on P1. Otherwise the previous agreement will used.*

QC: the higher SNR means side condition. It is ok to keep it open. Ok to consider higher SNR, and the question is exact level of the SNR. Simulation is needed.

Nokia: the proposal is not clear. What is the exact meaning of high operating point.

Apple: share the same view as QC and Nokia. Have the detailed discussion in WI phase. Some of the parameters is configured by network. Avoid the performance gap between MR and LP-WUR.

vivo: higher operating point means higher SNR / side condition. It is the direction suggested for WI, and the exact value can be discussed further.

**Issue 1-1-3: Accuracy**

* Proposals
  + P1:The accuracy requirement defined in section 10.1.2B of TS38.133 introduced for Rel-16 EMR can be used as the base for the study for serving cell measurement offloading to LP-WUR. (vivo)
  + P2: Suggest to consider possible further relaxation on the accuracy target for related measurement metric like RSRP due to simplified functionality (serving cell measurement offloading) performed by LP-WUR. (vivo)
  + P3: RAN4 not to further discuss the target accuracy for LP-WUR based RRM in SI phase (Huawei)
  + P4: RAN4 agrees that LP-WUR based measurements need to reach the same accuracy level as MR based measurements including the necessary implementation margin for offloading feasibility. Different target accuracies could be determined for absolute and relative measurements. (Nokia)

*Recommendations: Discuss proposals.*

Samsung: agree with P3. The scope of Rel-19 WI and RAN1/2 design is not clear now.

QC: agree with P3. Delay, accuracy and target SNR are to be discussed in WI, and are discussed together.

Apple: ok with P3. Need to discuss fix delay, accuracy or side condition first in the WI.

Nokia: ok with P3.

**Issue 1-2-1: Suggestion for issues to be considered at WI phase**

* Proposals
  + P1: Capture high level recommendation for Rel-19 WI consideration into Rel-18 SI TR: RAN4 early involvement during Rel-19 WI phase required to evaluate RRM impact for serving cell measurement offloading operation e.g. LP-WUS waveform design, MR measurement relaxation and LP-MUR RRM measurement (Samsung)
  + P2-1: During RAN4 Rel-19 WI phase, RAN4 can further discuss/evaluate the following: (Apple)
    - Further relaxation on the RSRP accuracy target due to simplified functionality performed by LP-WUR based measurement.
    - A study phase is needed in R19 WI for RAN4 to evaluate the RRM performance based on:
      * Different SNR side condition,
      * Different samples/symbols for both LP-SS and SSS
      * Measurement accuracy and measurement delay
      * Coverage
      * A criterion to design the RRM requirement, e.g., assume the LP-WUR based RRM have the equivalent accuracy performance as legacy case, or assume the LP-WUR based RRM have the equivalent side condition of SNR as legacy case.
      * The exact relaxations and offloading mechanism
  + P2-2: A study phase maybe needed in Rel-19 WI phase. RAN4 will consider at least the following aspects during WI phase: SNR side conditions; accuracy requirements; sample and measurement delay. (vivo)
  + P3: RAN4 not to further discuss the issues to be considered in WI phase in SI phase (Huawei)
  + P4: RAN4 first aims to agree the required accuracy for the LP-WUR based measurements (target), and then considers the necessary side conditions (i.e. SNR, NF) to meet the agreed accuracy. LP-WUR based measurements need to reach the same accuracy level as MR based measurements including the necessary implementation margin for offloading feasibility. From LP-WUR measurement perspective, RAN4 will conclude the required side conditions to meet the target accuracy in WI phase (if agreed). (Nokia)

*Recommendations: Discuss proposals*

Apple: agree with P1. Even if RAN1 design is not finished, early RAN4 involvement is helpful.

Vivo: agree with P1.

In RAN4 understanding, RAN4 early involvement during Rel-19 WI phase is helpful from RRM perspective ~~required~~ ~~to evaluate RRM impact for serving cell measurement offloading operation~~. The exact WI scope and TU allocation are up to RAN plenary discussion.

QC: many aspects are depending on RAN1 desing of the waveform.

**Revision of TP**

### 8.22 Expanded and improved NR positioning

#### 8.22.2 RRM core requirements

**R4-2320572 Draft CR # 18 General aspects: Introduction (include aslo general aspects of CPP)**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2321424 (from R4-2320572).**

[**R4-2321424**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321424.zip) **Draft CR # 18 General aspects: Introduction (include aslo general aspects of CPP)**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Return to.**

**R4-2320573 Draft CR # 20 General aspects: Introduction (PRS measurement requirements for RedCap in RRC\_CONNECTED state)**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2321425 (from R4-2320573).**

[**R4-2321425**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321425.zip) **Draft CR # 20 General aspects: Introduction (PRS measurement requirements for RedCap in RRC\_CONNECTED state)**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Return to.**

**R4-2320916 DraftCR #2 General aspects and PRS-RTSD measurement requirements in RRC\_IDLE**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2321426 (from R4-2320916).**

**[R4-2321426](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321426.zip) DraftCR #2 General aspects and PRS-RTSD measurement requirements in RRC\_IDLE**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Return to.**

##### 8.22.2.1 General aspects

**R4-2319942 Feature list proposals for positioning enhancements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2319990 On measurement definitions for positioning with bandwidth aggregation**

*Type: LS out For: Approval  
 to RAN1  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320358 Draft CR # 6: General aspects - introduction (inclulding general aspects of PRS measurement with bandwidth aggregation and CPP)**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR based on work split agreed in RAN4#108bis.

**Decision: Revised to R4-2321427 (from R4-2320358).**

[**R4-2321427**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321427.zip) **Draft CR # 6: General aspects - introduction (inclulding general aspects of PRS measurement with bandwidth aggregation and CPP)**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR based on work split agreed in RAN4#108bis.

**Decision: Return to.**

**R4-2320366 Discussion on RAN1 LS on PRS bandwidth aggregation**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Discussion on RAN1 LS to RAN4 agreed in RAN1#114bis meeting.

**Decision: Noted.**

**R4-2320700 Updated work Split on RRM Core Requirements for Positioning**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

The paper provides updated work split between companies for defining RRM core requirements for positioning in R18. Compared to the work split in R4-2317388, the new draft CRs include requirements for TA validation for SRS transmission with and without val

**Decision: Revised to R4-2321460 (from R4-2320700).**

[**R4-2321460**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321460.zip) **Updated work Split on RRM Core Requirements for Positioning**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

The paper provides updated work split between companies for defining RRM core requirements for positioning in R18. Compared to the work split in R4-2317388, the new draft CRs include requirements for TA validation for SRS transmission with and without val

**Decision: Return to.**

**R4-2320701 Updated Big Draft CR on Skeleton for RRM Core Requirements for Positioning**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This is updated Draft Big CR on skeleton/structure for defining RRM core requirements for positioning in Rel-18

**Decision: Revised to R4-2321428 (from R4-2320701).**

[**R4-2321428**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321428.zip) **Updated Big Draft CR on Skeleton for RRM Core Requirements for Positioning**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This is updated Draft Big CR on skeleton/structure for defining RRM core requirements for positioning in Rel-18

**Decision: Return to.**

**R4-2320702 Big CR on RRM Core Requirements for Positioning Enhancement in Rel-18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3878 rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

The Big CR for defining all the RRM core requirements for positioning enhancement in Rel-18. The Big CR is for post RAN4 meeting agreement to capture all the endorsed draft CRs.

**Decision: Revised to R4-2321429 (from R4-2320702).**

[**R4-2321429**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321429.zip) **Big CR on RRM Core Requirements for Positioning Enhancement in Rel-18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3878 rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

The Big CR for defining all the RRM core requirements for positioning enhancement in Rel-18. The Big CR is for post RAN4 meeting agreement to capture all the endorsed draft CRs.

**Decision: Return to.**

**R4-2320808 General aspects for RRM core requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

##### 8.22.2.2 SL Positioning

**R4-2318280 Simulation results for sidelink positioning**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318336 Discussion on RRM requirements of sidelink positioning**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318337 Draft CR #27: on SL Rx-Tx time difference and SL RSRPP measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: CATT*

**Decision: Revised to R4-2321430 (from R4-2318337).**

[**R4-2321430**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321430.zip) **Draft CR #27: on SL Rx-Tx time difference and SL RSRPP measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: CATT*

**Decision: Return to.**

**R4-2318856 Discussion on Sidelink Positioning**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2319071 Discussion on RRM requirements for sidelink positioning**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319072 Updated Link-level simulation results for SL-PRS measurement**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319073 Draft CR #28 TS 38.133 SL-AoA and SL-RTOA measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Revised to R4-2321431 (from R4-2319073).**

[**R4-2321431**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321431.zip) **Draft CR #28 TS 38.133 SL-AoA and SL-RTOA measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Return to.**

**R4-2319094 Discussion on sidelink positioning**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319480 Discussion on SL positioning**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319991 Discussion on RRM requirements for SL positioning**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319992 Updated simulation results for SL positioning**

*Type: discussion For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320458 On SL positioning**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on remaining open issues on SL positioning

**Decision: Noted.**

**R4-2320459 Draft CR #25 38133 Introduction to SL positioning measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR #25 38133 Introduction to SL positioning measurement requirements

**Decision: Revised to R4-2321432 (from R4-2320459).**

[**R4-2321432**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321432.zip) **Draft CR #25 38133 Introduction to SL positioning measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR #25 38133 Introduction to SL positioning measurement requirements

**Decision: Return to.**

**R4-2320460 Draft CR #26 38133 SL RSTD and SL PRS-RSRP measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR #25 38133 Introduction to SL positioning measurement requirements

**Decision: Revised to R4-2321433 (from R4-2320460).**

[**R4-2321433**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321433.zip) **Draft CR #26 38133 SL RSTD and SL PRS-RSRP measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR #25 38133 Introduction to SL positioning measurement requirements

**Decision: Return to.**

**R4-2320809 RRM Core Requirements for SL positioning**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320853 Simulation Results for Sidelink Positioning**

*Type: other For: Information  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320911 On requirements for SL positioning**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

##### 8.22.2.3 LPHAP use case

**R4-2318276 Draft CR #9 on PRS based UE Rx-Tx and RSRPP measurement requirements for LPHAP in RRC\_INACTIVE state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: CATT*

**Decision: Revised to R4-2321434 (from R4-2318276).**

[**R4-2321434**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321434.zip) **Draft CR #9 on PRS based UE Rx-Tx and RSRPP measurement requirements for LPHAP in RRC\_INACTIVE state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: CATT*

**Decision: Return to.**

**R4-2318338 Discussion on RRM requirements of LPHAP**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318858 Discussion on Positioning in LPHAP case 6**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2319074 Discussion on reply LS on TA validation for LPHAP**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319095 Discussion on LPHA positioning**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319098 Draft CR #8 on RSTD and PRS-RSRP measurement requirements for LPHAP in RRC inactive state**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: CMCC*

**Decision: Revised to R4-2321435 (from R4-2319098).**

[**R4-2321435**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321435.zip) **Draft CR #8 on RSTD and PRS-RSRP measurement requirements for LPHAP in RRC inactive state**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: CMCC*

**Decision: Return to.**

**R4-2319306 Draft CR # 17 UE transmit timing for positioning measurements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: LG Electronics Inc.*

**Decision: Revised to R4-2321436 (from R4-2319306).**

[**R4-2321436**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321436.zip) **Draft CR # 17 UE transmit timing for positioning measurements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: LG Electronics Inc.*

**Decision: Return to.**

**R4-2319481 Discussion on LPHAP use case**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319482 Draft CR #3 PRS-RSRP and PRS-RSRPP measurement requirement in RRC IDLE state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: OPPO*

**Decision: Revised to R4-2321437 (from R4-2319482).**

[**R4-2321437**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321437.zip) **Draft CR #3 PRS-RSRP and PRS-RSRPP measurement requirement in RRC IDLE state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: OPPO*

**Decision: Return to.**

**R4-2319499 Draft CR #8 on RSTD and PRS-RSRP measurement requirements for LPHAP in RRC inactive state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: CMCC*

**Decision: Revised to R4-2321438 (from R4-2319499).**

[**R4-2321438**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321438.zip) **Draft CR #8 on RSTD and PRS-RSRP measurement requirements for LPHAP in RRC inactive state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: CMCC*

**Decision: Return to.**

**R4-2319993 Discussion on RRM requirements for LPHAP**

*Type: LS out For: Approval  
 to RAN2, RAN1  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319994 DraftCR #7: Cell reselection measurement for positioning**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2321439 (from R4-2319994).**

[**R4-2321439**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321439.zip) **DraftCR #7: Cell reselection measurement for positioning**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2319995 DraftCR #14: Cell reselection measurement for positioning for RedCap UE**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2321440 (from R4-2319995).**

[**R4-2321440**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321440.zip) **DraftCR #14: Cell reselection measurement for positioning for RedCap UE**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2320368 Response to RAN2 LS on TA validation**

*Type: LS out For: Approval  
 to RAN2, cc RAN1  
 Source: Ericsson*

**Abstract:**

Response to RAN2 LS on TA validation issue for SRS transmission within validity area.

**Decision: Return to.**

**R4-2320369 On LPHAP requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Discussion paper on remaining issues on LPHAP core requirement.

**Decision: Noted.**

**R4-2320698 Draft CR # 7A: TA validation requirements for positioning for LPHAP in RRC inactive state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

The draftCR defines TA validation requirements for positioning measurements involving SRS transmission for LPHAP in RRC inactive state. TA validation is supported by RAN2. This draft CR was identified later and therefore was not included in the initial wo

**Decision: Revised to R4-2321441 (from R4-2320698).**

[**R4-2321441**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321441.zip) **Draft CR # 7A: TA validation requirements for positioning for LPHAP in RRC inactive state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

The draftCR defines TA validation requirements for positioning measurements involving SRS transmission for LPHAP in RRC inactive state. TA validation is supported by RAN2. This draft CR was identified later and therefore was not included in the initial wo

**Decision: Return to.**

**R4-2320854 RRM Core Requirements for LPHAP**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320912 On requirements for LPHAP**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

##### 8.22.2.4 RedCap Positioning

[**R4-2321463**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321463.zip) **Draft CR # 20A: CSSF for PRS measurement requirements in RRC connected state for RedCap**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source:*

**Decision: Return to.**

**R4-2318277 Draft CR #5 on PRS-RSRP(P) measurement requirements for RedCap positioning in RRC\_IDLE state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: CATT*

**Decision: Revised to R4-2321442 (from R4-2318277).**

[**R4-2321442**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321442.zip) **Draft CR #5 on PRS-RSRP(P) measurement requirements for RedCap positioning in RRC\_IDLE state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: CATT*

**Decision: Return to.**

**R4-2318278 Discussion on RRM requirements of RedCap UE positioning**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318857 Discussion on Positioning for RedCap UEs**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2318860 Draft CR # 4: PRS measurement requirements for RedCap in RRC idle state (Introduction and RSTD measurement requirements)**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Xiaomi*

**Decision: Revised to R4-2321443 (from R4-2318860).**

[**R4-2321443**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321443.zip) **Draft CR # 4: PRS measurement requirements for RedCap in RRC idle state (Introduction and RSTD measurement requirements)**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Xiaomi*

**Decision: Return to.**

**R4-2318861 Draft CR # 13:PRS measurement requirements for RedCap positioning in RRC INACTIVE state (Introduction)**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Xiaomi*

**Decision: Revised to R4-2321444 (from R4-2318861).**

[**R4-2321444**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321444.zip) **Draft CR # 13:PRS measurement requirements for RedCap positioning in RRC INACTIVE state (Introduction)**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Xiaomi*

**Decision: Return to.**

**R4-2318862 Draft CR # 16:PRS measurement requirements for RedCap positioning in RRC INACTIVE state (UE Rx-Tx time difference measurement requirements)**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Xiaomi*

**Decision: Revised to R4-2321445 (from R4-2318862).**

[**R4-2321445**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321445.zip) **Draft CR # 16:PRS measurement requirements for RedCap positioning in RRC INACTIVE state (UE Rx-Tx time difference measurement requirements)**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Xiaomi*

**Decision: Return to.**

**R4-2319483 Discussion on RedCap positioning**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319996 Discussion on RedCap positioning**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319997 Simulation results for PRS measurement with FH**

*Type: discussion For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319998 DraftCR #22: Requirements for RedCap Rx-Tx and PRS-RSRPP measurement in CONNECTED**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2321446 (from R4-2319998).**

[**R4-2321446**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321446.zip) **DraftCR #22: Requirements for RedCap Rx-Tx and PRS-RSRPP measurement in CONNECTED**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2320359 Draft CR # 15 PRS measurement requirements for RedCap positioning in RRC INACTIVE state (RSTD and PRS-RSRP measurement requirements)**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR based on work split agreed in RAN4#108bis.

**Decision: Revised to R4-2321447 (from R4-2320359).**

[**R4-2321447**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321447.zip) **Draft CR # 15 PRS measurement requirements for RedCap positioning in RRC INACTIVE state (RSTD and PRS-RSRP measurement requirements)**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR based on work split agreed in RAN4#108bis.

**Decision: Return to.**

**R4-2320362 Draft CR to 38.133 to implement measurement gap patterns for RedCap positioning**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Based on agreement reached in RAN4.

**Decision: Revised to R4-2321448 (from R4-2320362).**

[**R4-2321448**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321448.zip) **Draft CR to 38.133 to implement measurement gap patterns for RedCap positioning**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Based on agreement reached in RAN4.

**Decision: Return to.**

**R4-2320370 On issues related to RedCap positioning**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Discussion paper on remaining issues related to RedCap positioning core requirement.

**Decision: Noted.**

**R4-2320371 Additional simulation results for RedCap positioning with FH**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Simulation results for RedCap positioning with FH.

**Decision: Noted.**

**R4-2320372 Summary of simulation results for RedCap positioning with FH**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Summary of simulation results for RedCap positioning with FH submitted by companies to RAN4#109.

**Decision: Noted.**

**R4-2320699 Draft CR # 14A: TA validation requirements for RedCap positioning in RRC inactive state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

The draftCR defines TA validation requirements for RedCap positioning measurements involving SRS transmission in RRC inactive state. TA validation is supported by RAN2. This draft CR was identified later and therefore was not included in the initial work

**Decision: Revised to R4-2321449 (from R4-2320699).**

[**R4-2321449**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321449.zip) **Draft CR # 14A: TA validation requirements for RedCap positioning in RRC inactive state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

The draftCR defines TA validation requirements for RedCap positioning measurements involving SRS transmission in RRC inactive state. TA validation is supported by RAN2. This draft CR was identified later and therefore was not included in the initial work

**Decision: Return to.**

**R4-2320855 RRM Core Requirements for RedCap Positioning**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320856 Simulation Results for RedCap Positioning with Frequency Hopping**

*Type: other For: Information  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320913 On requirements for RedCap positioning**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2321011 Draft CR #21 on Rel-18 RSTD and PRS-RSRP Measurement Requirements for RedCap in RRC Connected State**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2321450 (from R4-2321011).**

**[R4-2321450](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321450.zip) Draft CR #21 on Rel-18 RSTD and PRS-RSRP Measurement Requirements for RedCap in RRC Connected State**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Return to.**

##### 8.22.2.5 PRS/SRS bandwidth aggregation

**R4-2318279 Discussion on RRM requirements of PRS SRS bandwidth aggregation**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318859 Discussion on Bandwidth Aggregation for Positioning**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2319096 Discussion on PRS/SRS bandwidth aggregation**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319307 Discussion on RRM core requirement for PRS/SRS bandwidth aggregation positioning**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2319484 Discussion on PRS/SRS bandwidth aggregation**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319999 Discussion on PRS/SRS Bandwidth Aggregation**

*Type: discussion For: Approval  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320000 DraftCR #10: Requirements for PRS BW aggregation in INACTIVE**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2321451 (from R4-2320000).**

[**R4-2321451**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321451.zip) **DraftCR #10: Requirements for PRS BW aggregation in INACTIVE**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2320360 Draft CR # 19 PRS measurement requirements with bandwidth aggregation in RRC CONNECTED state (RSTD and UE Rx-Tx measurement requirements)**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR based on work split agreed in RAN4#108bis.

**Decision: Revised to R4-2321452 (from R4-2320360).**

[**R4-2321452**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321452.zip) **Draft CR # 19 PRS measurement requirements with bandwidth aggregation in RRC CONNECTED state (RSTD and UE Rx-Tx measurement requirements)**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR based on work split agreed in RAN4#108bis.

**Decision: Return to.**

**R4-2320373 On PRS/SRS aggregation requirements for positioning**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Discussion paper on remaining issues related to core requirement for bandwidth aggregation for positioning measurements.

**Decision: Noted.**

**R4-2320810 RRM requirements for PRS/SRS Bandwidth Aggregation in NR Positioning**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320811 Draft CR 38.133 Transmission and reception configurations for PRS/SRS BW aggregation**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2321453 (from R4-2320811).**

[**R4-2321453**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321453.zip) **Draft CR 38.133 Transmission and reception configurations for PRS/SRS BW aggregation**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2320914 On requirements for PRS/SRS BW aggregation**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

##### 8.22.2.6 Carrier Phase Positioning

[**R4-2321462**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321462.zip) **Draft CR # 3A: Measurement requirements for DL RSCPD reported with RSTD**

*Type: draftCR For: Endorsement  
 38.133 v18.3.00 CR- rev Cat: B (Rel-18)  
 Source: Huawei*

**Decision: Return to.**

**R4-2318339 Discussion on RRM requirements of carrier phase positioning**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318899 Correction of Carrier Phase Measurement Errors Due to Carrier Frequency Offsets**

*Type: discussion For: Approval  
 Source: Lenovo*

**Decision: Noted.**

**R4-2319262 Updated simulation assumption for CPP measurements**

*Type: other For: Approval  
 Source: CATT*

**Decision: Revised to R4-2321459 (from R4-2319262).**

[**R4-2321459**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321459.zip) **Updated simulation assumption for CPP measurements**

*Type: other For: Approval  
 Source: CATT*

**Decision: Return to.**

**R4-2319485 Discussion on carrier phase positioning**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2320001 Discussion on RRM requirements for CPP**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320361 Draft CR # 23 Requirements for DL RSCPD reported with RSTD in RRC CONNECTED state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR based on work split agreed in RAN4#108bis.

**Decision: Revised to R4-2321454 (from R4-2320361).**

[**R4-2321454**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321454.zip) **Draft CR # 23 Requirements for DL RSCPD reported with RSTD in RRC CONNECTED state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR based on work split agreed in RAN4#108bis.

**Decision: Return to.**

**R4-2320374 On carrier phase positioning requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Discussion paper on remaining issues on carrier phase measurement core requirement.

**Decision: Noted.**

**R4-2320812 RRM requirements for NR Carrier Phase Positioning**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320813 Simulation results for DL RSCPD**

*Type: other For: Information  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320814 Draft CR 38.133 #11: Measurement requirements for RSCPD reported with RSTD in RRC\_INACTIVE**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2321455 (from R4-2320814).**

[**R4-2321455**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321455.zip) **Draft CR 38.133 #11: Measurement requirements for RSCPD reported with RSTD in RRC\_INACTIVE**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2320815 Draft CR 38.133 #12: Measurement requirements for DL RSCP reported with UE Rx-Tx time difference in RRC\_INACTIVE**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2321456 (from R4-2320815).**

[**R4-2321456**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321456.zip) **Draft CR 38.133 #12: Measurement requirements for DL RSCP reported with UE Rx-Tx time difference in RRC\_INACTIVE**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2320816 Draft CR 38.133 #24: Measurement requirements for DL RSCP reported with UE Rx-Tx time difference in RRC\_CONNECTED**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2321457 (from R4-2320816).**

[**R4-2321457**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321457.zip) **Draft CR 38.133 #24: Measurement requirements for DL RSCP reported with UE Rx-Tx time difference in RRC\_CONNECTED**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2320915 On requirements for carrier phase positioning**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

#### 8.22.3 RRM performance requirements

**R4-2319097 Discussion on RRM performance requirements for positioning**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2320002 Discussion on performance requirements for Rel-18 positioning**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320363 Draft CR to 38.133 to implement report mapping for positioning measurements with PRS/SRS bandwidth aggregation**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Based on agreement reached in RAN4.

**Decision: Revised to R4-2321458 (from R4-2320363).**

[**R4-2321458**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321458.zip) **Draft CR to 38.133 to implement report mapping for positioning measurements with PRS/SRS bandwidth aggregation**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Based on agreement reached in RAN4.

**Decision: Return to.**

**R4-2320375 On RRM performance requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Discussion paper on performance requirement for Rel. 18 positioning features.

