**3GPP TSG-RAN WG4 Meeting #100-e R4-210xxxx**

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**Third Generation Partnership Project (3GPP™)**

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## 4 Rel-15 and previous release maintenance

### 4.1 Rel-15 New radio access technology

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================================================================================

**Email discussion: [99-e][201] NR\_RRM\_maintenance\_R15\_Core**

**R4-2108125 Email discussion summary: [99-e][201] NR\_RRM\_maintenance\_R15\_Core** *Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108370 (from R4-2108125).**

**R4-2108370 Email discussion summary: [99-e][201] NR\_RRM\_maintenance\_R15\_Core** *Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 26th)

Issue 1-1-1: CSSF for NR inter-RAT measurement on NR serving carriers in EN-DC

* + Proposals
    - Option 1 (Apple, HW, MTK, Ericsson, QC, Intel, vivo)
      * Update the spec based on agreements from RAN4#98-e.
    - Option 2 (Nokia)
      * Newly added Note #6 in CSSF table in Change #1 is not agreeable
      * Change #2 is agreeable
  + Discussion
    - Moderator: based on discussion we can converge to Option 1.
    - Nokia: ok with the changes

Issue 1-1-2: Kp factor for measurement on deactivated SCC

* + Proposals
    - Option 1 (HW, Apple, MTK, Nokia, QC, vivo)
      * Kp shall also apply for measurement requirements on SCC with deactivated SCell, where Kp = 1/(1- (SMTC period /MGRP))
      * Option A (HW): Ceil(5 x Kp) x max(measCycleSCell, 1.5xDRX cycle) x CSSFintra
      * Option B (Apple): 5 x max(measCycleSCell, 1.5xDRX cycle) x CSSFintra x Kp
      * Option C (Nokia): 5 x max(measCycleSCell, Kp x 1.5xDRX cycle) x CSSFintra
    - Option 2 (Ericsson)
      * Do not add Kp for measurement requirements on SCC with deactivated SCell
  + Discussion
    - Moderator: resolved with 1a
  + Agreements:
    - Kp shall also apply for measurement requirements on SCC with deactivated SCell, where Kp = 1/(1- (SMTC period /MGRP))
      * Ceil(5 x Kp) x max(measCycleSCell, 1.5xDRX cycle) x CSSFintra

Issue 1-2-1: Condition for FR1 known SCell activation

* + Proposals
    - Option 1 (Apple, HW, MTK, Ericsson)
      * Use the following condition to branch the FR1 known SCell activation requirements
        + TFirstSSB+ 5ms, if the measurement period is at most X ms,
        + TFirstSSB\_MAX + Trs + 5ms, if the measurement period is longer than X ms
      * Option A (Apple, HW, MTK): X=800
      * Option B (Ericsson): X=5120
      * Option C: X=[2400]
    - Option 2 (Ericsson, Nokia, QC, NEC)
      * Keep the condition as is, possibly with modification of “SCell measurement cycle” to “measCycleSCell”
  + Discussion
    - Moderator: this is related to Rel-16 MR-DC discussion
    - E///: we cannot go with 1A since this limits the applicability to 1CC. We can be ok with Option 1 and have value which allows 3CCs (X = 2400).
    - Apple: We are ok with E/// compromise and keep value in []
    - Nokia: the problem is how to interpret the current spec. What is the measurement period? Is it Deactivated SCell measurement period?
      * E///: Measurement period is the total measurement time for N deactivated Scells (each with 5samples x 160ms)
      * Huawei: same understanding with E///
      * Apple: same view
    - Huawei: 2400ms is ok in []
  + Agreements:
    - Use the following condition to branch the FR1 known SCell activation requirements
      * TFirstSSB+ 5ms, if the measurement period is at most X ms,
      * TFirstSSB\_MAX + Trs + 5ms, if the measurement period is longer than X ms
      * X = [2400] ms
      * Measurement period is the total measurement time for Scell being activated

Issue 1-3-3: SMTC configuration determination in DC

* + Tentative agreements:
    - when SMTC configuration is not provided within the corresponding command (e.g. Handover, RRC release with redirection, SCell activation and PSCell addition/change), and MN and SN configure measObjectNR having same SSB frequency and subcarrier spacing but with different SMTC configurations, it should be clarified based on which SMTC the corresponding requirements are derived
  + Proposals
    - Option 1 (HW, MTK, Apple, QC)
      * The corresponding requirements are derived based on the SMTC with larger SMTC periodicity.
    - Option 2 (Ericsson, Nokia)
      * The corresponding requirements are derived based on the SMTC with the shortest SMTC periodicity.
  + Discussion
    - Huawei: New issue. Issue applies if SMTC is not configured explicitly. It is allowed in RAN2 spec. We are ok to allow relaxed requirements to avoid NBC issues. We are also ok to leave up to UE implementation. However, this needs to be clarified.
    - E///: If we get different configurations, then UE shall follow shorter one. Ok to leave it as it is.
    - Nokia: Same view as E///. Keep undefined and leave up to UE.
    - Apple: Understand concern from NW vendors. UE may not necessarily make the comparison since configurations come from different RATs.
    - QC: similar view as Apple.
  + Agreements:
    - When SMTC configuration is not provided within the corresponding command (e.g. Handover, RRC release with redirection, SCell activation and PSCell addition/change), and MN and SN configure measObjectNR having same SSB frequency and subcarrier spacing but with different SMTC configurations,
      * It is up to UE implementation which SMTC configuration to use
      * UE requirements will be based on the SMTC configuration used by the UE

1st round email discussion conclusions

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| [R4-2109294](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109294.zip) | Maintenance on CSSF for EN-DC and deactivated SCell measurement R15 | Apple, Huawei, HiSilicon | Revised | Issue 1-1-1 |
| [R4-2109319](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109319.zip) | Core requirement maintenance on signal characteristics (R15) | Apple | Revised | Issue 1-2-1, 1-3-1 |
| [R4-2109621](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109621.zip) | CR on RRC-based BWP switch on single CC requirements | vivo | Merged |  |
| [R4-2109848](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109848.zip) | CR on scheduling restriction of UE during intra-frequency measurements on FR2 in R15 | MediaTek inc. | Revised | Issue 1-1-3  Title change to: CR on intra-frequency measurements on FR2 in R15 |
| [R4-2109983](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109983.zip) | CR on TS38.133 inter-frequency without gaps - r15 | Ericsson | Revised | Issue 1-1-4 |
| [R4-2110358](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110358.zip) | CR on measurement on deactivated SCell and interruption to NR serving cells for measurements on deactivated NR Scell | Huawei, HiSilicon | Revised | Issue 1-1-2, 1-3-2 |
| [R4-2110769](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110769.zip) | Correction to interruption to LTE serving cells for measurements on deactivated NR SCell\_R15 | Huawei, Hisilicon | Revised | Issue 1-3-2 |
| [R4-2110927](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110927.zip) | CR on Rel-15 SCell activation, SMTC determination and UL timing 38133 | Huawei, HiSilicon | Revised | Issue 1-2-2, 1-2-3, 1-3-3 |
| [R4-2110928](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110928.zip) | CR on applicability of requirements for NE-DC operation and SMTC determination 36133 | Huawei, HiSilicon | Revised | Issue 1-3-3, 1-4-2 |
| [R4-2111029](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111029.zip) | CR on RRC-based BWP switch on single CC in Rel15 | Nokia, Nokia Shanghai Bell | Merged |  |
| [R4-2111032](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111032.zip) | CR on NR-DC PSCell addition and release delay in Rel15 | Nokia, Nokia Shanghai Bell | Revised | Issue 1-3-4 |
| [R4-2111313](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111313.zip) | Correction to reference point defintion for UE timing in TS 38.133 | Ericsson, Nokia, Intel | Not treated | Handled in email #239 |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108185 | Maintenance on CSSF for EN-DC and deactivated SCell measurement R15 | Apple, Huawei, HiSilicon | Agreeable |  |
| R4-2108186 | Core requirement maintenance on signal characteristics (R15) | Apple | Agreeable |  |
| R4-2108187 | CR on scheduling restriction of UE during intra-frequency measurements on FR2 in R15 | MediaTek inc. | Agreeable |  |
| R4-2108188 | CR on TS38.133 inter-frequency without gaps - r15 | Ericsson | Withdrawn | Revised CR, not available |
| R4-2109983 | CR on TS38.133 inter-frequency without gaps - r15 | Ericsson | Postponed | Original CR, postponed |
| R4-2108189 | CR on measurement on deactivated SCell and interruption to NR serving cells for measurements on deactivated NR Scell | Huawei, HiSilicon | Withdrawn | Revised CR, not available |
| [R4-2110358](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110358.zip) | CR on measurement on deactivated SCell and interruption to NR serving cells for measurements on deactivated NR Scell | Huawei, HiSilicon | Agreeable | Original CR, agreeable |
| R4-2108190 | Correction to interruption to LTE serving cells for measurements on deactivated NR SCell\_R15 | Huawei, Hisilicon | Withdrawn | Revised CR, not available |
| [R4-2110769](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110769.zip) | Correction to interruption to LTE serving cells for measurements on deactivated NR SCell\_R15 | Huawei, Hisilicon | Agreeable | Original CR, agreeable |
| R4-2108191 | CR on Rel-15 SCell activation, SMTC determination and UL timing 38133 | Huawei, HiSilicon | Agreeable |  |
| R4-2108192 | CR on applicability of requirements for NE-DC operation and SMTC determination 36133 | Huawei, HiSilicon | Agreeable |  |
| R4-2108193 | CR on NR-DC PSCell addition and release delay in Rel15 | Nokia, Nokia Shanghai Bell | Withdrawn | Revised CR, not available |
| R4-2111032 | CR on NR-DC PSCell addition and release delay in Rel15 | Nokia, Nokia Shanghai Bell | Agreeable | Original CR, agreeable |

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**R4-2109294 Maintenance on CSSF for EN-DC and deactivated SCell measurement R15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1885 rev Cat: F (Rel-15)  
  
 Source: Apple, Huawei, HiSilicon*

**Decision: Revised to R4-2108185 (from R4-2109294).**

**R4-2108185 Maintenance on CSSF for EN-DC and deactivated SCell measurement R15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1885 rev Cat: F (Rel-15)  
  
 Source: Apple, Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2109295 Maintenance on CSSF for EN-DC and deactivated SCell measurement R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1886 rev Cat: A (Rel-16)  
  
 Source: Apple, Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2109296 Maintenance on CSSF for EN-DC and deactivated SCell measurement R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1887 rev Cat: A (Rel-17)  
  
 Source: Apple, Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2109319 Core requirement maintenance on signal characteristics (R15)**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1896 rev Cat: F (Rel-15)  
  
 Source: Apple*

**Decision: Revised to R4-2108186 (from R4-2109319).**

**R4-2108186 Core requirement maintenance on signal characteristics (R15)**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1896 rev Cat: F (Rel-15)  
  
 Source: Apple*

**Decision: Agreed.**

**R4-2109320 Core requirement maintenance on signal characteristics (R16)**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1897 rev Cat: A (Rel-17)  
  
 Source: Apple*

Session chair: Intended to be a Rel-16 mirror CR, but requested for Rel-17 spec. Please check with MCC to change the spec. If not possible a new tdoc will be allocated.

**Decision: Withdrawn.**

**R4-2108419 Core requirement maintenance on signal characteristics (R16)**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-TBA rev Cat: A (Rel-16)  
  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2109321 Core requirement maintenance on signal characteristics (R17)**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1898 rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Agreed.**

**R4-2109621 CR on RRC-based BWP switch on single CC requirements**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1925 rev Cat: F (Rel-15)  
  
 Source: vivo*

**Decision: Merged.**

**R4-2109622 CR on RRC-based BWP switch on single CC requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1926 rev Cat: A (Rel-16)  
  
 Source: vivo*

**Decision: Withdrawn.**

**R4-2109623 CR on RRC-based BWP switch on single CC requirements**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1927 rev Cat: A (Rel-17)  
  
 Source: vivo*

**Decision: Withdrawn.**

**R4-2109848 CR on scheduling restriction of UE during intra-frequency measurements on FR2 in R15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1938 rev Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2108187 (from R4-2109848).**

**R4-2108187 CR on scheduling restriction of UE during intra-frequency measurements on FR2 in R15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1938 rev Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Decision: Agreed.**

**R4-2109849 CR on scheduling restriction of UE during intra-frequency measurements on FR2 in R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1939 rev Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Agreed.**

**R4-2109850 CR on scheduling restriction of UE during intra-frequency measurements on FR2 in R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1940 rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Agreed.**

**R4-2109983 CR on TS38.133 inter-frequency without gaps - r15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1957 rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

The CR corrects no gapless inter-frequency measurements in R-15

**Decision: Postponed.**

**R4-2108188 CR on TS38.133 inter-frequency without gaps - r15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1957 rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

The CR corrects no gapless inter-frequency measurements in R-15

Session chair: Cat A CRs are not reserved. Please inform if Cat A CRs are needed.

**Decision: Withdrawn.**

**R4-2110358 CR on measurement on deactivated SCell and interruption to NR serving cells for measurements on deactivated NR Scell**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2031 rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2108189 CR on measurement on deactivated SCell and interruption to NR serving cells for measurements on deactivated NR Scell**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2031 rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2110359 CR on measurement on deactivated SCell and interruption to NR serving cells for measurements on deactivated NR SCell**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2032 rev Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110360 CR on measurement on deactivated SCell and interruption to NR serving cells for measurements on deactivated NR SCell**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2033 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110769 Correction to interruption to LTE serving cells for measurements on deactivated NR SCell\_R15**

*Type: CR For: Agreement  
 36.133 v15.13.0 CR-7108 rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2108190 Correction to interruption to LTE serving cells for measurements on deactivated NR SCell\_R15**

*Type: CR For: Agreement  
 36.133 v15.13.0 CR-7108 rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Withdrawn.**

**R4-2110749 Correction to interruption to LTE serving cells for measurements on deactivated NR SCell\_R16**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7106 rev Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2110750 Correction to interruption to LTE serving cells for measurements on deactivated NR SCell\_R17**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7107 rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2110846 Discussion on remaining issues in Rel-15 NR RRM requirements**

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

**Decision: Noted.**

**R4-2110927 CR on Rel-15 SCell activation, SMTC determination and UL timing 38133**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2103 rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108191 (from R4-2110927).**

**R4-2108191 CR on Rel-15 SCell activation, SMTC determination and UL timing 38133**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2103 rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110848 CR on Rel-15 SCell activation, SMTC determination and UL timing 38133 R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2077 rev Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110849 CR on Rel-15 SCell activation, SMTC determination and UL timing 38133 R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2078 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110928 CR on applicability of requirements for NE-DC operation and SMTC determination 36133**

*Type: CR For: Agreement  
 36.133 v15.13.0 CR-7120 rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108192 (from R4-2110928).**

**R4-2108192 CR on applicability of requirements for NE-DC operation and SMTC determination 36133**

*Type: CR For: Agreement  
 36.133 v15.13.0 CR-7120 rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110851 CR on applicability of requirements for NE-DC operation and SMTC determination 36133 R16**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7110 rev Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110852 CR on applicability of requirements for NE-DC operation and SMTC determination 36133 R17**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7111 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2111028 discussion on RRC-based BWP switch on single CC in Rel15**

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

**Abstract:**

discussion on RRC-based BWP switch on multiple CCs

**Decision: Noted.**

**R4-2111029 CR on RRC-based BWP switch on single CC in Rel15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2106 rev Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

CR on RRC-based BWP switch on single CC in Rel15

**Decision: Merged.**

**R4-2111030 CR on RRC-based BWP switch on single CC in Rel16 - Cat A**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2107 rev Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Cat-A CR on RRC-based BWP switch on single CC in Rel16

**Decision: Withdrawn.**

**R4-2111031 CR on RRC-based BWP switch on single CC in Rel17 - Cat A**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2108 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Cat-A CR on RRC-based BWP switch on single CC in Rel17

**Decision: Withdrawn.**

**R4-2111032 CR on NR-DC PSCell addition and release delay in Rel15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2109 rev Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Maintenance CR NR-DC PSCell addition and release delay in Rel15

**Decision: Agreed.**

**R4-2108193 CR on NR-DC PSCell addition and release delay in Rel15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2109 rev Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Maintenance CR NR-DC PSCell addition and release delay in Rel15

**Decision: Withdrawn.**

**R4-2111033 CR on NR-DC PSCell addition and release delay in Rel16 - Cat A**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2110 rev Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Cat-A Maintenance CR NR-DC PSCell addition and release delay in Rel16

**Decision: Agreed.**

**R4-2111034 CR on NR-DC PSCell addition and release delay in Rel17 - Cat A**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2111 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Cat-A Maintenance CR NR-DC PSCell addition and release delay in Rel17

**Decision: Agreed.**

**R4-2111313 Correction to reference point definition for UE timing in TS 38.133**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2134 rev Cat: F (Rel-15)  
  
 Source: Ericsson, Nokia, Intel*

**Abstract:**

Definition of reference point for UE timing error is clarified

**Decision: Revised to R4-2108365 (from R4-2111313).**

**R4-2108365 Correction to reference point definition for UE timing in TS 38.133**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2134 rev Cat: F (Rel-15)  
  
 Source: Ericsson, Nokia, Intel*

**Abstract:**

Definition of reference point for UE timing error is clarified

vivo: “Detectable” is more reasonable than simply first path. Need more time to check till the next meeting.

E///: We are ok to remove “detectable”.