**Decision: Noted.**

**R4-2320857 RRM Performance Requirements for Positioning**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

#### 8.22.4 Moderator summary and conclusions

Topic: [109][219] NR\_pos\_enh2\_part1

**R4-2318175 Topic summary for [109][219] NR\_pos\_enh2\_part1**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

[109][200] RRM Session AI 8.22.2.1 (relevant tdocs), 8.22.2.4, 8.22.2.5, 8.22.3

**Decision: Noted.**

[**R4-2321461**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321461.zip) **Simulation assumptions for PRS measurement accuracy for PRS/SRS BW aggregation**

*Type: other For: Approval  
 Source: Huawei*

**Decision: Return to.**

[**R4-2321327**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321327.zip) **Ad-hoc minutes #1 on Positioning enhancement WI**

*Type: other For: Approval  
 Source: Ericsson*

**Decision: Return to.**

[**R4-2321328**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321328.zip) **Ad-hoc minutes #2 on Positioning enhancement WI**

*Type: other For: Approval  
 Source: Ericsson*

**Decision: Return to.**

[**R4-2321465**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321465.zip) **Ad-hoc minutes on #3on Positioning enhancement WI**

*Type: other For: Approval  
 Source: Ericsson*

**Decision: Return to.**

**Online session (Monday Nov 13, 2023)**

*Sub-topic description*

*Open issues and candidate options before meeting:*

*Following as agreed in the WF in R4-2317386 in RAN4#108bis:*

* *Condition of single TX chain (same antenna) shall be captured at least in the core part of TS 38.133 for UE PRS measurements:*
  + *The UE PRS measurement requirements with PRS aggregation applies provided that all the PFLs to be aggregated by the UE are transmitted by the gNB using single Tx chain and the same transmit antenna reference point. Meaning of single Tx chain is FFS.*

**Issue 3.2.1: How to capture the condition of single RF chain (same antenna) in RAN4 specifications**

* Proposals
  + Option 1: HW
    - RAN4 to take “single Rx chain” (same Rx antenna) assumption for defining accuracy requirements for PRS/SRS CA, i.e. no imperfection related to timing, frequency or phase error would be considered when deriving the requirements.
    - RAN4 to define the following side conditions for the UE RSTD and Rx-Tx measurement period and accuracy requirements.
      * The UE RSTD/Rx-Tx (core) and accuracy (performance) requirements apply provided that channel over which a symbol on the antenna port on one PFL for PRS transmission is conveyed can be inferred from the channel over which the same symbol on the antenna port on an aggregated PFL is conveyed
    - RAN4 to define the following side conditions for the gNB Rx-Tx measurement accuracy requirements.
      * The gNB Rx-Tx measurement accuracy (performance) requirements apply provided that the channel over which a symbol on the antenna port on one carrier for SRS transmission is conveyed can be inferred from the channel over which the same symbol on the antenna port on an aggregated carrier for SRS transmission is conveyed
  + Option 2: E///
    - Single Tx chain is defined as “common RF transmission bandwidth and the same transmit antenna reference point” in the requirement applicability section of core requirements for bandwidth aggregation for positioning measurements.
  + Option 3: Nokia
    - RAN4 to agree the following modification of clause 9.9.1.1 to TS 38.133:

When UE supports [PRS bandwidth aggregation capability] and is configured with [PRS bandwidth aggregation configuration], requirements are based on common numerology across all configured intra-band contiguous PFLs to be aggregated, whereby

- PRS resources to be aggregated from different PFLs may have equal or different number of PRS RBs.

- PRS resources to be aggregated from different PFLs are transmitted in the same slot and in the same symbols.

- PRS resources to be aggregated from different PFLs are transmitted by the same TRP and associated with a common Antenna Reference Point (ARP), as specified in TS 38.104.

- PRS resources to be aggregated from different PFLs are received with single RF chain and the same Antenna Reference Point (ARP), as specified in TS 38.101-1 for FR1 and TS 38.101-2 for FR2.

* + - RAN4 to agree the addition of the following new clause 7.5.X to TS 38.133:

7.5.X Minimum Requirements for SRS Bandwidth Aggregation

When UE supports [SRS bandwidth aggregation capability] and is configured with [SRS bandwidth aggregation configuration], relative transmission timing difference between slot timing of all pairs of configured intra-band contiguous carriers to be aggregated are based on common numerology across all intra-band contiguous carriers, whereby

- SRS resources to be aggregated from different carriers may have equal or different number of SRS RBs.

- SRS resources to be aggregated from different carriers are transmitted in the same slot and in the same symbols.

- SRS resources to be aggregated from different carriers are transmitted by single RF chain and associated with a common Antenna Reference Point (ARP), as specified in TS 38.101-1 for FR1 and TS 38.101-2 for FR2.

* + Option 4: CATT
    - RAN4 not to capture the condition of single RF chain (same antenna) in RAN4 specs which should be a prerequisite for BW aggregation.
* Recommended WF
  + Discuss the options.
  + Send LS reply to RAN1 LS (R1-2308449/R4-2315004) capturing agreement, if considered necessary.

Session chair: can we start with option 2.

* + - Single Tx chain is defined as “common RF transmission bandwidth and the same transmit antenna reference point” in the requirement applicability section of core requirements for bandwidth aggregation for positioning measurements.

Nokia: single Rx chain need to reflected as well.

“common RF transmission bandwidth and the same receive antenna reference point”

Huawei: option 2 is not sufficient for single Tx chain. Not only about RF, also about baseband. Also, antenna reference point does not mean RF chain.

“common RF transmission bandwidth and the same transmit antenna reference point”

HW:

Agreement:

For the transmitter side, both RF + antenna and baseband needs to be considered.

* Capture this in the core part as condition for positioning requirement for PRS aggregation.
* The condition applies for positioning requirement for SRS aggregation. FFS whether/how to capture it in the RAN4 spec in performance part.

For the receiver side, further discuss whether the condition of single Rx chain (RF + baseband) and antenna needs to be considered in the performance or core maintenance part.

* ~~The condition applies for positioning requirement for PRS and SRS aggregation. FFS whether/how to capture it in the RAN4 spec in performance part.~~

**Issue 3-2-4: Impact of PRS collision with other signals on PRS bandwidth aggregation requirement**

* Proposals
  + Option 1: CATT
    - RAN4 not to define UE behaviour which shall depend on priority rules or UE implementation when collisions occur.
  + Option 2: Nokia
    - In case of PRS resource dropping due to collision with signals on one or more PFLs, which is up to UE implementation, the UE needs to indicate to LMF the number of PFLs the aggregated PRS measurement is based on.
    - RAN4 to consider changes to collision handling for PRS and other signals/channels to include the case of two PFL groups.
  + Option 3: OPPO
    - When one of aggregated PRS resources is dropped due to collision, it is up to UE implementation to perform measurement based on the remaining PRS resources and RAN4 will not specify the exact value of extended measurement period.
  + Option 4: E///
    - Legacy measurement period requirement applies for the case when UE is configured to aggregate 2 PFLs for positioning measurement and one of the PFLs collide with other high priority DL signal.
    - For the case when UE is configured to perform positioning measurements on 3 aggregated PFLs in RRC\_CONNECTED state and one of the PFLs is dropped due to collision with SSB and non-colliding PFLs are contiguous then UE shall meet measurement period requirement for positioning measurements by aggregating 2 PFLs.
    - For the case when UE is configured to perform positioning measurements on 3 aggregated PFLs in RRC\_CONNECTED state and one of the PFLs is dropped due to collision with SSB and non-colliding PFLs are non-contiguous then UE determines PFL, among the non-colliding ones, to perform positioning measurements on. In this case legacy measurement period requirement applies.
  + Option 5: Xiaomi
    - When the PRS collision with other signals on PRS bandwidth aggregation requirement, UE’s measurement can rely on the PRS of the PFL which is not collided.
  + Option 6: HW
    - RAN4 not to define UE behaviour when there is no PRS resource dropping on any of the aggregated PFLs.
* Recommended WF
  + Discuss the options.

Xiaomi: the UE behaviour and requirement are differnet aspects.

Option 1: (Nokia, E///, Xiaomi)

* + - Legacy measurement period requirement applies for the case when UE is configured to aggregate 2 PFLs for positioning measurement and one of the PFLs collide with other high priority DL signal.

Option 2: up to UE implementation, not define the UE behaviour (OPPO, QC, Huawei, CATT, MTK)

Agreement:

Further discussion on this issue is not precluded and based on contribution driven in the maintenance part.

Topic: [109][220] NR\_pos\_enh2\_part2

**R4-2318176 Topic summary for [109][220] NR\_pos\_enh2\_part2**

*Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

[109][200] RRM Session AI 8.22.2.1 (relevant tdocs), 8.22.2.2, 8.22.2.6

**Decision: Noted.**

**Online session (Monday Nov 13, 2023)**

Issue 2-1-3: The impact of carrier frequency offset:

Proposals

* Option 1: (Lenovo)
  + Define a common reference time and refer the DL-PRS carrier phase measurements to this reference time by subtracting the phase rotation due to the carrier frequency offset in the time interval between the DL-PRS and the reference time from the carrier phase measurement.
  + Define the referred carrier phase difference as the difference between the referred carrier phase measurements.
  + Define the same common reference time for the UE and the PRU.
  + The UE and the PRU report either the referred carrier phase measurements or the carrier phase difference measurements computed using the referred carrier phase measurements.
* Option 2: (Huawei, CATT, Ericsson, QC)
  + RAN4 not to specify UE behavior or requirements related to measurement of carrier frequency offset. FFS whether and how to account for carrier frequency offset in the accuracy requirements of CP measurements.
* Option 3: (Nokia)
  + RAN4 to specify measures for mitigating the impact due to carrier frequency offsets of TRP, UE and PRU.
  + RAN4 to specify a common reference time for RSCP and RSCPD measurement, respectively, between UE and PRU and for different TRPs in TS 38.133. The reference time can be FFS, e.g. start of slot where the PRS is transmitted, or start of the measurement gap occasion or start of the configured time window for the CP measurement.

Recommended WF:

* Discuss in the meeting.

Nokia, Lenovo: this is different from the initial offset.

Agreement:

No consensus in RAN4 on whether or not to specify UE behavior or requirements related to measurement of carrier frequency offset in Rel-18 core part. RAN4 can close the WI core part without further agreement on this issue.

FFS whether and how to account for carrier frequency offset in the accuracy requirements in performance part.

Topic: [109][221] NR\_pos\_enh2\_part3

[**R4-2321464**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321464.zip) **Reply LS on TA validation for LPHAP**

*Type: other For: Approval  
To RAN2; CC: RAN1*  
*Source: Huawei*

**Decision: Return to.**

**R4-2318177 Topic summary for [109][221] NR\_pos\_enh2\_part3**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

[109][200] RRM Session AI 8.22.2.1 (relevant tdocs), 8.22.2.3

**Decision: Noted.**

**Online session (Monday Nov 13, 2023)**

Issue 1-2-3: Current RSRP for TA validation (related to RAN2 LS R2-2311568)

* Background:

|  |
| --- |
| RAN2 would like to thank RAN1 for informing the agreements related to TA validation for LPHAP. RAN2 has discussed the reference signal for the current RSRP for TA validation and agreed that the reference signal can be down-selected from the following two options:   * Option 1: Reference signal for the current RSRP is the SSB for the currently camped cell * Option 2: Reference signal for the current RSRP is the same as the RS for stored RSRP   **ACTION:** RAN2 respectfully asks RAN4 for a down-selection between the two options above and timely response would be much appreciated. |

* Proposals
  + Option 1 (OPPO, HW, E///, Nokia, QC):
    - Reference signal for the current RSRP is the SSB for the currently camped cell
  + Option 2 (Xiaomi, vivo):
    - Reference signal for the current RSRP is the same as the RS for stored RSRP
* Recommended WF
  + Discuss the options.

### 8.23 Multi-carrier enhancements for NR

#### 8.23.3 RRM core requirements maintenance

##### 8.23.3.1 DL interruption for Tx switching across 3/4 bands

**R4-2319376 Modification on DL interruption for Tx switching across 3/4 bands**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3754 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

#### 8.23.4 RRM performance requirements

**R4-2318765 Test cases for UL Tx switching across 3/4 bands**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2318766 Draft CR for 38.133 - Addition of new Test cases for DL interruptions at switching across 3/4 bands**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2318940 MC enhancement RRM test discussion**

*Type: discussion For: Approval  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2319297 Test cases for UL Tx switching across 3/4 bands**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2319377 RRM Test case for Tx switching across three or four uplink bands**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

#### 8.23.5 Moderator summary and conclusions

Topic: [109][222] NR\_MC\_enh

**R4-2318178 Topic summary for [109][222] NR\_MC\_enh**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

[109][200] RRM Session AI 8.23.3, 8.23.4

**Decision: Noted.**

[**R4-2321390**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321390.zip) **WF on** **RRM performance requirements for MC enhancements**

*Type: other For: Approval  
 Source: Huawei,HiSilicon*

**Decision: Return to.**

**Online session (Tuesday Nov 14, 2023)**

**Issue 1-1: The modification on “next larger” DL interruption is provided to in line with RF**

***Background***

*According to latest RF endorsed CR [R4-2317608], the discription of the DL interruption determined by the next larger value is changed (yellow highlight below).*

|  |
| --- |
| if the UE does not indicate [“1”] in the capability [*uplinkTxSwitchingMaintainedUL-Trans-r18*] and if UE additionally reports the capability [*TBD* *ULTxSAdditionalPeriod-on-unaffected-band-invovled*] as optional UE behaviour, UE is not required to transmit on any of the three bands during the switching period indicated by UE capability [*TBD* *ULTxSAdditionalPeriod-on-unaffected-band-invovled*] located on band X, as shown in Figure 6.3C.3.5-4. |

* Proposals
  + Option 1(Huawei):

If one downlink carrier is indicated to be interrupted by two band pairs for dynamic switching simultaneously, the DL interruption length on the victim carrier is determined by the maximum of uplink switching periods of the two band pairs. If [*UplinkTxSwitchingAdditionalPeriodDualUL-r18*] is reported, DL interruption length is determined by the uplink Tx switching period, which is indicated by [*UplinkTxSwitchingAdditionalPeriodDualUL-r18*]. If [*TBD* *ULTxSAdditionalPeriod-on-unaffected-band-invovled*] is reported, DL interruption length is determined by the uplink Tx switching period, which is indicated by [*TBD* *ULTxSAdditionalPeriod-on-unaffected-band-invovled*].

* Recommended WF

Is option 1 agreeable? Directly discuss the CR R4-2319376.

Option 1 is agreeable.

**Issue 2-1-1: Test case list for UL Tx switching across 3/4 bands**

* Proposals
  + Option 1 (Nokia, ZTE):

For single TAG

* DL interruptions at Tx switching across three uplink bands in TDD-TDD CA with different UL/DL pattern in SA
* DL interruptions at Tx switching across three uplink bands in FDD-TDD CA in SA
* DL interruptions at Tx switching across four uplink bands in TDD-TDD CA with different UL/DL pattern in SA
* DL interruptions at Tx switching across four uplink bands in FDD-TDD CA in SA

For Two TAG

* DL interruptions at Tx switching across three uplink bands in TDD-TDD CA with different UL/DL pattern in SA
* DL interruptions at Tx switching across three uplink bands in FDD-TDD CA in SA
* DL interruptions at Tx switching across four uplink bands in TDD-TDD CA with different UL/DL pattern in SA
* DL interruptions at Tx switching across four uplink bands in FDD-TDD CA in SA
  + Option 2 (Qualcomm, HW, Nokia)

For single TAG (time offset is 0us):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Switching pattern\CA config | A | B | C | D |
| AB -> CD | TDD | TDD | TDD | TDD |
| AB->C | FDD | FDD | TDD |  |

**For two TAGS (time offset is 9us):**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Switching pattern\CA config | A | B | C | D |
| AB -> CD | FDD | FDD | TDD | TDD |
| AB->C | TDD | TDD | TDD |  |

* + Option 3 (Huawei, QC, Nokia, MTK):

For single TAG

* DL interruptions at Tx switching across three uplink bands in TDD-TDD CA with different UL/DL pattern in SA
* DL interruptions at Tx switching across four uplink bands in FDD-TDD CA in SA

For Two TAG

* DL interruptions at Tx switching across three uplink bands in FDD-TDD CA in SA
* DL interruptions at Tx switching across four uplink bands in TDD-TDD CA with different UL/DL pattern in SA
* Recommended WF

Further discussion

Option 3 is agreed.

**Issue 2-1-5: Principle of verifying symbol level DL interruption for TX switching across 3 or 4 bands**

* Proposals
  + Option 1(Nokia, Qualcomm, Huawei): The legacy RRM tests for Tx switching on one or two UL bands can be considered as a starting point, that is,

Triggering an aperiodic CSI-RS L1-RSRP reporting with CSI-RS resources on the OFDM symbol right before the interruption and check UE’s aperiodic L1-RSRP report with corresponding measurement accuracy.

* Recommended WF

Is option 1 agreeable?

Option 1 is agreed.

### 8.24 Further NR mobility enhancements

#### 8.24.1 General aspects

#### 8.24.2 RRM Core requirements

##### 8.24.2.1 L1/L2 based inter-cell mobility

**R4-2318320 Draft CR on measurement restrictions for SSB and CSI-RS based BFD for LTM**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: CATT*

**Decision: Revised to R4-2321372 (from R4-2318320).**

[**R4-2321372**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321372.zip) **Draft CR on measurement restrictions for SSB and CSI-RS based BFD for LTM**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: CATT*

**Decision: Return to.**

**R4-2319627 Draft CR for intra-frequency L1-RSRP measurement on 38.133 R18 LTM**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: MediaTek Inc., Ericsson*

**Decision: Revised to R4-2321373 (from R4-2319627).**

[**R4-2321373**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321373.zip) **Draft CR for intra-frequency L1-RSRP measurement on 38.133 R18 LTM**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: MediaTek Inc., Ericsson*

**Decision: Return to.**

**R4-2319628 Draft CR for R18 LTM on 38.133**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: MediaTek Inc.*

**Decision: Revised to R4-2321374 (from R4-2319628).**

[**R4-2321374**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321374.zip) **Draft CR for R18 LTM on 38.133**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: MediaTek Inc.*

**Decision: Return to.**

**R4-2319629 Discussion on UE feature list for R18 LTM**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Noted.**

###### 8.24.2.1.1 General aspects and scenarios

**R4-2318321 Discussion on PDCCH-order RACH on neighbor cell for L1L2 based inter-cell mobility**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318599 Discussion on general aspects and scenarios of L1/L2 based inter-cell mobility**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2319051 Discussion on general aspects in R18 LTM**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319079 Discussion on general aspects for L1/L2 based inter-cell mobility**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319281 On general aspects of LTM**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319282 Draft CR on LTM candidate cell TCI state activation delay**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2321375 (from R4-2319282).**

[**R4-2321375**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321375.zip) **Draft CR on LTM candidate cell TCI state activation delay**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2319298 Discussion on general aspects and scenarios of L1/L2 triggered inter-cell mobility**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2319368 Discussion on general requirements for L1/L2-based inter-cell mobility**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319486 On general and scenarios of LTM**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319624 Discussion on general aspects and scenarios of LTM**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2320773 On LTM general aspects and scenarios**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss On LTM general aspects and scenarios

**Decision: Noted.**

###### 8.24.2.1.2 L1-RSRP measurement requirements

**R4-2318322 Discussion on L1-RSRP measurement requirements for L1/L2 based inter-cell mobility**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318600 Draft CR for requirements of inter-f L1-RSRP measurement with MG**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Revised to R4-2321376 (from R4-2318600).**

[**R4-2321376**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321376.zip) **Draft CR for requirements of inter-f L1-RSRP measurement with MG**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2318601 Discussion on L1-RSRP measurement requirements of L1/L2 based inter-cell mobility**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318842 Discussion on L1-RSRP measurement requirements for LTM**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2318843 DraftCR on CSSF for Inter-frequency L1-RSRP measurement within gap**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Xiaomi*

**Decision: Revised to R4-2321377 (from R4-2318843).**

[**R4-2321377**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321377.zip) **DraftCR on CSSF for Inter-frequency L1-RSRP measurement within gap**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Xiaomi*

**Decision: Return to.**

**R4-2318844 DraftCR on the Impact of CSSF for L3 measurement within gaps**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Xiaomi*

**Decision: Revised to R4-2321378 (from R4-2318844).**

[**R4-2321378**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321378.zip) **DraftCR on the Impact of CSSF for L3 measurement within gaps**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Xiaomi*

**Decision: Return to.**

**R4-2319052 Discussion on L1 measurements in R18 LTM**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319080 Discussion on L1-RSRP measurement requirements for L1/L2 based inter-cell mobility**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319084 DraftCR on inter-f L1-RSRP measurement without gap**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: CMCC*

**Decision: Revised to R4-2321379 (from R4-2319084).**

[**R4-2321379**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321379.zip) **DraftCR on inter-f L1-RSRP measurement without gap**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: CMCC*

**Decision: Return to.**

**R4-2319299 Discussion on L1-RSRP measurement requirements**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2319300 draftCR on measurement restrictions for SSB and CSI-RS based candidate beam detection for LTM requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2321380 (from R4-2319300).**

[**R4-2321380**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321380.zip) **draftCR on measurement restrictions for SSB and CSI-RS based candidate beam detection for LTM requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Return to.**

**R4-2319369 Discussion on L1-RSRP measurement requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319370 CR on measurement restriction for RLM due to intra-f L1-RSRP measurement on neighbor cell and Inter-f L1-RSRP measurement without gap**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2321381 (from R4-2319370).**

[**R4-2321381**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321381.zip) **CR on measurement restriction for RLM due to intra-f L1-RSRP measurement on neighbor cell and Inter-f L1-RSRP measurement without gap**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2319487 Draft CR for measurement restriction on BFD and CBD due to LTM L1-RSRP measurement**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: OPPO*

**Decision: Revised to R4-2321382 (from R4-2319487).**

[**R4-2321382**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321382.zip) **Draft CR for measurement restriction on BFD and CBD due to LTM L1-RSRP measurement**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: OPPO*

**Decision: Return to.**

**R4-2319625 Discussion on L1-RSRP measurement requirements for LTM**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2319789 Discussion on LTM Measurements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320774 On L1-RSRP measurement requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss On L1-RSRP measurement requirements

**Decision: Noted.**

**R4-2320960 L1-RSRP measurement requirements**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

###### 8.24.2.1.3 L1/L2 inter-cell mobility delay requirements

**R4-2318323 Discussion on cell switch delay requirements for LTM**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318602 Discussion on L1/L2 based inter-cell mobility delay requirements**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2319053 Discussion on cell switch delay requirements in R18 LTM**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319078 Discussion on L1/L2 inter-cell mobility delay requirements**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319283 On LTM cell switch delay**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319284 Draft CR on LTM cell switch delay requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2321383 (from R4-2319284).**

[**R4-2321383**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321383.zip) **Draft CR on LTM cell switch delay requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2319301 Discussion on L1/L2 inter-cell mobility delay requirements**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2319371 Discussion on L1/L2 inter-cell mobility delay requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319626 Discussion on LTM delay requirements**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2320775 On LTM delay requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss On LTM delay requirements

**Decision: Noted.**

**R4-2320961 LTM cell switch execution requirements**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

###### 8.24.2.1.4 Others

**R4-2318324 Draft Reply LS on PDCCH order RACH on neighbour cell**

*Type: LS out For: Approval  
 to RAN1, cc RAN2  
 Source: CATT*

**Decision: Return to.**

**R4-2318325 Draft Reply LS on beam application time for LTM**

*Type: LS out For: Approval  
 to RAN1,RAN2, cc RAN3  
 Source: CATT*

**Decision: Return to.**

**R4-2318326 Draft Reply LS on SMTC of LTM candidate cells for L1 measurements**

*Type: LS out For: Approval  
 to RAN2, cc RAN1  
 Source: CATT*

**Decision: Return to.**

**R4-2318603 Discussion on RAN2 LS on L1 measurements for LTM**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318604 Reply LS on L1 measurements for LTM**

*Type: LS out For: Approval  
 to RAN2, cc RAN1  
 Source: Apple*

**Decision: Return to.**

**R4-2319054 draftCR on UL transmit timing requirements for R18 LTM**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Revised to R4-2321384 (from R4-2319054).**

[**R4-2321384**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321384.zip) **draftCR on UL transmit timing requirements for R18 LTM**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Return to.**

**R4-2319055 draftCR on RRM requirements for TCI activation before cell switch in R18 LTM**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Revised to R4-2321385 (from R4-2319055).**

[**R4-2321385**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321385.zip) **draftCR on RRM requirements for TCI activation before cell switch in R18 LTM**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Return to.**

**R4-2319081 Discussion on LS on LTM**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319302 Discussion on using L3 measurement in L1 report**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2319372 Reply LS on L1 measurements for LTM**

*Type: LS out For: Approval  
 to RAN2, cc RAN1  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2319790 draftCR for 38.133 on LTM L3 measurements in L1 measurement report**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Introduction of NR LTM L3-measurements in L1 reporting on 38.133

**Decision: Revised to R4-2321386 (from R4-2319790).**

[**R4-2321386**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321386.zip) **draftCR for 38.133 on LTM L3 measurements in L1 measurement report**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Introduction of NR LTM L3-measurements in L1 reporting on 38.133

**Decision: Return to.**

**R4-2319791 Discussion on LTM L3 measurements in L1 report**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320776 On other aspects of LTM**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss On other aspects of LTM

**Decision: Noted.**

**R4-2320777 Intra-frequency measurments for LTM**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss Intra-frequency measurments for LTM

**Decision: Noted.**

**R4-2320778 Reply LS to RAN2 on L1 measurements for LTM**

*Type: LS out For: Approval  
 to RAN2, cc RAN1  
 Source: Ericsson*

**Abstract:**

Reply LS to RAN2 on L1 measurements for LTM

**Decision: Revised to R4-2321388 (from R4-2320778).**

[**R4-2321388**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321388.zip) **Reply LS to RAN2 on L1 measurements for LTM**

*Type: LS out For: Approval  
 to RAN2, cc RAN1  
 Source: Ericsson*

**Abstract:**

Reply LS to RAN2 on L1 measurements for LTM

**Decision: Return to.**

**R4-2320962 Early DL and UL synchronizations**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

##### 8.24.2.2 NR-DC with selective activation of cell groups via L3 enhancements

**R4-2319792 Discussion on NR-DC with selective activation of cell groups via L3 enhancements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319793 draftCR on NR-DC with selective activation of cell groups via L3 enhancements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

##### 8.24.2.3 Improvement on SCell/SCG setup delay

**R4-2318327 Discussion on improvement on SCell/SCG setup delay**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318605 Discussion on improvement on FR2 SCell/SCG setup delay**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318606 Draft CR on FR2 SCell/SCG setup delay improvement**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Merged.**

**R4-2318607 LS on FR2 SCell/SCG setup delay improvement**

*Type: LS out For: Approval  
 to RAN2  
 Source: Apple*

**Decision: Revised to R4-2321343 (from R4-2318607).**

[**R4-2321343**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321343.zip) **LS on FR2 SCell/SCG setup delay improvement**

*Type: LS out For: Approval  
 to RAN2  
 Source: Apple*

Continue discussion offline on the following part of the LS:

2) Solution based on enhanced measurement

RAN4 confirmed the feasibility of solution based on enhanced measurement for scenario 2. RAN4 will not define RRM requirements for solution based on enhanced measurement in R18.

* Definition of Scenario 2: measurement object configuration for RRC connected at least includes the carrier that being measured during the RRC idle/inactive status.

To perform enhanced measurement during RRC connection setup/resume, UE needs to know the measurement configuration. ~~RAN4 agreed that the context in existing MeasIdleCarrierNR-r16 can be reused for enhanced measurement.~~ It is up to RAN2 whether to introduce new measurement configuration or to reuse existing EMR configuration.

**Decision: Revised to R4-2321346 (from R4-2321343).**

[**R4-2321346**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321346.zip) **LS on FR2 SCell/SCG setup delay improvement**

*Type: LS out For: Approval  
 to RAN2  
 Source: Apple*

Continue discussion offline on the following part of the LS:

2) Solution based on enhanced measurement

RAN4 confirmed the feasibility of solution based on enhanced measurement for scenario 2. RAN4 will not define RRM requirements for solution based on enhanced measurement in R18.

* Definition of Scenario 2: measurement object configuration for RRC connected at least includes the carrier that being measured during the RRC idle/inactive status.

To perform enhanced measurement during RRC connection setup/resume, UE needs to know the measurement configuration. ~~RAN4 agreed that the context in existing MeasIdleCarrierNR-r16 can be reused for enhanced measurement.~~ It is up to RAN2 whether to introduce new measurement configuration or to reuse existing EMR configuration.

**Decision: Revised to R4-2321347 (from R4-2321346).**

[**R4-2321347**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321347.zip) **LS on FR2 SCell/SCG setup delay improvement**

*Type: LS out For: Approval  
 to RAN2  
 Source: Apple*

Session Chair: Continue discussion offline on the following part in this week:

2) Solution based on enhanced measurement

RAN4 confirmed the feasibility of solution based on enhanced measurement for scenario 2. RAN4 will not define RRM requirements for solution based on enhanced measurement in R18.

* Definition of Scenario 2: measurement object configuration for RRC connected at least includes the carrier that being measured during the RRC idle/inactive status.

To perform enhanced measurement during RRC connection setup/resume, UE needs to know the measurement configuration. ~~RAN4 agreed that the context in existing MeasIdleCarrierNR-r16 can be reused for enhanced measurement.~~ It is up to RAN2 whether to introduce new measurement configuration or to reuse existing EMR configuration.

**Decision: Approved.**

**R4-2319060 Discussion on RRM requirements of FR2 measurements for DC/CA setup/resume**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319083 Discussion on improvement on SCell/SCG setup delay**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319303 Discussion on the improvement on SCell/SCG setup delay**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2319324 Discussion on improvement on SCell/SCG setup delay**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2319373 Discussion on improvement on FR2 SCell/SCG setup/resume**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319488 On improvement on FR2 SCellSCG setupresume**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319631 Discussion on improvement on SCell/SCG setup/resume**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2319794 Discussion on Improvement on SCell/SCG setup delay**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319795 draftCR for 38.133 on Improvement on SCell/SCG setup delay**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Introduction of Improvement on SCell/SCG setup delay on 38.133

**Decision: Revised to R4-2321395 (from R4-2319795).**

[**R4-2321395**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321395.zip) **draftCR for 38.133 on Improvement on SCell/SCG setup delay**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Introduction of Improvement on SCell/SCG setup delay on 38.133

**Decision: Return to.**

**R4-2320491 Discussion on remaining issues Improvement on SCell/SCG setup delay**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2320621 Discussion on improvement for scg\_scell setup delay**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution provide our view on improvement on SCG Scell setup

**Decision: Noted.**

**R4-2320623 Draft CR to 38.133 for improvement for scg\_scell setup dealy enhancement**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This draft CR update TS38.133 to capture the agreement

**Decision: Revised to R4-2321396 (from R4-2320623).**

**[R4-2321396](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321396.zip) Draft CR to 38.133 for improvement for scg\_scell setup dealy enhancement**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This draft CR update TS38.133 to capture the agreement

**Decision: Return to.**

##### 8.24.2.4 Enhanced CHO configurations

**R4-2318608 Draft CR on Enhanced CHO configurations**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Merged.**

**R4-2319059 Discussion on Enhanced CHO configurations**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319285 On remaining details of CHO with CPC**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319286 Draft CR on CHO with CPC requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2321397 (from R4-2319286).**

[**R4-2321397**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321397.zip) **Draft CR on CHO with CPC requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2319304 Discussion on Enhanced CHO configurations**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2319374 Discussion on Enhanced CHO configurations**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

#### 8.24.3 RRM performance requirements

**R4-2318328 Discussion on RRM performance requirements for R18 further NR mobility**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318609 Discussion on RRM performance requirements of part 2**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2319065 Discussion on test cases for R18 NR Mobility Enhancements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319082 Discussion on performance requirements for mobility enhancement**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319287 On performance part of further mobility enhancements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319305 Discussion on performance requirements for mobility enhancements**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2319375 Discussion on performance requirements for mobility enhancements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319630 Discussion on RRM performance requirements for mobility enhancement**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2320622 Disucssion on mobility performance part**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution provide viiew on performance part

**Decision: Noted.**

#### 8.24.4 Moderator summary and conclusions

Topic: [109][223] NR\_Mob\_enh2\_part1

**R4-2318179 Topic summary for [109][223] NR\_Mob\_enh2\_part1**

*Type: other For: Information  
 Source: Moderator (MediaTek)*

**Abstract:**

[109][200] RRM Session AI 8.24.1, 8.24.2.1

**Decision: Noted.**

[**R4-2321326**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321326.zip) **Ad-hoc minutes #1 on NR\_Mob\_enh2 (Part 2)**

*Type: other For: Approval  
 Source: Apple*

*Note: minutes for Monday Ad-hoc on NR\_Mob\_enh2\_part2.*

**Decision: Approved.**

[**R4-2321331**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321331.zip) **Ad-hoc minutes #2 on NR\_Mob\_enh2**

*Type: other For: Approval  
 Source: Apple*

**Decision: Return to.**

[**R4-2321387**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321387.zip) **WF on NR mobility enhancements (part 1)**

*Type: other For: Approval  
 Source: MediaTek*

**Decision: Return to.**

[**R4-2321389**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321389.zip) **LS on n-TimingAdvanceOffset for PDCCH order RACH**

*Type: LS out For: Approval   
Source: Huawei  
To: RAN2, CC: RAN1*

**Decision: Return to.**

**Online session (Tuesday Nov 14, 2023)**

**(Signalling) Issue 1-2-3-1: n-TimingAdvanceOffset**

*For information:*

Table 7.1.2-2: The Value of 

|  |  |
| --- | --- |
| Frequency range and band of cell used for uplink transmission | (Unit: TC) |
| FR1 FDD or TDD band with neither E-UTRA–NR nor NB-IoT–NR coexistence case | 25600 (Note 1) |
| FR1 FDD band with E-UTRA–NR and/or NB-IoT–NR coexistence case | 0 (Note 1) |
| FR1 TDD band with E-UTRA–NR and/or NB-IoT–NR coexistence case | 39936 (Note 1) |
| FR2 | 13792 |
| Note 1: The UE identifies  based on the information n-TimingAdvanceOffset as specified in TS 38.331 [2]. If UE is not provided with the information n-TimingAdvanceOffset, the default value of  is set as 25600 for FR1 band. In case of multiple UL carriers in the same TAG, UE expects that the same value of n-TimingAdvanceOffset is provided for all the UL carriers according to clause 4.2 in TS 38.213 [3] and the value 39936 of  can also be provided for a FDD serving cell.  Note 2: Void | |

* Proposals
  + Option 1 (Apple, MTK):
    - n-TimingAdvanceOffset from serving cell cannot always be reused for neighbor cell on different band.
    - In the derivation of UL timing of PDCCH-ordered RACH on target cell, DL timing of the target cell which to transmit UL on should be used as a reference
      * Apple: ask RAN1/2 if n-TimingAdvanceOffset can be added in TA Management Related RRC parameters (e.g., LTM-EarlyUlSyncConfig-r18).
      * MTK: When “*n-TimingAdvanceOffset*” is not configured by NW for PDCCH-ordered RACH on target cell, reuse the default value in 38.133 Table 7.1.2-2.
  + Option 2 (vivo):
    - For PDCCH-ordered RACH to neighbour cell, UE always assumes the serving cell n-TimingAdvanceOffset also applies for the cell where PRACH transmitted.
    - Re-use the UL timing adjustment requirements defined for R17 FR2 HST as the baseline for PDCCH-ordered RACH to neighbour cell before cell switch command.
* Recommended WF
  + Recommend agree on
    - Ask RAN1/2 to add *n-TimingAdvanceOffset* in TA Management Related RRC parameters (e.g. LTM-EarlyUlSyncConfig-r18)
    - When “*n-TimingAdvanceOffset*” is not configured by NW for PDCCH-ordered RACH on target cell, reuse the default value in 38.133 Table 7.1.2-2.
    - In the derivation of UL timing of PDCCH-ordered RACH on target cell, DL timing of the target cell which to transmit UL on should be used as a reference.

Vivo: remove the 3rd bullet. pTAG or sTAG or any new TAG to be defined in RAN2?

Agreement:

* *n-TimingAdvanceOffset* is necessary for UE. Send LS to RAN2 and cc RAN1. Work on the wording offline.
  + - ~~Ask RAN1/2 to add~~ *~~n-TimingAdvanceOffset~~* ~~in TA Management Related RRC parameters (e.g. LTM-EarlyUlSyncConfig-r18)~~
    - ~~When “~~*~~n-TimingAdvanceOffset~~*~~” is not configured by NW for PDCCH-ordered RACH on target cell, reuse the default value in 38.133 Table 7.1.2-2.~~

RAN4 agreement (not captured in the RAN2 LS)

* In the derivation of UL timing of PDCCH-ordered RACH on target neighboring cell, DL timing of the target neighboring cell which to transmit UL on should be used as a reference unless further agreement in other WG. If any further agremenet in other WG, RAN4 will follow the agreement.

**Sub-topic 2-1 Applicability rule for L1-RSRP measurement**

**(Online) Issue 2-1-1: Whether L1 measurement layer is configured on the same frequency as one of current L3 MO**

* Proposals
  + Option 1 (Apple, vivo, ZTE, MTK, Nokia, CATT):
    - For LTM L1 measurement, RRM requirements are applicable only if L1 measurement layer is configured on the same frequency as one of current L3 MO
  + Option 2 (CMCC):
    - it is not necessary to have the limitation that RRM requirements for LTM are applicable only if L1 measurement layer is configured on the same frequency as one of current L3 MO.
* Recommended WF
  + Recommend agree on Option 1.

CMCC: We try to aovid the assumption. Ok with the requirement applicability in Rel-18. L3 configuraiton and LTM configuration are independent from RAN2 perspective.

Agreement:

* In Rel-18, for LTM L1 measurement, RAN4 RRM requirements are applicable only if L1 measurement layer is configured on the same frequency as one of current L3 MO.
* Note: From network configuration perspective, whether this limitation is not needed is up to other WG agreement.

**(Online) Issue 4-1-1: Whether to include SMTC in the RS configuration for L1-RSRP measurement**

* Proposals
  + Option 1 (Apple, vivo, MTK, Huawei, Ericsson, CATT): additional SMTC configuration dedicated for L1 measurement is unnecessary
  + Option 2 (CMCC): configure SMTC of LTM candidate cells to UE
* Recommended WF
  + Need more discussion.

Option for consideration:

From RAN4 perspecitve, SMTC configuration (offset) is ~~necessary or~~ not essential for L1-RSRP measurement for the scenarios with RAN4 requirement in Rel-18. Whether to add SMTC configuration in the RS configuration for L1-RSRP measurement is up to RAN2.

**(Online) Issue 2-3-2-1: Measurement period for UE incapable of RTD>CP or UE incapable of measuring multiple cells on the same OFDM symbol when actual RTD>CP**

* Proposals
  + Option 1 (CATT, CMCC, ZTE, Huawei, MTK, [Nokia], Ericsson)
    - when the actual RTD of serving cell and neighbour cell is no larger than CP, the legacy measurement period, measurement restriction and scheduling restriction defined for non-serving cell in R17 apply for intra-frequency L1-RSRP measurement on neighbour cell.
    - when actual RTD>CP, FFS **no requirements**
    - RAN4 assume the same UE implementation for RTD within CP and RTD > CP.
      * Nokia:
        + Discuss how does UE know “actual RTD” when UE does not support RTD > CP?
        + Discuss how the network knows RTD conditions.
        + Requirements for RTD <= CP and RTD > CP shall be clearly separated in order not to penalize UEs not supporting RTD > CP with extra symbols.
  + Option 2 (Apple, QC): RAN4 to define requirements for both RTD > CP and RTD <= CP
    - In FR1:‘the existing L1-RSRP measurement period (Table 9.5.4.1-1)’ x ‘the number of L1 measurement cells (including non-LTM L1-RSRP measurement cells) having SSBs colliding in the time domain’
    - In FR2: same as the measurement period when UE supports RTD>CP
    - Define scheduling restriction based on SSB + 1 symbol before/after the SSB to measure
  + Option 3 (xiaomi):
    - For UE incapable of RTD>CP, it is assumed that no spare FFT module used for intra-frequency L1-RSRP measurement on neighbour cells.
    - RAN4 to define the measurement delay requirement for UE incapable of RTD>CP when actual RTD>CP in FR1, and the neighbour cell whose TCI state is activated and the serving cell are prioritized.
    - When TCI state of neighbor cell is activated, UE performs L1-RSRP measurement on the neighbor cell whose TCI state is activated and the serving cell. UE may measure any other cell(s) based on UE implementation.
* The measurement period of serving cell is R15/R16 SSB based L1-RSRP measurement period is scaled by 3.
* The measurement period of the neighbor cell whose TCI state is activated is R15/R16 SSB based L1-RSRP measurement period is scaled by 3.
  + Assuming the NW activate TCI state(s) from only one neighbor cell.
* For the other neighbor cells: no measurement delay requirements
  + - When TCI state of neighbor cell is not activated, UE performs L1-RSRP measurement on the neighbor cells and the serving cell.
* The measurement period of serving cell is R15/R16 SSB based L1-RSRP measurement period is scaled by 3.
  + - The measurement period of the neighbor cell is R15/R16 SSB based L1-RSRP measurement period is scaled by 3\*(number of neighbor cells).
* Recommended WF
  + Further discussion.

**(Online) Issue 1-1-2: Whether and how to define TCI state activation delay requirements for early T/F tracking before cell switch command**

*Existing TCI state activation delay cannot be reused directly considering inter-f case.*

*Please further check whether the compromised solution is acceptable “add a condition on the time gap between TCI state activation command and cell switch command in cell switch delay requirements”.*

* Proposals
  + Option 1 (Apple, MTK, [QC]): No need to define delay requirement for TCI state activation before cell switch.
    - Option 1a (MTK): Not to define TCI state activation delay requirements before cell switch command. A condition on the cell switch delay requirements can be added, i.e., T/F tracking after cell switch command can be skipped only if cell switch command is received at least 3ms+ L1-RSRP measurement period after UE sends ACK for the reception of TCI state activation command.
    - Option 1b (QC): It is clarified that the TCI state pre-activation on the first bullet of the agreement on Issue 3-2-2-1 in RAN4#108bis means that the time gap between the TCI state activation command reception and the LTM cell switch command reception is at least not smaller than the existing TCI state activation delay value
  + Option 2 (vivo, Nokia, Huawei): RAN4 to define TCI state activation delay requirement for early TCI state activation for LTM candidate cell before the cell switch.
    - Option 2a (vivo):
      * The end point is defined as the slot X that:
        + If UE receives cell switch command to the cell with active TCI after slot X, and the TCI to be used after cell switch is activated, then UE may not need additional T\_delta in cell switch delay
      * This TCI activation delay counts the following parts:
        + SFN (system frame number) acquisition delay, if needed.
        + SSB-based rough time-frequency tracking delay
        + the delay for waiting next SSB occasion follows the actual L1-RSRP measurement delay defined for SSB-based L1-RSRP measurement before cell switch
    - Option 2b (Nokia):
      * Define early candidate cell TCI state activation delay requirements for both known and unknown target TCI state.
      * Early DL/UL TCI state activation delay for a known TCI state is defined as n+ THARQ + 3Nslotsubframe,µ+ TOk\* (Tfirst-RS+ TSSB-proc)/ NR slot length after receiving the MAC-CE command.
      * Early DL/UL TCI state activation delay for an unknown TCI state is defined as n+ THARQ + 3Nslotsubframe,µ+ TL1-RSRP + TOuk\* (Tfirst-RS+ TSSB-proc)/ NR slot length after receiving the MAC-CE command.
    - Option 2c (Huawei)
      * The legacy requirements for “active TCI state list update delay” can be reused for early T/F tracking of candidate LTM cells before cell switching command. No need to define additional requirements for LTM.
* Recommended WF
  + Recommend agree on the compromised solution
    - Not define TCI state activation delay before cell switch command.
    - Add a condition on the time gap between TCI state activation command and cell switch command in cell switch delay requirements.

**Issue 1-3-1: Whether and how to define timing requirements for UE based TA measurement**

*In moderator’s understanding, it is not enough to only define UL timing requirements for the use of UE based TA measurement. For completeness, the requirements on the synchronization between serving cell and target cell (usually captured in 38.104) should be defined too. Considering this is the last meeting, suggest not to define requirements for UE based TA measurement in R18.*

* Proposals
  + Option 1 (CMCC): define timing requirements for UE-based TA measurement, and the timing requirements introduced for FR2 Power Class 6 UE (FR2 HST UE) can be reused.
  + Option 2 (vivo): UE-based TA during cell switch command can be applicable to both with-early-RACH scenario and without-early-RACH scenario. RAN4 to clarify in the spec that for the case of UE-based TA, UE shall also follow existing requirements in TS 38.133. Similar to previous issue, if RTD between cells is larger than CP/4, existing requirements defined for FR2 HST can be re-used.
  + Option 3 (MTK): Not to define requirements for UE based TA measurement in R18.
* Recommended WF
  + Recommend agree on
    - Not to define requirements for UE based TA measurement in R18.

**(Online) Issue 2-1-3:** **known cell condition for L1-RSRP measurement***.*

*For information:*

*RAN4#108bis*

|  |
| --- |
| **Issue 2-1-3: known cell condition for L1-RSRP measurement***.*  **< Agreement>**   * + In L1-RSRP measurement for neighbour cell, target cell is considered as known if the following conditions are met in this requirement:     - The UE has performed L3 measurement on the target cell, and       * FFS whether to add time constraint e.g. during the last [5] seconds     - The SSB from the target cell configured for L1 measurementremains detectable according to the cell identification requirements specified in clause 9.2 and 9.3.   + Otherwise, it is unknown |

* Proposals
  + Option 1 (CATT, Apple, ZTE ):
    - Add the time constraint “The UE has performed L3 measurement on the target cell during the last [5] seconds” in known cell condition for L1-RSRP measurement.
  + Option 2 (Nokia): Not to have “during the last [5] seconds” as part of known condition
* Recommended WF
  + Recommend agree on Option 1.

**4.2.2 Sub-topic 4-2 Using L3 measurement in L1 report**

**(Online) Issue 4-2-1: Measurement reporting**

* Proposals
  + Option 1 (ZTE, Nokia):
    - UE reports based on L1 measurement configuration
    - Measurement report mapping: No changes to Table 10.1.6.1-1 are needed due to support of L3 measurements in L1 measurement report.
    - L3 and L1 measurements are not included in the same report, at least in rel-18
  + Option 2 (Ericsson):
    - RAN4 to agree that the L1-RSRP report sent to NW can contain L1-RSRP derived from L1 measurement and L1-RSRP derived from L3 measurement results.
    - One bit field can be introduced in the measurement report to distinguish whether L1-RSRP is measured or L1-RSRP derived. Detailed signalling can be left to RAN1/RAN2.
    - NW to indicate whether UE should report a L1 based report alone or report containing L1 and L3 results.
* Recommended WF
  + Need more discussion.

**(Online) Issue 4-2-2: NW needs to know UE using L3 results in L1 report or not?**

* Proposals
  + Option 1 (vivo): No need for gNB to know whether the L1 reported results is obtained by L3 measurement of the UE, or L1 measurement of the UE.
  + Option 2 (MTK, Ericsson): Yes
* Recommended WF
  + Need more discussion.

**(Online) Issue 4-2-3: The condition to switch to using L3 results in L1 report**

* Proposals
  + Option 1 (vivo, ZTE): UE enters fall-back mode, i.e., reporting L3 measurements in L1 report, if the conditions, under which UE is able to ensure L1 measurement performance based on L1 measurement delay, are not met. UE may return to the normal mode when the conditions are stable for a pre-defined period. It is up to UE to determine the actual threshold/mechanism how to determine the conditions are met or not.
  + Option 2 (Nokia): If the number of cells to measure exceeds the L1 based LTM measurement capability, UE is allowed to perform L3 measurements and report them in L1 reporting format.
* Recommended WF
  + Need more discussion.

Topic: [109][224] NR\_Mob\_enh2\_part2

**R4-2318180 Topic summary for [109][224] NR\_Mob\_enh2\_part2**

*Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

[109][200] RRM Session AI 8.24.2.2, 8.24.2.3, 8.24.2.4, 8.24.3

**Decision: Noted.**

[**R4-2321398**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321398.zip) **WF on R18 Further NR mobility enhancement – part 2**

*Type: other For: Approval  
 Source: Apple*

**Decision: Return to.**

[**R4-2321399**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321399.zip) **WF on** **R18 Further NR mobility enhancement – RRM performance requirements**

*Type: other For: Approval  
 Source:*

**Decision: Return to.**

### 8.25 Dual Tx/Rx Multi-SIM for NR

#### 8.25.1 General aspects

**R4-2320292 General aspects, terminology**

*Type: discussion For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

#### 8.25.2 RRM requirements for Rel-17 MUSIM gaps

**R4-2319244 draft CR on genearl aspects for MUSIM gaps and collision handling**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Revised to R4-2321404 (from R4-2319244).**

[**R4-2321404**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321404.zip) **draft CR on genearl aspects for MUSIM gaps and collision handling**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Return to.**

**R4-2319245 Big CR to TS 38.133 on Dual TxRx Multi-SIM for NR**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3738 rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Revised to R4-2321405 (from R4-2319245).**

[**R4-2321405**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321405.zip) **Big CR to TS 38.133 on Dual TxRx Multi-SIM for NR**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3738 rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Return to.**

**R4-2320561 [NR\_DualTxRx\_MUSIM-Core]: Measurement gap related requirements of MUSIM gaps.**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2321406 (from R4-2320561).**

[**R4-2321406**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321406.zip) **[NR\_DualTxRx\_MUSIM-Core]: Measurement gap related requirements of MUSIM gaps.**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Return to.**

**R4-2320562 [NR\_DualTxRx\_MUSIM-Core]: Positioning measurement impacted by MUSIM gap**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2321407 (from R4-2320562).**

**[R4-2321407](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321407.zip) [NR\_DualTxRx\_MUSIM-Core]: Positioning measurement impacted by MUSIM gap**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Return to.**

##### 8.25.2.1 General aspects

**R4-2318610 Discussion on general aspects of R18 MUSIM**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2319103 Discussion on open issues for MUSIM gaps**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319136 Discussions on general issues in MUSIM gaps**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the general rules for MUSIM gaps

**Decision: Noted.**

**R4-2319140 Draft CR on MUSIM NW-B requirement**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

The CR for MUSIM NW-B's requirement

**Decision: Revised to R4-2321408 (from R4-2319140).**

[**R4-2321408**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321408.zip) **Draft CR on MUSIM NW-B requirement**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

The CR for MUSIM NW-B's requirement

**Decision: Return to.**

**R4-2319239 On remaining issues for general aspects for MUSIM gaps**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319489 Discussion on general RRM requirements for Rel-17 MUSIM gaps**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319984 Discussion on general issues related to MUSIM gaps**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320293 General aspects**

*Type: discussion For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320757 Discussion on general aspects for MUSIM**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Charter Communications, Inc*

**Decision: Noted.**

**R4-2321007 Discussion on the general aspects of MUSIM gaps**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

##### 8.25.2.2 Collisions between gaps and priority rules

**R4-2318611 Discussion on collisions between gaps and priority rules of R18 MUSIM**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318867 Discussion on Collisions between gaps and priority rules**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2319033 Discussion on collisions between gaps and priority rules**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted.**

**R4-2319101 Discussion on collisions between gaps and priority rules for MUSIM gaps**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319137 Discussions on collision between MUSIM gaps**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the priority rules for MUSIM gaps

**Decision: Noted.**

**R4-2319240 On remaining issues for collisions between gaps and priority rules for MUSIM gaps**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319490 Discussion on collision between gap and priority rules**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319985 Discussion on collision handling for MUSIM gaps**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320294 Collisions between gaps and priority rules**

*Type: discussion For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320297 NR\_DualTxRx\_MUSIM-Core DraftCR on Measurement for Propagation Delay Compensation**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2321409 (from R4-2320297).**