**Decision: Postponed.**

**R4-2111314 Correction to reference point definition for UE timing in TS 38.133**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2135 rev Cat: A (Rel-16)  
  
 Source: Ericsson, Nokia, Intel*

**Abstract:**

Definition of reference point for UE timing error is clarified

**Decision: Withdrawn.**

**R4-2111315 Correction to reference point definition for UE timing in TS 38.133**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2136 rev Cat: A (Rel-17)  
  
 Source: Ericsson, Nokia, Intel*

**Abstract:**

Definition of reference point for UE timing error is clarified

**Decision: Withdrawn.**

#### 4.1.8 RRM performance requirements maintenance (38.133/36.133)

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**Email discussion: [99-e][202] NR\_RRM\_maintenance\_R15\_Perf**

**R4-2108126 Email discussion summary: [99-e][202] NR\_RRM\_maintenance\_R15\_Perf** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108371 (from R4-2108126).**

**R4-2108371 Email discussion summary: [99-e][202] NR\_RRM\_maintenance\_R15\_Perf** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 26th)

* Sub-topic 1-1: CA channel BW configuration shortage for RRM TCs
  + Proposals
    - Option 1: Anritsu
      * RAN4 solves the issue with a shortage of channel bandwidth configurations in RRM test configurations identified in R4-2108849.
  + Session chair: continue discussion till next meeting
* Sub-topic 1-4: Further considerations on FR1 FR2 test case design
  + Session chair: draft WF shared by moderator is acceptable by companies
  + Session chair: Need to add a bullet on the criteria for selection of test cases (e.g. control of absolute power for FR1/LTE or control of relative power between FR1/LTE and FR2 carrier)

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108194 | WF on Rel-15 NR RRM test case related issues | Ericsson | Open issues identified for RAN#100-e can be in one WF |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2108825 | CR to Interruptions during measurements on deactivated NR SCC | Anritsu corporation | Revised |  |
| R4-2108828 | CR to CSI-RS based L1-RSRP measurement on resource set with repetition off TCs | Anritsu corporation | Agreeable |  |
| [R4-2108831](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2108831.zip) | CR to the notation of SMTC in the general test parameters of Re-establishment TCs | Anritsu corporation | Agreeable |  |
| R4-2108834 | CR to BWP configuration for interruption test case. | Anritsu corporation | Agreeable |  |
| R4-2108837 | CR to new SMTC pattern for ReSelection back in A.6.1.1.1 | Anritsu corporation | Merged with R4-2108949 |  |
| R4-2108840 | Update of DRX configuration in Event-triggered Test cases | Anritsu corporation | Revised | R4-2110754 merged in this. |
| R4-2108841 | Update of DRX configuration in Event-triggered Test cases | Anritsu corporation | Revised |  |
| R4-2108843 | Correction to FR1 NR SA interruption during SCell measurement test cases | Anritsu corporation | Withdrawn | Not available |
| R4-2108849 | CA channel BW configuration shortage for RRM TCs | Anritsu corporation | ~~Return to~~ Noted |  |
| R4-2108850 | PDSCH scheduling issue during SMTC for interference TC | Anritsu corporation | ~~Revised~~ Noted |  |
| R4-2108883 | Update RRM Test cases where 66RBs gives insufficient dB range | ANRITSU LTD | Revised |  |
| R4-2108886 | Update Reference channels and OCNG for FR2 240kHz SSB SCS RRM Test cases | ANRITSU LTD | Revised |  |
| R4-2108949 | Cat-F CR to Cell Reselection Tests with Async Cells in Rel-15 | Qualcomm Incorporated | ~~Return to~~ Revised | R4-2108837 merged in this  Session chair: CR coversheet issue |
| R4-2108952 | Cat-F CR to Cell Reselection Tests with Async Cells in Rel-16 | Qualcomm Incorporated | ~~Return to~~ Revised | Session chair: CR coversheet issue |
| R4-2108954 | Cat-F CR to FR2 CORESET and Search Space RMC in Rel-15 | Qualcomm Incorporated | Revised |  |
| R4-2108957 | Cat-F CR to PDSCH RMC in Rel-15 | Qualcomm Incorporated | Return to |  |
| R4-2108960 | Cat-F CR to TRS Configuration in Rel-15 Test Case | Qualcomm Incorporated | Agreeable |  |
| R4-2108998 | Maintenance CR for test cases - R15 | ZTE Corporation | Revised |  |
| R4-2109074 | CR on BFD and link recovery test cases | CATT | Agreeable |  |
| R4-2109176 | Discussion on FR2 inter-frequency relative RSRP accuracy | MediaTek inc. | ~~Return to~~ Noted |  |
| R4-2109637 | Correction on the SS-RSRP difference value for SS-RSRP measurement TC in R15 | MediaTek inc. | Revised |  |
| R4-2109638 | Correction on the SS-RSRP difference value for SS-RSRP measurement TC in R16 | MediaTek inc. | Revised | Cat A was also submitted |
| R4-2109639 | Correction on the SS-RSRP difference value for SS-RSRP measurement TC in R17 | MediaTek inc. | Revised | Cat A was also submitted |
| R4-2109640 | Correction on the CSI-reporting period for SCell activation delay in R15 | MediaTek inc. | Revised |  |
| R4-2109641 | Correction on the CSI-reporting period for SCell activation delay in R16 | MediaTek inc. | Revised | Cat A was also submitted |
| R4-2109642 | Correction on the CSI-reporting period for SCell activation delay in R17 | MediaTek inc. | Revised | Cat A was also submitted |
| R4-2109847 | Further considerations on FR1 FR2 test case design | vivo | ~~Return to~~ Noted |  |
| R4-2110239 | CR to TS 38.133: Correction of TDD Configuration for several TCs (Rel-15) | Rohde & Schwarz | Agreeable |  |
| R4-2110257 | CR to TS 38.133: Correction of OCNG pattern for several TCs (Rel-15) | Rohde & Schwarz | Revised |  |
| R4-2110260 | CR to TS 38.133: Correction of IRAT TCs (Rel-15) | Rohde & Schwarz | Agreeable |  |
| R4-2110263 | CR to TS 38.133: Corrections to SS-RSRP/RSRQ/SINR accuracy TCs (Rel 15) | Rohde & Schwarz | Agreeable |  |
| R4-2110266 | CR to TS 38.133: Several corrections to TCs (Rel 15) | Rohde & Schwarz | Return to |  |
| R4-2110278 | CR on maintaining condition requirements in TS38.133 R16 | Huawei, HiSilicon | Agreeable |  |
| R4-2110279 | CR on maintaining condition requirements in TS38.133 R17 | Huawei, HiSilicon | Agreeable |  |
| R4-2110751 | Correction to CSI-RS reference configuration\_R15 | Huawei, Hisilicon | Agreeable |  |
| R4-2110754 | Correction to LTE DRX reference configuration\_R15 | Huawei, Hisilicon | Merged with R4-2108840 |  |
| [R4-2110760](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110760.zip) | Correction to TRS reference configuration\_R15 | Huawei, Hisilicon | Return to |  |
| R4-2110763 | Correction to FR1 test cases using DLBWP.0.2\_R15 | Huawei, Hisilicon | Revised |  |
| R4-2110771 | Correction to reference configurations related to DLBWP.0.2\_R15 | Huawei, Hisilicon | Agreeable |  |
| R4-2110773 | Correction to interruption during measurement on deactivated SCell test cases\_R15 | Huawei, Hisilicon | Agreeable |  |
| R4-2110782 | Correction of test parameters for SA inter-frequency event triggered reporting TCs | Ericsson, Anritsu | Agreeable |  |
| R4-2111035 | Maintenance CR for RRM test cases in Rel15 | Nokia, Nokia Shanghai Bell | Revised |  |
| R4-2111317 | Correction to AoA setup in FR2 | Ericsson | ~~Agreeable~~ Revised | Session chair: CR coversheet issue |
| R4-2111320 | Correction to AoA setup and beam assumptions in FR2 tests in Rel-16 | Ericsson | ~~Agreeable~~ Revised | Session chair: CR coversheet issue |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108194 | WF on RRM test case related issues | Ericsson | Return to |  |
| R4-2108195 | CR to Interruptions during measurements on deactivated NR SCC | Anritsu corporation | Agreeable | Rev of [R4-2108825](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2108825.zip) |
| R4-2108196 | Update of DRX configuration in Event-triggered Test cases | Anritsu corporation | Agreeable | Rev of R4-2108840 |
| R4-2108197 | Update of DRX configuration in Event-triggered Test cases | Anritsu corporation | Agreeable | Rev of R4-2108841 |
| R4-2108198 | Update RRM Test cases where 66RBs gives insufficient dB range | ANRITSU LTD | Agreeable | Rev of R4-2108883 |
| R4-2108199 | Update Reference channels and OCNG for FR2 240kHz SSB SCS RRM Test cases | ANRITSU LTD | Agreeable | Rev of R4-2108886 |
| R4-2108200 | Cat-F CR to Cell Reselection Tests with Async Cells in Rel-15 | Qualcomm Incorporated | Agreeable | Rev of R4-2108949. CR coversheet issue |
| R4-2108201 | Cat-F CR to Cell Reselection Tests with Async Cells in Rel-16 | Qualcomm Incorporated | Agreeable | Rev of R4-2108952. CR coversheet issue |
| R4-2108202 | Cat-F CR to FR2 CORESET and Search Space RMC in Rel-15 | Qualcomm Incorporated | Agreeable | Rev of R4-2108954 |
| **R4-2108957** | Cat-F CR to PDSCH RMC in Rel-15 | Qualcomm Incorporated | Agreeable |  |
| R4-2108203 | Maintenance CR for test cases - R15 | ZTE Corporation | Agreeable | Rev of R4-2108998 |
| R4-2108204 | Correction on the SS-RSRP difference value for SS-RSRP measurement TC in R15 | MediaTek inc. | Agreeable | Rev of R4-2109637 |
| R4-2108207 | Correction on the CSI-reporting period for SCell activation delay in R15 | MediaTek inc. | Agreeable | Rev of R4-2109640 |
| R4-2108210 | CR to TS 38.133: Correction of OCNG pattern for several TCs (Rel-15) | Rohde & Schwarz | Agreeable | Rev of R4-2110257 |
| R4-2108025 | CR to TS 38.133: Several corrections to TCs (Rel 15) | Rohde & Schwarz | Agreeable | Rev of R4-2110266 |
| **R4-2110760** | Correction to TRS reference configuration\_R15 | Huawei, Hisilicon | Agreeable |  |
| R4-2108211 | Correction to FR1 test cases using DLBWP.0.2\_R15 | Huawei, Hisilicon | Agreeable | Rev of R4-2110763 |
| R4-2108212 | Maintenance CR for RRM test cases in Rel15 | Nokia, Nokia Shanghai Bell | Agreeable | Rev of R4-2111035 |
| R4-2108213 | Correction to AoA setup in FR2 | Ericsson | Agreeable | Rev ofR4-2111317.  CR coversheet issue |
| R4-2108214 | Correction to AoA setup and beam assumptions in FR2 tests in Rel-16 | Ericsson | Agreeable | Rev of R4-2111320. CR coversheet issue |

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**R4-2108194 WF on Rel-15 NR RRM test case related issues**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108038 (from R4-2108194).**

**R4-2108038 WF on Rel-15 NR RRM test case related issues**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108825 CR to Interruptions during measurements on deactivated NR SCC**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1810 rev Cat: F (Rel-15)  
  
 Source: Anritsu corporation*

**Decision: Revised to R4-2108195 (from R4-2108825).**

**R4-2108195 CR to Interruptions during measurements on deactivated NR SCC**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1810 rev Cat: F (Rel-15)  
  
 Source: Anritsu corporation*

**Decision: Agreed.**

**R4-2108826 CR to Interruptions during measurements on deactivated NR SCC**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1811 rev Cat: A (Rel-16)  
  
 Source: Anritsu corporation*

**Decision: Agreed.**

**R4-2108827 CR to Interruptions during measurements on deactivated NR SCC**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1812 rev Cat: A (Rel-17)  
  
 Source: Anritsu corporation*

**Decision: Agreed.**

**R4-2108828 CR to CSI-RS based L1-RSRP measurement on resource set with repetition off TCs**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1813 rev Cat: F (Rel-15)  
  
 Source: Anritsu corporation*

**Decision: Agreed.**

**R4-2108829 CR to CSI-RS based L1-RSRP measurement on resource set with repetition off TCs**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1814 rev Cat: A (Rel-16)  
  
 Source: Anritsu corporation*

**Decision: Agreed.**

**R4-2108830 CR to CSI-RS based L1-RSRP measurement on resource set with repetition off TCs**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1815 rev Cat: A (Rel-17)  
  
 Source: Anritsu corporation*

**Decision: Agreed.**

**R4-2108831 CR to the notation of SMTC in the general test parameters of Re-establishment TCs**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1816 rev Cat: F (Rel-15)  
  
 Source: Anritsu corporation*

**Decision: Agreed.**

**R4-2108832 CR to the notation of SMTC in the general test parameters of Re-establishment TCs**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1817 rev Cat: A (Rel-16)  
  
 Source: Anritsu corporation*

**Decision: Agreed.**

**R4-2108833 CR to the notation of SMTC in the general test parameters of Re-establishment TCs**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1818 rev Cat: A (Rel-17)  
  
 Source: Anritsu corporation*

**Decision: Agreed.**

**R4-2108834 CR to BWP configuration for interruption test case.**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1819 rev Cat: F (Rel-15)  
  
 Source: Anritsu corporation*

**Decision: Agreed.**

**R4-2108835 CR to BWP configuration for interruption test case.**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1820 rev Cat: A (Rel-16)  
  
 Source: Anritsu corporation*

**Decision: Agreed.**

**R4-2108836 CR to BWP configuration for interruption test case.**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1821 rev Cat: A (Rel-17)  
  
 Source: Anritsu corporation*

**Decision: Agreed.**

**R4-2108837 CR to new SMTC pattern for ReSelection back in A.6.1.1.1**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1822 rev Cat: F (Rel-15)  
  
 Source: Anritsu corporation*

**Decision: Merged.**

**R4-2108838 CR to new SMTC pattern for ReSelection back in A.6.1.1.1**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1823 rev Cat: A (Rel-16)  
  
 Source: Anritsu corporation*

**Decision: Withdrawn.**

**R4-2108839 CR to new SMTC pattern for ReSelection back in A.6.1.1.1**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1824 rev Cat: A (Rel-17)  
  
 Source: Anritsu corporation*

**Decision: Withdrawn.**

**R4-2108840 Update of DRX configuration in Event-triggered Test cases**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1825 rev Cat: F (Rel-15)  
  
 Source: Anritsu corporation*

**Decision: Revised to R4-2108196 (from R4-2108840).**

**R4-2108196 Update of DRX configuration in Event-triggered Test cases**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1825 rev Cat: F (Rel-15)  
  
 Source: Anritsu corporation*

**Decision: Agreed.**

**R4-2108841 Update of DRX configuration in Event-triggered Test cases**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1826 rev Cat: F (Rel-16)  
  
 Source: Anritsu corporation*

**Decision: Revised to R4-2108197 (from R4-2108841).**

**R4-2108197 Update of DRX configuration in Event-triggered Test cases**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1826 rev Cat: F (Rel-16)  
  
 Source: Anritsu corporation*

**Decision: Agreed.**

**R4-2108842 Update of DRX configuration in Event-triggered Test cases**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1827 rev Cat: A (Rel-17)  
  
 Source: Anritsu corporation*

**Decision: Agreed.**

**R4-2108843 Correction to FR1 NR SA interruption during SCell measurement test cases**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1828 rev Cat: F (Rel-15)  
  
 Source: Anritsu corporation*

**Decision: Withdrawn.**

**R4-2108844 Correction to FR1 NR SA interruption during SCell measurement test cases**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1829 rev Cat: A (Rel-16)  
  
 Source: Anritsu corporation*

**Decision: Withdrawn.**

**R4-2108845 Correction to FR1 NR SA interruption during SCell measurement test cases**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1830 rev Cat: A (Rel-17)  
  
 Source: Anritsu corporation*

**Decision: Withdrawn.**

**R4-2108849 CA channel BW configuration shortage for RRM TCs**

*Type: discussion For: Approval  
 Source: Anritsu corporation*

**Abstract:**

In this contribution we would like to raise an issue with a shortage of CA channel BW configuration with RRM TCs.

**Decision: Noted.**

**R4-2108850 PDSCH scheduling issue during SMTC for interference TC**

*Type: discussion For: Approval  
 Source: Anritsu corporation*

**Abstract:**

In this paper we raise an issue with PDSCH scheduling during SMTC for interference TC.

Session chair: The discussion paper includes wrong figures and they will be corrected in the WF

**Decision: Noted.**

**R4-2108883 Update RRM Test cases where 66RBs gives insufficient dB range**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1831 rev Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

a) Update Test Configurations, choosing 24RBs where necessary, change PDSCH Reference Measurement Channel to SR.3.2 (same 24RBs as the CORESET), and change to OCNG pattern OP.3.

b) In FR2 RRC Re-establishment, update Noc and Es/Noc values to be compatible

**Decision: Revised to R4-2108198 (from R4-2108883).**

**R4-2108198 Update RRM Test cases where 66RBs gives insufficient dB range**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1831 rev Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

a) Update Test Configurations, choosing 24RBs where necessary, change PDSCH Reference Measurement Channel to SR.3.2 (same 24RBs as the CORESET), and change to OCNG pattern OP.3.

b) In FR2 RRC Re-establishment, update Noc and Es/Noc values to be compatible

**Decision: Agreed.**

**R4-2108884 Update RRM Test cases where 66RBs gives insufficient dB range**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1832 rev Cat: A (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

a) Update Test Configurations, choosing 24RBs where necessary, change PDSCH Reference Measurement Channel to SR.3.2 (same 24RBs as the CORESET), and change to OCNG pattern OP.3.

b) In FR2 RRC Re-establishment, update Noc and Es/Noc values to be compatible

**Decision: Agreed.**

**R4-2108885 Update RRM Test cases where 66RBs gives insufficient dB range**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1833 rev Cat: A (Rel-17)  
  
 Source: ANRITSU LTD*

**Abstract:**

a) Update Test Configurations, choosing 24RBs where necessary, change PDSCH Reference Measurement Channel to SR.3.2 (same 24RBs as the CORESET), and change to OCNG pattern OP.3.

b) In FR2 RRC Re-establishment, update Noc and Es/Noc values to be compatible

**Decision: Agreed.**

**R4-2108886 Update Reference channels and OCNG for FR2 240kHz SSB SCS RRM Test cases**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1834 rev Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

a) Update 240kHz SSB SCS Configs to use 48RBs RMSI CORESET, Control Channel and PDSCH RMCs.

b) Update Intra-freq Event-triggered Test cases in Spherical Coverage to make verdict predictable.

**Decision: Revised to R4-2108199 (from R4-2108886).**

**R4-2108199 Update Reference channels and OCNG for FR2 240kHz SSB SCS RRM Test cases**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1834 rev Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

a) Update 240kHz SSB SCS Configs to use 48RBs RMSI CORESET, Control Channel and PDSCH RMCs.

b) Update Intra-freq Event-triggered Test cases in Spherical Coverage to make verdict predictable.

**Decision: Agreed.**

**R4-2108887 Update Reference channels and OCNG for FR2 240kHz SSB SCS RRM Test cases**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1835 rev Cat: A (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

a) Update 240kHz SSB SCS Configs to use 48RBs RMSI CORESET, Control Channel and PDSCH RMCs.

b) Update Intra-freq Event-triggered Test cases in Spherical Coverage to make verdict predictable.