[**R4-2321409**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321409.zip) **NR\_DualTxRx\_MUSIM-Core DraftCR on Measurement for Propagation Delay Compensation**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2320559 Discussion on collisions between gaps and priority rules**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2320907 On requirements for Rel-17 MUSIM gaps - Gap collisions**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2321008 Discussion on RRM requirements for MUSIM gaps collision handling**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

##### 8.25.2.3 On network A requirements

**R4-2318612 Discussion on network A requirements of R18 MUSIM**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318868 draftCR on impact on RLM and link recovery due to MUSIM gaps**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Xiaomi*

**Decision: Revised to R4-2321411 (from R4-2318868).**

[**R4-2321411**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321411.zip) **draftCR on impact on RLM and link recovery due to MUSIM gaps**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Xiaomi*

**Decision: Return to.**

**R4-2319035 Draft CR on CSI-RS based L3 measurement impact due to MUSIM gap**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: China Telecom*

**Decision: Revised to R4-2321410 (from R4-2319035).**

[**R4-2321410**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321410.zip) **Draft CR on CSI-RS based L3 measurement impact due to MUSIM gap**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: China Telecom*

**Decision: Return to.**

**R4-2319138 Discussions on NW-A’s requirement in MUSIM gaps**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the NW-A's requirement for MUSIM gaps

**Decision: Noted.**

**R4-2319241 On remaining issues for network A RRM requirements of MUSIM gaps**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319491 [NR\_DualTxRx\_MUSIM-Core] CR on TRP specific Link Recovery Procedures due to MUSIM gaps**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: OPPO*

**Decision: Revised to R4-2321412 (from R4-2319491).**

[**R4-2321412**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321412.zip) **[NR\_DualTxRx\_MUSIM-Core] CR on TRP specific Link Recovery Procedures due to MUSIM gaps**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: OPPO*

**Decision: Return to.**

**R4-2319986 Discussion on NW A requirements with MUSIM gaps**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319987 draftCR on NW A L1 measurement requirements with MUSIM gaps**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2321413 (from R4-2319987).**

[**R4-2321413**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321413.zip) **draftCR on NW A L1 measurement requirements with MUSIM gaps**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2320295 On network A requirements**

*Type: discussion For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2321009 Discussion on NW A RRM requirements for MUSIM**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

##### 8.25.2.4 On network B requirements

**R4-2318613 Discussion on network B requirements of R18 MUSIM**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318614 CR for NW B inactive state requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Revised to R4-2321414 (from R4-2318614).**

[**R4-2321414**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321414.zip) **CR for NW B inactive state requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2318869 Discussion on network B requirements**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2319034 Discussion on network B requirements for MUSIM gaps**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted.**

**R4-2319102 Discussion on network B requirements for MUSIM gaps**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319139 Discussions on NW-B’s requirement in MUSIM gaps**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the NW-B's requirement for MUSIM gaps

**Decision: Noted.**

**R4-2319242 On remaining issues for network B RRM requirements of MUSIM gaps**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319492 Discussion on network B requirements**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319988 Discussion on NW B requirements with MUSIM gaps**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320296 Network B requirements**

*Type: discussion For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320908 On requirements for Rel-17 MUSIM gaps - Network B requirements**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2321010 Discussion on NW B RRM requirements for MUSIM**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

#### 8.25.3 RRM performance requirements

**R4-2319104 Discussion on performance requirements for MUSIM gaps**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319141 Discussions on test cases in MUSIM gaps**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the general rules for MUSIM gap test cases

**Decision: Noted.**

**R4-2319238 Work plan on RRM performance part for R18 MUSIM**

*Type: Work Plan For: Approval  
 Source: vivo*

**Decision: Return to.**

**R4-2319243 Discussion on RRM performance requirements for MUSIM**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319989 Discussion on RRM test cases for MUSIM**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320298 RRM performance requirements for NR\_DualTxRx\_MUSIM**

*Type: discussion For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320909 Scope of RRM performance for Rel-17 MUSIM gaps**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

#### 8.25.4 Moderator summary and conclusions

Topic: [109][225] NR\_DualTxRx\_MUSIM

**R4-2318181 Topic summary for [109][225] NR\_DualTxRx\_MUSIM**

*Type: other For: Information  
 Source: Moderator (Vivo)*

**Abstract:**

[109][200] RRM Session AI 8.25

**Decision: Noted.**

[**R4-2321337**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321337.zip) **Ad-hoc minutes on NR\_DualTxRx\_MUSIM WI**

*Type: other For: Approval  
 Source: vivo*

**Decision: Return to.**

**Online session (Tuesday Nov 14, 2023)**

**Issue 4-1-2: Network B requirements framework**

* Proposals
  + Option 1: The network B requirement is related to MGRP, with DRX cycle replaced by max(DRX cycle, MGRP\_max), where MGRP\_max is the maximum MGRP among all configured MUSIM gaps. (Apple xiaomi MTK)
    - Option 1-1: DRX cycle is replaced by max(DRX cycle, MGRP), MGRP is the MGRP of the mandatory gap pattern (CMCC)
    - Option 1-2: For NW-B measurement requirements, the ‘DRX cycle’ in current requirements is replaced with ‘Max(DRX cycle, Min(MUSIM gap MGRP)), (MUSIM gap MGRP) includes the MGRP from all the UE configured periodic MUSIM gaps (Nokia, MTK, Apple)
      * Object: E///
  + Option 2: The network B requirements is not related to MGRP, and with a fixed scaling factor N based on the DRX cycle of network B. (xiaomi, China Telecom, CMCC, Ericsson, vivo, oppo, Huawei, Qualcomm)
    - Option 2a: N = 4, and other values are not precluded. (China telecom, Ericsson vivo, Huawei, Qualcomm)
    - Option 2b: The NW-B requirements is defined based on min(N\*DRX cycle, 5.12s), provided that the MGRP requested by UE should not be larger than N\*DRX cycle. (oppo)

*Recommendations: This issue has been discussed for a few meetings and based on majority view, suggest companies to check whether option 2 can be used as the compromise solution.*

Nokia: why a fixed scaling factor?

MTK: We have concern on option 2 in certain scenarios.

QC: We have relaxlation for both option 1 and 2.

Apple: Option 2 does not always measn relaxation.

MTK: does network B needs to know MGRP?

E///: the network A requirement is based on DRX cycle, and the UE requirement is based on the network’s own configuration.

Nokia: UE requests the MUSIM gap. The option 2 with relaxation impact UE reception of paging, i.e., cannot receive the paging in some cases.

vivo: We agree with E/// the relaxation is up to 16 with option 1. Can we put 4 in [].

MTK: If UE request one MUSIM gap pattern, larger MGRP is configured to UE compared to UE’s request.

Apple: Same concern, and UE cannot meet the requirement with option 2.

Vivo: When UE request only one MUSIM gap, there is no requirement.

E///: We already agreed that:

* + No requirement if network does not configure the MUSIM gap(s) according to UE request.

Tentative Agreement:

* + Option 1-2: For NW-B measurement requirements, the ‘DRX cycle’ in current requirements is replaced with ‘Max(DRX cycle, Min(MUSIM gap MGRP)), (MUSIM gap MGRP) includes the MGRP from all the UE configured periodic MUSIM gaps (Nokia, MTK, Apple)
    - * Object: E///
  + Option 2: The network B requirements is not related to MGRP, and with a fixed scaling factor N based on the DRX cycle of network B.
    - Option a: N = [4]
      * Object: Nokia, MTK want to add that no requirement under certain condition.
  + Companies to select option 1-2 or option 2 by offline discussion in this week.
  + ~~The requirement does not apply if the [minimal / maximum] of MGRP of MUSIM gap is [bigger/smaller] than 1.28s.~~

**Issue 4-1-3: Requirement when MGRP = 5.12s**

* Proposals
  + P1: For MUSIM gap with 5.12s MGPR, new requirement for 5.12s could be defined. (Apple CMCC Huawei MTK Nokia)
    - P1-1: The new requirements for 5.12s could reuse corresponding requirements (number of DRX cycles) when DRX = 2.56s. (Apple Huawei MTK)
  + P2: RAN4 not need to define the requirement for MGRP=5.12s if the NW-B’s requirement is only related to NW-B’s DRX. (xiaomi, China telecom, Ericsson, vivo)

*Recommendations: Depending on issue 4-1-2.*

**Issue 4-1-1: Network B requirements conditions**

* Proposals
  + P1: Update the agreement on NW B requirements to include inactive state as: Define NW B measurement/cell reselection requirements in IDLE/inactive mode only (Apple xiaomi China Telecom CMCC Ericsson vivo oppo Huawei)
    - P1-1: The inactive state requirement should be the same as NW B’s Idle state (Apple China Telecom Ericsson vivo oppo)
  + P2: Add the condition “MUSIM gaps will not be dropped due to collision with other MUSIM gaps” when defining NW B requirements (Apple)
  + P3: RAN4 only one set of requirements for NW-B requirements when UE is allocated with MUSIM gaps. NW-B requirements when UE is allocated with MUSIM gaps are the same as current Idle mode measurement requirements. (Nokia)
  + P4: Postpone the discussion of additional conditions for defining Network B requirements until there is agreement on the framework for defining the requirements (issue 4-1-2). (Qualcomm)

*Recommendations: Suggest to agree P1 and P1-1 based on majority view.*

**Issue 1-1-3: Use of term “GAP” for MUSIM gaps**

* Proposals
  + P1: Do not include MUSIM gaps in term “GAP”. (Huawei, QC, Nokia)

*Recommendations: Agree P1*

**Issue 2-3-2: Solutions for collision between MUSIM gap and any measurement gap without assigned priority**

* Proposals
  + P1: When a MUSIM gap collides with a legacy MG, requirements shall not apply if any one of the collided gaps is not assigned a priority. (Apple xiaomi oppo)
  + P2: Collision is handled based on the MGRP of the collided gaps (Ericsson vivo Huawei ZTE Qualcomm MTK)
    - P2-1: In a collision, prioritize the gap with longer MGRP when any measurement gaps in the collision gaps is not assigned a priority; (Ericsson vivo Huawei MTK Qualcomm)
    - P2-2: No requirements apply if any of the two gaps in a collision have the same MGRP. (Ericsson vivo Huawei Qualcomm)
    - P2-3: If the MGRPs of the collided MUSIM gap and Type-1 MG are the same, then prioritize MUSIM gap only if it is configured with the highest priority level; otherwise prioritize Type-1 MG (MTK)
    - P2-4: The gap pattern with longer MGRP implicitly is implied to have higher priority. In case of collision between multiple MUSIM and measurement gap occasions, collision between gaps are resolved sequentially in order of decreasing MGRP, starting with the gap that has the longest MGRP. When “keep solution” is granted, UE keeps all remaining non-dropped colliding periodic and aperiodic MUSIM gaps. (vivo)
  + P3: Introduce priority for Type-1 MG; the Type-1 gap priority is only applied when MUSIM gaps are configured (Nokia)
  + P4: If priorities are not assigned for Rel-18 MUSIM gaps, no requirements apply (including collision with either Type-1 or Type-2 gaps). (vivo)

*Recommendations: Based on majority view could companies compromise to P2 with P2-1, P2-2 and P2-4?*

*P2-4 is necessary when multiple MUSIM gaps collide with a Type-1 gap.*

Agreement*:*

* + P2: Collision is handled based on the MGRP of the collided gaps (Ericsson vivo Huawei ZTE Qualcomm MTK)
    - P2-1: In a collision, the gap occasion with longer MGRP will be kept when any measurement gaps in the collision gaps is not assigned a priority; and the gap occasion with shorter MGRP will be dropped.
    - P2-2: No requirements apply if any of the two gaps in a collision have the same MGRP.

**Work plan for performance part in R4-2319238**

**Issue 1-1-1: Mandatory MUSIM gap patterns**

* Proposals
  + P1: No need to discuss further whether to introduce mandatory MUSIM gap patterns (Apple oppo Huawei MTK QC)
  + P2: RAN4 to define the mandatory MUSIM gap patterns (CMCC Ericsson Nokia Charter Communications)
    - P2-1: The UE which supports MUSIM feature shall support MUSIM gap patterns with MGL = 6ms, MGRP = 640ms or 1280ms. (Ericsson)
    - P2-2: As minimum the UE shall support MUSIM gap 6ms MGL and 160ms MGRP (Nokia)
  + P3: Compromise one, for UE support MUSIM feature, at least one gap pattern among MUSIM gap pattern 16, 17, 20, 21, 24, 25, 26 shall be supported (vivo)

|  |  |  |
| --- | --- | --- |
| **MUSIM Gap Pattern Id** | **MUSIM Gap Length (MGL, ms)** | MUSIM Gap Repetition Period (MGRP, ms) |
| 16 | 6 | 1280 |
| 17 | 6 | 2560 |
| 20 | 10 | 1280 |
| 21 | 10 | 2560 |
| 24 | 20 | 1280 |
| 25 | 20 | 2560 |
| 26 | 20 | 5120 |

*Recommendations: Check whether the compromise proposal P3 is agreeable*

### 8.26 NR NTN enhancement

#### 8.26.6 RRM core requirements

**R4-2320003 Discussion on RRM impacts of DMRS bundling**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320574 Draft CR: Cell Re-selection for NR UE satellite access in RRC\_IDLE state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2321490 (from R4-2320574).**

[**R4-2321490**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321490.zip) **Draft CR: Cell Re-selection for NR UE satellite access in RRC\_IDLE state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Return to.**

**R4-2320575 Draft CR: Cell Re-selection for NR UE satellite access in RRC\_INACTIVE state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2321491 (from R4-2320575).**

**[R4-2321491](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321491.zip) Draft CR: Cell Re-selection for NR UE satellite access in RRC\_INACTIVE state**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Return to.**

##### 8.26.6.1 NR-NTN RRM requirements in above 10 GHz bands

**R4-2318340 Discussion on NTN RRM requirements in above 10 GHz bands**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318341 Draft CR on RRC\_IDLE and RRC\_INACTIVE state mobility for NTN in above 10 GHz bands**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: CATT*

**Decision: Revised to R4-2321492 (from R4-2318341).**

[**R4-2321492**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321492.zip) **Draft CR on RRC\_IDLE and RRC\_INACTIVE state mobility for NTN in above 10 GHz bands**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: CATT*

**Decision: Return to.**

**R4-2318460 Discussion on RRM requirements for NTN above 10 GHz bands and other enhancement**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2318654 On NR-NTN RRM requirements in above 10 GHz bands**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2318819 draft CR on handover for VSAT UE**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

draft CR on handover for VSAT UE

**Decision: Revised to R4-2321493 (from R4-2318819).**

[**R4-2321493**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321493.zip) **draft CR on handover for VSAT UE**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

draft CR on handover for VSAT UE

**Decision: Return to.**

**R4-2318821 RRM requirements in above 10 GHz bands**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

RRM requirements in above 10 GHz bands

**Decision: Noted.**

**R4-2318841 Discussion on RRM requirements for NR NTN UE in above 10GHz bands**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2318845 Discussion on RRM requirements for NTN bands above 10GHz**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2318846 DraftCR on measurement delay requirements for NTN bands above 10GHz**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Xiaomi*

**Decision: Revised to R4-2321494 (from R4-2318846).**

[**R4-2321494**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321494.zip) **DraftCR on measurement delay requirements for NTN bands above 10GHz**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Xiaomi*

**Decision: Return to.**

**R4-2319062 General discussion on NTN RRM requirements in above 10 GHz bands**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319212 Discussion on RRM requirements for NR-NTN UEs in above 10GHz bands**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2319214 Draft CR on VSAT UE timing requirements for NTN in above 10GHz**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Samsung*

**Decision: Revised to R4-2321495 (from R4-2319214).**

[**R4-2321495**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321495.zip) **Draft CR on VSAT UE timing requirements for NTN in above 10GHz**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Samsung*

**Decision: Return to.**

**R4-2320004 Discussion on RRM requirements for NTN in Ka band**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320005 draftCR on HO requirements for NTN in Ka band**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2321496 (from R4-2320005).**

[**R4-2321496**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321496.zip) **draftCR on HO requirements for NTN in Ka band**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2320557 Discussion on NR-NTN deployment in above 10GHz bands**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2320736 On solutions for NTN requirements for operations above 10 GHz**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320965 draft Cat-B CR RLM in NTN band above 10GHz**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2321497 (from R4-2320965).**

[**R4-2321497**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321497.zip) **draft Cat-B CR RLM in NTN band above 10GHz**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Return to.**

**R4-2320966 NTN support for frequency band above 10GHz**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2320971 On the NTN UL Timing Accuracy for above 10 GHz**

*Type: discussion For: Discussion  
 Source: THALES*

**Abstract:**

Some previous analysis with respect to timing error accuracy for FR1 has been done in R4-2119505 (THALES) “On the NTN UL Timing Accuracy”. Some of the analysis can be reused also for NTN in above 10 GHz with higher SCS (60 and 120 kHz).

**Decision: Noted.**

##### 8.26.6.2 Network verified UE location

**R4-2319063 Discussion on RRM impacts on Network verified UE location for NTN enhancement**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2320006 Discussion on RRM requirements for NW verified location**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320737 Impact of NTN specificities on RX-TX Difference measurements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320738 DraftCR on requirements for UE verified Location**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2321498 (from R4-2320738).**

[**R4-2321498**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321498.zip) **DraftCR on requirements for UE verified Location**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2320967 Network verified UE location**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

##### 8.26.6.3 NTN-TN and NTN-NTN mobility and service continuity enhancements

**R4-2318342 Discussion on RRM requirements for NTN-TN and NTN-NTN mobility and service continuity enhancements**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318461 Discussion on RRM requirements for NR NTN mobility enhancement**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2318655 On mobility and service continuity for eNTN**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2318820 NTN-TN and NTN-NTN mobility and service continuity enhancements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

NTN-TN and NTN-NTN mobility and service continuity enhancements

**Decision: Noted.**

**R4-2318897 Discussion on NTN service continuity enhancement**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2318908 Discussion on RRM core requirement for NR NTN mobility enhancements**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319061 Discussion on RRM requirements for mobility on NTN enhancement**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319064 draft CR on RRC\_CONNECTED state mobility for NTN**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Revised to R4-2321499 (from R4-2319064).**

[**R4-2321499**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321499.zip) **draft CR on RRC\_CONNECTED state mobility for NTN**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Return to.**

**R4-2319213 Discussion on RRM requirements for NTN-NTN and NTN-TN mobility**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2320007 Discussion on mobility enhancements in NTN**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320558 Discussion on RRM requirements for NTN enhancement**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2320739 Service continuity and mobility enhancements between TN and NTN**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

#### 8.26.7 RRM performance requirements

**R4-2318822 RRM performance requirement for NTN**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

RRM performance requirement for NTN

**Decision: Noted.**

**R4-2320008 Discussion on performance requirements for Rel-18 NTN**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320740 Test cases scope and configuration for NTN enhancements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

#### 8.26.9 Moderator summary and conclusions

Topic: [109][226] NR\_NTN\_enh

**R4-2318182 Topic summary for [109][226] NR\_NTN\_enh**

*Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

[109][200] RRM Session AI 8.26.6, 8.26.7

**Decision: Noted.**

[**R4-2321330**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321330.zip) **Ad-hoc minutes on NR\_NTN\_enh WI**

*Type: other For: Approval  
 Source: Samsung*

**Decision: Approved.**

[**R4-2321362**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321362.zip) **WF on NTN RRM requirements**

*Type: other For: Approval  
 Source: Qualcomm*

**Decision: Return to.**

**Online session (Wednesday Nov 15, 2023)**

**Topic #3: Network verified UE location**

**Issue 3-2: Measurement period and accuracy requirements on RTD**

**Agreement [RAN4#108b]:**

* Measurement period requirements for UE Rx-Tx measurement is defined to reuse the existing TN requirements with MG as baseline.
  + Option 1: a higher Es/Iot than the existing one is needed, targeting the same accuracy as the existing one.
  + Other options are not precluded.

**Views from companies**

* UE Rx-Tx measurement period requirement is the same as the existing requirement with MG
  + Vivo
* Discuss whether the scope include measurements across different frequency layers and how to treat the case where inter-frequency MGs are to be shared between more than one satellite
  + Nokia
* A higher Es/Iot than the existing Es/Iot and the same accuracy requirement
  + Vivo
* Discuss whether Nsample = 4 is applicable
  + Huawei

**Moderator’s WF**

* For UE Rx-Tx measurement period requirement, discuss and decide the following in RAN4#109:
  + Option 1-A: The scope includes measurements across different frequency layers.
    - Further discuss and decide the details, in RAN4#109, about how to treat the case where inter-frequency MGs are to be shared between more than one satellite.
  + Option 1-B: The scope does not include measurements across different frequency layers.

Nokia: one or more satellites to be considered?

MTK: Option 1-B is sufficient and can be starting point. The scenario is one satellite.

Ericsson: agree with MTK. RAN2 only considers single satellite.

ZTE: agree with E///.

Charter: single satellite should be the regular scenario. Different mode if consider more than 1 satellite.

Agreement:

* For UE Rx-Tx measurement period requirement, as baseline, the scope does not include measurements across different frequency layers.

Agreement:

* For UE Rx-Tx measurement accuracy requirement, compared to the existing requirements, discuss the following in the performance requirement phase.
  + Whether and how much to increase Es/Iot
  + Whether to reuse or modify the same accuracy requirement.
  + Whether Nsample = 4 is applicable

HW: Nsample is related to core part and waiting for RAN1.

Agreement:

For the core part CR, Nsample = [1].

**Topic #4: Idle/Inactive mode mobility enhancements**

**Issue 4-1: TN to NTN cell reselection**

**Agreement [RAN4#108b]:**

* FFS: whether/how to define TN to NTN cell reselection.

**Views from companies**

* Option 1: Do not define requirements on TN to NTN cell reselection.
  + CMCC, MTK, Ericsson, Huawei, ZTE, Apple (if no requirement on NTN to TN)
* Option 2: Define requirements on TN to NTN cell reselection.
  + CATT, Samsung
* Option 3: Wait for RAN2 conclusion
  + LGE, vivo, Nokia

**Moderator’s WF**

* Further discuss the above

Alternative 1: (Apple, MTK, HW, Samsung, QC)

o Do not define requirements on TN to NTN cell reselection.

o Do not define requirements on NTN to TN cell reselection.

Object: Nokia, E///, LGE, ZTE

Alternative 2: (Nokia, QC, E///, LGE, CMCC)

o Do not define requirements on TN to NTN cell reselection.

o Define requirements on NTN to TN cell reselection.

Object: Apple, Samsung, OPPO, CATT, Xiaomi

Alternative 3: (Samsung, Thales, LGE, Apple, E///, Nokia, ZTE, vivo, Xiaomi, CATT, OPPO, CMCC)

o Define requirements on TN to NTN cell reselection.

o Define requirements on NTN to TN cell reselection.

Object: HW, QC, MTK

QC: NTN to TN cell reselection is much more relevant from scenario perspective.

QC: how to define requirments for TN to NTN cell reselection?

Apple: timer or location based measurements do not apply to TN to NTN. Consider NTN to NN as baseline.

HW: we have concern on TN to NTN cell reselection. UE need to open GNSS when there is coverage for TN. RAN2 signaling does not mean RAN4 requirement.

QC: The requirement for TN to NTN cell reselection will be more than 10 conds. requirement does not make sense.

MTK: also have concern on alternative 3.

CMCC: Is this requirement under section for TN or NTN?

Status of the discussion:

o Define requirements on TN to NTN cell reselection.

Define core requirements for GNSS ON and GNSS switch OFF to ON, no test case.

No specific value for the GNSS time to first fix to be define for the case of GNSS switch OFF to ON.

o Define requirements on NTN to TN cell reselection.

CATT has strong view.

o Define requirements on TN to NTN cell reselection.

Define core requirements for GNSS ON and GNSS switch OFF to ON, FFS whether to define test case.

No specific value for the GNSS time to first fix to be define for the case of GNSS switch OFF to ON.

o Define requirements on NTN to TN cell reselection.

QC, HW have strong view.

**Issue 4-2: NTN to TN cell reselection**

**Agreement [RAN4#108b]:**

* UE is allowed to skip TN neighbour cells measurement in an area where there is no coverage of the frequency based on the provided TN cell coverage information and UE GNSS position information. FFS whether and how to implement it RAN4 CR.
* FFS on how to enhance NTN-to-TN cell reselection in case of mismatch between practical TN cell coverage and TN cell coverage information provided by serving cell.

**Views from companies**

* Whether and how to define NTN to TN cell reselection requirements
  + Option 1-A: RAN4 to not update the existing UE requirements other than adding the clarification that UE is not required to perform TN cell measurement in an area where there is no TN network coverage on a given frequency layer based on the provide TN cell coverage information and UE GNSS position information.
    - MTK
  + Option 1-B: Re-use the same requirements for inter-frequency cell reselection (Tmeasure, Tdetect, Tmeasure) used for NTN to NTN, with K\_multi\_SMTC =1.
    - Nokia
  + Option 1-C: Define inter-frequency NTN-to-TN cell re-selection requirements and inter-RAT NTN-to-TN cell re-selection requirements.
    - CMCC
  + Option 2: Do not define requirements on NTN to TN cell reselection.
    - Huawei, Apple (if no TN to NTN cell reselection requirement)
* Whether and how to account for UE GNSS error
  + Option 1: Add a margin of plus [50] meters on top of the TN coverage radius information.
    - Apple, LGE
* Whether and how to account for the mismatch between the TN coverage area configured by the Network and the real coverage area
  + Option 1: Do not provide enhancements for the TN cell reselection.
    - Nokia

**Moderator’s WF**

* Decide one of the options:
  + Option 1-A: RAN4 to not update the existing UE requirements other than adding the clarification that UE is not required to perform TN cell measurement in an area where there is no TN network coverage on a given frequency layer based on the provide TN cell coverage information and UE GNSS position information.
  + Option 1-B: Re-use the same requirements for inter-frequency cell reselection (Tmeasure, Tdetect, Tmeasure) used for NTN to NTN, with K\_multi\_SMTC =1.
  + Option 1-C: Define inter-frequency NTN-to-TN cell re-selection requirements and inter-RAT NTN-to-TN cell re-selection requirements.
  + Option 2: Do not define requirements on NTN to TN cell reselection.
* It Option 2 is not agreed,
  + add a margin of plus [50] meters on top of the TN coverage radius information to account for UE GNSS error
  + do not provide enhancements for the TN cell reselection to account for the mismatch between the TN coverage area configured by the Network and the real coverage area.