**Decision: Agreed.**

**R4-2108888 Update Reference channels and OCNG for FR2 240kHz SSB SCS RRM Test cases**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1836 rev Cat: A (Rel-17)  
  
 Source: ANRITSU LTD*

**Abstract:**

a) Update 240kHz SSB SCS Configs to use 48RBs RMSI CORESET, Control Channel and PDSCH RMCs.

b) Update Intra-freq Event-triggered Test cases in Spherical Coverage to make verdict predictable.

**Decision: Agreed.**

**R4-2108949 Cat-F CR to Cell Reselection Tests with Async Cells in Rel-15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1837 rev Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2108200 (from R4-2108949).**

**R4-2108200 Cat-F CR to Cell Reselection Tests with Async Cells in Rel-15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1837 rev Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

Session chair: CR coversheet error. Please update in revision if CR is agreeable.

**Decision: Agreed.**

**R4-2108950 Cat-A CR to Cell Reselection Tests with Async Cells in Rel-16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1838 rev Cat: A (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed.**

**R4-2108951 Cat-A CR to Cell Reselection Tests with Async Cells in Rel-17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1839 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed.**

**R4-2108952 Cat-F CR to Cell Reselection Tests with Async Cells in Rel-16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1840 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2108201 (from R4-2108952).**

**R4-2108201 Cat-F CR to Cell Reselection Tests with Async Cells in Rel-16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1840 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

Session chair: CR coversheet error. Please update in revision if CR is agreeable..

**Decision: Agreed.**

**R4-2108953 Cat-A CR to Cell Reselection Tests with Async Cells in Rel-17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1841 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed.**

**R4-2108954 Cat-F CR to FR2 CORESET and Search Space RMC in Rel-15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1842 rev Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2108202 (from R4-2108954).**

**R4-2108202 Cat-F CR to FR2 CORESET and Search Space RMC in Rel-15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1842 rev Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed.**

**R4-2108955 Cat-A CR to FR2 CORESET and Search Space RMC in Rel-16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1843 rev Cat: A (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed.**

**R4-2108956 Cat-A CR to FR2 CORESET and Search Space RMC in Rel-17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1844 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed.**

**R4-2108957 Cat-F CR to PDSCH RMC in Rel-15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1845 rev Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed.**

**R4-2108029 Cat-F CR to PDSCH RMC in Rel-15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1845 rev Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Decision: Withdrawn.**

**R4-2108958 Cat-A CR to PDSCH RMC in Rel-16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1846 rev Cat: A (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed.**

**R4-2108959 Cat-A CR to PDSCH RMC in Rel-17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1847 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed.**

**R4-2108960 Cat-F CR to TRS Configuration in Rel-15 Test Case**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1848 rev Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed.**

**R4-2108961 Cat-A CR to TRS Configuration in Rel-16 Test Case**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1849 rev Cat: A (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed.**

**R4-2108962 Cat-A CR to TRS Configuration in Rel-17 Test Case**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1850 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed.**

**R4-2108998 Maintenance CR for test cases - R15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1855 rev Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2108203 (from R4-2108998).**

**R4-2108203 Maintenance CR for test cases - R15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1855 rev Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Decision: Agreed.**

**R4-2108999 Maintenance CR for test cases - R16 Cat A**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1856 rev Cat: A (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

This is a Cat A CR.

**Decision: Agreed.**

**R4-2109000 Maintenance CR for test cases - R17 Cat A**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1857 rev Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Abstract:**

This is a Cat A CR.

**Decision: Agreed.**

**R4-2109074 CR on BFD and link recovery test cases**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1862 rev Cat: F (Rel-15)  
  
 Source: CATT*

**Decision: Agreed.**

**R4-2109075 CR on BFD and link recovery test cases**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1863 rev Cat: A (Rel-16)  
  
 Source: CATT*

**Decision: Agreed.**

**R4-2109076 CR on BFD and link recovery test cases**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1864 rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Agreed.**

**R4-2109176 Discussion on FR2 inter-frequency relative RSRP accuracy**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2109637 Correction on the SS-RSRP difference value for SS-RSRP measurement TC in R15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1928 rev Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2108204 (from R4-2109637).**

**R4-2108204 Correction on the SS-RSRP difference value for SS-RSRP measurement TC in R15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1928 rev Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Decision: Agreed.**

**R4-2109638 Correction on the SS-RSRP difference value for SS-RSRP measurement TC in R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1929 rev Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2108205 (from R4-2109638).**

**R4-2108205 Correction on the SS-RSRP difference value for SS-RSRP measurement TC in R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1929 rev Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Agreed.**

**R4-2109639 Correction on the SS-RSRP difference value for SS-RSRP measurement TC in R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1930 rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2108206 (from R4-2109639).**

**R4-2108206 Correction on the SS-RSRP difference value for SS-RSRP measurement TC in R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1930 rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Agreed.**

**R4-2109640 Correction on the CSI-reporting period for SCell activation delay in R15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1931 rev Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2108207 (from R4-2109640).**

**R4-2108207 Correction on the CSI-reporting period for SCell activation delay in R15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1931 rev Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Decision: Agreed.**

**R4-2109641 Correction on the CSI-reporting period for SCell activation delay in R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1932 rev Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2108208 (from R4-2109641).**

**R4-2108208 Correction on the CSI-reporting period for SCell activation delay in R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1932 rev Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Agreed.**

**R4-2109642 Correction on the CSI-reporting period for SCell activation delay in R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1933 rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2108209 (from R4-2109642).**

**R4-2108209 Correction on the CSI-reporting period for SCell activation delay in R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1933 rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Agreed.**

**R4-2109847 Further considerations on FR1 FR2 test case design**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2110239 CR to TS 38.133: Correction of TDD Configuration for several TCs (Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1981 rev Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed.**

**R4-2110255 CR to TS 38.133: Correction of TDD Configuration for several TCs (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1982 rev Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed.**

**R4-2110256 CR to TS 38.133: Correction of TDD Configuration for several TCs (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1983 rev Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed.**

**R4-2110257 CR to TS 38.133: Correction of OCNG pattern for several TCs (Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1984 rev Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Decision: Revised to R4-2108210 (from R4-2110257).**

**R4-2108210 CR to TS 38.133: Correction of OCNG pattern for several TCs (Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1984 rev Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed.**

**R4-2110258 CR to TS 38.133: Correction of OCNG pattern for several TCs (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1985 rev Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed.**

**R4-2110259 CR to TS 38.133: Correction of OCNG pattern for several TCs (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1986 rev Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed.**

**R4-2110260 CR to TS 38.133: Correction of IRAT TCs (Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1987 rev Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed.**

**R4-2110261 CR to TS 38.133: Correction of IRAT TCs (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1988 rev Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed.**

**R4-2110262 CR to TS 38.133: Correction of IRAT TCs (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1989 rev Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed.**

**R4-2110263 CR to TS 38.133: Corrections to SS-RSRP/RSRQ/SINR accuracy TCs (Rel 15)**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1990 rev Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed.**

**R4-2110264 CR to TS 38.133: Corrections to SS-RSRP/RSRQ/SINR accuracy TCs (Rel 16)**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1991 rev Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed.**

**R4-2110265 CR to TS 38.133: Corrections to SS-RSRP/RSRQ/SINR accuracy TCs (Rel 17)**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1992 rev Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed.**

**R4-2110266 CR to TS 38.133: Several corrections to TCs (Rel 15)**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1993 rev Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Decision: Revised to R4-2108025 (from R4-2110266).**

**R4-2108025 CR to TS 38.133: Several corrections to TCs (Rel 15)**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-1993 rev Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed.**

**R4-2110267 CR to TS 38.133: Several corrections to TCs (Rel 16)**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1994 rev Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed.**

**R4-2110268 CR to TS 38.133: Several corrections to TCs (Rel 17)**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1995 rev Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed.**

**R4-2110278 CR on maintaining condition requirements in TS38.133 R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1996 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110279 CR on maintaining condition requirements in TS38.133 R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1997 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110751 Correction to CSI-RS reference configuration\_R15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2056 rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2110752 Correction to CSI-RS reference configuration\_R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2057 rev Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2110753 Correction to CSI-RS reference configuration\_R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2058 rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2110754 Correction to LTE DRX reference configuration\_R15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2059 rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Merged.**

**R4-2110755 Correction to LTE DRX reference configuration\_R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2060 rev Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Withdrawn.**

**R4-2110770 Correction to LTE DRX reference configuration\_R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2069 rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Withdrawn.**

**R4-2110760 Correction to TRS reference configuration\_R15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2063 rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2110761 Correction to TRS reference configuration\_R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2064 rev Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2110762 Correction to TRS reference configuration\_R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2065 rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2110763 Correction to FR1 test cases using DLBWP.0.2\_R15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2066 rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2108211 (from R4-2110763).**

**R4-2108211 Correction to FR1 test cases using DLBWP.0.2\_R15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2066 rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2110764 Correction to FR1 test cases using DLBWP.0.2\_R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2067 rev Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2110772 Correction to FR1 test cases using DLBWP.0.2\_R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2071 rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2110771 Correction to reference configurations related to DLBWP.0.2\_R15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2070 rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2110758 Correction to reference configurations related to DLBWP.0.2\_R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2061 rev Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2110759 Correction to reference configurations related to DLBWP.0.2\_R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2062 rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2110773 Correction to interruption during measurement on deactivated SCell test cases\_R15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2072 rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2110774 Correction to interruption during measurement on deactivated SCell test cases\_R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2073 rev Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2110768 Correction to interruption during measurement on deactivated SCell test cases\_R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2068 rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Agreed.**

**R4-2110782 Correction of test parameters for SA inter-frequency event triggered reporting TCs**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2074 rev Cat: F (Rel-15)  
  
 Source: Ericsson, Anritsu*

**Abstract:**

This CR corrects the test parameters for SA inter-frequency event triggered reporting test cases.

**Decision: Agreed.**

**R4-2110783 Correction of test parameters for SA inter-frequency event triggered reporting TCs**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2075 rev Cat: A (Rel-16)  
  
 Source: Ericsson, Anritsu*

**Abstract:**

This CR corrects the test parameters for SA inter-frequency event triggered reporting test cases.

**Decision: Agreed.**

**R4-2110784 Correction of test parameters for SA inter-frequency event triggered reporting TCs**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2076 rev Cat: A (Rel-17)  
  
 Source: Ericsson, Anritsu*

**Abstract:**

This CR corrects the test parameters for SA inter-frequency event triggered reporting test cases.

**Decision: Agreed.**

**R4-2111035 Maintenance CR for RRM test cases in Rel15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2112 rev Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Maintenance CR on RRM test cases

**Decision: Revised to R4-2108212 (from R4-2111035).**

**R4-2108212 Maintenance CR for RRM test cases in Rel15**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2112 rev Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Maintenance CR on RRM test cases

**Decision: Agreed.**

**R4-2111036 Maintenance CR for RRM test cases in Rel16 - Cat A**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2113 rev Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Cat-A maintenance CR on RRM test cases for Rel16

**Decision: Agreed.**

**R4-2111037 Maintenance CR for RRM test cases in Rel17 - Cat A**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2114 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Cat-A maintenance CR on RRM test cases for Rel17

**Decision: Agreed.**

**R4-2111317 Correction to AoA setup in FR2**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2137 rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Correction to AoA setup in FR2 tests from Rel-15

**Decision: Revised to R4-2108213 (from R4-2111317).**

**R4-2108213 Correction to AoA setup in FR2**

*Type: CR For: Agreement  
 38.133 v15.13.0 CR-2137 rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Correction to AoA setup in FR2 tests from Rel-15

**Decision: Agreed.**

**R4-2111318 Correction to AoA setup in FR2**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2138 rev Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Correction to AoA setup in FR2 tests from Rel-15

**Decision: Agreed.**

**R4-2111319 Correction to AoA setup in FR2**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2139 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Correction to AoA setup in FR2 tests from Rel-15

**Decision: Agreed.**

**R4-2111320 Correction to AoA setup and beam assumptions in FR2 tests in Rel-16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2140 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Correction to AoA setup and beam assumptions in FR2 tests in Rel-16. AoA and beams are defined in corresponding tests in Rel-15.

**Decision: Revised to R4-2108214 (from R4-2111320).**

**R4-2108214 Correction to AoA setup and beam assumptions in FR2 tests in Rel-16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2140 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Correction to AoA setup and beam assumptions in FR2 tests in Rel-16. AoA and beams are defined in corresponding tests in Rel-15.

**Decision: Agreed.**

**R4-2111321 Correction to AoA setup and beam assumptions in FR2 tests in Rel-16**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2141 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Correction to AoA setup and beam assumptions in FR2 tests in Rel-16. AoA and beams are defined in corresponding tests in Rel-15.

**Decision: Agreed.**

#### 4.1.10 Positioning specs maintenance (36.171, 37.171 and 38.171)

================================================================================

**Email discussion: [99-e][242] NR\_NewRAT\_Positioning**

**R4-2108166 Email discussion summary: [99-e][242] NR\_NewRAT\_Positioning** *Type: other For: Information  
 Source: Moderator (Spirent)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108372 (from R4-2108166).**

**R4-2108372 Email discussion summary: [99-e][242] NR\_NewRAT\_Positioning** *Type: other For: Information  
 Source: Moderator (Spirent)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108232 | WF on Frequency Bands for testing of A-GNSS Sensitivity requirements in NR and LTE | TBA |  |
| R4-2108233 | Reply LS on Frequency Bands for testing of A-GNSS Sensitivity requirements in NR and LTE | Apple |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2108881 | Addition of missing data for BDS B1C | Spirent | Return to | Agreeable. WI code needs to be clarified. |
| R4-2108882 | Addition of missing data for BDS B1C | Spirent | Return to | Agreeable. WI code needs to be clarified. |
|  |  |  |  |  |
|  |  |  |  |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108232 | WF on Frequency Bands for testing of A-GNSS Sensitivity requirements in NR and LTE | Apple | Return to |  |
| R4-2108233 | Reply LS on Frequency Bands for testing of A-GNSS Sensitivity requirements in NR and LTE | Apple | Return to |  |
| R4-2108881 | Addition of missing data for BDS B1C | Spirent | Agreed |  |

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**R4-2108232 WF on Frequency Bands for testing of A-GNSS Sensitivity requirements in NR and LTE**

*Type: other For: Approval  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108233 Reply LS on Frequency Bands for testing of A-GNSS Sensitivity requirements in NR and LTE**

*Type: LS out For: Approval  
 to RAN5  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108881 Addition of missing data for BDS B1C**

*Type: CR For: Agreement  
 38.171 v16.0.0 CR-0012 rev Cat: F (Rel-16)  
  
 Source: Spirent Communications*

Session chair: This is a Cat F TEI16 CR, which corresponds to the previously introduced BDS B1C functionality. The previous CRs (R4-2008540, R4-2008551) were introduced as TEI and therefore no new TEI identifier is introduced.

**Decision: Agreed.**

**R4-2108882 Addition of missing data for BDS B1C**

*Type: CR For: Agreement  
 36.171 v16.1.0 CR-0021 rev Cat: F (Rel-16)  
  
 Source: Spirent Communications*

Session chair: This is a Cat A TEI16 CR, which corresponds to the previously introduced BDS B1C functionality. The previous CRs (R4-2008540, R4-2008551) were introduced as TEI and therefore no new TEI identifier is introduced.

**Decision: Agreed.**

**R4-2109002 Frequency bands for testing of A-GNSS sensitivity requirements in NR and LTE**

*Type: discussion For: (not specified)  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2109326 Further discussion on testing of A-GNSS Sensitivity requirements in NR and LTE**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2110199 Discussion on Frequency Bands for testing of A-GNSS Sensitivity requirements in NR and LTE**

*Type: discussion For: Approval  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2110959 Discussion on frequency bands for testing of A-GNSS Sensitivity requirements in NR and LTE**

*Type: discussion For: (not specified)  
 Source: Spirent Communications*

Session chair: moved from AI 13.1

**Decision: Noted.**

### 4.2 LTE maintenance (up to Rel15)

================================================================================

**Email discussion: [99-e][203] LTE\_RRM\_maintenance**

**R4-2108127 Email discussion summary: [99-e][203] LTE\_RRM\_maintenance** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108373 (from R4-2108127).**

**R4-2108373 Email discussion summary: [99-e][203] LTE\_RRM\_maintenance** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108215 | WF on LTE RRM maintenance | Ericsson |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2110349 | CR on RRC re-establishment for NB-IoT R13 | Huawei, HiSilicon | Return to |  |
| R4-2110350 | CR on RRC re-establishment for NB-IoT R14 | Huawei, HiSilicon | Return to |  |
| R4-2110351 | CR on RRC re-establishment for NB-IoT R15 | Huawei, HiSilicon | Return to |  |
| R4-2110352 | CR on RRC re-establishment for NB-IoT R16 | Huawei, HiSilicon | Return to |  |
| R4-2110353 | CR on RRC re-establishment for NB-IoT R17 | Huawei, HiSilicon | Return to |  |
| R4-2110354 | CR on requirements of cell reselection for NB-IoT R14 | Huawei, HiSilicon | Revised |  |
| R4-2110355 | CR on requirements of cell reselection for NB-IoT R15 | Huawei, HiSilicon | Return to |  |
| R4-2110356 | CR on requirements of cell reselection for NB-IoT R16 | Huawei, HiSilicon | Return to |  |
| R4-2110357 | CR on requirements of cell reselection for NB-IoT R17 | Huawei, HiSilicon | Return to |  |
| R4-2109868 | Time synchronization assumption for RSS-based neighbor cell measurements | Qualcomm Incorporated | Revised |  |
| R4-2109869 | Time synchronization assumption for RSS-based neighbor cell measurements | Qualcomm Incorporated | Return to |  |
| R4-2110854 | CR on remaining issues in Rel-16 eMTC RRM | Huawei, HiSilicon | Noted. | To be merged with R4-2109868 based on comments. |
| R4-2110855 | CR on remaining issues in Rel-16 eMTC RRM R17 | Huawei, HiSilicon | Withdrawn |  |
| R4-2111251 | LS on RAN4 agreement on RSS based RSRQ measurement for cat-M | Ericsson | Return to |  |
| R4-2110375 | Clarification on asynchronous DAPS handover R16 | Huawei, HiSilicon | Return to |  |
| R4-2110376 | Clarification on asynchronous DAPS handover R17 | Huawei, HiSilicon | Return to |  |
| R4-2110391 | Correction on the synchronous condition for DAPS handover | Ericsson | ~~Return to~~ Revised | Session chair: CR coversheet issue |
| R4-2110392 | Correction on the synchronous condition for DAPS handover | Ericsson | Return to |  |
| R4-2110647 | Correction of RLM test parameters for MPDCCH performance improvement | Ericsson | Revised |  |
| R4-2110779 | Correction of RLM test parameters for MPDCCH performance improvement | Ericsson | Return to |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108215 | WF on LTE RRM maintenance | Ericsson | Agreeable |  |
| R4-2110349 | CR on RRC re-establishment for NB-IoT R13 | Huawei, HiSilicon | Noted |  |
| R4-2110350 | CR on RRC re-establishment for NB-IoT R14 | Huawei, HiSilicon | Withdrawn |  |
| R4-2110351 | CR on RRC re-establishment for NB-IoT R15 | Huawei, HiSilicon | Withdrawn |  |
| R4-2110352 | CR on RRC re-establishment for NB-IoT R16 | Huawei, HiSilicon | Withdrawn |  |
| R4-2110353 | CR on RRC re-establishment for NB-IoT R17 | Huawei, HiSilicon | Withdrawn |  |
| R4-2108216 | CR on requirements of cell reselection for NB-IoT R14 | Huawei, HiSilicon | ~~Agreeable~~ Return to | Session chair: Return to in GTW. |
| R4-2110355 | CR on requirements of cell reselection for NB-IoT R15 | Huawei, HiSilicon | ~~Agreeable~~ Return to | Cat-A |
| R4-2110356 | CR on requirements of cell reselection for NB-IoT R16 | Huawei, HiSilicon | ~~Agreeable~~ Return to | Cat-A |
| R4-2110357 | CR on requirements of cell reselection for NB-IoT R17 | Huawei, HiSilicon | ~~Agreeable~~ Return to | Cat-A |
| R4-2108217 | Time synchronization assumption for RSS-based neighbor cell measurements | Qualcomm Incorporated | Agreeable |  |
| R4-2109869 | Time synchronization assumption for RSS-based neighbor cell measurements | Qualcomm Incorporated | Agreeable | Cat-A |
| R4-2110855 | CR on remaining issues in Rel-16 eMTC RRM R17 | Huawei, HiSilicon | Withdrawn | Original CR (R4-2110854) was merged. Cat-A shall be withdrawn. |
| R4-2111251 | LS on RAN4 agreement on RSS based RSRQ measurement for cat-M | Ericsson | Noted |  |
| R4-2110375 | Clarification on asynchronous DAPS handover R16 | Huawei, HiSilicon | Noted |  |
| R4-2110376 | Clarification on asynchronous DAPS handover R17 | Huawei, HiSilicon | Withdrawn | Cat-A |
| R4-2108218 | Correction on the synchronous condition for DAPS handover | Ericsson | Withdrawn |  |
| R4-2110392 | Correction on the synchronous condition for DAPS handover | Ericsson | Withdrawn | Cat-A |
| R4-2108219 | Correction of RLM test parameters for MPDCCH performance improvement | Ericsson | Agreeable |  |
| R4-2110779 | Correction of RLM test parameters for MPDCCH performance improvement | Ericsson | Agreeable | Cat-A |

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#### 4.2.3 RRM requirements

**R4-2108215 WF on LTE RRM maintenance**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2110349 CR on RRC re-establishment for NB-IoT R13**

*Type: CR For: Agreement  
 36.133 v13.21.0 CR-7092 rev Cat: F (Rel-13)  
  
 Source: Huawei, HiSilicon*

Session chair: Rel-13 CR. Need very strong justification to make changes to Rel-13. Further clarifications whether the change is critical and on backward compatibility shall be provided. Need to come back in GTW before CR is agreed.

**Decision: Postponed.**

**R4-2110350 CR on RRC re-establishment for NB-IoT R14**

*Type: CR For: Agreement  
 36.133 v14.18.0 CR-7093 rev Cat: A (Rel-14)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2110351 CR on RRC re-establishment for NB-IoT R15**

*Type: CR For: Agreement  
 36.133 v15.13.0 CR-7094 rev Cat: A (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2110352 CR on RRC re-establishment for NB-IoT R16**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7095 rev Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2110353 CR on RRC re-establishment for NB-IoT R17**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7096 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2110354 CR on requirements of cell reselection for NB-IoT R14**

*Type: CR For: Agreement  
 36.133 v14.18.0 CR-7097 rev Cat: F (Rel-14)  
  
 Source: Huawei, HiSilicon, MediaTek inc*

**Decision: Revised to R4-2108216 (from R4-2110354).**

**R4-2108216 CR on requirements of cell reselection for NB-IoT R14**

*Type: CR For: Agreement  
 36.133 v14.18.0 CR-7097 rev Cat: F (Rel-14)  
  
 Source: Huawei, HiSilicon, MediaTek inc*

Session chair: Rel-14 CR. Need very strong justification to make changes to Rel-14. Further clarifications whether the change is critical and on backward compatibility shall be provided. Need to come back in GTW before CR is agreed.

**Session chair: come back in GTW**

MTK: Fix inconsistency between R13 and R14. There was some issue with CR implementation in the past.

Huawei: Previously Cat A CRs were not implemented correctly.

**Decision: Agreed.**

**R4-2110355 CR on requirements of cell reselection for NB-IoT R15**

*Type: CR For: Agreement  
 36.133 v15.13.0 CR-7098 rev Cat: A (Rel-15)  
  
 Source: Huawei, HiSilicon, MediaTek inc*

**Decision: Agreed.**

**R4-2110356 CR on requirements of cell reselection for NB-IoT R16**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7099 rev Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon, MediaTek inc*

**Decision: Agreed.**

**R4-2110357 CR on requirements of cell reselection for NB-IoT R17**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7100 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon, MediaTek inc*

**Decision: Agreed.**

## 5 Rel-16 maintenance

### 5.1 NR maintenance

#### 5.1.1 Enhancements on MIMO for NR

================================================================================

**Email discussion: [99-e][205] NR\_eMIMO\_RRM**

**R4-2108128 Email discussion summary: [99-e][205] NR\_eMIMO\_RRM** *Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108374 (from R4-2108128).**

**R4-2108374 Email discussion summary: [99-e][205] NR\_eMIMO\_RRM** *Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 24th)

* Issue 1-1: Applicability of MRTD/MTTD requirements
  + Proposals
    - Proposal: To capture 96e agreements on Multi-TRP in the spec, explicitly add an explanation for applicability of the requirements to Multi-TRxP. (Apple R4-2109336, captured as below)

|  |
| --- |
| 3.6.11 Applicability of MRTD/MTTD requirements in intra-band DC/CA Unless explicitly stated otherwise the Maximum Transmission Timing Difference (MTTD) and Maximum Receive Timing Difference (MRTD) requirements in clauses 7.5.3, 7.6.3 and 7.6.4 for co-located deployment are applicable when   * ~~The network configures MIMO or TX diversity~~ * When UE is configured to receive multiple PDCCH * When UE is configured by *repetitionScheme* set to one of 'fdmSchemeA', 'fdmSchemeB' and 'tdmSchemeA' |

* + - Option 1: Support (Apple, QC, MTK)
    - Option 2: Do not support (Huawei, Nokia, Ericsson)
  + Background: RAN4#96e agreement:
    - No RRM core requirement impact identified on MRTD/MTTD values specified in Rel-15;
    - It is RAN4 common understanding that MRTD/MTTD requirements in clauses 7.5.3, 7.6.3 and 7.6.4 is sufficient for support the deployment with multi-DCI based and single-DCI based multi-TRxP transmission
  + Discussion
    - Session chair: what does network configure TX diversity mean (is there any signalling)?
      * Apple: ok to remove the first line
    - QC: support the proposals
    - Huawei: Do not see the need
    - E///: Multi-TRP corresponds to MIMO. RAN1 had a clear agreement for Multi-TRP case the signals from multiple TRPs shall be within 1 CP and this means that Multi-TRP is equivalent to regular MIMO scheme. Not all agreements shall be captured in the spec.
    - Nokia: We see no need to capture this.
    - Apple: It seems that everyone agrees with the technical part. Then it is not clear why we cannot capture this.
    - Samsung: This requirement is already applicable to the Multi-TRP case. If we add clarification for MRTD, do we need to clarify this for each possible requirement?
      * Apple: are there any examples?
      * Samsung: companies may bring proposals for other requirements.
      * Apple: it looks like the concern is more for the spec maintenance. We do not expect many other cases.
    - Session chair: Continue discussion. Further clarify MRTD/MTTD requirements for multi-TRP case in the spec. The contents of the CR need further discussion (e.g. clarify what is the definition of MRTD for multi-TRP case).

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108225 | WF on NR eMIMO RRM requirement Maintenance | Samsung | To capture the meeting agreements in the WF. |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2109334 | CR to 38.133 on Link recovery requirements - R16 | Apple | Agreeable | Editorial changes for CBD requirement. |
| R4-2109336 | CR to 38.133 on applicability of requirements to multi-TRxP - R16 | Apple | Return to | More discussion needed.  It is not Cat B CR. Should be Cat F CR. |
| R4-2109643  R4-2109644 | Introduce the SCell beam failure recovery without the dedicated PUCCH resource in R16  Introduce the SCell beam failure recovery without the dedicated PUCCH resource in R17 | MTK | Revised | Revised according to comments.  Revised for R4-2109643 only. |
| R4-2110144 | CR to 38.133 Correction on SCell BFR for no dedicated PUCCH case (Rel-16) | Samsung | Merged | Merged to R4-2109643 |
| R4-2110285 | CR on maintaining L1-SINR measurent requirements R16 | Huawei | Agreeable |  |
| R4-2110035 | CR to 38.133 Correction on the requirement of FR2 L1-SINR measurement accuracy (Rel-16) | Samsung | Return to | Based on Issue 2-1-1 |
| R4-2110280 | CR on maintaining L1-SINR measurent accuracy requirements R16 | Huawei | Revised | More discussion needed. |
| R4-2110283 | CR on maintaining L1-SINR measurement accuracy tests R16 | Huawei | Agreeable |  |
| R4-2110476 | CR on condition requirements for L1-SINR measurements R16 | Huawei | Merged | Merged to Nokia’s CR |
| R4-2110477 | CR on condition requirements for L1-SINR measurements R17 | Huawei | Revised | Revised according to 2nd round discussion.  supposed to be a category F CR. |
| R4-2110654 | Correction of test case of link recovery with link recovery requests | Ericsson | Agreeable |  |
| R4-2111272 | CR to TS 38.133: Adding conditions for L1-SINR reporting (Annex B.2) | Nokia | Revised | Supposed to be a category F CR. No Cat A CR corresponding to this CR. |
| R4-2111287 | CR to TS 38.133: Corrections to the table for L1-SINR absolute accuracy for CSI-RS based CMR only (10.1.27.1.1) | Nokia | Merged | Merged to Huawei’s CR |
| R4-2111322 | Correction to beam assumptions in L1-SINR FR2 tests | Ericsson | Revised | Revised according to comments. |
| R4-2108761 | [CR] Test cases for applicable timing for PL RS activated by MAC-CE | ZTE | Revised | Revised according to comments and 2nd round discussion. |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108374 | Email discussion summary: [99-e][205] NR\_eMIMO\_RRM | Samsung | Noted |  |
| R4-2108225 | WF on NR eMIMO RRM requirement Maintenance | Samsung | Agreeable |  |
| R4-2108227 | CR on maintaining L1-SINR measurement accuracy requirements R16 | Huawei | Agreeable |  |
| R4-2108228 | [CR] Test cases for applicable timing for PL RS activated by MAC-CE | ZTE | Return to | Per company’s request, we may have a discussion in GTW to clarify the issues, or otherwise Postponed.  An additional LS is prepared by ZTE. |
| R4-2110035 | CR to 38.133 Correction on the requirement of FR2 L1-SINR measurement accuracy (Rel-16) | Samsung | Agreeable | Agreeable is majority view in 1st round and no more comments received in 2nd round. |
| R4-2108229 | Correction to beam assumptions in L1-SINR FR2 tests | Ericsson | Agreeable | Ericsson replied to Apple’s concern in reflector and no more comments received. |
| R4-2108026 | CR to 38.133 on applicability of requirements to multi-TRxP - R16 | Apple | Return to | Per company’s strong request, it is marked as “Return to”. It may be discussed in GTW, or otherwise Postponed. |
| R4-2108028 | Introduce the SCell beam failure recovery without the dedicated PUCCH resource in R16 | MTK | Agreeable | No more comments received in 2nd round. |
| R4-2108416 | CR to TS 38.133: Adding conditions for L1-SINR reporting (Annex B.2) (Rel-16) | Nokia | Agreeable |  |
| R4-2108415 | CR on condition requirements for L1-SINR measurements R17 | Huawei | Agreeable |  |
| R4-2108763 | Test cases for applicable timing for PL RS activated by MAC-CE | ZTE | Noted | Discussion paper for CR R4-2108228 |
| R4-2110282 | Discussion on testability of pathloss-RS activation delay | Huawei, HiSilicon | Noted | Discussion paper for PL RS test case. |

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**R4-2108225 WF on NR eMIMO RRM requirement Maintenance**

*Type: other For: Approval  
 Source: Samsung*

**Abstract:**

**Discussion:**

Tentative agreement: Further clarify MRTD/MTTD requirements applicability for multi-TRP and single TRP case ~~in the RAN4 specification~~.

E///: Object to capture in RAN4 specification. RAN2 specifications already clarify this.

E///, Nokia, Huawei: Object to capture in RAN4 specification

Apple: Do not understand E/// concern on this. There is clearly ambiguity among companies.

Apple: It is not constructive to object without technical reason.

Session chair: No technical arguments provided for the objection. Recommend companies to further discuss requirements applicability and how to capture this in the specification.

Agreement: Further clarify MRTD/MTTD requirements applicability for multi-TRP and single TRP case. FFS whether and how to capture this in RAN4 specification.

**Decision: Approved.**

##### 5.1.1.1 RRM performance requirements (38.133)

###### 5.1.1.1.1 L1-SINR measurement accuracy

**R4-2110034 Discussion on FR2 L1-SINR measurement accuracy OTA test**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2110280 CR on maintaining L1-SINR measurent accuracy requirements R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1998 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108227 (from R4-2110280).**

**R4-2108227 CR on maintaining L1-SINR measurement accuracy requirements R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1998 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110281 CR on maintaining L1-SINR measurement accuracy requirements R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1999 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2111287 CR to TS 38.133: Corrections to the table for L1-SINR absolute accuracy for CSI-RS based CMR only (10.1.27.1.1)**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2132 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

The table reference number and the caption for Table 10.1.27.1.1-1 seem to be misplaced. They appear in the first column in the table.

**Decision: Merged.**

**R4-2111289 CR to TS 38.133: Corrections to the table for L1-SINR absolute accuracy for CSI-RS based CMR only (10.1.27.1.1)**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2133 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

The table reference number and the caption for Table 10.1.27.1.1-1 seem to be misplaced. They appear in the first column in the table.

**Decision: Merged.**

###### 5.1.1.1.2 Test cases

**R4-2108761 [CR] Test cases for applicable timing for PL RS activated by MAC-CE**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1806 rev Cat: B (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

Add test cases related to the core requirements for PL RS activation delay.

**Decision: Revised to R4-2108228 (from R4-2108761).**

**R4-2108228 [CR] Test cases for applicable timing for PL RS activated by MAC-CE**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1806 rev Cat: B (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

Add test cases related to the core requirements for PL RS activation delay.

**Discussion:**

ZTE: We would like to check if companies have technical concerns

Apple: For PL RS we do not have any accuracy requirements. The TC will not measure any accuracy. If there is huge accuracy error, UE will still pass the test. ZTE suggested L1-RSRP but this is different since we use L3 filtering for PL RS measurements. Also, we do not verify that PHR is in the valid range. It is not feasible to introduce the test.

Huawei: Same concerns as Apple. PHR test method is too complex.

ZTE: Agree we do not have accuracy requirement and therefore we test core requirements (delay only) and do not test accuracy. Accuracy requirement is a separate issue and we are open to further discus it. For L3 filtering – we agree it is used but we do not have the accuracy. We only say that UE needs to transmit PHR within a certain delay and do not verify the actual values.

Apple: We do not think it is a complete approach. UEs with huge measurement error will pass the test. It is meaningless.

ZTE: the reason is that we do not have accuracy requirement. Accuracy is a separate issue.

QC: Agree with Apple that we may need to further look into this.

Samsung: Agree with QC. L3 filtering window may have impact on the delay in the test.

Session chair: Come back in the next meeting. Proponents and opponents are encouraged to bring analysis on feasibility of the test.

**Decision: Postponed.**

**R4-2108762 [CR] Test cases for applicable timing for PL RS activated by MAC-CE (Cat A)**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1807 rev Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Abstract:**

This is a Cat A CR. Add test cases related to the core requirements for PL RS activation delay.

**Decision: Withdrawn.**

**R4-2108763 Test cases for applicable timing for PL RS activated by MAC-CE**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2110035 CR to 38.133 Correction on the requirement of FR2 L1-SINR measurement accuracy (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1969 rev Cat: F (Rel-16)  
  
 Source: Samsung*

**Decision: Agreed.**

**R4-2110036 CR to 38.133 Correction on the requirement of FR2 L1-SINR measurement accuracy (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1970 rev Cat: A (Rel-17)  
  
 Source: Samsung*

**Decision: Agreed.**

**R4-2110282 Discussion on testbility of pathloss-RS activation delay**

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

**Decision: Noted.**

**R4-2110283 CR on maintaining L1-SINR measurement accuracy tests R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2000 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110284 CR on maintaining L1-SINR measurement accuracy tests R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2001 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110654 Correction of test case of link recovery with link recovery requests**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2054 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects the link recovery test cases defined in eMIMO.

**Decision: Agreed.**

**R4-2110655 Correction of test case of link recovery with link recovery requests**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2055 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects the link recovery test cases defined in eMIMO.

**Decision: Agreed.**

**R4-2111322 Correction to beam assumptions in L1-SINR FR2 tests**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2142 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Beam assumption (rough) in L1-SINR FR2 tests introduced under eMIMO Rel-16 WI is defined.

**Decision: Revised to R4-2108229 (from R4-2111322).**

**R4-2108229 Correction to beam assumptions in L1-SINR FR2 tests**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2142 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Beam assumption (rough) in L1-SINR FR2 tests introduced under eMIMO Rel-16 WI is defined.

**Decision: Agreed.**

**R4-2111323 Correction to beam assumptions in L1-SINR FR2 tests**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2143 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Beam assumption (rough) in L1-SINR FR2 tests introduced under eMIMO Rel-16 WI is defined.