**Issue 4-3: NTN to NTN time-based measurement initiation for cell reselection in earth-moving cell**

**Agreement [RAN4#108b]:**

Further discuss the requirements on time-based measurement initiation for cell reselection in earth-moving cell based on following Options:

* Option 1: For NTN to NTN time-based measurement initiation for cell reselection in earth-moving cell, the existing RRC idle/inactive mode requirements referring to ‘t-service’ are reused.
* Option 2: Enhance the requirements on time-based measurement initiation for cell reselection in earth-moving cell
  + Introduce coverage information of serving cell for helping UE to assess the available time left for cell reselection measurement before UE leaves the coverage area of serving cell
* Option 3: For earth-moving cell, time-based measurement initiation may only apply to hard satellite switch in RAN2 design. (Nokia)

**Views from companies**

* Option 1: For time-based NTN to NTN cell reselection in earth-moving cell, the existing RRC idle/inactive mode requirements (4.2C and 5.1C) referring to ‘t-service’ can be reused.
  + CATT, Apple, Ericsson, CMCC, Samsung, Huawei, ZTE
  + Option 1-A: (LGE) the following conditions should be precluded:
    - UE shall start measurement of the neigbhor cells indicated by the serving cell before t-Service is reached according to the requirements
    - UE shall be able to detect, measure, and evaluate neighbour cells before the serving cell stops serving the area regardless of whether the distance condition based on serving cell reference location or the legacy Srxlev/Squal condition are met.
* Option 2: Enhance the requirements on time-based measurement initiation for cell reselection in earth-moving cell.
  + For the case that the actual stop time point for specific UE is earlier than the stop time due to feeder link switching, RAN4 to introduce coverage information of serving cell for helping UE to assess the available service time left for cell reselection measurement.
  + RAN4 to send a LS to ask RAN2 to introduce the coverage information (i.e., a reference point of cell centre plus radius) of serving cell for time-based cell reselection measurement initiation.
  + Support: vivo
  + Oppose: Huawei, ZTE

**Moderator’s WF**

* For time-based NTN to NTN cell reselection in earth-moving cell, the existing RRC idle/inactive mode requirements (4.2C and 5.1C) referring to ‘t-service’ can be reused.
* And discuss/decide the following details:
  + UE shall start measurement of the neigbhor cells indicated by the serving cell before t-Service is reached according to the requirements
  + UE shall be able to detect, measure, and evaluate neighbour cells before the serving cell stops serving the area regardless of whether the distance condition based on serving cell reference location or the legacy Srxlev/Squal condition are met.
* Further discuss the following:
  + Enhance the requirements on time-based measurement initiation for cell reselection in earth-moving cell.
    - For the case that the actual stop time point for specific UE is earlier than the stop time due to feeder link switching, RAN4 to introduce coverage information of serving cell for helping UE to assess the available service time left for cell reselection measurement.
    - RAN4 to send a LS to ask RAN2 to introduce the coverage information (i.e., a reference point of cell centre plus radius) of serving cell for time-based cell reselection measurement initiation.

Vivo,

* + Enhance the requirements on time-based measurement initiation for cell reselection in earth-moving cell.
    - For the case that the actual stop time point for specific UE is earlier than the stop time due to feeder link switching, RAN4 to introduce coverage information of serving cell for helping UE to assess the available service time left for cell reselection measurement.
    - RAN4 to send a LS to ask RAN2 to introduce the coverage information (i.e., a reference point of cell centre plus radius) of serving cell for time-based cell reselection measurement initiation.

LGE: also observe the issue, and propose some condition to address the issue.

Nokia: don’t think this is an issue. Enhancement from signaling is discussed in RAN1/2.

QC: Satellite is swiching gateway. We don’t see the issue.

Apple: Nework already considers the margin when do the configuration. That can be hanlded by the network.

HW: This is not related to the Tserivce.

Options for further offline discussion:

Option 1: (E///, Samsung, ZTE, QC, CATT, CMCC)

* For time-based NTN to NTN cell reselection in earth-moving cell, the existing RRC idle/inactive mode requirements (4.2C and 5.1C) referring to ‘t-service’ can be reused.
  + FFS any necessary modification can be considered for the earth moving scenario. Opiton for consideration:
  + Option A: remove the following condition:
    - UE shall start measurement of the neigbhor cells indicated by the serving cell before t-Service is reached according to the requirements
    - UE shall be able to detect, measure, and evaluate neighbour cells before the serving cell stops serving the area regardless of whether the distance condition based on serving cell reference location or the legacy Srxlev/Squal condition are met.

Option 2: Not define the requirement (vivo)

**Issue 4-4: NTN to NTN location-based measurement initiation for cell reselection in earth-moving cell**

**Agreement [RAN4#108b]:**

* For NTN to NTN location-based measurement initiation for cell reselection in earth-moving cell, RAN4 to define the requirements based on the existing requirements on ‘4.2C Cell Re-selection for NR UE for Satellite Access,’ and introduce a new definition of reference location and an extra location margin.

**Views from companies**

* No need to introduce new cell reselection requirements for earth-moving cell since that *referenceLocation* for earth-moving cell only indicates initiating measurement but no impact current measurement delay requirements in ‘Clause 4.2C Cell Re-selection for NR UE for Satellite Access.’
  + Ericsson
* A margin for beam footprint location is introduced, e.g. 20 meters.
  + CMCC

**Moderator’s WF**

* Introduce a margin for beam footprint location, [20] meters.
* Note from Moderator: Please confirm if the above value is consistent with the margin assumed for satellite positioning error in defining Te\_NTN requirements.

**Topic #5: Connected mode mobility enhancements**

**Issue 5-1: NTN to NTN RACH-less (C)HO**

**Agreement [RAN4#108b]:**

* RACH-less handover delay requirement consists of ‘RRC procedure delay + Interruption time,’ i.e. = TRRC + TInterrupt, where TInterrupt = Tprocessing + Tsearch + T∆ + Tmargin + TIU.
  + Tsearch: the definition and values are the same as that in 6.1C.1.2.2 in NTN HO.
  + Tprocessing: the definition and values are the same as that in 6.1C.1.2.2 in NTN HO.
  + T∆: the definition and values are the same as that in 6.1C.1.2.2 in NTN HO.
  + Tmargin: the definition and values are the same as that in 6.1C.1.2.2 in NTN HO.
  + TIU is the interruption uncertainty in acquiring the first UL transmission resource, which can be a configured grant based PUSCH, dynamic grant based PUSCH, SR on PUCCH, according to NW configuration and scheduling, or PRACH if no SSB mapping to pre-allocated grant has RSRP above the threshold while T304 is running.
* The RACH-less handover delay requirement applies to
  + both known and unknown cases
  + both intra-satellite and inter-satellite handover cases
  + both intra-frequency and inter-frequency target cell cases
* The RACH-less handover delay requirement is applicable only when the UE is provided with all essential information of the target satellite as the existing NTN handover requirement, i.e.
  + (from 6.1C.1.2 of TS38.133) The requirements apply provided that UE has the valid and applicable parameters of ephemeris information, common TA, DL and UL Polarization information, K offset , and K mac for target NR SAN cell during D handover, otherwise interruption time may be longer than the requirements in clause 6.1C.1.2.2.

**Views from companies**

* (Ericsson) Update TIU as below:
  + TIU is the interruption uncertainty in acquiring the first UL transmission resource, which can be a configured grant based PUSCH, dynamic grant based PUSCH, SR on PUCCH, according to NW configuration and scheduling~~, or PRACH if no SSB mapping to pre-allocated grant has RSRP above the threshold while T304 is running~~.
* (vivo) Define a new requirement for combination of RACH-less HO with time-based CHO. The requirement is the same as time-based CHO with the adoption of TIU defined for RACH-less HO:

**Moderator’s WF**

* Decide and decide the following:
  + Update TIU as below:
    - TIU is the interruption uncertainty in acquiring the first UL transmission resource, which can be a configured grant based PUSCH, dynamic grant based PUSCH, SR on PUCCH, according to NW configuration and scheduling~~, or PRACH if no SSB mapping to pre-allocated grant has RSRP above the threshold while T304 is running~~.
  + Define a new requirement for combination of RACH-less HO with time-based CHO. The requirement is the same as time-based CHO with the adoption of TIU defined for RACH-less HO:

**Issue 5-2: NTN to NTN Satellite switching without PCI change**

**Agreement [RAN4#108b]:**

* For satellite switching without PCI change,
  + define requirements for both hard and soft switch scenarios.
    - TBD on how to define hard/soft satellite switch without PCI change (which will be determined mostly based on further clarification expected to be made by RAN2)
  + define requirements for PRACH-based and for without RACH performed solution.
  + The above does not necessarily mean that a common requirement formula cannot be defined. e.g. requirements for each case can be represented by a common formula with different definitions of respective components.
    - Starting point of the interruption time for the switch is t-Service, FFS other starting point needs to be considered for other cases depending on RAN2 progress
    - Ending point of the interruption time for the switch is PRACH transmission for PRACH-based case and [first UL transmission excepting PRACH for without RACH performed solution]
* Interruption time for the hard switch is defined as Tinterrupt = Tsearch + TIU + Tprocessing + T∆ + Tmargin 
  + Tsearch = [Trs] ms
  + Tprocessing = [5] ms
  + T∆, Tmargin and TIU are same as existing requirements
* FFS Interruption time for soft switch
* FFS on
  + whether/how to define requirements resulting from separate link switch time instances for UL and DL.
    - Note: the starting and ending may be revisited depending outcome of discussions
  + whether/how to define UE behavior (e.g. skipping/relaxation of L1/L3 measurement and evaluation) during the switch.

**Views from companies**

* For soft and hard satellite switch without PCI change, Tinterrupt = Tsearch + TIU + Tprocessing + T∆ + Tmargin (i.e. same formula as hard satellite switch) and the values of respective components are the same.
  + Apple, Ericsson, Huawei
* For soft satellite switch without PCI change,
  + Starting point of the interruption time:
    - between t-Start and t-Service, and the exact starting time is up to UE implementation.
      * Apple, Ericsson, vivo
    - t-Service
      * CMCC, Huawei
  + Ending point of the interruption time:
    - same as hard switch case.
      * Apple, Ericsson, vivo, Huawei
  + Tsearch
    - Tfirst\_SSB ms, where Tfirst\_SSB is the time to the end of the first complete SSB burst indicated by the SMTC of target satellite. [Note: SMTC configuration details need to be updated as RAN2 makes further progress]
      * Apple
    - Consider known condition
      * CMCC, vivo
      * Tfirst\_SSB ms, where Tfirst\_SSB is the time to the end of the first complete SSB burst indicated by the SMTC of target satellite for unknown target cell [and the target cell Es/Iot ≥ -2 dB], and 0 for known target cell. [Note: SMTC configuration details need to be updated as RAN2 makes further progress]
        + CMCC, vivo
      * In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds before UE starts synchronizing with target satellite otherwise it is unknown. Relevant cell identification requirements are described in Clause 9.2.5 for intra-frequency handover ~~and Clause 9.3.4 for inter-frequency handover~~.
        + Vivo
  + Tprocessing = 5 ms
    - Apple, CMCC, vivo
  + T∆, Tmargin and TIU are same as existing requirements.
    - Apple, CMCC
* For hard satellite switch without PCI change,
  + Starting point of the interruption time:
    - t-Service
      * CMCC
  + Tsearch = Tfirst\_SSB ms, where Tfirst\_SSB is the time to the end of the first complete SSB burst indicated by the SMTC of target satellite. [Note: SMTC configuration details need to be updated as RAN2 makes further progress]
    - Apple, CMCC
  + Tprocessing = 5 ms
    - Apple, CMCC
  + A scheduling restriction applies to UEs that do not support parallelMeasurementWithoutRestriction-r17 starting at the UL slot to be transmitted at tue\_ul\_switch = t-service – common delay
    - Nokia
  + Include in the interruption time a component associated to the DL transmission gap
    - Nokia
* Whether/how to define requirements resulting from separate link switch time instances for UL and DL
  + Option 1: Do not define separate starting points for UL and DL for hard switch
    - Huawei
  + Option 2: Define separate starting points for UL and DL for hard switch
    - Nokia
* During satellite switching without PCI change, UE is not required to monitor other cells than the target cell:
  + Apple, Huawei, Ericsson
  + For soft satellite switch without PCI change, UE shall skip or deprioritize measurements on serving cell and neighbor cells after t-Start
    - Ericsson
  + For hard satellite switch without PCI change, UE is not required to monitor other cells than the target cell after t-Service
    - Apple, Huawei, Ericsson

**Moderator’s WF#1**

* For soft and hard satellite switch without PCI change, Tinterrupt = Tsearch + TIU + Tprocessing + T∆ + Tmargin (i.e. same formula as hard satellite switch). The following are the same for both cases:
  + Tprocessing = 5 ms
  + TIU, T∆ and Tmargin are same as existing requirements.
  + Ending point of the interruption time: PRACH transmission for PRACH-based case and [first UL transmission excepting PRACH for without RACH performed solution, if supported by RAN2]
* For soft satellite switch without PCI change,
  + Starting point of the interruption time:
    - Option 1: between t-Start and t-Service, and the exact starting time is up to UE implementation.
    - Option 2: t-Service
  + Tsearch
    - Decide whether to consider the following known condition.
      * In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds before UE starts synchronizing with target satellite otherwise it is unknown. Relevant cell identification requirements are described in Clause 9.2.5 for intra-frequency handover ~~and Clause 9.3.4 for inter-frequency handover~~.
    - If agreed to not consider known vs. unknown condition,
      * Tfirst\_SSB ms, where Tfirst\_SSB is the time to the end of the first complete SSB burst indicated by the SMTC of target satellite.
    - Otherwise,
      * Tfirst\_SSB ms, where Tfirst\_SSB is the time to the end of the first complete SSB burst indicated by the SMTC of target satellite for unknown target cell [and the target cell Es/Iot ≥ -2 dB], and 0 for known target cell.
* For hard satellite switch without PCI change,
  + Starting point of the interruption time: t-Service
  + Tsearch = Tfirst\_SSB ms, where Tfirst\_SSB is the time to the end of the first complete SSB burst indicated by the SMTC of target satellite.
* Note: The SMTC configuration details need to be updated as RAN2 makes further progress.

**Moderator’s WF#2**

* During satellite switching without PCI change, UE is not required to monitor other cells than the target cell:
  + For soft satellite switch without PCI change, UE [may or shall] skip measurements on other cells than the target cell after t-Start
  + For hard satellite switch without PCI change, UE is not required to monitor other cells than the target cell after t-Service

**Moderator’s WF#3**

* For hard satellite switch without PCI change, further discuss the following:
  + A scheduling restriction applies to UEs that do not support parallelMeasurementWithoutRestriction-r17 starting at the UL slot to be transmitted at tue\_ul\_switch = t-service – common delay
  + Include in the interruption time a component associated to the DL transmission gap

**Moderator’s WF#4**

* Decide whether/how to define requirements resulting from separate link switch time instances for UL and DL
  + Option 1: Do not define separate starting points for UL and DL for hard switch
  + Option 2: Define separate starting points for UL and DL for hard switch

**Issue 5-3: NTN to NTN time and location-based trigger CHO enhancements**

**Agreement [RAN4#108b]:**

* Define time and location-based NTN to NTN CHO requirements without L3 measurement criteria by modifying the current NTN to NTN CHO requirements.

**Views from companies**

* The existing conditional CHO requirement defined in 6.1C.2.2 (DCHO = TRRC + TEvent\_DU + Tmeasure + Tinterrupt + TCHO\_execution, Tinterrupt = Tprocessing + TIU + T∆ + Tmargin) is reused with the following updates:
  + TEvent\_DU is the delay uncertainty which is the time from when the UE successfully decodes a conditional handover command until the time or location condition is fulfilled.
    - Vivo, Huawei
  + Remove Tmeasure
    - Vivo, Huawei, CMCC
  + Add Tsearch to Tinterrupt, i.e. Tinterrupt = Tprocessing + TIU + T∆ + Tmargin+ Tsearch, and the definition of Tseach is the same as the existing one defined in 6.1C.2.2.
    - CMCC, Huawei, Nokia

**Moderator’s WF**

* The existing conditional CHO requirement defined in 6.1C.2.2 (DCHO = TRRC + TEvent\_DU + Tmeasure + Tinterrupt + TCHO\_execution, Tinterrupt = Tprocessing + TIU + T∆ + Tmargin) is reused with the following updates:
  + TEvent\_DU is the delay uncertainty which is the time from when the UE successfully decodes a conditional handover command until the time or location condition is fulfilled.
  + Remove Tmeasure
  + Add Tsearch to Tinterrupt, i.e. Tinterrupt = Tprocessing + TIU + T∆ + Tmargin+ Tsearch, and the definition of Tseach is the same as the existing one defined in 6.1C.2.2.

### 8.28 NR Network-controlled Repeaters

#### 8.28.5 RRM core requirements

**R4-2320346 Big CR to TS 38.133 on RRM core requirements for NR network-controlled repeaters**

*Type: CR For: Agreement  
 38.106 v18.2.0 CR-0048 rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation,Ericsson,Nokia*

**Decision: Endorsed.**

#### 8.28.7 Moderator summary and conclusions

Topic: [109][227] NR\_netcon\_repeater

**R4-2318183 Topic summary for [109][227] NR\_netcon\_repeater**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

[109][200] RRM Session AI 8.28.5

**Decision: Noted.**

### 8.29 NR MIMO evolution for downlink and uplink

#### 8.29.2 RRM core requirements

##### 8.29.2.1 RRM requirements impacts

**R4-2318583 On RRM requirements for TDCP measurement**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318849 Discussion on RRM requirement for FeMIMO**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: xiaomi*

**Decision: Noted.**

**R4-2319056 Draft CR on L1-RSRP RRM requirements in R18 NR MIMO evolution**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Return to.**

**R4-2319215 Discussion on other RRM impacts on Rel-18 MIMO evolution: TDCP**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2319621 Discussion on R18 MIMO for RRM requirements impacts**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2320466 Discussion on Feasibility study of RRM TDCP accuracy requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320726 Discussion on Feasibility study of RRM TDCP accuracy requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320779 On TDCP requirements**

*Type: discussion For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

On TDCP requirements

**Decision: Noted.**

**R4-2320780 Draft CR on On TDCP requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR on On TDCP requirements

**Decision: Return to.**

**R4-2320963 TDCP requirements**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

##### 8.29.2.2 Timing requirements for UL multi-DCI multi-TRP with two TAs

**R4-2318615 Discussion on timing requirements for UL multi-DCI multi-TRP with two TAs of R18 eFeMIMO**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318616 Draft CR on MRTD requirements**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2319216 Discussion on timing requirements for Multi-DCI multi-TRP with two TAs**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2319622 Discussion on R18 MIMO for Timing requirements for UL multi-DCI multi-TRP with two Tas**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2319636 Timing requirements for UL multi-DCI multi-TRP with two TAs**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Timing issues: mDCI mTRP 2TA and TAG management for multi-TRP with 2 TAs

**Decision: Noted.**

**R4-2319637 UL Transmit timing for MIMO Evolution**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Definition of reference time added to sections 7.1.1 & 7.1.2, for mDCI, mTRP 2 TA case.

**Decision: Return to.**

**R4-2319966 Discussion on timing requirements for UL multi-DCI multi-TRP with two TAs**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319967 DraftCR on MTTD requirements for UL multi-DCI multi-TRP with two TAs**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2320729 Discussion on timing requirements for UL multi-DCI multi-TRP with two Tas**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320964 Timing requirements for UL multi-DCI multi-TRP with two TAs**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

##### 8.29.2.3 Unified TCI framework

**R4-2318584 On RRM requirements for unified TCI framework with mTRP**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318585 DraftCR on UL TCI state switching delay requirements for eUTCI for mDCI**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2318850 Discussion on Unified TCI states for FeMIMO**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: xiaomi*

**Decision: Noted.**

**R4-2318853 DraftCR on L1-RSRP measurement for cell with different PCI when actual timing offset can be larger than CP**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: xiaomi*

**Decision: Return to.**

**R4-2319217 Discussion on enhanced unified TCI framework in Rel-18 MIMO evolution**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2319219 Draft CR on active downlink TCI state switching delay for unified TCI for sDCI mTRP**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: Samsung*

**Decision: Return to.**

**R4-2319362 Discussion on RRM requirements for uTCI extension to mTRP for Rel-18 MIMO**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319363 Draft CR on Active uplink TCI state switching delay for unified TCI for sDCI mTRP**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2319623 Discussion on R18 MIMO for Unified TCI framework**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2320727 Discussion on Rel-18 extension of Unified TCI framework for mTRP operation**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320728 Draft CR for Active downlink TCI state switching delay for unified TCI for mDCI mTRP**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2320781 Unified TCI state requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Unified TCI state requirements

**Decision: Noted.**

#### 8.29.3 RRM performance requirements

**R4-2318586 On performance test cases for eUTCI**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2319218 Discussion on RRM Performance part for Rel-18 MIMO evolution for Downlink and Uplink**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2319968 Discussion on RRM performance for R18 MIMO evolution**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320730 Discussion on RRM performance requirements and test cases for Rel-18 MIMO evolution for Downlink and Uplink**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320782 RRM performance requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

RRM performance requirements

**Decision: Noted.**

#### 8.29.5 Moderator summary and conclusions

Topic: [109][228] NR\_MIMO\_evo\_DL\_UL

**R4-2318184 Topic summary for [109][228] NR\_MIMO\_evo\_DL\_UL**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

[109][200] RRM Session AI 8.29.2, 8.29.3

**Decision: Noted.**

[**R4-2321329**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321329.zip) **Ad-hoc minutes on NR\_MIMO\_evo\_DL\_UL WI**

*Type: other For: Approval  
 Source: Samsung*

**Decision: Return to.**

**Online session (Monday Nov 13, 2023)**

**Issue 2-1-1: TAG management for multi-TRP with 2 TAs**

* Proposals
  + Proposal 1: (Apple)
    - consider RTD monitoring in R19
      * UE indicates its category to NW after access NW (baseline UE or advanced UE).
      * Network configures UE to monitor RTD between the two nodes.
      * UE monitors the RTD consistently, and report to network when status changes (e.g. RTD becomes larger/smaller than CP)
      * Upon receiving RTD status change from UE, network can update configuration accordingly (e.g. fallback to single TAG or enable two TAGs).
  + Proposal 2: UE implementation (Samsung, MediaTek, Ericsson, Huawei)
    - When the transmission timing difference between two TAGs for multi-TRP operation exceeds the MTTD value, there is no need to define requirements and it is up to UE implementation.
  + Proposal 2a: RAN2 is discussing this issue and can be left to RAN2 discussion as the similar behaviour for CA is captured in RAN2 spec.
  + Proposal 3: (Nokia)
    - Define a rule such that UE and network know which UL transmission the UE will stop when the transmission timing difference between the two TAGs exceeds the MTTD value.
    - Adopt at least one of the following options for the rule defining which UL transmission the UE will stop when the transmission timing difference between the two TAGs exceeds the MTTD value:
      * The UE stops the UL transmission corresponding to the TAG with lowest or highest TAG index or ID.
      * The UE stops the UL transmission corresponding to the TAG associated (e.g., through TCI states) with lowest or highest coresetPoolIndex.
* Recommended WF
  + TBA

Moderator: P2 is similar to NR CA with no RAN4 requirement, and UE behaviour is defined in RAN2.

Nokia: If UE stop one transmission, UE behaviour should be clear. What UE assume to do if with no requirement?

Apple: UE can stop one transmission for uplink. The UE behaviour is not clear.

QC: network does not know the actual time difference.

Nokia: we need to send LS to RAN2.

Samsung: for NR CA, no additional UE requirement in RAN4, and UE behaviour is defined in RAN2. The similar approach can be followed here.

QC: MTD is artificial, does UE need to track it?

Session chair: In RAN4 understanding, RAN2 is discussing this issue and whether to define the UE behaviour is up to RAN2 discussion.

QC: Any of the transmission shall apply the Te requirement.

Apple: the legacy requirement does not apply.

Agreement:

* When the transmission timing difference between two TAGs for multi-TRP operation exceeds the MTTD value, no additional UE behavior to be defined in RAN4.

**Issue 1-1-1: Is it feasible to define TDCP accuracy requirement for TDCP?**

* Proposals
  + Proposal 1: (Apple, MediaTek, Huawei)
    - Not feasible. Do not define accuracy requirements for TDCP measurement.
  + Proposal 2: (Ericsson, Qualcomm)
    - Yes. It is feasible. Define TDCP accuracy requirements.
    - Proposal 2a: Ericsson
      * TDCP observed from simulation results are within acceptable range from the ideal value; and
      * it is possible to define the accuracy requirements that can be tested using the ideal value derived from Bessel function as reference.
    - Proposal 2b: Qualcomm
      * Two Doppler spread values, one for a low Doppler spread and the other for a high Doppler spread, should be chosen. e.g. [30Hz or 75Hz] and 300Hz.
      * The requirement is defined such that [50]% of CDF of the reported TDCP values (more than X TDCP samples over Y sec) is within Z1 and Z1. FFS on X, Y, Z1, and Z2.
      * The requirement is applicable at SNR > 5dB.
  + Proposal 3: (others)
    - RAN4 to discuss the necessity to define accuracy test with large delta compared with quantization step. (Xiaomi)
    - It cannot define a common accuracy requirement for TDCP amplitude reporting to cover all conditions. The accuracy is only can be applicable under a certain condition. In RRM requirements, usually the requirements are applicable for all conditions when SNR > side condition. To decide whether can define an accuracy requirement in a certain condition in this meeting. (Samsung)
    - RAN4 to evaluate TDCP feasibility with (Nokia)
      * 2 and 4 averaging samples
      * Investigating different lags between TRS symbols

*Moderator’s summary of simulations:*

Table in: only TDL-A and one shot (if not the only config) are captured for comparison, others can be found in contributions.