**Decision: Agreed.**

##### 5.1.1.3 Others

**R4-2109334 CR to 38.133 on Link recovery requirements - R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1901 rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Agreed.**

**R4-2109335 CR to 38.133 on Link recovery requirements - R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1902 rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Agreed.**

**R4-2109336 CR to 38.133 on applicability of requirements to multi-TRxP - R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1903 rev Cat: F (Rel-16)  
  
 Source: Apple*

Session chair: CR coversheet error. Please update in revision if CR is agreeable.

**Decision: Revised to R4-2108026 (from R4-2109336).**

**R4-2108026 CR to 38.133 on applicability of requirements to multi-TRxP - R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1903 rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Postponed.**

**R4-2109337 CR to 38.133 on applicability of requirements to multi-TRxP - R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1904 rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Withdrawn.**

**R4-2109643 Introduce the SCell beam failure recovery without the dedicated PUCCH resource in R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1934 rev Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Merged.**

**R4-2108226 Introduce the SCell beam failure recovery without the dedicated PUCCH resource in R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1934 rev Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Withdrawn.**

**R4-2108028 Introduce the SCell beam failure recovery without the dedicated PUCCH resource in R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2181 rev Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Agreed.**

**R4-2109644 Introduce the SCell beam failure recovery without the dedicated PUCCH resource in R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1935 rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2108420 (from R4-2109644).**

**R4-2108420 Introduce the SCell beam failure recovery without the dedicated PUCCH resource in R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1935 rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Agreed.**

**R4-2110144 CR to 38.133 Correction on SCell BFR for no dedicated PUCCH case (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1979 rev Cat: F (Rel-16)  
  
 Source: Samsung*

**Decision: Merged.**

**R4-2110145 CR to 38.133 Correction on SCell BFR for no dedicated PUCCH case (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1980 rev Cat: A (Rel-17)  
  
 Source: Samsung*

**Decision: Withdrawn.**

**R4-2110285 CR on maintaining L1-SINR measurement requirements R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2002 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110286 CR on maintaining L1-SINR measurement requirements R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2003 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2111272 CR to TS 38.133: Adding conditions for L1-SINR reporting (Annex B.2)**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2128 rev Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

The CR provides the text proposal for the conditions for NR L1-SINR reporting, which are required by the L1-SINR accuracy requirements.

**Decision: Revised to R4-2108416 (from R4-2111272).**

**R4-2108416 CR to TS 38.133: Adding conditions for L1-SINR reporting (Annex B.2)**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2128 rev Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

The CR provides the text proposal for the conditions for NR L1-SINR reporting, which are required by the L1-SINR accuracy requirements.

Session chair: The corresponding Rel-17 CR is R4-2108415.

**Decision: Agreed.**

**R4-2111284 CR to TS 38.133: Adding conditions for L1-SINR reporting (Annex B.2)**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2129 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

The CR provides the text proposal for the conditions for NR L1-SINR reporting, which are required by the L1-SINR accuracy requirements.

**Decision: Withdrawn.**

**R4-2110476 CR on condition requirements for L1-SINR measurements R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2052 rev Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Merged.**

**R4-2110477 CR on condition requirements for L1-SINR measurements R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2053 rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108415 (from R4-2110477).**

**R4-2108415 CR on condition requirements for L1-SINR measurements R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2053 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

Session chair: Cat F is required due to different table formats in R16/17. Changed to Cat F from Cat B. check with MCC to update the CR category

**Decision: Agreed.**

#### 5.1.2 UE power saving in NR

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**Email discussion: [99-e][243] NR\_UE\_pow\_sav\_RRM**

**R4-2108167 Email discussion summary: [99-e][243] NR\_UE\_pow\_sav\_RRM** *Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108375 (from R4-2108167).**

**R4-2108375 Email discussion summary: [99-e][243] NR\_UE\_pow\_sav\_RRM** *Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 26th)

* Issue 1-1: When Srxlev > SnonIntraSearchP and Squal > SnonIntraSearchQ and the UE is configured with *highPriorityMeasRelax* [2] then the UE shall search for inter-frequency layers (E-UTRA inter-RAT frequency layers) of higher priority at least every K2\*Thigher\_priority\_search where Thigher\_priority\_search is described in clause 4.2.2.7 and, K2 = 60. Whether to change “K2\* Thigher\_priority\_search” to “1 hour” directly?
  + Proposals
    - Option 1: Yes. Accept the proposal in R4-2109845. Change it to “1 hour” (vivo, Huawei, QC, MTK)
    - Option 2: No. Keep the existing requirements defined in TS38.133 and RAN4 sends an LS to RAN2 (CATT, Ericsson, Apple)
  + RAN4 #98-bis-e
    - Session chair: For issue “Whether to change “K2\* Thigher\_priority\_search” to “1 hour” in Slide 2, continue discussion in RAN4 #98-bis-e. If no consensus is reached to modify RAN4 specification, then LS to RAN2 shall be sent to inform on mismatch in RAN4 and RAN2 specs.
  + Discussion
    - Apple: Option 2
    - QC: Option 1
    - vivo: 1h is RAN2 conclusion. No need to send LS.
    - E///: LS to RAN2 can be helpful to inform on mismatch.
    - Huawei: Option 1.
  + Session chair: No consensus to revise previous agreements
  + Agreement: Send LS to RAN2 to inform on RAN4 agreement and mismatch in RAN4 and RAN2 specs.
* Issue 2-1: Whether to consider UE gain G for two test cases of FR2 inter-frequency measurement?
  + Proposals
    - Option 1: No. Follow the release 15 approach in defining the FR2 inter-frequency test cases and shall not consider UE gain factor G (Ericsson, CATT, vivo)
    - Option 1a: Follow the release 15 approach in defining the FR2 inter-frequency test cases. Impact of UE gain shall be discussed in Rel-15.
    - Option 2: Yes. (MTK)
  + Agreements:
    - Follow the release 15 approach in defining the FR2 inter-frequency test cases.

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108230 | LS on RRM relaxation in power saving | CATT, Ericsson | To: RAN2 |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2109845 | CR for removing scaling factor K2 for R16 UE power saving | vivo | Return to |  |
| R4-2109846  (Cat-A) | CR for removing scaling factor K2 for R16 UE power saving | vivo |  |  |
| R4-2110362 | Correction on measurement requiements in relaxed measurement | Huawei,HiSilicon | Return to |  |
| R4-2110363  (Cat-A) | Correction on measurement requiements in relaxed measurement | Huawei,HiSilicon |  |  |
| R4-2109071 | Correction to cell reselection test case for UE Power saving | CATT | Agreeable |  |
| R4-2109072  (Cat-A) | Correction to cell reselection test case for UE Power saving | CATT |  |  |
| R4-2111240 | Changes to cell reselection tests under power saving | Ericsson | To be revised |  |
| R4-2111239  (Cat-A) | Changes to cell reselection tests under power saving | Ericsson |  |  |
| R4-2109073 | Draft LS on RRM relaxation in power saving | CATT | To be noted. |  |
| R4-2111241 | LS on relaxed requirements for higher priority carriers | Ericsson | To be noted. |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108230 | LS on RRM relaxation in power saving | CATT, Ericsson | Agreeable | R4-2108230 |
| R4-2109845 | CR for removing scaling factor K2 for R16 UE power saving | vivo | To be noted | R4-2109845 |
| R4-2109846  (Cat-A) | CR for removing scaling factor K2 for R16 UE power saving | vivo |  | R4-2109846  (Cat-A) |
| R4-2108413  (Revised from  R4-2110362) | Correction on measurement requiements in relaxed measurement | Huawei,HiSilicon | To be noted | R4-2108413  (Revised from  R4-2110362) |
| R4-2110363  (Cat-A) | Correction on measurement requiements in relaxed measurement | Huawei,HiSilicon |  | R4-2110363  (Cat-A) |
| R4-2108231  (Revised from R4-2111240) | Changes to cell reselection tests under power saving | Ericsson | Agreeable | R4-2108231  (Revised from R4-2111240) |
| R4-2111239  (Cat-A) | Changes to cell reselection tests under power saving | Ericsson |  | R4-2111239  (Cat-A) |

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##### 5.1.2.2 Others

**R4-2108230 LS on RRM relaxation in power saving**

*Type: LS out For: Approval  
 to RAN2  
 Source: CATT, Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2109071 Correction to cell reselection test case for UE Power saving**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1860 rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Agreed.**

**R4-2109072 Correction to cell reselection test case for UE Power saving**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1861 rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Agreed.**

**R4-2109073 Draft LS on RRM relaxation in power saving**

*Type: LS out For: Approval  
 to RAN2  
 Source: CATT*

**Decision: Noted.**

**R4-2109844 Remain issues on Rel-16 UE power saving**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2109845 CR for removing scaling factor K2 for R16 UE power saving**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1936 rev Cat: F (Rel-16)  
  
 Source: vivo*

Session chair: CR coversheet error. Please update in revision if CR is agreeable.

**Decision: Postponed.**

**R4-2109846 CR for removing scaling factor K2 for R16 UE power saving**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1937 rev Cat: A (Rel-17)  
  
 Source: vivo*

**Decision: Withdrawn.**

**R4-2110361 Discussion on measurement requirements for relaxed carriers and non-relaxed carriers**

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

**Decision: Noted.**

**R4-2110362 Correction on measurement requiements in relaxed measurement**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2034 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

Session chair: CR coversheet error. Please update in revision if CR is agreeable.

**Decision: Revised to R4-2108413 (from R4-2110362).**

**R4-2108413 Correction on measurement requiements in relaxed measurement**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2034 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

Session chair: CR coversheet error. Please update in revision if CR is agreeable.

**Decision: Postponed.**

**R4-2110363 Correction on measurement requirements in relaxed measurement**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2035 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2111225 Changes to cell reselection tests under power saving**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2120 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The cell reselection test cases contain square brackets which for the signal levels which are removed. Signal levels are checked and no need to further modify them.

Session chair: moved from AI 5.1.2. Please do not submit tdocs to the top-level agenda unless explicitly allowed

**Decision: Withdrawn.**

**R4-2111224 Changes to cell reselection tests under power saving**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2119 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The cell reselection test cases contain square brackets which for the signal levels which are removed. Signal levels are checked and no need to further modify them.

Session chair: moved from AI 5.1.2. Please do not submit tdocs to the top-level agenda unless explicitly allowed

**Decision: Withdrawn.**

**R4-2111226 LS on relaxed requirements for higher priority carriers**

*Type: LS out For: Approval  
 to RAN2  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss one of the open issues in release 16 UE power saving WI. At RAN4#98e meeting a way forward contain following two open issues related to relaxation of higher priority carriers and whether to consider UE gain in the FR2 test

Session chair: moved from AI 5.1.2. Please do not submit tdocs to the top-level agenda unless explicitly allowed

**Decision: Withdrawn.**

**R4-2111240 Changes to cell reselection tests under power saving**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2122 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The cell reselection test cases contain square brackets which for the signal levels which are removed. Signal levels are checked and no need to further modify them.

Session chair: moved from AI 5.1.2. Please do not submit tdocs to the top-level agenda unless explicitly allowed

**Decision: Revised to R4-2108231 (from R4-2111240).**

**R4-2108231 Changes to cell reselection tests under power saving**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2122 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The cell reselection test cases contain square brackets which for the signal levels which are removed. Signal levels are checked and no need to further modify them.

**Decision: Agreed.**

**R4-2111239 Changes to cell reselection tests under power saving**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2121 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The cell reselection test cases contain square brackets which for the signal levels which are removed. Signal levels are checked and no need to further modify them.

Session chair: moved from AI 5.1.2. Please do not submit tdocs to the top-level agenda unless explicitly allowed

**Decision: Agreed.**

**R4-2111241 LS on relaxed requirements for higher priority carriers**

*Type: LS out For: Approval  
 to RAN2  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss one of the open issues in release 16 UE power saving WI. At RAN4#98e meeting a way forward contain following two open issues related to relaxation of higher priority carriers and whether to consider UE gain in the FR2 test

Session chair: moved from AI 5.1.2. Please do not submit tdocs to the top-level agenda unless explicitly allowed

**Decision: Noted.**

#### 5.1.3 NR RRM requirement enhancement

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**Email discussion: [99-e][206] NR\_RRM\_Enh\_RRM\_1**

**R4-2108130 Email discussion summary: [99-e][206] NR\_RRM\_Enh\_RRM\_1** *Type: other For: Information  
 Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108376 (from R4-2108130).**

**R4-2108376 Email discussion summary: [99-e][206] NR\_RRM\_Enh\_RRM\_1** *Type: other For: Information  
 Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2110338 (Rel-16)  R4-2110339 (Rel-17) | CR on maintenance of BWP Switch on multiple CCs 38133 R16  CR on maintenance of BWP Switch on multiple CCs 38133 R17 | Huawei, HiSilicon | Agreeable |  |
| R4-2110340 (Rel-16)  R4-2110341 (Rel-17) | CR on maintenance of BWP Switch on multiple CCs 36133 R16  CR on maintenance of BWP Switch on multiple CCs 36133 R17 | Huawei, HiSilicon | Agreeable |  |
| [R4-2111038](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111038.zip) (Rel-16)  R4-2111039 (Rel-17) | CR on RRC-based BWP switch on multiple CCs in Rel16  CR on RRC-based BWP switch on multiple CCs in Rel17-Cat A | Nokia | Revised | Both new formal CR for Rel-16 and Cat A CR for Rel-17 are needed. |
| [R4-2109340](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109340.zip) (Rel-16)  [R4-2109374](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109340.zip) (Rel-17) | CR to 38.133 on Uplink Spatial relation switch for PUCCH - R16  CR to 38.133 on Uplink Spatial relation switch for PUCCH - R17 | Apple | Revised | Both new formal CR for Rel-16 and Cat A CR for Rel-17 are needed. |
| [R4-2109240](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109240.zip) (Rel-16)  R4-2109241(Rel-17) | CR on RRC based BWP switching on multiple CCs of EN-DC for FR1 (R16)  CR on RRC based BWP switching on multiple CCs of EN-DC for FR1 (R17) | Intel | Return to |  |
| [R4-2109342](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109342.zip) (Rel-16)  R4-2109343(Rel-17) | CR to introduce testcase for RRC based BWP switch on multiple CCs- SA in FR2 -R16  CR to introduce testcase for RRC based BWP switch on multiple CCs- SA in FR2 -R17 | Apple | Revised | Both new formal CR for Rel-16 and Cat A CR for Rel-17 are needed. |
| [R4-2110342](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110342.zip) | DraftCR on introdueing RRC based Active BWP Switch on multiple CCs in EN-DC FR2 | Huawei, HiSilicon | Revised | Since this is draftCR and it should be formal CR. Both new formal CR for Rel-16 and Cat A CR for Rel-17 are needed. |
| [R4-2111040](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111040.zip) (Rel-16)  [R4-2111040](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111040.zip) (Rel-17) | on test case for RRC-based BWP switch on multiple CCs - TC3  on test case for RRC-based BWP switch on multiple CCs - TC3 in Rel-17 Cat A | Nokia | Return to |  |
| [R4-2109619](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109619.zip) (Rel-16)  R4-2109620 (Rel-17) | CR for test cases for simultaneous DCI and Timer based BWP switch on multiple CCs for NR SA  CR for test cases for simultaneous DCI and Timer based BWP switch on multiple CCs for NR SA | vivo | Revised | Both new formal CR for Rel-16 and Cat A CR for Rel-17 are needed. |
| [R4-2109574](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109574.zip)(Rel-16)  R4-2111500(Rel-17) | CR: UL spatial relation test  (R17mirror) CR: UL spatial relation test | Qualcomm, Inc. | Agreeable |  |
| [R4-2111326](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111326.zip) (Rel-16)  R4-2111327 (Rel-17) | Correction to beam assumptions in FR2 tests on UL spatial relation  Correction to beam assumptions in FR2 tests on UL spatial relation | Ericsson | Revised | Both new formal CR for Rel-16 and Cat A CR for Rel-17 are needed. |

2nd round email discussion conclusions

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| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108234 (Rel-16)  (Revised from [R4-2111038](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111038.zip))  R4-2111039 (Rel-17) | CR on RRC-based BWP switch on multiple CCs in Rel16  CR on RRC-based BWP switch on multiple CCs in Rel17-Cat A | Nokia | Agreeable |  |
| R4-2108235 (Rel-16)  (Revised from [R4-2109340](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109340.zip))  [R4-2109374](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109340.zip) (Rel-17) | CR to 38.133 on Uplink Spatial relation switch for PUCCH - R16  CR to 38.133 on Uplink Spatial relation switch for PUCCH - R17 | Apple | Agreeable |  |
| R4-2108421(Rel-16)  (Revised from [R4-2109240](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109240.zip))  R4-2109241(Rel-17) | CR on RRC based BWP switching on multiple CCs of EN-DC for FR1 (R16)  CR on RRC based BWP switching on multiple CCs of EN-DC for FR1 (R17) | Intel | Agreeable |  |
| R4-2108027 (Rel-16)  (Revised from [R4-2109342](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109342.zip))  R4-2109343 (Rel-17) | CR to introduce testcase for RRC based BWP switch on multiple CCs- SA in FR2 -R16  CR to introduce testcase for RRC based BWP switch on multiple CCs- SA in FR2 -R17 | Apple | Agreeable |  |
| R4-2108031 (Rel-16)  (Revised from [R4-2110342](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110342.zip))  R4-2108238 (Rel-17) | DraftCR on introdueing RRC based Active BWP Switch on multiple CCs in EN-DC FR2  DraftCR on introdueing RRC based Active BWP Switch on multiple CCs in EN-DC FR2 | Huawei, HiSilicon | Agreeable |  |
| R4-2108030 (Rel-16)  (Revised from [R4-2111040](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111040.zip))  [R4-2111041](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111040.zip) (Rel-17) | on test case for RRC-based BWP switch on multiple CCs - TC3  on test case for RRC-based BWP switch on multiple CCs - TC3 in Rel-17 Cat A | Nokia | Agreeable |  |
| R4-2108239 (Rel-16)  (Revised from [R4-2109619](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109619.zip))  R4-2109620 (Rel-17) | CR for test cases for simultaneous DCI and Timer based BWP switch on multiple CCs for NR SA  CR for test cases for simultaneous DCI and Timer based BWP switch on multiple CCs for NR SA | vivo | Agreeable |  |
| R4-2108240 (Rel-16)  (Revised from [R4-2109574](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109574.zip))  R4-2111500 (Rel-17) | CR: UL spatial relation test  (R17mirror) CR: UL spatial relation test | Qualcomm, Inc. | Agreeable |  |
| R4-2108241 (Rel-16)  (Revised from [R4-2111326](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111326.zip))  R4-2111327 (Rel-17) | Correction to beam assumptions in FR2 tests on UL spatial relation  Correction to beam assumptions in FR2 tests on UL spatial relation | Ericsson | Agreeable |  |

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**Email discussion: [99-e][207] NR\_RRM\_Enh\_RRM\_2**

**R4-2108131 Email discussion summary: [99-e][207] NR\_RRM\_Enh\_RRM\_2** *Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108377 (from R4-2108131).**

**R4-2108377 Email discussion summary: [99-e][207] NR\_RRM\_Enh\_RRM\_2** *Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 26th)

* Issue 3-1: Whether to allow R16 UEs to skip some of R15 TCs
  + Proposals
    - Option 1: No (ZTE, Ericsson, Nokia)
    - Option 2: Yes, partly (Apple, QC)
  + Discussion
    - Moderator (ZTE): there was analysis showing the R16 test cases cannot sufficiently cover the R15 scenarios.
    - QC: Option 2.
    - Apple: We can skip R15 test cases since R16 can be more demanding. We have quite many examples. There are many other R15 test cases which verify functionality.
    - Nokia: Provided detailed analysis on test coverage.
    - E///: We need to make sure R15 functionality is tested.
  + Session chair: continue discussion

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108242 | WF on SRS carrier switching and mandatory gap patterns | ZTE corporation |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2109564 | CR: Correction on SRS carrier switching | Qualcomm, Inc. | To be merged |  |
| R4-2111497 | (R17mirror) CR:Correction on SRS carrier switching | Qualcomm, Inc. | withdrawn |  |
| R4-2109986 | CR on TS38.133 mandatory gaps - r16 | Ericsson, Mediatek Inc. | Return to |  |
| R4-2109987 | CR on TS38.133 mandatory gaps - r17 | Ericsson, Mediatek Inc. | Return to |  |
| R4-2109573 | CR: CGI reading test | Qualcomm, Inc. | revised |  |
| R4-2111499 | (R17mirror) CR: CGI reading test | Qualcomm, Inc. | Return to |  |
| R4-2109312 | CR for test applicability for mandatory gap patterns | Apple | Return to |  |
| R4-2111324 | Correction to beam assumptions in FR2 tests on Rel-16 Mandatory gaps | Ericsson | ~~Agreeable~~ Revised |  |
| R4-2111325 | Correction to beam assumptions in FR2 tests on Rel-16 Mandatory gaps | Ericsson | ~~Agreeable~~ Return to |  |
| R4-2109923 | CR to 38.133 correction on SRS carrier based switching core requirements | vivo, Qualcomm, Huawei, HiSilicon, MediaTek Inc., Apple, Nokia | ~~Agreeable~~ Revised |  |
| R4-2109924 | CR to 38.133 correction on SRS carrier based switching core requirements | vivo, Qualcomm, Huawei, HiSilicon, MediaTek Inc., Apple, Nokia | ~~Agreeable~~ Return to |  |
| R4-2109925 | CR to 38.133 correction on SRS carrier based switching test cases | vivo | ~~Agreeable~~ Revised |  |
| R4-2109926 | CR to 38.133 correction on SRS carrier based switching test cases | vivo | ~~Agreeable~~ Return to |  |
| R4-2110388 | Correction on SRS carrier switching | Huawei, HiSilicon | revised | To be revised to contain agreeable content in R4-2109564. Qualcomm can be added as a co-sourcing company. |
| R4-2110431 | Correction on SRS carrier switching | Huawei, HiSilicon | Return to |  |

2nd round email discussion conclusions

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| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| [R4-2109986](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109986.zip) | CR on TS38.133 mandatory gaps - r16 | Ericsson, Mediatek Inc. | Postponed |  |
| R4-2109987 | CR on TS38.133 mandatory gaps - r17 | Ericsson, Mediatek Inc. | withdrawn |  |
| R4-2108243 | CR: CGI reading test | Qualcomm, Inc. | agreeable |  |
| R4-2111499 | (R17mirror) CR: CGI reading test | Qualcomm, Inc. | agreeable |  |
| [R4-2109312](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109312.zip) | CR for test applicability for mandatory gap patterns | Apple | Postponed |  |
| R4-2108247 | Correction on SRS carrier switching | Huawei, HiSilicon, Qualcomm | agreeable |  |
| R4-2110431 | Correction on SRS carrier switching | Huawei, HiSilicon | agreeable |  |
| R4-2108242 | WF on SRS carrier switching and mandatory gap patterns | ZTE Corporation | Return to | Not sure if companies have enough time to check so let’s check it online during the final round return to |

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**Email discussion: [99-e][208] NR\_RRM\_Enh\_RRM\_3**

**R4-2108132 Email discussion summary: [99-e][208] NR\_RRM\_Enh\_RRM\_3** *Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108378 (from R4-2108132).**

**R4-2108378 Email discussion summary: [99-e][208] NR\_RRM\_Enh\_RRM\_3** *Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 24th)

* Issue 1-2: Condition of SMTC configuration to apply multiple SCell activation requirement
  + Proposals
    - Option 3 (Apple, QC, MTK):
      * Upon receiving SCell activation command in slot *n, i*f the TFirstSSB\_MAX in different bands which have SCells being activated after *n*+THARQ+3ms are not aligned on time domain among
        + SCells in different bands activated by the same MAC CE if UE does not support per FR gap, or
        + SCells in different FR1 bands activated by the same MAC CE if UE supports per FR gap,
        + At least one target SCell which needs AGC estimation is in the same band as an active serving cell
      * The multiple SCell activation and corresponding interruption requirement cannot apply.
    - Option 4 (HW, Nokia):
      * Upon receiving SCell activation command in slot *n,* if the closest SSB\_MAX after *n*+THARQ+3ms is not aligned on time domain among
        + SCells in different bands activated by the same MAC CE if UE does not support per FR gap, or
        + SCells in different FR1 bands activated by the same MAC CE if UE supports per FR gap,
      * If for a to-be-activated SCell the activation requirements involves TFirstSSB\_MAX, for activated FR1 serving cells in the same band there may be more interruption than allowed in clause 8.2
    - Option 5 (Ericsson):
      * Upon receiving SCell activation command in slot *n,* if the TFirstSSB\_MAX in different bands which have SCells being activated after *n*+THARQ+3ms are not aligned on time domain among
        + SCells in different bands being activated by the same MAC CE if UE does not support per FR gap, or
        + SCells in different FR1 bands being activated by the same MAC CE if UE supports per FR gap.
      * Multiple interruptions may be expected for the activated serving cells.
        + The number of interruptions cannot be larger than the number of FR1 bands which have both SCells requiring AGC retuning and the active serving cell.
        + In each interruption occasion, the interruption length X2 is defined in clause 8.2.2.2.2.
      * However, when the following conditions are fulfilled, there is no additional interruption is expected.
        + all SCells being activated are on FR2, or
        + no additional AGC retuning is needed for all SCells being activated, or
        + no active serving cell(s) in the same band with the SCells being activated which require AGC retuning
    - Option 5a (Apple):
      * Upon receiving SCell activation command in slot *n,* if the TFirstSSB\_MAX in different bands which have SCells being activated after *n*+THARQ+3ms are not aligned on time domain among
        + SCells in different bands being activated by the same MAC CE if UE does not support per FR gap, or
        + SCells in different FR1 bands being activated by the same MAC CE if UE supports per FR gap.
      * Multiple interruptions may be expected for the activated serving cells.
        + The number of interruptions cannot be larger than the number of FR1 bands which have both SCells requiring AGC retuning and the active serving cell.
        + In each interruption occasion, the interruption length X2 is defined in clause 8.2.2.2.2.
        + Longer activation delay may be expected for multiple SCell activation under one MAC CE with multiple interruptions.
      * However, when the following conditions are fulfilled, there is no additional interruption is expected.
        + all SCells being activated are on FR2, or
        + no additional AGC retuning is needed for all SCells being activated, or
        + no active serving cell(s) in the same band with the SCells being activated which require AGC retuning
  + Discussion
    - E///: Preference is Option 5 and can go with 5a. Disagree with Option 3 and 4, since Option 3 precludes many scenarios
    - Apple: We can support Option 3, 4 and 5a
    - Huawei: Can support Option 4 and 5a. Option 3 implies restriction on network. Further details shall be discussed for 4 and 5a (SSB instead of SSB\_MAX and number of interruptions).
    - Nokia: We can support 4 and 5a.
    - MTK: 5a is ok
  + Agreements:
    - Upon receiving SCell activation command in slot *n,* if the [TFirstSSB\_MAX] in different bands which have SCells being activated after *n*+THARQ+3ms are not aligned on time domain among
      * SCells in different bands being activated by the same MAC CE if UE does not support per FR gap, or
      * SCells in different FR1 bands being activated by the same MAC CE if UE supports per FR gap.
    - Multiple interruptions may be expected for the activated serving cells.
      * FFS: whether the number of interruptions can be larger than the number of FR1 bands which have both SCells requiring AGC retuning and the active serving cell.
      * In each interruption occasion, the interruption length X2 is defined in clause 8.2.2.2.2.
      * Longer activation delay may be expected for multiple SCell activation under one MAC CE with multiple interruptions.
      * The conditions when multiple interruptions are expected are FFS

1st round email discussion conclusions

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| [R4-2109523](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109524.zip) | CR on inter-frequency measurement without measurement gap | CMCC | Merged | Merge in MTK CR R4-2109883 |
| [R4-2109883](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109883.zip) | CR on TS38.133 for typo modifications on intra frequency and inter frequency measurement requirement | MediaTek inc. | Revised |  |
| [R4-2109989](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109989.zip) | CR on TS38.133 multiple SCell activation - r16 | Ericsson | Not Pursued |  |
| [R4-2110901](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110901.zip) | CR on SMTC alignment in multiple SCell activation | Huawei, HiSilicon | Revised |  |
| R4-2109984 | CR on TS38.133 inter-frequency without gap -r16 | Ericsson, Mediatek Inc. | ~~Agreeable~~ Revised |  |
| R4-2110898 | CR on SSB offset in multiple SCell activation | Huawei, HiSilicon | ~~Agreeable~~ Revised |  |
| R4-2110289 | CR on maintaining SCell activation and deactivation delay test for FR2 inter-band CA R16 | Huawei, HiSilicon | ~~Agreeable~~ Revised |  |

2nd round email discussion conclusions

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| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108248 | CR on TS38.133 for typo modifications on intra frequency and inter frequency measurement requirement | MediaTek inc. | Agreeable | Revised from R4-2109883 |
| R4-2108249 | CR on SMTC alignment in multiple SCell activation | Huawei, HiSilicon | Agreeable | Revised from R4-2110901 |
| R4-2108250 | CR on TS38.133 inter-frequency without gap -r16 | Ericsson, Mediatek Inc. | Agreeable | Revised from R4-2109984, correct coversheet |
| R4-2108251 | CR on SSB offset in multiple SCell activation | Huawei, HiSilicon | Agreeable | Revised from R4-2110898, correct coversheet |
| R4-2108252 | CR on maintaining SCell activation and deactication delay test for FR2 inter-band CA R16 | Huawei, HiSilicon | Agreeable | Revised from R4-2110289, correct coversheet |

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**R4-2108242 WF on SRS carrier switching and mandatory gap patterns**

*Type: other For: Approval  
 Source: ZTE*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2109923 CR to 38.133 correction on SRS carrier based switching core requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1945 rev Cat: F (Rel-16)  
  
 Source: vivo, Qualcomm, Huawei, HiSilicon, MediaTek Inc., Apple, Nokia*

**Decision: Revised to R4-2108245 (from R4-2109923).**

**R4-2108245 CR to 38.133 correction on SRS carrier based switching core requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1945 rev Cat: F (Rel-16)  
  
 Source: vivo, Qualcomm, Huawei, HiSilicon, MediaTek Inc., Apple, Nokia*

**Decision: Agreed.**

**R4-2109924 CR to 38.133 correction on SRS carrier based switching core requirements**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1946 rev Cat: A (Rel-17)  
  
 Source: vivo, Qualcomm, Huawei, HiSilicon, MediaTek Inc., Apple, Nokia*

**Decision: Agreed.**

**R4-2109925 CR to 38.133 correction on SRS carrier based switching test cases**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1947 rev Cat: F (Rel-16)  
  
 Source: vivo*

**Decision: Revised to R4-2108246 (from R4-2109925).**

**R4-2108246 CR to 38.133 correction on SRS carrier based switching test cases**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1947 rev Cat: F (Rel-16)  
  
 Source: vivo*

**Decision: Agreed.**

**R4-2109926 CR to 38.133 correction on SRS carrier based switching test cases**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1948 rev Cat: A (Rel-17)  
  
 Source: vivo*

**Decision: Agreed.**

**R4-2109984 CR on TS38.133 inter-frequency without gap -r16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1958 rev Cat: F (Rel-16)  
  
 Source: Ericsson, Mediatek Inc.*

**Abstract:**

The CR corrects inter-frequency without gap measurements

**Decision: Revised to R4-2108250 (from R4-2109984).**

**R4-2108250 CR on TS38.133 inter-frequency without gap -r16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1958 rev Cat: F (Rel-16)  
  
 Source: Ericsson, Mediatek Inc.*

**Abstract:**

The CR corrects inter-frequency without gap measurements

Session chair: CR coversheet error. Please update in revision if CR is agreeable. Correct WI code is NR\_RRM\_enh-Core

**Decision: Revised to R4-2108048 (from R4-2108250).**

**R4-2108048 CR on TS38.133 inter-frequency without gap -r16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1958 rev Cat: F (Rel-16)  
  
 Source: Ericsson, Mediatek Inc.*

**Abstract:**

The CR corrects inter-frequency without gap measurements

**Decision: Agreed.**

**R4-2109985 CR on TS38.133 inter-frequency without gap -r17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1959 rev Cat: A (Rel-17)  
  
 Source: Ericsson, Mediatek Inc.*

**Abstract:**

The CR corrects inter-frequency without gap measurements

**Decision: Agreed.**

**R4-2110338 CR on maintenance of BWP Switch on multiple CCs 38133 R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2029 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110339 CR on maintenance of BWP Switch on multiple CCs 38133 R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2030 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110340 CR on maintenance of BWP Switch on multiple CCs 36133 R16**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7090 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110341 CR on maintenance of BWP Switch on multiple CCs 36133 R17**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7091 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110388 Correction on SRS carrier switching**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2046 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108247 (from R4-2110388).**

**R4-2108247 Correction on SRS carrier switching**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2046 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon, Qualcomm*

**Decision: Agreed.**

**R4-2110431 Correction on SRS carrier switching**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2051 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110898 CR on SSB offset in multiple SCell activation**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2095 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108251 (from R4-2110898).**

**R4-2108251 CR on SSB offset in multiple SCell activation**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2095 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

Session chair: CR coversheet error. Please update in revision if CR is agreeable. Correct WI code is NR\_RRM\_enh-Core

**Decision: Agreed.**

**R4-2110899 CR on SSB offset in multiple SCell activation R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2096 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

##### 5.1.3.1 RRM core requirements

**R4-2109340 CR to 38.133 on Uplink Spatial relation switch for PUCCH - R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1905 rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Revised to R4-2108235 (from R4-2109340).**

**R4-2108235 CR to 38.133 on Uplink Spatial relation switch for PUCCH - R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1905 rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Agreed.**

**R4-2109374 CR to 38.133 on Uplink Spatial relation switch for PUCCH - R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1908 rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Agreed.**

**R4-2109523 CR on inter-frequency measurement without measurement gap**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1910 rev Cat: F (Rel-16)  
  
 Source: CMCC*

**Decision: Merged.**

**R4-2109524 CR on inter-frequency measurement without measurement gap**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1911 rev Cat: A (Rel-17)  
  
 Source: CMCC*

**Decision: Merged.**

**R4-2109564 CR:Correction on SRS carrier switching**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1919 rev Cat: F (Rel-16)  
  
 Source: Qualcomm, Inc.*

**Decision: Merged.**

**R4-2111497 (R17mirror) CR:Correction on SRS carrier switching**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2158 rev Cat: A (Rel-17)  
  
 Source: Qualcomm, Inc.*

**Decision: Withdrawn.**

**R4-2109883 CR on TS38.133 for typo modifications on intra frequency and inter frequency measurement requirement**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1943 rev Cat: D (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2108248 (from R4-2109883).**

**R4-2108248 CR on TS38.133 for typo modifications on intra frequency and inter frequency measurement requirement**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1943 rev Cat: D (Rel-16)  
  
 Source: MediaTek inc.*

Session chair: CR coversheet error. Please update in revision if CR is agreeable. Correct WI code is NR\_RRM\_enh-Core

**Decision: Agreed.**

**R4-2109884 CR on TS38.133 for typo modifications on intra frequency and inter frequency measurement requirement**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1944 rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Agreed.**

**R4-2109986 CR on TS38.133 mandatory gaps - r16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1960 rev Cat: F (Rel-16)  
  
 Source: Ericsson, Mediatek Inc.*

**Abstract:**

The CR deletes supportedGapPattern-NRonly in EN-DC or NE-DC for mandatory gap

Session chair: CR coversheet error. Please update in revision if CR is agreeable. Correct WI code is NR\_RRM\_enh-Core

**Decision: Postponed.**

**R4-2109987 CR on TS38.133 mandatory gaps - r17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1961 rev Cat: A (Rel-17)  
  
 Source: Ericsson, Mediatek Inc.*

**Abstract:**

The CR deletes supportedGapPattern-NRonly in EN-DC or NE-DC for mandatory gap

**Decision: Withdrawn.**

**R4-2109988 Remaining issues on Multiple SCell activation**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the open issues for active serving cell in the same band with SCell being activated

**Decision: Noted.**

**R4-2109989 CR on TS38.133 multiple SCell activation - r16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1962 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR fix the issue for active serving cell in the same band with SCell being activated

**Decision: Not pursued.**

**R4-2109990 CR on TS38.133 multiple SCell activation - r17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1963 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The CR fix the issue for active serving cell in the same band with SCell being activated

**Decision: Withdrawn.**

**R4-2110900 Discussion on remaining issues in multiple SCell activation**

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

**Decision: Noted.**

**R4-2110901 CR on SMTC alignment in multiple SCell activation**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2097 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108249 (from R4-2110901).**

**R4-2108249 CR on SMTC alignment in multiple SCell activation**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2097 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

Session chair: CR coversheet error. Please update in revision if CR is agreeable. Correct WI code is NR\_RRM\_enh-Core

**Decision: Agreed.**

**R4-2110902 CR on SMTC alignment in multiple SCell activation R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2098 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2111038 CR on RRC-based BWP switch on multiple CCs in Rel16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2115 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

An updated CR on RRC-based BWP switch on multiple CCs based on the endorsed draftCR R4-2105835 in RAN4#98bis-e

**Decision: Revised to R4-2108234 (from R4-2111038).**

**R4-2108234 CR on RRC-based BWP switch on multiple CCs in Rel16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2115 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

An updated CR on RRC-based BWP switch on multiple CCs based on the endorsed draftCR R4-2105835 in RAN4#98bis-e

Session chair: CR coversheet error. Please update in revision if CR is agreeable. Correct WI code is NR\_RRM\_enh-Core

**Decision: Agreed.**

**R4-2111039 CR on RRC-based BWP switch on multiple CCs in Rel17 - Cat A**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2116 rev Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Cat-A CR for an update on RRC-based BWP switch on multiple CCs based on the endorsed draftCR R4-2105835 in RAN4#98bis-e

**Decision: Agreed.**

##### 5.1.3.2 RRM performance requirements

###### 5.1.3.2.1 General

**R4-2110970 On test case applicability for mandatory measurement gaps in R15/R16**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on test case applicability for measurement gaps.