Observation:

* Different estimated TDCP depends on [SNR], channel conditions, Doppler spread
  + Nokia, Qualcomm, Ericsson: correlation results are almost at the same level for different SNR;
    - LS+Noise suppression is used in Ericsson’s, not sure for others
  + Apple, Xiaomi, Huawei, MediaTek: correlation results vary in different SNR level. Lower SNR have the worse performance.
  + Correlation decreased as doppler spread increased.

Firstly, all companies have proved the accuracy are different in different condition such as channel model and Doppler spread and [SNR]. It cannot define a uniform accuracy requirement.

RAN4 to decide whether RRM accuracy requirements can be accepted in a certain condition.

Ericsson: RAN4 requirement is needed for the features defined in RAN1, to guarantee UE implementation.

Apple: the existing RRM accuray requirement are applicable for all conditions (channel model, SNR) with certain margin. Under certain contion like TDL-D, the reported value is not close to the ideal value. The requirement, if defined, does not make too much sense.

HW: TDCP is due to UE implementation, and but guaranteed, also agree with Apple.

Xiaomi: for low Doppler condition, it is feasible to define requirement. Not sure about the necessity of defining requirement.

QC: the TDCP can be useful in high SNR and low Doppler.

Ericsson: we can take one scenario. UE functionality need to be defined.

MTK: can consider test case for some specific requirement.

E///: define two sets of requirments with high and low Doppler spreads.

* + - * The requirement is defined such that [M]% of CDF of the reported TDCP values (more than X TDCP samples over Y sec) is within Z1 and Z2. FFS on X, Y, Z1, and Z2.
      * Further discuss the channel model, SNR value, and only consider the feasible scenario in performance test.

MTK: Accuray is also performance requirement.

Samsung: generic definition is section 9.

QC:

Nokia:

Samsung

Option 1: define generic core requirement, and acrruacy performance requirement

Option 2: only define acrruacy performance requirement (E///, QC)

Option 3: not define performance requirement (Nokia, Apple, MTK, Xiaomi, HW)

No RRM core requirement to be defined, and further discuss the following options:

Option 2: only define acrruacy performance requirement

Option 3: not define performance requirement

**Issue 1-1-2: How to achieve ideal value of TDCP reporting?**

* Proposals
  + Proposal 1: (Xiaomi)
    - Ideal mean/median value can be derived from TDL-A channel without noise. The ideal mean value or median value derived from TDL-A model is close to ideal value derived from Bessel function.
    - It’s possible to use a constant value over time as ideal value for low doppler case, e.g. smaller than 30Hz. It’s hard to use a constant value as ideal value for high doppler case, e.g. larger than 75Hz.
  + Proposal 2: (Nokia, Ericsson, MediaTek)
    - Using Bessel function depends on doppler spread denoted as and the delay ().

### 8.30 NR sidelink evolution

#### 8.30.3 RRM core requirements

**R4-2318840 Big CR for RRM requirements for NR sidelink evolution**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3701 rev Cat: B (Rel-18)  
  
 Source: LG Electronics, OPPO*

**Decision: Revised to R4-2321354 (from R4-2318840).**

[**R4-2321354**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321354.zip) **Big CR for RRM requirements for NR sidelink evolution**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3701 rev Cat: B (Rel-18)  
  
 Source: LG Electronics, OPPO*

**Decision: For post-meeting email agreement.**

**R4-2319969 Discussion on RRM open issues for R18 SL evolution**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 8.30.3.1 Sidelink CA

**R4-2318831 Discussion on NR sidelink CA operation**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2318870 Discussion on RRM core requirements for sidelink CA**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2318871 draftCR on interruptions to WAN due to sidelink carrier aggregation**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Xiaomi*

**Decision: Return to.**

**R4-2319493 On remaining RRM issues for SL-CA**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2320125 Discussions on RRM requirements for sidelink CA**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss the RRM requirements for SL CA operation.

**Decision: Noted.**

**R4-2320864 RRM Core Requirements for NR Sidelink CA**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

##### 8.30.3.2 SL unlicensed operation

**R4-2318832 Discussion on NR sidelink unlicensed operation**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2318833 Draft CR for RRM requirements for NR sidelink unlicensed operation**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: LG Electronics Inc.*

**Decision: Revised to R4-2321352 (from R4-2318833).**

[**R4-2321352**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321352.zip) **Draft CR for RRM requirements for NR sidelink unlicensed operation**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: LG Electronics Inc.*

**Decision: Return to.**

**R4-2318872 Discussion on RRM core requirements for SL unlicensed operation**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2318937 SL enhancement RRM discussion (SL-U, SL-CA core and performance included)**

*Type: discussion For: Approval  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2319494 Draft CR for RRM requirements for NR SL CA**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: OPPO*

**Decision: Return to.**

**R4-2319495 On RRM requirements for NR SL-U**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319632 Discussion on RRM core requirements for SL unlicensed operation**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2320115 Discussion on RRM core requirements for NR SL unlicensed operation**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320123 Discussions on remaining issues of sidelink RRM for unlicensed operation**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss the RRM requirements for SL unlicensed operation.

**Decision: Noted.**

**R4-2320124 DraftCR: RRM requirements for initiation/cease of SLSS Transmissions with CCA**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR to introduce RRM requirements for sidelink operation on unlicensed spectrum.

**Decision: Revised to R4-2321473 (from R4-2320124).**

[**R4-2321473**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321473.zip) **DraftCR: RRM requirements for initiation/cease of SLSS Transmissions with CCA**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR to introduce RRM requirements for sidelink operation on unlicensed spectrum.

**Decision: Return to.**

**R4-2320450 LS on SL-U RSSI measurement**

*Type: LS out For: Approval  
 to RAN1  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

##### 8.30.3.3 Co-channel coexistence for LTE SL and NR SL

#### 8.30.4 RRM performance requirements

**R4-2318839 Discussion on RRM performance for NR sidelink evolution**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2319496 Discussion on test case design for R18 SL-CA and SL-U**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: OPPO*

**Decision: Noted.**

**R4-2319970 Discussion on RRM test cases for R18 SL evolution**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320117 Discussion on NR sidelink evolution RRM performance requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320126 Discussions on RRM performance requirements for sidelink**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution, we discuss and provide our initial view on the performance requirements based on the agreed core requirements.

**Decision: Noted.**

#### 8.30.6 Moderator summary and conclusions

Topic: [109][229] NR\_SL\_enh2\_part1

**R4-2318185 Topic summary for [109][229] NR\_SL\_enh2\_part1**

*Type: other For: Information  
 Source: Moderator (LGE)*

**Abstract:**

[109][200] RRM Session AI 8.30.3.2

**Decision: Noted.**

[**R4-2321336**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321336.zip) **Ad-hoc minutes on NR\_SL\_enh2 WI**

*Type: other For: Approval  
 Source: Apple*

**Decision: Return to.**

[**R4-2321353**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321353.zip) **WF on R18 NR SL RRM requirements (part 1)**

*Type: other For: Approval  
 Source: LGE*

**Decision: Return to.**

Topic: [109][230] NR\_SL\_enh2\_part2

**R4-2318186 Topic summary for [109][230] NR\_SL\_enh2\_part2**

*Type: other For: Information  
 Source: Moderator (OPPO)*

**Abstract:**

[109][200] RRM Session AI 8.30.3.1, 8.30.3.3, 8.30.4

**Decision: Noted.**

### 8.31 Enhanced support of reduced capability NR devices

#### 8.31.2 RRM core requirements

**R4-2320119 Big CR to TS 38.133 on Enhanced support of reduced capability NR devices**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3803 rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This is an endorsed CR from RAN4#108bis meeting with Tdoc number: R4-2317438.

**Decision: Revised to R4-2321367 (from R4-2320119).**

[**R4-2321367**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321367.zip) **Big CR to TS 38.133 on Enhanced support of reduced capability NR devices**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3803 rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This is an endorsed CR from RAN4#108bis meeting with Tdoc number: R4-2317438.

**Decision: For post meeting email agreement.**

**R4-2320858 RRM Core Requirements for Enhanced RedCap**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320933 Discussion on eDRX relaxed requirements for eRedCap**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2320947 CR on eDRX operation in INACTIVE mode for R18 eRedCap Ues**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3921 rev Cat: B (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

Note: The CR coversheet is not Rel-18 on the coversheet.

The requirements in sub-clause 4.2B.2.7 shall apply when the UE is not configured with eDRX\_INACTIVE.

When configured with eDRX\_INACTIVE, the UE shall search every layer of higher priority at least every Thigher\_priority\_search = max(60, [TBD]\*eDRX\_INACTIVE cycle length) \* Nlayers seconds; where Nlayers is the total number of higher priority NR and E-UTRA carrier frequencies broadcasted in system information.

QC: the similar change for LTE.

E///: will introduce the relaxation for the high priority carriers. Not for the relaxation search?

HW: leave it in the maintenance. This is the first time to discus the CR.

**Decision: Revised to R4-2321366 (from R4-2320947).**

[**R4-2321366**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321366.zip) **CR on eDRX operation in INACTIVE mode for R18 eRedCap Ues**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3921 rev Cat: B (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

Note: The CR coversheet is not Rel-18 on the coversheet.

Sessionc chiar: replace “12” with “TBD”, and endorse the CR and implement the CR in the WI big CR.

**Decision: Return to.**

**R4-2320989 CR on eDRX operation in INACTIVE mode for R18 eRedCap Ues**

*Type: CR For: Approval  
 38.133 v18.3.0 CR-3941 rev Cat: B (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Withdrawn.**

**R4-2321000 CR on eDRX operation in INACTIVE mode for R18 eRedCap UEs**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3943 rev Cat: B (Rel-18)  
  
 Source: Qualcomm*

**Decision: Withdrawn.**

#### 8.31.3 Moderator summary and conclusions

Topic: [109][231] NR\_redcap\_enh

**R4-2318187 Topic summary for [109][231] NR\_redcap\_enh**

*Type: other For: Information  
 Source: Modrator (Ericsson)*

**Abstract:**

[109][200] RRM Session AI 8.31.2

**Decision: Noted.**

**Online session (Wednesday Nov 15, 2023)**

**Sub-topic 1-1 Extended RRC INACTIVE eDRX cycle**

*Sub-topic description:*

Under this sub-topic the requirements for eDRX cycle > 10.24s with PTW for Rel-18 RedCap UE in RRC INACTIVE state is discussed.

*Open issues and candidate options before meeting:*

**Issue 1-1: Relaxed requirements for INACTIVE mode with eDRX > 10.24s**

* Proposals
  + Option 1 (MTK): RAN4 shall define relaxed requirements for INACTIVE mode with eDRX > 10.24s for intra-frequency, inter-frequency and inter-RAT.
* Recommended WF
* In Rel-17 RedCap, relaxed neighbour cell measurement requirements when configured with eDRX were specified as follows, see for example clause 4.2B.2.9.2 in TS 38.133:
  + *“If the UE is configured with eDRX\_IDLE cycle then the requirements in Table 4.2B.2.9.2-3 and Table 4.2B.2.9.2-4 are applicable for eDRX cycle up to 10.24 s in FR1 and FR2 respectively.*
  + *If the UE is configured with eDRX\_IDLE cycle greater than 10.24 s in FR1 and FR2, then the requirements in Table Table 4.2B.2.9.2-5 and Table 4.2B.2.9.2-6 respectively apply provided eDRX cycle is ≤ [163.84] sec and evaluation/measurement time with relaxation on one carrier is not greater than single PTW window length.”*
* Discuss whether the cited requirements from Rel-17 RedCap can be reused for Rel-18 RedCap intra-, inter- and inter-RAT neighbour cell measurements when configured with following Rel-17 RedCap IDLE mode relaxation criteria:
  + - Measurements for UE fulfilling stationary criterion
    - Measurements for a UE fulfilling stationary and not-at-cell edge criteria
    - Measurements for a UE fulfilling stationary and Rel-16 not at cell edge criteria
    - Measurements for a UE fulfilling low mobility and stationary criteria
    - Measurements for a UE fulfilling low mobility criterion and stationary and not-at-cell edge criteria
    - Measurements for a UE fulfilling not-at-cell edge criterion and stationary and not-at-cell edge criteria
    - Measurements for a UE fulfilling low mobility and not-at-cell edge criteria and stationary and notatcell edge criteria
    - Measurements for a UE fulfilling low mobility and not-at-cell edge criteria and stationary criterion
    - Measurements for UE fulfilling low mobility criterion
    - Measurements for UE fulfilling not-at-cell edge criterion
    - Measurements for UE fulfilling low mobility and not-at-cell edge criteria
* Update the Big CR if agreement can be reached.

MTK: We are fine with the recommended WF.

HW: Opiton 1 is in principle is fine. For the detailed WF, one PTW is considered for R17, two PTWs are considered for R18. Further discuss the feasibility of directly reusing the R17 requirement.

QC: We agree with HW.

MTK: we just reusing one PTW from R17.

E///: We can capture in the WF, and discuss the CR in the next emeting. It is combination of two sub-featuers, and does not clearly belong to the WI.

Apple: need to consider the NR-U related interruption requirement or not?

QC: NR-U eDRX.

Agreement:

* Agree the following and disucss the details of the CR in the next meeting. The RRM core part of this WI can be closed without this CR.
  + RAN4 shall define relaxed requirements for INACTIVE mode with eDRX > 10.24s for intra-frequency, inter-frequency and inter-RAT for RedCap.

### 8.32 Enhanced NR Sidelink Relay

#### 8.32.1 RRM core requirements

**R4-2319387 Discussion on sidelink relay RRM core requirements**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2319633 Discussion on RRM core requirements for R18 SL relay**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2320689 Analysis of interruption requirements for multipath UE relay operation**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper further analyzes the interruption requirements due to SL-DRX in multipath relay scenario

**Decision: Noted.**

**R4-2320690 Draft CR on delay requirements for U2U relay operation**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This draft CR defines the requirements related to reselection for UE based relay based on latest version (v18.3.0) of TS 38.133. The technical contents are the same as in the endorsed Draft CR in R4-2317385.

**Decision: Endorsed.**

**R4-2320691 Draft CR on interruption requirements for multipath relay operation under SL-DRX**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This draft CR defines the requirements related to discovery and reselection for UE based relay

**Decision: Revised to R4-2321370 (from R4-2320691).**

[**R4-2321370**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321370.zip) **Draft CR on interruption requirements for multipath relay operation under SL-DRX**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This draft CR defines the requirements related to discovery and reselection for UE based relay

**Decision: Return to.**

**R4-2320865 RRM Core Requirements for Enhanced NR Sidelink Relay**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

#### 8.32.2 RRM performance requirements

**R4-2318939 SL relay discussion**

*Type: discussion For: Approval  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2319401 Discussion on sidelink relay RRM performance requirements**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2319402 Work plan for RRM Performance of Rel-18 NR Sidelink relay**

*Type: Work Plan For: Approval  
 Source: LG Electronics Inc.*

**Decision: Approved.**

**R4-2320692 Further analysis of RRM performance requirements for UE relay enhancement**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper analyzes the performance requirements including test cases related to discovery and reselection for UE based relay

**Decision: Noted.**

**R4-2320693 Draft CR on applicability of SD-RSRP and SL-RSRP accuracy requirements in multipath scenario**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR defines applicability of SD-RSRP and SL-RSRP accuracy requirements for the remote UE in multipath scenario

**Decision: Return to.**

**R4-2320866 RRM Performance Requirements for Enhanced NR Sidelink Relay**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

#### 8.32.3 Moderator summary and conclusions

Topic: [109][232] NR\_SL\_relay\_enh

**R4-2318188 Topic summary for [109][232] NR\_SL\_relay\_enh**

*Type: other For: Information  
 Source: Moderator (LGE)*

**Abstract:**

[109][200] RRM Session AI 8.32

**Decision: Noted.**

[**R4-2321416**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321416.zip) **WF on NR\_SL\_relay\_enh**

*Type: other For: Approval  
 Source: LGE*

**Decision: Return to.**

**Online session (Wednesday Nov 15, 2023)**

**Sub-topic 1-1 Whether and how to capture the interruption requirement for remote UE due to the SL-DRX operation in multipath relay scenario**

*This sub-topic is for whether and how to capture the interruption requirement for remote UE due to the SL-DRX operation in multipath relay scenario*

*Open issues and candidate options before meeting:*

**Issue 1-1-1: Whether to capture the interruption requirement for remote UE due to the SL-DRX operation in multipath relay scenario or not**

* Proposals
  + Option 1: No need to define new interruption requirements for remote UE due to SL-DRX operation. The legacy requirements apply. (MTK, Nokia)
  + Option 2: Explicitly define requirements on interruptions caused by the remote UE on its serving cell of the direct path due to the SL-DRX operation while in multipath relay operation. (Ericsson, LGE)
    - The remote UE while operating in U2N relay scenario does NOT cause any interruption to its serving cell.
    - The interruption requirements in clause 12.7.4 in TS 38.133, Rel-17, apply ONLY to the relay UE in U2N scenario i.e. when the remote UE has connection to its serving cell via relay UE.
* Recommended WF
  + Moderator’s view: Need further discussion with focusing on Rel-17 applicability scenario. Whether the Rel-17 U2N scenario covered the remote UE’s direct path or not.

Moderator: can we agree option 2?

Nokia: still prefer option 1. The R17 interruption is generic.

LGE: this issue is not HOW to capture the requirement.

E///: the interruption is not allowed for remote UE in single path scenario.

RAN4 understanding:

In R17, there is no scenario for the interruption for remote UE due to the SL-DRX operation.

**Issue 1-1-2: How to capture the interruption requirement for remote UE due to the SL-DRX operation in multipath relay scenario if necessary**

* Proposals
  + Option 1: The interruption requirements (in terms of interruption probabilities and interruption length) on the remote UE due to the SL-DRX operation in the multipath scenario are reused from clause 12.7.4 of TS 38.133; but are defined in new clause for clarity and to prevent misinterpretation. (Ericsson)
  + Option 2: RAN4 not to add a new section to clarify interruption requirements caused by the remote UE on serving cell in multipath scenario. (Nokia)
  + Option 2A: (Qualcomm)
    - Do not add new clauses for multi-path relay scenarios. If the need of the specification change on RRC configuration related interruption is identified based on the previous meeting WF, we have the following proposals for text change
      * We propose to add applicability description in the end of the existing clauses:
        + 12.7.8: The requirement in this clause is applicable to multipath relay scenario
      * If clarification on DRx related interruption requirements is needed, we propose the following revision:
        + 12.7.4: The requirement in this clause is applicable to the interruptions on the PCell/serving cell on the direct path caused by a remote UE due to transitions between active and non-active times during SL-DRX in multi-path relay scenario
* Recommended WF
  + Moderator’s view: This issue depends on issue 1-1-1. If agreed option 2 of Issue 1-1-1, then can be discussed further how to capture the interruption requirement. Else Issue 1-1-2 does not need to discuss anymore.

E///: In the Core part, add clarification in the exsiting section.

E///: we can add clarification for R17.

Agreement:

* In the Core part, add clarification in the exsiting section.
* 12.7.4: The requirement in this clause is applicable to the interruptions on the PCell/serving cell on the direct path caused by a remote or relay UE due to transitions between active and non-active times during SL-DRX in multi-path relay scenario.

**Sub-topic 1-2 CRs**

*This sub-topic is for Draft CR of core requirements*

*Open issues and candidate options before meeting:*

**Issue 1-2-1: Draft CRs for NR\_SL\_relay\_enh RRM core requirements**

* Proposals
  + R4-2320690 Draft CR on delay requirements for U2U relay operation
  + R4-2320691 Draft CR on interruption requirements for multipath relay operation under SL-DRX
* Recommended WF
  + Moderator’s view: The contents of R4-2320690 is already endorsed at last 108bis meeting. So, R4-2320690 is agreeable. Regarding R4-2320691, it will updated by conclusions of the open issues issue 1-1-1 and issue 1-1-2.

### 8.33 Mobile IAB (Integrated Access and Backhaul) for NR

#### 8.33.4 RRM core requirements

**R4-2318824 Big CR to TS 38.174 on RRM core requirements for NR Mobile IAB**

*Type: CR For: Agreement  
 38.174 v18.2.0 CR-0073 rev Cat: B (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Return to.**

**R4-2320685 Analysis of performance requirements for mIAB-MT**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper analyzes RRM performance requirements including test cases for mIAB

**Decision: Noted.**

**R4-2320686 Draft CR on conditions for mIAB-MT in Annex H of TS 38.174**

*Type: draftCR For: Endorsement  
 38.174 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This draft CR defines conditions for mIAB-MT in annex H of TS 38.174

**Decision: Return to.**

#### 8.33.5 RRM performance requirements

**R4-2318830 RRM performance requirements for mobile IAB**

*Type: Work Plan For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2319367 Discussion on performance requirements for R18 mobile IAB**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319826 On Mobile IAB RRM Performance Requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

#### 8.33.7 Moderator summary and conclusions

Topic: [109][233] NR\_mobile\_IAB

**R4-2318189 Topic summary for [109][233] NR\_mobile\_IAB**

*Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

[109][200] RRM Session AI 8.33.4, 8.33.5

**Decision: Noted.**

**Online session (Wednesday Nov 15, 2023)**

**Issue 1-1: RRM Core requirements for 38.174**

* Proposals
  + Option 1: Big CR in R4-2318824 is agreeable
* Recommended WF
  + Option 1

Please provide any comments for any necessary changes

**Issue 1-2: Draft CR to Section H with the side conditions**

* Proposals
  + Option 1: Draft CR in R4-2320686 is agreeable
* Recommended WF
  + Option 1

Please provide any comments for any necessary changes

**Issue 1-3: Work plan for RRM performance requirements**

* Proposals
  + Option 1:

RAN4#109 (November 2023)

* Approve the work plan
* Discuss scope of the work on a high level

RAN4#110 (February 2024)

* Discuss the RRM performance requirements
* Agree on CR split

RAN4#110bis (April 2024)

* Further discuss the RRM performance requirements
* Initial discussion on draft CRs

RAN4#111 (May 2024)

* Finalize the discussion on the RRM requirements
* Approve the final CRs
* Recommended WF
  + Agree Option 1

**Issue 1-4: RRM Tests to be Defined**

* Proposals
  + Option 1: RAN4 to define test cases for Rel-18 Mobile IAB to verify following requirements, and keep the same principle as Rel-16/17 that the configuration parameters are left to implementation and manufacturer declaration, and the corresponding test requirements shall be based on the actual configuration parameters used in the test.
    - Intra-frequency HO
    - Intra-frequency RRC re-establishment
    - Active TCI state switching
    - RLM
    - Link recovery procedure
    - L1-RSRP
    - Intra-frequency measurement requirement
  + Option 2: others
* Recommended WF
  + Adopt Option 1 and further discuss the tests to be defined

### 8.34 Network energy saving for NR

#### 8.34.3 RRM core requirements

**R4-2319381 Big CR on network energy saving**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3756 rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

##### 8.34.3.1 RRM requirements impacts

**R4-2318656 On RRM requirement impacts for NES**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2318909 Discussion on RRM impact of cell DTX/DRX and CHO for network energy saving**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319010 RRM requirements impact due to other NES features**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319012 draftCR on SCell activation due to Cell DTX/DRX**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2319057 Draft CR on L1 measurement reporting requirements for R18 NES**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Return to.**

**R4-2319067 draft CR on conditional handover requirements for network energy saving**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: vivo*

**Decision: Return to.**

**R4-2319068 Discussion on RRM requirement impacts for network energy saving**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319134 NR network energy saving RRM aspects - other aspects**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2319152 Discussion on NES general issues**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the general issues for NES

**Decision: Noted.**

**R4-2319364 Discussion on RRM requirements for NES**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 8.34.3.2 SSB-less SCell operation

**R4-2318343 Discussion on RRM requirements for SSB-less SCell operation**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2318401 RRM impact for SSB-less SCell operation**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2318462 Discussion on RRM requirements for inter-band SSB-less SCell operation**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2318657 On SSB-less SCell operation for NES**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2318910 Discussion on SSB-less SCell operation for network energy saving**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319009 SSB-less operation for FR1 inter-band co-located CA**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319058 Discussion on remaining issues for SSB-less SCell operation for network energy saving**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319070 Discussion on remaining issues for SSB-less SCell operation for network energy saving**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2319133 NR network energy saving RRM aspects - SSB-less SCell**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2319380 Discussion on SSB-less SCell operation**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319382 CR on SCell activation/deactivation requirements for inter-band SSB-less**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3757 rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2319523 RRM requirements on SSB-less SCell operation for FR1 inter-band CA**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted.**

**R4-2320429 Discussion on SSB-less SCell operation of Network energy saving for NR**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2320492 Discussion on remaining issues SSBless Scell operation**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2320783 On SCell activation procedures for SSB-less inter-band SCell in FR1**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On SCell activation procedures for SSB-less inter-band SCell in FR1

**Decision: Noted.**

**R4-2320784 On SCell activation procedures for SSB-less inter-band SCell in FR1**

*Type: draftCR For: Endorsement  
 38.133 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

On SCell activation procedures for SSB-less inter-band SCell in FR1

**Decision: Noted.**

#### 8.34.4 RRM performance requirements

**R4-2318911 Discussion on RRM performance requirements for network energy saving**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2319011 RRM performance requirements for network energy saving**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2319153 Discussion on NES test case**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the NES test case

**Decision: Noted.**

**R4-2319365 Discussion on performance requirements for R18 NES**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319524 Discussion on RRM performance requirements for NES**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted.**

**R4-2320493 View on RRM performance requirements on Network Energy Saving**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

#### 8.34.6 Moderator summary and conclusions

Topic: [109][234] Netw\_Energy\_NR

**R4-2318190 Topic summary for [109][234] Netw\_Energy\_NR**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

[109][200] RRM Session AI 8.34.3, 8.34.4

**Decision: Noted.**

[**R4-2321334**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321334.zip) **Ad-hoc minutes on Netw\_Energy\_NR WI**

*Type: other For: Approval  
 Source: Huawei*

**Decision: Return to.**

**Online session (Tuesday Nov 14, 2023)**

Topic #1: Core: SSB-less SCell operatio

**Issue 1-2-1: SCell activation requirements**

* Proposals
  + Option 1: Tactivation\_time = Tfirst\_TRS +3 ms or Tfirst\_ATRS+3 ms. (CATT, ZTE)
  + Option 2: Tactivation\_time = Tfirst\_TRS + TTRS +3 ms or Tfirst\_ATRS+Tgap + TATRS +3 ms (Samsung, CMCC, CTC, Ericsson, Huawei)
    - Option 2a: Tactivation\_time = Tfirst\_ATRS+Tgap + TATRS +3 ms, Tgap can be same value as specified in section 8.3.16 of TS38.133 (Apple)
    - Option 2b: Tactivation\_time  = Tfirst\_ATRS+Tgap + TATRS +5 ms. (Nokia, QC)
  + Option 3: When TRS is used for SSB-less SCell activation, it is up to UE implementation to determine the TRS for SCell activation. RAN4 to discuss if considering the case where TRS ID for SCell activation is not explicitly indicated by the network. (Nokia)
* Recommended WF
  + Moderator: Based on the contributions, 8 out of 10 companies support that 2 samples (TRS or A-TRS) are needed for Scell activation delay. 2 companies support one sample for Scell activation delay.
  + Please check whether following is agreeable:
    - For TRS based Scell activation, Tactivation\_time = Tfirst\_TRS + TTRS + [5] ms;
    - For A-TRS based Scell activation, Tactivation\_time = Tfirst\_ATRS+Tgap + TATRS +[5] ms;
    - The applicable conditions are discussed in sub-topic 1-1.
    - Whether to define both TRS and A-TRS based SCell activation requirements depends on the conclusion in issue 1-1-4.
  + Discuss CR R4-2319382 and R4-2320784.