**Decision: Noted.**

###### 5.1.3.2.2 Test cases

5.1.3.2.2.1 SRS carrier switching requirements

5.1.3.2.2.2 Multiple Scell activation/deactivation

5.1.3.2.2.3 CGI reading requirements with autonomous gap

**R4-2109573 CR: CGI reading test**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1921 rev Cat: F (Rel-16)  
  
 Source: Qualcomm, Inc.*

**Decision: Revised to R4-2108243 (from R4-2109573).**

**R4-2108243 CR: CGI reading test**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1921 rev Cat: F (Rel-16)  
  
 Source: Qualcomm, Inc.*

Session chair: CR coversheet error. Please update in revision if CR is agreeable. Correct WI code is NR\_RRM\_enh-Perf

**Decision: Agreed.**

**R4-2111499 (R17mirror) CR: CGI reading test**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2160 rev Cat: A (Rel-17)  
  
 Source: Qualcomm, Inc.*

**Decision: Agreed.**

5.1.3.2.2.4 BWP switching on multiple CCs

**R4-2109240 CR on RRC based BWP switching on multiple CCs of EN-DC for FR1 (R16)**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1879 rev Cat: F (Rel-16)  
  
 Source: Intel Corporation*

Session chair: CR coversheet error. Please update in revision if CR is agreeable. Correct WI code is NR\_RRM\_enh-Core

**Decision: Revised to R4-2108421 (from R4-2109240).**

**R4-2108421 CR on RRC based BWP switching on multiple CCs of EN-DC for FR1 (R16)**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1879 rev Cat: F (Rel-16)  
  
 Source: Intel Corporation*

Session chair: CR coversheet error. Please update in revision if CR is agreeable. Correct WI code is NR\_RRM\_enh-Core

**Decision: Agreed.**

**R4-2109241 CR on RRC based BWP switching on multiple CCs of EN-DC for FR1 (R17)**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1880 rev Cat: A (Rel-17)  
  
 Source: Intel Corporation*

**Decision: Agreed.**

**R4-2109342 CR to introduce testcase for RRC based BWP switch on multiple CCs- SA in FR2 -R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1906 rev Cat: B (Rel-16)  
  
 Source: Apple*

**Decision: Revised to R4-2108236 (from R4-2109342).**

**R4-2108236 CR to introduce testcase for RRC based BWP switch on multiple CCs- SA in FR2 -R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1906 rev Cat: B (Rel-16)  
  
 Source: Apple*

Session chair: CR coversheet error. Please update in revision if CR is agreeable. Correct WI code is NR\_RRM\_enh-Perf

**Decision: Revised to R4-2108027 (from R4-2108236).**

**R4-2108027 CR to introduce testcase for RRC based BWP switch on multiple CCs- SA in FR2 -R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1906 rev Cat: F (Rel-16)  
  
 Source: Apple*

Session chair: CR coversheet error. Please update in revision if CR is agreeable. Correct WI code is NR\_RRM\_enh-Perf

**Decision: Agreed.**

**R4-2109343 CR to introduce testcase for RRC based BWP switch on multiple CCs- SA in FR2 -R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1907 rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Agreed.**

**R4-2109619 CR for test cases for simultaneous DCI and Timer based BWP switch on multiple CCs for NR SA**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1923 rev Cat: F (Rel-16)  
  
 Source: vivo*

**Decision: Revised to R4-2108239 (from R4-2109619).**

**R4-2108239 CR for test cases for simultaneous DCI and Timer based BWP switch on multiple CCs for NR SA**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1923 rev Cat: F (Rel-16)  
  
 Source: vivo*

Session chair: CR coversheet error. Please update in revision if CR is agreeable. Correct WI code is NR\_RRM\_enh-Perf

**Decision: Agreed.**

**R4-2109620 CR for test cases for simultaneous DCI and Timer based BWP switch on multiple CCs for NR SA**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1924 rev Cat: A (Rel-17)  
  
 Source: vivo*

**Decision: Agreed.**

**R4-2110342 DraftCR on introdueing RRC based Active BWP Switch on multiple CCs in EN-DC FR2**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Merged.**

**R4-2108237 CR on introducing RRC based Active BWP Switch on multiple CCs in EN-DC FR2**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-TBA rev Cat: B (Rel-16)  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108031 (from R4-2108237).**

**R4-2108031 CR on introducing RRC based Active BWP Switch on multiple CCs in EN-DC FR2**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2178 rev Cat: F (Rel-16)  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

Session chair: changed to Cat F

**Decision: Agreed.**

**R4-2108238 CR on introducing RRC based Active BWP Switch on multiple CCs in EN-DC FR2**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-TBA rev Cat: A (Rel-17)  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2111040 CR on test case for RRC-based BWP switch on multiple CCs - TC3**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2117 rev Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

CR on test case for RRC-based BWP switch on multiple CCs - TC3

**Decision: Revised to R4-2108417 (from R4-2111040).**

**R4-2108417 CR on test case for RRC-based BWP switch on multiple CCs - TC3**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2117 rev Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

CR on test case for RRC-based BWP switch on multiple CCs - TC3

**Decision: Revised to R4-2108030 (from R4-2108417).**

**R4-2108030 CR on test case for RRC-based BWP switch on multiple CCs - TC3**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2117 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

CR on test case for RRC-based BWP switch on multiple CCs - TC3

Session chair: CR coversheet error. Please update in revision if CR is agreeable. Correct WI code is NR\_RRM\_enh-Perf

Session chair: changed to Cat F

**Decision: Agreed.**

**R4-2111041 CR on test case for RRC-based BWP switch on multiple CCs - TC3 in Rel-17 - Cat A**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2118 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Cat-A CR on test case for RRC-based BWP switch on multiple CCs - TC3 in Rel-17

**Decision: Agreed.**

5.1.3.2.2.5 Inter-frequency measurement requirement without MG

5.1.3.2.2.6 Mandatory MG patterns

**R4-2108767 On test cases for mandatory gap patterns**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109312 CR for test applicability for mandatory gap patterns**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Postponed.**

**R4-2111278 Discussion on test cases for new mandatory GPs**

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

**Decision: Noted.**

**R4-2111324 Correction to beam assumptions in FR2 tests on Rel-16 Mandatory gaps**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2144 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Beam assumption is added in FR2 tests on spatial relation and mandatory gaps in Rel-16 introduced under RRM enhancement WI

**Decision: Revised to R4-2108244 (from R4-2111324).**

**R4-2108244 Correction to beam assumptions in FR2 tests on Rel-16 Mandatory gaps**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2144 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Beam assumption is added in FR2 tests on spatial relation and mandatory gaps in Rel-16 introduced under RRM enhancement WI

**Decision: Agreed.**

**R4-2111325 Correction to beam assumptions in FR2 tests on Rel-16 Mandatory gaps**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2145 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Beam assumption is added in FR2 tests on spatial relation and mandatory gaps in Rel-16 introduced under RRM enhancement WI

**Decision: Agreed.**

5.1.3.2.2.7 UE-specific CBW change

5.1.3.2.2.8 Spatial relation switch for uplink

**R4-2109574 CR: UL spatial relation test**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1922 rev Cat: F (Rel-16)  
  
 Source: Qualcomm, Inc.*

**Decision: Revised to R4-2108240 (from R4-2109574).**

**R4-2108240 CR: UL spatial relation test**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1922 rev Cat: F (Rel-16)  
  
 Source: Qualcomm, Inc.*

Session chair: CR coversheet error. Correct WI code is NR\_RRM\_enh-Perf. Please update in revision.

**Decision: Agreed.**

**R4-2111500 (R17mirror) CR: UL spatial relation test**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2161 rev Cat: A (Rel-17)  
  
 Source: Qualcomm, Inc.*

**Decision: Agreed.**

**R4-2111326 Correction to beam assumptions in FR2 tests on UL spatial relation**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2146 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Beam assumption is added in FR2 tests on UL spatial relation in Rel-16 introduced under RRM enhancement WI

**Decision: Revised to R4-2108241 (from R4-2111326).**

**R4-2108241 Correction to beam assumptions in FR2 tests on UL spatial relation**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2146 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Beam assumption is added in FR2 tests on UL spatial relation in Rel-16 introduced under RRM enhancement WI

Session chair: CR coversheet error. Please update in revision if CR is agreeable. Correct WI code is NR\_RRM\_enh-Perf

**Decision: Agreed.**

**R4-2111327 Correction to beam assumptions in FR2 tests on UL spatial relation**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2147 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Beam assumption is added in FR2 tests on UL spatial relation in Rel-16 introduced under RRM enhancement WI

**Decision: Agreed.**

5.1.3.2.2.9 Inter-band CA requirement for FR2 UE measurement capability of independent Rx beam

**R4-2110289 CR on maintaining SCell activation and deactication delay test for FR2 inter-band CA R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2004 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108252 (from R4-2110289).**

**R4-2108252 CR on maintaining SCell activation and deactication delay test for FR2 inter-band CA R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2004 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

Session chair: CR coversheet error. Please update in revision if CR is agreeable. Correct WI code is NR\_RRM\_enh-Perf

**Decision: Agreed.**

**R4-2110290 CR on maintaining SCell activation and deactication delay test for FR2 inter-band CA R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2005 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

#### 5.1.7 Other WIs

##### 5.1.7.3 RRM requirements

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**Email discussion: [99-e][204] NR\_RRM\_maintenance\_R16**

**R4-2108129 Email discussion summary: [99-e][204] NR\_RRM\_maintenance\_R16** *Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108379 (from R4-2108129).**

**R4-2108379 Email discussion summary: [99-e][204] NR\_RRM\_maintenance\_R16** *Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 24th)

* Issue 2-1: NeedForGaps in Rel-16 is only applied in NR SA.
  + Question: Is it TEI or specific WI?
  + Proposals
    - Option 1: Yes
    - Option 2: No
  + Discussion
    - Session chair: is this TEI or continuation of some item?
    - E///: This is a very important feature for NW and UE. It was introduced by RAN2 as a part of TEI in Rel-16. Rel-17 NCSG has dependency on this.
    - HW: RAN4 has requirements for NeedForGap for intra-frequency and now we discuss inter-frequency. Agree with E/// that it is important.
    - MTK: We think that intra-frequency requirement was a mistake and they are incomplete. We agree with other companies that this is important. Would like to clarify the procedure how to handle the TEI. Need to clarify the relation to NCSG.
    - Apple: Agree with companies that it was introduced by RAN2 but RAN4 has not introduced requirements. We can find examples in the past when RAN4 defined features as TEI or in a separate WI. As a moderator we see that it cannot be handled within 1 or even 2 meetings.
    - QC: NeedForGap has impact on RAN4 requirements. Further analysis is needed.
    - vivo: Agree that existing requirements are incomplete. There are other topics in Rel-16 which need to be addressed.
    - Nokia: Agree it needs to be done, but there will be workload and time required
    - Intel: We agree that requirements are needed. Need to comply with RAN guidance on TEI. RAN2 has not identified the RAN4 impacts.
    - Session chair: We are in the very late stage and Rel-16 Core part is closed. The TEI scope needs to be limited to control the workload. Based on comments the work will take quite long time. Recommend to handle in Rel-17 if there is consensus/interest to do so.
    - E///: There is a relation to Rel-17 NCSG and this NeedForGap is the pre-requisite for this work.
    - Apple: We do not need to couple NeedForGap and NCSG and can discuss independently.
    - OPPO: Same view as Apple. NeedForGap and NCSG may have different signalling.
    - Huawei: If we wait for Rel-17 then it will delay the commercial adoption of the feature. We need two meeting cycle to fix the problem.
    - MTK: TEI may not be a good place due to long work. We may need to discuss NeedForGap and NCSG together.
    - Intel: For adoption we think that additional interruptions would still apply for NeedForGap. We can do it in Rel-17.
    - CMCC: Prefer to solve in Rel-16. Understand companies concerns on workload and timing. Rel-17 may be late.
  + Session chair: Rel-16 is closed and it is late to start new big work. We can consider other alternatives – proponents can be bring proposals to extend the scope of Rel-17 WIs, add a new WI or consider this as a Rel-17 TEI.
  + Session chair: Please continue discussion on the WF to identify the possible scope and objections of the possible work. Check the WF in Thu GTW.
* Issue 5-1: Can new MRTD requirements for FR1 intra-band non-contiguous NR-CA/NR-DC be defined from Rel-16?
  + Proposals
    - Option 1: Yes
    - Option 2: No
  + Discussion
    - Session chair: is this TEI or continuation of some item?
    - E///: For LTE 36.300 it is stated 30us propagation difference is accounted for non-contiguous CA. This can be another solution for this issue.
    - HW: This is important issue.
    - Nokia: MRTD shall be introduced.
    - Softbank: The scenario is very important for us.
    - Intel: See the significance of this work. Should there be also RF room discussion?
    - QC: Non-collocation results in longer MRTD. Current UE implementations cannot support this. This is late for Rel-16 and requires long time.
    - Apple: This was discussed for a long time. Reuse of LTE requirements is not a good argument. RF session needs to be involved.
  + Session chair: Rel-16 is closed and it is late to start new big work. Based on the comments RF scope is expected and the work load is non-trivial. We can consider other alternatives – proponents can be bring proposals to extend the scope of Rel-17 WIs, add a new WI or consider this as a Rel-17 TEI.
* Issue 1-1-1: SSB-less SCell activation requirement
  + Question: Is it TEI or specific WI?
  + Proposals
    - Option 1 (QC): For FR1 SSB-less single SCell activation, RAN4 to adopt the following requirement and implement it in Rel-16 spec and the requirement will be propagated to multiple FR1 SCell activation case:
      * If the SCell being activated belongs to FR1 and if there is at least one active serving cell contiguous to the SCell on that FR1 band, if the UE supporting *scellWithoutSSB* is not provided with any SSB configuration (*absoluteFrequencySSB*) nor SMTC for the target SCell, Tactivation\_time is 3 ms, provided:
        + the RS(s) of SCell being activated is (are) QCL-TypeA with TRS(s) of the SCell being activated and the TRS(s) is (are) QCL-TypeC with SSB(s) of one active serving cell contiguous to the SCell being activated on that FR1 band, and
        + its RTD with the contiguous active serving cell is smaller than or equal to 260ns, and
        + its reception power difference with the contiguous active serving cell is smaller than or equal to 6dB.
    - Option 2 (Apple): RAN4 to specify the SSB-less SCell activation for FR1 as,
      * If the SCell being activated belongs to FR1 and if there is at least one active serving cell contiguous to the SCell on that FR1 band, if the UE supporting *scellWithoutSSB* is not provided with any SSB configuration (*absoluteFrequencySSB*) nor SMTC for the target SCell, Tactivation\_timeis 3 ms, provided:
        + the RS(s) of SCell being activated is (are) QCL-TypeA with TRS(s) of the SCell being activated and the TRS(s) of the SCell being activated is (are) QCL-TypeC with SSB(s) of any active serving cell that is contiguous to the SCell being activated on that FR1 band, and
        + its RTD with the contiguous active serving cell is smaller than or equal to 260ns, and
        + its reception power difference with the contiguous active serving cell is smaller than or equal to 6dB.
    - Option 3 (HW): In Rel-16, if UE is not provided with SMTC configuration for the target SCell in FR1, Tactivation\_time is 3 ms provided
      * The target SCell is contiguous to an active serving cell in the same band, and
        + The RTD between the target SCell and the contiguous active serving cell is <= CP/2, and
        + The difference of the reception power with the contiguous active serving cell is <= 6dB, and
        + The RS(s) of SCell being activated is (are) QCL-TypeA with TRS(s) of the SCell being activated, and the TRS(s) is (are) further QCL-TypeC with SSB(s) of with the contiguous active serving cell.
  + Discussion
    - Huawei: This originated from Rel-15 NR maintenance. Based on discussion most companies are fine to introduce it from Rel-15.
    - Apple: This is Rel-15. Ok to have CRs starting from Rel-15.
    - QC: Ok with Rel-15 version of the CR.
    - Huawei: the current plan is to Rel-16 CRs under TEI and have Cat A CRs for Rel-15 CRs.
  + Session chair: The discussion will continue in [201]. Rel-15 CR will include resolution for issue 1-1-1, 1-1-2, 1-1-3

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108220 | WF on NeedForGap measurements | Ericsson |  |
| R4-2108221 | WF on MRTD requirements for FR1 intra-band non-contiguous NR-CA/NR-DC | Huawei |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| SSB-less SCell activation | | | | |
| R4-2108965 |  |  | not pursued |  |
| R4-2109306 |  |  | Not pursued |  |
| R4-2110909 |  |  | revised |  |
| R4-2108963 |  |  | revised |  |
| Sync conditions for intra-band DAPS handover | | | | |
| R4-2110292 |  |  | Return to |  |
| R4-2110394 |  |  | Return to |  |
| NeedForGap measurements | | | | |
| R4-2110373 |  |  | Return to |  |
| NR V2X | | | | |
| R4-2109565 |  |  | Return to |  |
| MRTD for FR1 intra-band non-contiguous NR-CA/NR-DC in non-collocated scenario | | | | |
| R4-2110296 |  |  | Return to |  |
| R4-2110298 |  |  | Return to |  |
| R4-2110402 |  |  | Return to |  |
| Misc | | | | |
| R4-2108823 | CR to A.3.14 CSI-RS configurations for nzp-CSI-RS-ResourceId values |  | agreeable |  |
| R4-2109069 | Correction to cell reselection test case for HST |  | Return to |  |
| R4-2109271 | Correction on the power of the first preamble for 2-step RACH |  | agreeable |  |
| R4-2109303 | CR on interruption for SCell addition/release R16 |  | ~~Agreeable~~ Return to |  |
| R4-2109526 | CR on CSSFintra for HST measurement requirements |  | agreeable |  |
| R4-2109527 | CR on test case on NR intra-frequency cell reselection for HST |  | Return to |  |
| R4-2110370 | Correction on test cases for inter-RAT cell identification in connected mode for HST |  | agreeable |  |
| R4-2111257 | CR on CSSF for SCell measurements outside gaps |  | Return to |  |
| R4-2111328 | Correction to HO tests in FR2 under mobility enhancements |  | agreeable |  |
| R4-2110294 | CR on maintaining interruptions for intra-band DAPS handover R16 |  | agreeable |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| [R4-2109069](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109069.zip) | Correction to cell reselection test case for HST |  | agreeable |  |
| [R4-2109527](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109527.zip) | CR on test case on NR intra-frequency cell reselection for HST |  | agreeable |  |
| [R4-2111257](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111257.zip) | CR on CSSF for SCell measurements outside gaps |  | postponed |  |

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**R4-2108220 WF on NeedForGap measurements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Session chair: Please remove slides 5+.**

**Decision: Revised to R4-2108039 (from R4-2108220).**

**R4-2108039 WF on NeedForGap measurements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

Session chair: There is no consensus to do the work in Rel-16 TEI due to potentially larger scope and late stage of Rel-16. The WF is agreeable to RAN4 and provides a set of candidate objectives. WF is noted as no work is planned. Further discussion in the plenary is recommended on whether and how to handle this.