Nokia: to have or not have Tgap for both TRS and A-TRS.

QC: Whether RAN4 need to define the boundary of Tgap or following the existing one. Tgap is needed for ATRS framework.

Apple: If the power difference is too large, more samples are needed. Minimal TRS periodicity is 10ms, and Tgap is not needed.

vivo: 5ms includes 3 + 2ms. The 2ms is not needed for TRS.

HW: 5ms is copied from the exisiting A-TRS requirements. For TRS, it is very similar, and is open for discussion.

Nokia: TTRS is periodicity of the TRS.

QC: 2ms is typical processing time for RS. Same for TRS and A-TRS.

vivo: 2ms is needed for SSB, but not needed for RS.

Agreement:

* Define both TRS and A-TRS based SCell activation requirements
  + - For TRS based Scell activation, Tactivation\_time = Tfirst\_TRS + TTRS + [3 or 5] ms;
      * TTRS is periodicity of the TRS.
    - For A-TRS based Scell activation, Tactivation\_time = Tfirst\_ATRS+Tgap + TATRS +[3 or 5] ms;
    - The applicable conditions are discussed in sub-topic 1-1.
    - ~~Whether to define both TRS and A-TRS based SCell activation requirements depends on the conclusion in issue 1-1-4.~~

**Issue 1-1-3: QCL/TCI indication**

*For* ***TCI/QCL assumptions****, following agreements were reached in RAN4#108bis R4-2317405*

|  |
| --- |
| **Issue 1-2-4: QCL/TCI indication**   * Proposals   + Option 1: RS of SCell without SSB is QCL-A with TRS of the SCell without SSB, and the TRS(s) of the SCell is (are) further QCL-TypeC with SSB(s) of an inter-band active serving cell. (QC, CATT, Apple, Nokia, Huawei, MTK, CTC, Intel)   + Option 2: Without QCL configuration between the RSs from inter-band carriers (Nokia, CMCC, ZTE, Ericsson)     - Option 2a: timing is derived from explicit indication of the cell and not through QCL relation. (Ericsson)     - Option 2b: The condition of QCL-C relation between the TRS of the SSB-less SCell and the SSB of the reference cell is not always necessary. (ZTE)       * Provided that the RTD is limited within 260ns, the reference cell and the associated SSB can be identified at UE side, no need to consider this condition.       * Otherwise, this condition is needed.     - Option 2c: The fine sync between all the RSs within the SSB-less SCell should be guaranteed by default. (ZTE) |

* Proposals
  + Option 1: RS of SCell without SSB is QCL-A with TRS of the SCell without SSB, and the TRS(s) of the SCell is (are) further QCL-TypeC with SSB(s) of an inter-band active serving cell. (CATT, MTK, Apple, Vivo, Intel, Huawei, CTC, ZTE, QC)
    - Option 1a: The reference cell should also be the QCL source of the SSB-less SCell. (CATT, CMCC, QC)
    - Option 1b: Requirements does not apply if the reference SSB/TCI is not in the activated TCI of the refence Cell. (MTK)
    - Option 1c: There is no activation requirement applicable to the UE if the indicated reference cell does not transmit the QCL source of the target SCell scheduling. (Intel)
  + Option 2: Without QCL configuration between the RSs from inter-band carriers (Samsung, Nokia, Apple, ZTE, Ericsson)
    - Option 2a: The RS of SCell without SSB is QCL-A with TRS of the SCell without SSB, and the TRS/A-TRS of the SCell without SSB can reuse the coarse timing from an inter-band reference cell. (Apple)
    - Option 2b: Do not consider the case where reference cell and QCL source cell are different when QCL is configured. (Nokia)
    - Option 2c: (ZTE)
      * UE trains through all SSB indexes to derive the proper reference SSB index.
      * The fine sync between all the RSs within the SSB-less SCell should be guaranteed by default.
* Recommended WF
  + Moderator:10 companies support that option 1 with inter-band QCL. 5 companies support option 2 that inter-band QCL relation is not needed.
  + To aligned the understanding on this issue, companies are encouraged to discuss following questions:
    - Q1: Whether inter-band QCL is needed apart from acquiring coarse reference timing (e.g. doppler shift estimation)
  + RAN1 spec for information (TS 38.214 5.1.5)

|  |
| --- |
| For a periodic CSI-RS resource in an *NZP-CSI-RS-ResourceSet* configured with higher layer parameter *trs-Info*, the UE shall expect that a TCI-State indicates one of the following quasi co-location type(s):  - 'typeC' with an SS/PBCH block and, when applicable, 'typeD' with the same SS/PBCH block, or  - 'typeC' with an SS/PBCH block and, when applicable,'typeD' with a CSI-RS resource in an *NZP-CSI-RS-ResourceSet* configured with higher layer parameter *repetition*. |

* + Check whether following is agreeable:
    - RS of SCell without SSB is QCL-A with TRS of the SCell without SSB, and the TRS(s) of the SCell is (are) further QCL-TypeC with SSB(s) of an inter-band active serving cell, and the inter-band active serving cell shall be same as the reference cell.

QC, Nokia: agree with moderator.

CMCC: Is this side condition or feasibility?

Intel: applicability for the requirment

HW: Same view as Intel.

E///: do we have the side condition for intra-band SSB-less case?

HW: yes.

ZTE: ok with the moderator proposal.

Samsung: what’s the UE assumption for inter-band? For intra-band, the time and Doppler shift is referred. Different LOs for iner-band are used. If this is the case, fine with the moderator proposal.

HW: yes. The the time and Doppler shift can be referred, and UE can do pre-compensation.

Samsung: for QCL typeC, in RAN1 the two carriers can share the same FFT window. Of course, additional TRS/ATRS can be used for timing.

E///: The same FFT window cannot be assumed from RRM perspective. We need to inform RAN1.

HW: when there are more than 1 cell with SSB, UE needs to know which one can be referred.

QC: QCLtypeC is needed for UE processing.

vivo: UE can check the frequency, and this impacts the feasibility.

Apple: To E///, QCL typeC relation does not put limit whether the same or different FFT window is used. We agreed the RTD in previous meeting.

Samsung: delay and frequency shift is QCL typeC information. How can UE use the frequency information when the carrier frequency for the two bans are different?

QC: relative value can be referred.

Agreement:

QCL/TCI indication (as side condition for the requirement)

* RS of SCell without SSB is QCL-A with TRS of the SCell without SSB, and the TRS(s) of the SCell is (are) further QCL-TypeC with SSB(s) of an inter-band active serving cell, and the inter-band active serving cell shall be same as the reference cell.

**Issue 1-3-1: By default reference cell when the reference cell indication is not provided.**

*For* ***RTD*** *conditions, following agreements were reached in RAN4#108bis R4-2317405.*

|  |
| --- |
| **RAN4#108bis**  **Issue 1-6-1: Reference Cell**  **Agreement:**  The reference cell is not restricted to PCell. And the reference cell shall has SSB.  **Issue 1-6-2: Reference Cell indication**  Agreement:   * Introduce indication from NW to UE to indicate which cell (e.g., PCI, SSB frequency, etc.) is the reference cell. * RAN4 will define “by default cell” as reference cell if the indication is not provided. * Reference cell means the timing and AGC source of SSB-less Cell.   + FFS whether to consider the reference cell and QCL source cell are different.     - Whether QCL is needed will be discussed in other issue. * The details of the signalling is up to RAN2. * If the reference cell is an SCell, it should be activated. * RAN4 FFS the conditions for reference cell. (e.g. activated SCell)   **Issue 1-6-3: SSB-less Cell indication**  Agreement:  If the UE is not provided with SSB configuration (absoluteFrequencySSB) in the SCell (FrequencyInfoDL) nor SMTC configuration for the SCell, this cell is regarded as SSB-less SCell.  Note: update the wording in RAN4 requirements for inter-band SSB-less. |

* + Option 1: If the indication is not provided, the default reference cell can be any one of the active cells within the same TAG as the SSB-less SCell. (CATT)
    - Option 1a: If NW didn’t provide “Reference Cell indication”, UE can take any active serving cell(s) with SSB(s) under current inter-band CA operation which UE capable of supporting inter-band SSB-less Scell operation as reference cell. (Samsung)
    - Option 1b: If the refence cell is not indicated, it is up to UE to select an active serving cell within the TAG. No need to introduce new signalling for the reference SSB/TCI indication. (MTK)
  + Option 2: QCL source cell shall be the ~~default~~ reference cell (CMCC)
  + Option 3: UE use SpCell as the reference cell. (Vivo, Nokia, Apple, Huawei)
    - Option 3a: The default cell is the PCell or PSCell which is in the same CG of the SSB-less SCell. (Nokia)
    - Option 3b: (Apple)
      * NR SpCell if UE has active FR1 NR SpCell in the same TAG as target FR1 inter-band SSB-less SCell,
      * Otherwise, any active NR FR1 SCell in the same TAG as target FR1 inter-band SSB-less SCell
    - Option 3c: (Huawei)
      * If there is only one active cell in the same TAG, if no indication of reference is indicated, the active cell is regarded as “by default reference cell”.
      * If there are more than one active cell in the same pTAG, if no indication of reference is indicated, SpCell is regarded as “by default reference cell”.
      * If there are more than one active cell in the same sTAG, it would cause problem if UE use any of the activated SCells as the reference cell. Dedicated indication of reference cell is expected to be provided in this case.
    - Option 4d: No UE RRM requirements are applicable, if SSB-less SCell is configured in sTAG and no explicit signalling on the reference cell is provided by network. (Vivo)
  + Option 4:
    - RAN4 does not define default reference cell concept. (QC)
    - The reference cell shall be active upon the SCell addition and SCell activation, and when SSBless SCell is active.
* Recommended WF
  + No clear majority on the options. Several companies proposed that it could up to UE to choose any SCell as reference cell under certain case. Companies please first be aligned on following question:
    - Whether NW and UE should have consistent understanding on which Cell is the reference cell?
  + From moderator’s perspective, the benefits of having default cell is to reduce signalling overhead in some cases which is quite limited. It is not expected to create additional complexity and ambiguities to NW and UE.

QC:

* + Option 2: QCL source cell shall be the ~~default~~ reference cell (CMCC)
  + RAN4 does not define default reference cell concept. (QC)

Apple: each cell can have more than one TRS.

Nokia: CMCC proposl is a simple and straightforward one.

E///: network can give the QCL reference cell, don’t need to define the default call.

MTK: Option 2 and option 4 are the same.

CMCC: Agree with Nokia.

ZTE: By default cell is one solution. No need for further indiciton if no confusion.

Apple: more than one QCL source cells

* For the case of one active QCLtypeC source cell, QCLtypeC source cell shall be the reference cell if the Rel-18 network indication is not provided.

Under the following contion:

* RS of SCell without SSB is QCL-A with TRS of the SCell without SSB, and the TRS(s) of the SCell is (are) further QCL-TypeC with SSB(s) of an inter-band active serving cell, and the inter-band active serving cell shall be same as the reference cell.
* For the case of more than one QCLtypeC source cells
  1. Option 1: UE is not expected to handle the scenario that: 1) If there are more than one QCL source cells and 2) the Rel-18 network indication is not provided.
  2. Option 2: up to UE to decide
  3. Option 3: No requirement is applied for the case of more than one QCLtypeC source cells and without Rel-18 network indication in Rel-18.
  4. Other option is not precluded.

**Issue 1-1-2: Power difference conditions for scenario 1**

*For* ***reception******power difference*** *conditions, following agreements were reached in RAN4#108bis R4-2317405*

|  |
| --- |
| **Online discussion on October 12 (Thursday)**  **Agreement:**  **Issue 1-2-3: Power difference conditions for scenario 1**   * One set of condition (Set 2) and one requirement * Set 2: The maximum received Power difference can be up to [X] dB, and X is larger than 6. * TRS/A-TRS is needed for Scell activation |

* Proposals
  + Option 1: The maximum received Power difference can be up to [25] dB. (Samsung, CMCC, Intel?, Nokia)
  + Option 2: use 9dB for power difference between reference cell and target SSB-less SCell, without any clarification on BW size difference, carrier frequency difference, and PSD at gNB Tx. (Apple)
    - If larger Rx power difference is assumed based on alt 1, then UE shall be allowed to have more samples for AGC settling on SSB-less SCell
  + Option 3: use X=Y+6dB for difference between reference cell and target SSB-less SCell, Y is decided by the BW size difference, carrier frequency difference, and PSD difference at gNB Tx. (Apple)
  + Option 4: When Received power difference between SSB-less SCell and reference cell is less than 12dB, one TRS /ATRS is needed for AGC. (Huawei)
  + Option 5: The maximum received Power difference can be up to 30 dB (ZTE)
  + Option 6: Do not define receive power difference as a side condition (Nokia, Ericsson)
* Recommended WF
  + Moderator: No clear majority on each option. Based on the proposals from companies, 6 out of 8 companies state that the power difference could be larger if TRS/A-TRS is allowed for AGC (option 1/5/6). The recommended WF for online discussion are as follows:
    - Based on the assumption that two samples TRS/A-TRS are allowed for T/F tracking AND AGC to define the SCell activation requirements, discuss the value during the meeting.

Session chair: can we go with option 1?

Apple: we have concern on 25dB with one sample for AGC. 1) use one small value, or 2) clarify what are the factors impacting the value if a larger value id needed.

E///: We are not ok with defining a value.

HW: check if the methodology in option 3 is acceptable?

Nokia: the exiting power imbalance of 25dB can be used.

CMCC: also support 25dB. If go with Apple proposal, no need to define a value.

ZTE: we agreed to define a value in the last meeting. Larger than 25dB.

QC: Same view as Apple. The condition for the 25dB is not clear.

MTK: if go with 25dB, more sample are needed. Agree with QC, power or PSD?

vivo: the condition needs to be defined.

Samsung: 25dB is from receiver power. Consider whether to define in the test or core requirement.

OPPO: converage to one value in this meeting. Option 3 from Apple is reasonable.

## 9 Rel-18 on-going work Items for LTE

### 9.6 IoT (Internet of Things) NTN (non-terrestrial network) enhancements

#### 9.6.4 RRM core requirements

**R4-2318073 Discussion on RRM core requirements for IoT NTN enhancement**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2318074 CR on cell re-selection requirement for IoT NTN enhancement for UE category NB-IoT**

*Type: draftCR For: Endorsement  
 36.133 v18.3.1 CR- rev Cat: B (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Return to.**

**R4-2318912 Discussion on RRM core requirements for IOT NTN enhancement**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2318913 Draft CR to TS 36.133: Conditional HO for Cat-M1 for IOT-NTN**

*Type: draftCR For: Endorsement  
 36.133 v18.3.1 CR- rev Cat: B (Rel-18)  
  
 Source: CMCC*

**Decision: Return to.**

**R4-2319352 Discussion on RRM requirements for IoT NTN enhancement**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2319353 Draft CR on RRM impact of GNSS re-acquisition for NB-IoT**

*Type: draftCR For: Endorsement  
 36.133 v18.3.1 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2320015 draftCR on IDLE mode requirements for eMTC over NTN**

*Type: draftCR For: Endorsement  
 36.133 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Return to.**

**R4-2320140 Discussions on RRM requirements for IoT NTN enhancements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In the last RAN4 meeting a WF to specify necessary RRM requirements for the enhancements of IoT NTN operation for eMTC and NB-IoT was approved [1]. In this contribution we further analyze the RRM requirements to support these enhancements based on the ope

**Decision: Noted.**

**R4-2320141 IoT NTN RRM requirements during GNSS reacquisition**

*Type: draftCR For: Endorsement  
 36.133 v18.3.1 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

As per the worksplit, this CR contains RRM requirements for IoT NTN during GNSS reacqusition.

**Decision: Noted.**

**R4-2320142 IoT NTN RRC re-establishment requirements during discontinuous coverage**

*Type: draftCR For: Endorsement  
 36.133 v18.3.1 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

RAN2 has agreed to signal carrier frequency information of the neighbour cells in SIB32 to enable the UE to determine similarities between the cells before and after a NTN coverage gap, see the agreement [RAN2#123bis]:

**Decision: Return to.**

**R4-2320741 Discussion on open issues for IoT NTN enh**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2320742 DraftCR to 36.133 on Connected Mode Mobility for IoT NTN**

*Type: draftCR For: Endorsement  
 36.133 v18.3.1 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

**R4-2320743 DraftCR to 36.133 on Connected Mode Mobility for Emtc NTN**

*Type: draftCR For: Endorsement  
 36.133 v18.3.1 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Return to.**

#### 9.6.5 RRM performance requirements

**R4-2318075 Work Plan on RRM performance part for IoT NTN enhancements**

*Type: Work Plan For: Approval  
 Source: MediaTek inc.*

**Decision: Return to.**

**R4-2318076 Discussion on RRM performance requirements for IoT NTN enhancement**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2319354 Discussion on performance requirements for IoT NTN enhancement**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2320143 Discussions on RRM performance requirements for IoT NTN enhancements**

*Type: discussion For: Approval  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss the RRM performance requirements for IoT NTN.

**Decision: Noted.**

**R4-2320744 Performance Considerations for IoT NTN enhancements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

#### 9.6.7 Moderator summary and conclusions

Topic: [109][235] IoT\_NTN\_enh

**R4-2318191 Topic summary for [109][235] IoT\_NTN\_enh**

*Type: other For: Information  
 Source: Moderator (MediaTek)*

**Abstract:**

[109][200] RRM Session AI 9.6.4, 9.6.5

**Decision: Noted.**

[**R4-2321339**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321339.zip) **Ad-hoc minutes on IoT\_NTN\_enh WI**

*Type: other For: Approval  
 Source: MediaTek*

**Decision: Return to.**

**Online session (Monday Nov 13, 2023)**

**Sub-Topic 1-2: CONN mode neighbour cell measurements**

Issue 1-2-1: For NB-IoT NGSO, intra-frequency inter-satellite neighbour cell measurement

Proposals:

* Proposal 1: Define requirements for NGSO intra-frequency inter-satellite neighbour cell measurement as “inter-frequency” case. (Huawei, MTK)
* Proposal 2: Reuse the legacy intra-frequency measurements requirements for inter-satellite neighbor NGSO satellite intra-frequency measurement case. The whole intra-frequency measurements requirements will be scaled by ksatellite. (CMCC)
* Proposal 2a: For intra-frequency neighbour cells managed by a satellite different from the serving satellite, the legacy requirements apply provided that cell is available as indicated by *t-ServiceStartNeigh*. (Ericsson)

Recommended WF:

* Define requirements for NGSO intra-frequency inter-satellite neighbour cell measurement as “inter-frequency” case
* Add condition that requirements apply provided that cell is available as indicated by t-ServiceStartNeigh if indicated.

Nokia: clarify the intra-frequency inter-satellite, intra-frequency intra-satellite. Intra-frequency and inter-frequency happen together.

Nokia: the time to start measurement is up to UE implementation.

E///: there are still UE requirement. Support the first bullet.

MTK: the discussion is generic, and not only for time based. For time based, the start time is a separate discussion.

Nokia: how can this be verified.

Agreement:

* Define requirements for NGSO intra-frequency inter-satellite neighbour cell measurement as “inter-frequency” case
* Add condition that requirements apply provided that cell is available as indicated by t-ServiceStartNeigh if indicated.

Issue 1-2-3: For eMTC, time-based triggering and MG perspectives

Background: Agreement in RAN4 #108bis

*Agreement:*

* *Trigger is defined as Max (Tidentify\_intra\_UE cat M1­, Tidentify\_inter\_UE cat M1)*

Proposals:

* Proposal 1 (Huawei): For eMTC neighbour cell measurement, MG shall be configured as legacy TN case.
* Proposal 2 (Nokia):
  + For eMTC, time-based measurement initiation is only applicable for the cases where the UE does not require a MG (e.g. intra-frequency measurements, for cells in the same satellite, if any is configured).
  + Revise the agreement for T trigger, to include only the measurements where a MG is not needed.
  + Discuss the effect of t-serviceStartNeigh on Ttrigger

Recommended WF:

* Further discuss the above issue.

MTK: to follow legacy behaviour. Proposal 1 is the baseline.

E///: we need to discuss the condition UE can do the measurement.

Nokia: P1 measures the time based requirement only applies when the MG is configured.

MTK: yes

E///: The MG is suspended till the time t-serviceStartNeigh.

QC: this is kind of enhancement, and beyond RAN4 requirement.

HW: the measurement can be done by UE only if the MG is configured.

* *Trigger is defined as Max (Tidentify\_intra\_UE cat M1­, Tidentify\_inter\_UE cat M1 when applicable).*

E///: eMTC UE can do the measurement without MG configured, the same way as NB-IoT.

Nokia: ok with P1.

The MG is suspended till the time t-serviceStartNeigh.

* Suppport: E///, HW with improved wording, Nokia, CMCC
* Not support: QC (RAN2 scope)

For eMTC neighbour cell measurement, MG shall be configured as legacy TN case.

RAN4 tentatively agree that the MG is suspended till the time t-serviceStartNeigh

* Companies to check with RAN2 colleague with this RAN4 tentiave agreement in this week.
* Detailed wording to be updated, to be aligned the wording of Issue 1-2-5.

Issue 1-2-4: For eMTC, location-based triggering and MG perspectives

Proposals:

* Proposal 1 (Huawei): For eMTC neighbour cell measurement, MG shall be configured as legacy TN case.
* Proposal 2 (Nokia): For eMTC, location-based measurement initiation is only applicable for the cases where the UE does not require a MG (e.g. intra-frequency measurements, for cells in the same satellite, if any is configured).
  + Proposal 2a (Ericsson): For eMTC location-based triggering of neighbour cell measurements, RAN4 to discuss the conditions on when the neighbour cell measurements can be performed without gaps. The NB-IoT conditions defined in clause 8.14.6 in TS 36.33 is used as baseline.

Recommended WF:

* Further discuss whether the location-based measurement initiation is appliable when MG is configured.
* Further discuss the conditions on when the neighbour cell measurements can be performed without gaps.

**Sub-Topic 1-4: GNSS re-acquisition gap in connected mode**

Issue 1-4-1: GNSS-MG spec impact

Background: Agreement in RAN4 #108bis

*Discuss the following options until next meeting.*

* *Option 1: add generic description that the measurement delay could be longer if GNSS fix happens during measurement period.*
* *Option 2: The measurement delay requirements are extended by the duration of the GNSS-MG.* 
  + *When the UE triggers an early termination of the GNSS-MG, the measurement delay requirements are extended by the duration of the early-terminated GNSS-MG.*
* *Option 3: The measurement delay requirements are suspended until the termination of the GNSS-MG.*

Background: RAN2#123bis agreement

Proposal 4: The following update in NOTE in Stage 2 running CR is agreed:

NOTE: The AS operations (e.g. RLM related timers, dataInactivityTimer, CHO execution, neighbour cell measurement, RACH, SR, and BSR) are **suspended** when UE is performing GNSS measurement during GNSS measurement gap and **resumed** when the GNSS measurement is finished

* Agreed

Proposals:

* Proposal 1: add generic description that the measurement delay requirements are suspended and resumed when the GNSS measurement is finished. (MTK)
  + When the UE triggers an early termination (i.e. MSG3) of the GNSS-MG, the measurement delay requirements are suspended by the duration of the early-terminated GNSS-MG.
  + The UE shall restart the cell detection/measurement when the interval between two samples are larger than 5000 ms.
* Proposal 2 (CMCC)
  + When the GNSS gap shorter than [5]s, the measurement delay requirements are extended by the duration of the GNSS-MG.
  + When the GNSS gap equal or longer than [5]s, UE should re-start the measurements after GNSS measurement gap. The requirements are not applicable when the UE is performing GNSS measurement using such gaps.
* Proposal 3 (Huawei): Add generic description that the measurement delay could be longer if GNSS fix happens during measurement period
* Proposal 4 (Ericsson): Measurements that occur during GNSS reacquisition time period using gaps are suspended.
* Proposal 5 (Nokia):
  + For the cases where the GNSS-MG is smaller than the eDRX cycle, the RLM requirements are still applicable.
  + When the GNSS-MG is shorter than the (e)DRX cycle and it collides with the on Duration part of one (e)DRX cycle, the time to evaluate requirements might be extended by one (e)DRX cycle.
  + When the UE is configured with eDRX cycle, and the GNSS-MG is larger than the eDRX cycle, the requirements applicable right after the GNSS-MG shall be corresponding to a DRX cycle of [1.28] s.

Recommended WF:

* Add generic description that the measurements are suspended when UE is performing GNSS measurement during GNSS measurement gap. Wording to be discussed directly in the CR.
* Discuss whether the UE shall restart the cell detection/measurement when the interval between two samples are larger than 5000 ms.
* Further discuss the following proposals for (e)DRX cycle during the meeting
  + For the cases where the GNSS-MG is smaller than the eDRX cycle, the RLM requirements are still applicable.
  + When the GNSS-MG is shorter than the (e)DRX cycle and it collides with the on Duration part of one (e)DRX cycle, the time to evaluate requirements might be extended by one (e)DRX cycle.
  + When the UE is configured with eDRX cycle, and the GNSS-MG is larger than the eDRX cycle, the requirements applicable right after the GNSS-MG shall be corresponding to a DRX cycle of [1.28] s.

Issue 1-4-2: For eMTC, GNSS-MG overlapping with MG

Background: Agreement in RAN4 #108bis

*Agreement:*

* *If gaps configured for reacquiring GNSS and gaps configured for mobility measurements at least partially overlaps in time with other, then UE shall suspend the gaps configured for mobility measurements and instead prioritize the use of GNSS gaps*
  + *Note: it considers as no overlapping between GNSS-MG and gaps configured for mobility measurements after the UE has performed early termination of GNSS-MG.*

Proposals:

* Proposal 1: When GNSS gap overlaps with MG, MG is not suspended if GNSS-MG is terminated earlier than MG and UE does not sent CBRA or after CBRA if CBRA is sent. (Huawei)

Recommended WF:

* When GNSS gap overlaps with MG, MG applies if GNSS-MG is terminated earlier than MG and after CBRA if CBRA is sent.
  + Further discuss whether MG is applicable if GNSS-MG is terminated earlier than MG but the UE does not sent CBRA.

## 11 Liaison and output to other groups

### 11.1 R18 related

#### 11.1.1 LS on combination of HST and RRM relaxation (R2-2311435)

All there of the CRs related to combination of HST and RRM relaxation were reserved as CAT F CRs.

- Rel-16 CR is reserved as CR-3816 CAT F

- Rel-17 CR is reserved as CR-3817 CAT F

- Rel-18 CR is reserved as CR-3818 CAT F

[**R4-2321415**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321415.zip) **WF on** **combination of HST and RRM relaxation**

*Type: other For: Approval  
 Source: Apple*

**Decision: Return to.**

**R4-2318621 Discussion on RAN2 LS on combination of HST and RRM relaxation**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2318622 Reply LS on combination of HST and RRM relaxation**

*Type: LS out For: Approval  
 to RAN2  
 Source: Apple*

**Decision: Postponed.**

**R4-2320148 CR on combination of HST and RRM relaxation - R16**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3816 rev Cat: F (Rel-16)  
  
 Source: Apple*

**Abstract:**

This CR was submitted because RAN4 received an LS from RAN2 (R2-2311435) on combination of HST and RRM relaxation. After discussion, RAN4 agreed to clarify UE measurement behavior when both HST flag and low mobility relaxation are enabled.

This CR clarify UE measurement behavior when both HST flag and low mobility relaxation are enabled.

**Decision: Postponed.**

**R4-2320149 CR on combination of HST and RRM relaxation - R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3817 rev Cat: F (Rel-17)  
  
 Source: Apple*

**Abstract:**

This CR was submitted because RAN4 received an LS from RAN2 (R2-2311435) on combination of HST and RRM relaxation. After discussion, RAN4 agreed to clarify UE measurement behavior when both HST flag and low mobility relaxation are enabled.

This CR clarify UE measurement behavior when both HST flag and low mobility relaxation are enabled.

**Decision: Postponed.**

**R4-2320150 CR on combination of HST and RRM relaxation - R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3818 rev Cat: F (Rel-18)  
  
 Source: Apple*

**Abstract:**

This CR was submitted because RAN4 received an LS from RAN2 (R2-2311435) on combination of HST and RRM relaxation. After discussion, RAN4 agreed to clarify UE measurement behavior when both HST flag and low mobility relaxation are enabled.

This CR clarify UE measurement behavior when both HST flag and low mobility relaxation are enabled.

**Decision: Postponed.**

### 11.2 R17 related

#### 11.2.1 Applicability of pre-configured measurement gaps for RedCap UE (R3-233478)

#### 11.2.2 Monitoring of paging occasions for CG-SDT with HD-FDD Redcap UEs (R2-2304562)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TDoc** | **Title** | **Source** | **Type** | **For** | **Agenda item** | **TDoc Status** | **Rel** | **Spec** | **Ver** | **Related WIs** | **CR** | **Decision** |
| [**R4-2319385**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319385.zip) | Modification on interruption in paging reception for HD-FDD RedCap UEs | Huawei, HiSilicon | CR | Agreement | 11.2.2 | **available** | [**Rel-17**](https://portal.3gpp.org/desktopmodules/Release/ReleaseDetails.aspx?releaseId=192) | [**38.133**](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3204) | 17.11.0 | [**NR\_redcap-Core**](https://portal.3gpp.org/desktopmodules/WorkItem/WorkItemDetails.aspx?workitemId=900162) | 3760 |  |
| R4-2319386 | Modification on interruption in paging reception for HD-FDD RedCap UEs | Huawei, HiSilicon | CR | Agreement | 11.2.2 | reserved | [**Rel-18**](https://portal.3gpp.org/desktopmodules/Release/ReleaseDetails.aspx?releaseId=193) | [**38.133**](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3204) | 18.3.0 | [**NR\_redcap-Core**](https://portal.3gpp.org/desktopmodules/WorkItem/WorkItemDetails.aspx?workitemId=900162) | 3761 |  |
| [**R4-2320069**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320069.zip) | CR on interruption in paging reception for HD-FDD RedCap Ues | vivo | CR | Agreement | 11.2.2 | **available** | [**Rel-17**](https://portal.3gpp.org/desktopmodules/Release/ReleaseDetails.aspx?releaseId=192) | [**38.133**](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3204) | 17.11.0 | [**NR\_redcap-Core**](https://portal.3gpp.org/desktopmodules/WorkItem/WorkItemDetails.aspx?workitemId=900162) | 3801 |  |
| R4-2320070 | CR on interruption in paging reception for HD-FDD RedCap Ues R17 | vivo | CR | Agreement | 11.2.2 | reserved | [**Rel-18**](https://portal.3gpp.org/desktopmodules/Release/ReleaseDetails.aspx?releaseId=193) | [**38.133**](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3204) | 18.3.0 | [**NR\_redcap-Core**](https://portal.3gpp.org/desktopmodules/WorkItem/WorkItemDetails.aspx?workitemId=900162) | 3802 |  |

**R4-2319385 Modification on interruption in paging reception for HD-FDD RedCap UEs**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3760 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In RAN4#108bis meeting, the clarification CR R4-2317396 on monitoring of paging occasions for CG-SDT with HD-FDD Redcap UEs was endorsed. This is a resubmission.

For RedCap UE in HD-FDD mode, if paging occasions partially overlap with CG-SDT transmission, the UE is required to monitor for SI change indication in any paging occasion at least once per modification period [2] during SDT if the initial downlink BWP on which the SDT procedure is ongoing is associated with a CD-SSB.

**Decision: Return to.**

**R4-2319386 Modification on interruption in paging reception for HD-FDD RedCap UEs**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3761 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In RAN4#108bis meeting, the clarification CR R4-2317396 on monitoring of paging occasions for CG-SDT with HD-FDD Redcap UEs was endorsed. This is a resubmission.

For RedCap UE in HD-FDD mode, if paging occasions partially overlap with CG-SDT transmission, the UE is required to monitor for SI change indication in any paging occasion at least once per modification period [2] during SDT if the initial downlink BWP on which the SDT procedure is ongoing is associated with a CD-SSB.

**Decision: Return to.**

**R4-2320069 CR on interruption in paging reception for HD-FDD RedCap Ues**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3801 rev Cat: F (Rel-17)  
  
 Source: vivo*

**Abstract:**

The requirements does not depend on partial overlapping scenario between CG-SDT transmission and paging occasion in endorsed CR R4-2317396.

Remove the part where UE can drop a CG-SDT transmission.

**Decision: Return to.**

**R4-2320070 CR on interruption in paging reception for HD-FDD RedCap Ues R17**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3802 rev Cat: A (Rel-18)  
  
 Source: vivo*

**Abstract:**

The requirements does not depend on partial overlapping scenario between CG-SDT transmission and paging occasion in endorsed CR R4-2317396.

Remove the part where UE can drop a CG-SDT transmission.

**Decision: Return to.**

#### 11.2.3 LS on CG-SDT RRM test procedure (R5-235340)

**R4-2320476 [NR\_SmallData\_INACTIVE-Perf] CR on CG-SDT RRM test procedure**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3849 rev Cat: F (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

Update test configuration based on endorsed draft CR R4-2317398. BW for test configuration 3 is missing. Io and Es/NoC is not properly configured in test configuration.

Add 40MHz BW in test parameter for test configuraiton 3 and update Io in Table A.6.2.1.2-3.

**Decision: Return to.**

**R4-2320477 [NR\_SmallData\_INACTIVE-Perf] CR on CG-SDT RRM test procedure**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3850 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Return to.**

**Abstract:**

Update test configuration based on endorsed draft CR R4-2317398. BW for test configuration 3 is missing. Io and Es/NoC is not properly configured in test configuration.

Add 40MHz BW in test parameter for test configuraiton 3 and update Io in Table A.6.2.1.2-3.

**R4-2321012 [NR\_SmallData\_INACTIVE-Perf] Formal CR to Rel-17 TS 38.133 on SDT test cases**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3946 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc.*

**Abstract:**

This is the re-submitted formal CR for the endorsed CR R4-2317398 in R4#108b: RAN5 LS (R5-235340) asks RAN4 to re-define the TS 38.133 test cases A.6.2.1 and A.7.2.1.1 for SDT by splitting the test into 2 subtests.

The test is divided into two subtests, Sub-test#1 and Sub-test#2. The second subtest is only tested when the first one is passed.

- In Sub-test#1, the original time points are reused with removing T5 and W1 from T4

- In Sub-test#2, the time points are repeated from Sub-test#1 with removing time point TH

- The power levels are updated accordingly for both subtests

**Decision: Revised to R4-2321474 (from R4-2321012).**

[**R4-2321474**](ftp://10.10.10.10/ftp/tsg_ran/WG4_Radio/TSGR4_109/Inbox/R4-2321474.zip) **[NR\_SmallData\_INACTIVE-Perf] Formal CR to Rel-17 TS 38.133 on SDT test cases**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3946 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc.*

**Abstract:**

This is the re-submitted formal CR for the endorsed CR R4-2317398 in R4#108b: RAN5 LS (R5-235340) asks RAN4 to re-define the TS 38.133 test cases A.6.2.1 and A.7.2.1.1 for SDT by splitting the test into 2 subtests.

The test is divided into two subtests, Sub-test#1 and Sub-test#2. The second subtest is only tested when the first one is passed.

- In Sub-test#1, the original time points are reused with removing T5 and W1 from T4

- In Sub-test#2, the time points are repeated from Sub-test#1 with removing time point TH

- The power levels are updated accordingly for both subtests

**Decision: Return to.**

**R4-2321013 [NR\_SmallData\_INACTIVE-Perf] Formal CR to Rel-18 TS 38.133 on SDT test cases (Mirror)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3947 rev Cat: A (Rel-18)  
  
 Source: MediaTek inc.*

This is the re-submitted formal CR for the endorsed CR R4-2317398 in R4#108b: RAN5 LS (R5-235340) asks RAN4 to re-define the TS 38.133 test cases A.6.2.1 and A.7.2.1.1 for SDT by splitting the test into 2 subtests.

The test is divided into two subtests, Sub-test#1 and Sub-test#2. The second subtest is only tested when the first one is passed.

- In Sub-test#1, the original time points are reused with removing T5 and W1 from T4

- In Sub-test#2, the time points are repeated from Sub-test#1 with removing time point TH

- The power levels are updated accordingly for both subtests

**Decision: Return to.**

**R4-2321014 [NR\_redcap-Perf] Formal CR to Rel-17 TS 38.133 on RedCap SDT test cases**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3948 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc.*

**Abstract:**

RAN5 LS (R5-235340) asked RAN4 to re-define the TS 38.133 test cases A.6.2.1 and A.7.2.1.1 for SDT by splitting the test into 2 subtests. In RAN4#108bis meeting, RAN4 alos agreed to update RedCap CG-SDT test cases accordingly with the one updated in (R4-2317398) for non-RedCap UE.

Following the same changes principle made for the non-RedCap UE in (R4-2317398), the test is divided into two subtests, Sub-test#1 and Sub-test#2. The second subtest is only tested when the first one is passed.

- In Sub-test#1, the original time points are reused with removing T5 and W1 from T4

- In Sub-test#2, the time points are repeated from Sub-test#1 with removing time point TH

- The power levels are updated accordingly for both subtests

Note that the power levels in Table A.16.2.1.1.2-3 and Table A.16.2.1.2.2-3 are also corrected.

**Decision: Return to.**

**R4-2321015 [NR\_redcap-Perf] Formal CR to Rel-18 TS 38.133 on RedCap SDT test cases (Mirror)**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3949 rev Cat: A (Rel-18)  
  
 Source: MediaTek inc.*

**Abstract:**

RAN5 LS (R5-235340) asked RAN4 to re-define the TS 38.133 test cases A.6.2.1 and A.7.2.1.1 for SDT by splitting the test into 2 subtests. In RAN4#108bis meeting, RAN4 alos agreed to update RedCap CG-SDT test cases accordingly with the one updated in (R4-2317398) for non-RedCap UE.

Following the same changes principle made for the non-RedCap UE in (R4-2317398), the test is divided into two subtests, Sub-test#1 and Sub-test#2. The second subtest is only tested when the first one is passed.

- In Sub-test#1, the original time points are reused with removing T5 and W1 from T4

- In Sub-test#2, the time points are repeated from Sub-test#1 with removing time point TH

- The power levels are updated accordingly for both subtests

Note that the power levels in Table A.16.2.1.1.2-3 and Table A.16.2.1.2.2-3 are also corrected.

**Decision: Return to.**

#### 11.2.4 Reply LS on monitoring of paging occasions for CG-SDT with HD-FDD Redcap UEs (R2-2311424)

### 11.3 R15, R16 related

The following contributions are treated under email thread from another agenda item:

- The contribution R4-2319497 CR for MRTD/MTTD requirement for EN-DC/NE-DC (R16) will be covered in email thread [109][201] (under agenda item 4.4).

- The contribution R4-2319498 Discussion on left issues for MRTD-MTTD requirements in ENDC and NEDC will be covered in email thread [109][201] (under agenda item 4.4).

- The contribution R4-2320496 further discussion on MTTD/MRTD requirement for FDD-FDD inter-band EN-DC/NE-DC with overlapping DL frequency will be covered in email thread [109][201] (under agenda item 4.4).

#### 11.3.1 LS on RRM test cases with testability issues (R5-233782)

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| **TDoc** | **Title** | **Source** | **Type** | **For** | **Agenda item** | **TDoc Status** | **Rel** | **Spec** | **Ver** | **Related WIs** | **CR** | **Decision** |
| [**R4-2318623**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2318623.zip) | CR on RRM test cases with testability issues - R15 | Apple | CR | Agreement | 11.3.1 | **available** | [**Rel-15**](https://portal.3gpp.org/desktopmodules/Release/ReleaseDetails.aspx?releaseId=190) | [**38.133**](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3204) | 15.23.0 | TEI15\_Test, 5GS\_NR\_LTE-UEConTest | 3683 |  |
| [**R4-2318624**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2318624.zip) | CR on RRM test cases with testability issues - R16 | Apple | CR | Agreement | 11.3.1 | **available** | [**Rel-16**](https://portal.3gpp.org/desktopmodules/Release/ReleaseDetails.aspx?releaseId=191) | [**38.133**](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3204) | 16.17.0 | TEI15\_Test, 5GS\_NR\_LTE-UEConTest | 3684 |  |
| [**R4-2318625**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2318625.zip) | CR on RRM test cases with testability issues - R17 | Apple | CR | Agreement | 11.3.1 | **available** | [**Rel-17**](https://portal.3gpp.org/desktopmodules/Release/ReleaseDetails.aspx?releaseId=192) | [**38.133**](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3204) | 17.11.0 | TEI15\_Test, 5GS\_NR\_LTE-UEConTest | 3685 |  |
| R4-2318626 | CR on RRM test cases with testability issues - R18 | Apple | CR | Agreement | 11.3.1 | reserved | [**Rel-18**](https://portal.3gpp.org/desktopmodules/Release/ReleaseDetails.aspx?releaseId=193) | [**38.133**](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3204) | 18.3.0 | TEI15\_Test, 5GS\_NR\_LTE-UEConTest | 3686 |  |

**R4-2318623 CR on RRM test cases with testability issues - R15**

*Type: CR For: Agreement  
 38.133 v15.23.0 CR-3683 rev Cat: F (Rel-15)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2318624 CR on RRM test cases with testability issues - R16**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3684 rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2318625 CR on RRM test cases with testability issues - R17**

*Type: CR For: Agreement  
 38.133 v17.11.0 CR-3685 rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision: Return to.**

**R4-2318626 CR on RRM test cases with testability issues - R18**

*Type: CR For: Agreement  
 38.133 v18.3.0 CR-3686 rev Cat: A (Rel-18)  
  
 Source: Apple*

**Decision: Return to.**

#### 11.3.2 LS on SRS antenna switching for TDD-FDD band combinations (R1-2308582)

#### 11.3.4 Reply LS on update for “interBandMRDC-WithOverlapDL-Bands-r16” in 38.306 (R2-2309218)

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TDoc** | **Title** | **Source** | **Type** | **For** | **Agenda item** | **TDoc Status** | **Rel** | **Spec** | **Ver** | **Related WIs** | **CR** | **Decision** |
| [**R4-2319497**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319497.zip) | CR for MRTD/MTTD requirement for EN-DC/NE-DC (R16) | OPPO | CR | Agreement | 11.3.4 | **available** | [**Rel-16**](https://portal.3gpp.org/desktopmodules/Release/ReleaseDetails.aspx?releaseId=191) | [**38.133**](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3204) | 16.17.0 | [**TEI16**](https://portal.3gpp.org/desktopmodules/WorkItem/WorkItemDetails.aspx?workitemId=770050) | 3763 |  |

**R4-2319497 CR for MRTD/MTTD requirement for EN-DC/NE-DC (R16)**

*Type: CR For: Agreement  
 38.133 v16.17.0 CR-3763 rev Cat: F (Rel-16)  
  
 Source: OPPO*

**Abstract:**

This contribution will be treated under email tread [201].

**Decision: Return to.**

**R4-2319498 Discussion on left issues for MRTD-MTTD requirements in ENDC and NEDC**

*Type: other For: Approval  
 38.133 v CR- rev Cat: (Rel-16)  
  
 Source: OPPO*

**Abstract:**

This contribution will be treated under email tread [201].

**Decision: Noted.**

**R4-2320496 further discussion on MTTD/MRTD requirement for FDD-FDD inter-band EN-DC/NE-DC with overlapping DL frequency**

*Type: discussion For: Discussion  
 Source: Apple*

**Abstract:**

This contribution will be treated under email tread [201].

**Decision: Noted.**

### 11.4 Moderator summary and conclusions

Topic: [109][236] Reply\_LS

**R4-2318192 Topic summary for [109][236] Reply\_LS**

*Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

[109][200] RRM Session AI 11

**Decision: Noted.**

**Online session (Wednesday Nov 15, 2023)**

**Topic #1: LS on combination of HST and RRM relaxation (R2-2311435)**

**Issue 1-1-1: whether the UE behavior needs to be clarified when both HST flag and power saving flag are configured?**

* Proposals
  + Proposal 1: it is better to clarify UE measurement behavior when both HST flag and relaxed measurement flag are configured, especially at train station wherein there could be many UE on HST and also large number of UE not on HST. (Apple)
  + Other, please specify.
* Recommended WF

E///: the combination is a valid scenario. Need to consider both FR1 and FR2 HST, which have different requirements. Keep it open to allow more time to think.

Apple: RAN2 tends to allow the configuration of this combination. RAN4 view on UE behaviour needs to checked. This has no negative impact on UE in high mobility mode, since the relaxed measurement criteria are unlikely to be met for them. The flag is the same for all the UEs.

HW: No requirement to support the combination of the scenario. We propose no requirement in RAN4, and configuration is allowed in RAN2.

QC: The configuraiton is possible in RAN2, no requirement in RAN4. The relaxation is for low mobility and DRX. It does not make sense to apply the realxiation and HST requirement together.

Session chiar: Apple to organize offline discussion based on the WF.

**Issue 1-1-2: if answer to 1-1-1 is yes, how to clarify the UE behavior?**

* Proposals
  + Proposal 1: clarify that UE is allowed to enable relaxed measurement when both HST flag and low mobility evaluation are enabled. This has no negative impact on UE in high mobility mode, since the relaxed measurement criteria are unlikely to be met for them.
  + Other, please specify.
* Recommended WF

**Issue 1-1-3: Please comment on the CR in R4-2320148/49/50. Agreeable or not?**

**Issue 1-1-4: is the LS in R4-2318622 agreeable?**

* Proposals
  + Option 1: yes
  + Option 2, No. please give comments.

**Topic#2: Monitoring of paging occasions for CG-SDT with HD-FDD Redcap UEs**

**Issue 1-1-1: Which modification is acceptable？**

* Proposals
  + Proposal 1: (Huawei, E///)

For RedCap UE in HD-FDD mode, if paging occasions partially overlap with CG-SDT transmission, the UE is only required to monitor for SI change indication in any paging occasion at least once per modification period [2] during SDT if the initial downlink BWP on which the SDT procedure is ongoing is associated with a CD-SSB.

* + Proposal 2:

For RedCap UE in HD-FDD mode, the UE is only required to monitor for SI change indication in any paging occasion other than occasions overlap with CG-SDT at least once per modification period [2] during SDT if the initial downlink BWP on which the SDT procedure is ongoing is associated with a CD-SSB.

* + Other, please specify.
* Recommended WF

Proponent of proposal 2 to discuss offline the interested companies.

**Topic #3: LS on CG-SDT RRM test procedure**

**Issue 2-1-1: whether additional changes are needed for endorsed CR on CG-SDT RRM test case?**

* Proposals
  + Option 1: Yes, Add 40MHz BW in test parameter for test configuration 3 and update Io in Table A.6.2.1.2-3 as proposed in R4-2320476. (QC)
  + Option 2: No, agree R4-2321012 which is based on the endorsed CR in RAN4#108bis.
* Recommended WF

QC: option 1 is to add something missing.

Option 1 is technically agreed.

**Issue 2-1-2: Is CR in R4-2321014 (which is based on the endorsed CR in RAN4#108bis) agreeable or not?**

* Proposals
  + Option 1: Yes
  + Option 2: No
* Recommended WF
  + Option 1

Check with QC whether or not add 40MHz BW in test parameter for test configuration.

**Topic #4: LS on RRM test cases with testability issues**

**Issue 4-1-1: whether the R16 CR in R4-2318623/24/25 is agreeable or not?**

* Proposals
  + Option 1: Yes
  + Option 2: No
* Recommended WF
  + These CRs are endorsed in the last meeting. Option 1 if no new comment in this meeting.

Formal CR in R4-2318623/24/25 is agreeable

## Annex F: List of actions – Post-meeting

*The timeline for post-meeting is provided below.*

*- November 20 (Monday), 17:00 UTC: Session chairs will provide the list of tdocs for post-meeting email process.*

*- November 21 (Tuesday), 17:00 UTC: Authors of tdocs need share the drafts and submit them into inbox for review.*

*- November 23 (Thursday), 13:00 UTC: Companies provided comments if any and author should provide necessary revisions*

*- November 23 (Thursday), 17:00 UTC: Based on the summary, session chair will announce decisions.*

### F.1 CR Agreements

*Tdocs under post-meeting email process:*

*- Big CRs for Rel-18 on-going WIs*

*- Big CRs/Revised WIDs/TRs for Rel-18 basket WIs*

*- Other tdocs based on Chairs guidance*

#### F.1.2 RRM CR Agreements

RRM Existing Tdocs

RRM New allocated Tdocs post-meeting