**Decision: Noted.**

**R4-2108221 WF on MRTD requirements for FR1 intra-band non-contiguous NR-CA/NR-DC**

*Type: other For: Approval  
 Source: Huawei*

**Abstract:**

**Discussion:**

Session chair: There is no consensus to do the work in Rel-16 TEI due to potentially larger scope and late stage of Rel-16. The WF is agreeable to RAN4 and provides a set of candidate objectives. WF is noted as no work is planned. Further discussion in the plenary is recommended on whether and how to handle this.

**Decision: Noted.**

###### 5.1.7.3.1 RRM core

**R4-2108963 Cat-F CR to FR1 Single SCell activation requirement with TCI activation in Rel-16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1851 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2108223 (from R4-2108963).**

**R4-2108223 FR1 Single SCell activation requirement with TCI activation [FR1\_SCell\_TCI\_Act]**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1851 rev Cat: B (Rel-16)  
  
 Source: Qualcomm Incorporated*

Session chair: This is a Rel-16 TEI CR. Unique TEI identifier is [FR1\_SCell\_TCI\_Act]. WI code is TEI16

**Decision: Agreed.**

**R4-2108964 FR1 Single SCell activation requirement with TCI activation [FR1\_SCell\_TCI\_Act]**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1852 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

Session chair: This is a Rel-16 TEI CR. Unique TEI identifier is [FR1\_SCell\_TCI\_Act]. WI code is TEI16

**Decision: Agreed.**

**R4-2108965 Cat-F CR to FR1 SSB-less SCell activation requirement in Rel-16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1853 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Decision: Not pursued.**

**R4-2108966 Cat-A CR to FR1 SSB-less SCell activation requirement in Rel-17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1854 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Withdrawn.**

**R4-2108967 Maintenance on FR1 SCell Activation**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2109303 CR on interruption for SCell addition/release R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1892 rev Cat: F (Rel-16)  
  
 Source: Apple*

Session chair: Please provide information on the relevant WI.

**Decision: Revised to R4-2108418 (from R4-2109303).**

**R4-2108418 CR on interruption for SCell addition/release R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1892 rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Agreed.**

**R4-2109304 CR on interruption for SCell addition/release R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1893 rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Agreed.**

**R4-2109305 On SSB-less SCell activation**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-16)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2109306 CR on SSB-less SCell activation requirement R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1894 rev Cat: B (Rel-16)  
  
 Source: Apple*

**Decision: Not pursued.**

**R4-2109307 CR on SSB-less SCell activation requirement R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1895 rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Withdrawn.**

**R4-2109526 CR on CSSFintra for HST measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1913 rev Cat: F (Rel-16)  
  
 Source: CMCC*

**Decision: Revised to R4-2108257 (from R4-2109526).**

**R4-2108257 CR on CSSFintra for HST measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1913 rev Cat: F (Rel-16)  
  
 Source: CMCC*

**Decision: Agreed.**

**R4-2109525 CR on CSSFintra for HST measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1912 rev Cat: A (Rel-17)  
  
 Source: CMCC*

**Decision: Revised to R4-2108258 (from R4-2109525).**

**R4-2108258 CR on CSSFintra for HST measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1912 rev Cat: A (Rel-17)  
  
 Source: CMCC*

**Decision: Agreed.**

**R4-2109991 Discussion on NeedForGap measurements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the UE behaviour for NeedForGap measurements

**Decision: Noted.**

**R4-2110291 Discussion on sync conditions for intra-band DAPS handover**

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

**Decision: Noted.**

**R4-2110292 CR on maintaining sync conditions for intra-band DAPS handover R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2006 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108423 (from R4-2110292).**

**R4-2108423 CR on maintaining sync conditions for intra-band DAPS handover R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2006 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110293 CR on maintaining sync conditions for intra-band DAPS handover R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2007 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110294 CR on maintaining interruptions for intra-band DAPS handover R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2008 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110295 CR on maintaining interruptions for intra-band DAPS handover R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2009 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110908 Discussion on SCell activation requirements in Rel-16**

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

**Decision: Noted.**

**R4-2110909 CR on Rel-16 SCell activation requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2101 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Not pursued.**

**R4-2108222 CR on Rel-16 SCell activation requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2101 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2110910 CR on Rel-16 SCell activation requirements R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2102 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2111257 CR on CSSF for SCell measurements outside gaps**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2124 rev Cat: F (Rel-16)  
  
 Source: vivo*

Session chair: Proponents are asked to provide the specific WI code and the coversheet needs to be updated once it is clear.

**Decision: Postponed.**

**R4-2111258 CR on CSSF for SCell measurements outside gaps**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2125 rev Cat: A (Rel-17)  
  
 Source: vivo*

**Decision: Withdrawn.**

###### 5.1.7.3.2 RRM performance

**R4-2108823 CR to A.3.14 CSI-RS configurations for nzp-CSI-RS-ResourceId values**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1808 rev Cat: F (Rel-16)  
  
 Source: Anritsu corporation*

**Abstract:**

Re-submission of previously agreed CR (R4-2010858) for #96-e. Some part of contents were not correctly captured in the previous spec.

**Decision: Agreed.**

**R4-2108824 CR to A.3.14 CSI-RS configurations for nzp-CSI-RS-ResourceId values**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1809 rev Cat: A (Rel-17)  
  
 Source: Anritsu corporation*

**Decision: Agreed.**

**R4-2109069 Correction to cell reselection test case for HST**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1858 rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Revised to R4-2108032 (from R4-2109069).**

**R4-2108032 Correction to cell reselection test case for HST**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1858 rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Agreed.**

**R4-2109070 Correction to cell reselection test case for HST**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1859 rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Agreed.**

**R4-2109271 Correction on the power of the first preamble for 2-step RACH**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1881 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of the power of the first preamble of 2-step RACH

**Decision: Agreed.**

**R4-2109272 Correction on the power of the first preamble for 2-step RACH**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1882 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of the power of the first preamble of 2-step RACH

**Decision: Agreed.**

**R4-2109527 CR on test case on NR intra-frequency cell reselection for HST**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1914 rev Cat: F (Rel-17)  
  
 Source: CMCC*

**Decision: Revised to R4-2108224 (from R4-2109527).**

**R4-2108224 CR on test case on NR intra-frequency cell reselection for HST**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1914 rev Cat: F (Rel-17)  
  
 Source: CMCC*

Session chair: correct WI code shall be NR\_HST-**P**erf. Please update in the revision.

**Decision: Agreed.**

**R4-2110370 Correction on test cases for inter-RAT cell identification in connected mode for HST**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2040 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110371 Correction on test cases for inter-RAT cell identification in connected mode for HST**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2041 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2111328 Correction to HO tests in FR2 under mobility enhancements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2148 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Beam assumption and AoA are missing in DAPS HO and conditional test cases defined under NR mobility enhancement Rel-16 WI

**Decision: Agreed.**

**R4-2111329 Correction to HO tests in FR2 under mobility enhancements**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2149 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Beam assumption and AoA are missing in DAPS HO and conditional test cases defined under NR mobility enhancement Rel-16 WI

**Decision: Agreed.**

### 5.2 LTE maintenance

#### 5.2.1 Even further mobility enhancement

##### 5.2.1.1 RRM core requirements

**R4-2110375 Clarification on asynchronous DAPS handover R16**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7101 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Postponed.**

**R4-2110376 Clarification on asynchronous DAPS handover R17**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7102 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2110390 TDD UL-DL and DL-UL switching in LTE DAPS handover**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Further clarification on DL-to-UL and UL-to-DL switching time

**Decision: Noted.**

**R4-2110391 Correction on the synchronous condition for DAPS handover**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7103 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Add conditions for not expected to transmit / not expected to receive covering both source and target cell. Add autonomous interruption allowance if these conditions are unspecified.

**Decision: Postponed.**

**R4-2108218 Correction on the synchronous condition for DAPS handover**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7103 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Add conditions for not expected to transmit / not expected to receive covering both source and target cell. Add autonomous interruption allowance if these conditions are unspecified.

Session chair: CR coversheet error. Please update in revision.

**Decision: Withdrawn.**

**R4-2110392 Correction on the synchronous condition for DAPS handover**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7104 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Add conditions for not expected to transmit / not expected to receive covering both source and target cell. Add autonomous interruption allowance if these conditions are unspecified.

**Decision: Withdrawn.**

##### 5.2.1.2 RRM performance requirements

#### 5.2.2 Other WIs

##### 5.2.2.3 RRM requirements

###### 5.2.2.3.1 RRM core requirements

**R4-2109868 Time synchronization assumption for RSS-based neighbor cell measurements**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7082 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2108217 (from R4-2109868).**

**R4-2108217 Time synchronization assumption for RSS-based neighbor cell measurements**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7082 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed.**

**R4-2109869 Time synchronization assumption for RSS-based neighbor cell measurements**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7083 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed.**

**R4-2110276 Discussion on RSS based RSRQ for LTE-MTC**

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

**Abstract:**

Discussion on incoming reply LS from RAN2 on RSS based RSRQ

**Decision: Noted.**

**R4-2110853 Discussion on remaining issues in Rel-16 eMTC RRM**

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

**Decision: Noted.**

**R4-2110854 CR on remaining issues in Rel-16 eMTC RRM**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7112 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Merged.**

**R4-2110855 CR on remaining issues in Rel-16 eMTC RRM R17**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7113 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2111236 LS on RAN4 agreement on RSS based RSRQ measurement for cat-M**

*Type: LS out For: Approval  
 to RAN2  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss the RSS based RSRQ measurement for release 16 eMTC based on the incoming LSs.

**Decision: Withdrawn.**

**R4-2111251 LS on RAN4 agreement on RSS based RSRQ measurement for cat-M**

*Type: LS out For: Approval  
 to RAN2  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss the RSS based RSRQ measurement for release 16 eMTC based on the incoming LSs.

**Decision: Noted.**

###### 5.2.2.3.2 RRM performance requirements

**R4-2110647 Correction of RLM test parameters for MPDCCH performance improvement**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7105 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects the RLM test parameters for eMTC MPDCCH performance improvement.

**Decision: Revised to R4-2108219 (from R4-2110647).**

**R4-2108219 Correction of RLM test parameters for MPDCCH performance improvement**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7105 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects the RLM test parameters for eMTC MPDCCH performance improvement.

**Decision: Agreed.**

**R4-2110779 Correction of RLM test parameters for MPDCCH performance improvement**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7109 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects the RLM test parameters for eMTC MPDCCH performance improvement.

**Decision: Agreed.**

### 5.3 Rel-16 UE feature list maintenance

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**Email discussion: [99-e][241] R16\_UE\_feature\_list\_RRM**

**R4-2108165 Email discussion summary: [99-e][241] R16\_UE\_feature\_list\_RRM** *Type: other For: Information  
 Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108380 (from R4-2108165).**

**R4-2108380 Email discussion summary: [99-e][241] R16\_UE\_feature\_list\_RRM** *Type: other For: Information  
 Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 21st)

**Topic#1: NR support for high speed train scenario**

* Issue 1-1: Clarification on requirements of 10-1
  + Proposals
    - Option 1 (Intel): Clarify in the spec that regarding UE indicating support of 10-1 but not capable of measuring on or operating under LTE with 500km/h (e.g., NR SA UE), the UE is not required to meet the Rel-16 inter-RAT HST measurement requirements specified for CONNECTED or IDLE mode.
  + Discussion
    - Huawei: the issue is not very clear to us. UE shall not report 10-1 if it does support LTE meas
    - Intel: There may be already some UEs in the field indicating 10-1 (e.g. NR NSA UEs). This is the problem of the legacy specification, which says that UE needs to support inter-RAT measurements.
    - CMCC: Share views from Huawei. There are no UEs in the field, since they cannot pass the requirements.
    - Apple: If UE does not support LTE then it should not indicate 10-1.
    - vivo: Same view with Huawei, CMCC and Apple.
    - Intel: When we agree 10-1 originally there were no decisions to exclude UEs which support NR only.
    - QC: In our understanding 10-1 implies support of both NR SA and EN-DC
    - CMCC: when we discussed the capability there was a common understanding there will be no UEs which support NR only and all chipsets will support both NR and LTE operation.
    - Intel: we do not think that there was clear consensus on this. What is the harm to allow UEs without LTE support not to pass the respective requirements.
      * CMCC: we need to understand the benefits and if there are any UEs in the field.
        + Intel: For SA operation there are UEs which support NR+LTE. But still a portion of UEs can support NR only RAT.
    - ZTE: is it possible for UE to support NR only?
      * Intel: Yes.
  + Session chair: Continue discussion. Come back in the 2nd round.
* Issue 1-2: Clarification on the applicability of HST RRM requirements
  + RAN4 #98-bis-e agreements
    - Add two new UE capabilities to
      * 10-4) Support of intra-NR HST RRM measurement with speed up to 500km/h
      * 10-5) Support of NR-LTE inter-RAT RRM measurement with speed up to 500km/h
      * Note 1: UE can indicate support of 10-4 or 10-5 only if 10-1 is NOT supported.
      * Note 2: The principle of adding the capabilities is to avoid the NBC issues
  + Proposals
    - Option 1 (Huawei):
      * When UE reports 10-4 as “supported”, 10-5 is not reported (i.e., inter-RAT NR-LTE HST RRM is not supported) and if network indicates highSpeedMeasFlag-r16 as “true”, then UE is not required to meet the specified connected or idle mode measurement requirements for R16 HST inter-RAT NR-LTE enhancement.
    - Option 2 (Apple):
      * Intra-frequency HST RRM measurement shall only applies if UE supports intra-NR HST, i.e. measurementEnhancement-r16 (10-1) or the new capability intraRAT-MeasurementEnhancement-r16 (10-4).
      * Inter-RAT NR-LTE HST RRM measurement shall only applies if UE supports inter-RAT NR-LTE HST, i.e. measurementEnhancement-r16 (10-1) or the new capability interRAT-MeasurementEnhancement-r16 (10-5).
  + Recommended WF:
    - Intra-frequency HST RRM measurement shall only apply if UE supports intra-NR HST, i.e. measurementEnhancement-r16 (10-1) or the new capability intraRAT-MeasurementEnhancement-r16 (10-4).
    - Inter-RAT NR-LTE HST RRM measurement shall only apply if UE supports inter-RAT NR-LTE HST, i.e. measurementEnhancement-r16 (10-1) or the new capability interRAT-MeasurementEnhancement-r16 (10-5).
  + Discussion
    - Huawei: recommended WF is ok.
    - Intel: Agree with the first bullet. Disagree with the 2nd bullet due to NBC issues. This is also relevant to the discussion on the previous issues.
    - Apple: Fine with the recommended WF. To Intel we can discuss the principle.
    - CMCC: We can add a note to sub-bullet to clarify that some exceptions can be allowed
    - QC: Agree with CMCC, Apple, Huawei. To Intel – need to bring a CR to discuss this.
    - Intel: we cannot agree with current text. To QC we have a CR.
  + Agreements
    - Intra-frequency HST RRM measurement shall only apply if UE supports intra-NR HST, i.e. [measurementEnhancement-r16] (10-1) or the new capability [intraRAT-MeasurementEnhancement-r16] (10-4).
  + Session chair: Continue discussion on the Inter-RAT NR-LTE HST RRM measurement applicability. Come back in the 2nd round.

**Topic#2: per-FR gap capability**

* RAN4 #98-bis-e
  + Tentative Agreements:
    - Do not introduce per-BC indication of per-FR measurement gap UE capabilities in Rel-16
    - Add the following statement to the chairman notes: RAN4 has a common understanding that further enhancements to the per-FR measurement gap UE capabilities can be further studied in Rel-17 (e.g. in FeRRM WI) and is subject to RAN plenary approval and available time budget.
  + Session chair: no consensus reached in this meeting. The discussion can continue in May meeting and shall be concluded.
* Issue 2-1: Whether to introduce per-BC indication of per-FR measurement gap UE capabilities
  + Proposals
    - Option 1 (Qualcomm, Huawei): Keep the original per UE per-FR gap indication and add new Per BC indication for the per-FR gap capability
    - Option 2 (Intel): RAN4 agrees on generating a new objective of R17 standards to introduce per-BC indication of per-FR measurement gap UE capabilities, was there no consensus on introducing it in Rel-16.
  + Recommended WF:
    - Proponents of per-BC indication of per-FR measurement gap UE capabilities provide analysis on the impacts on RRM requirements. It seems that no new RRM requirements are needed.
    - Companies are encouraged to provide comments based on the analysis in submitted contributions.
  + Discussion
    - Apple: We discussed for several meeting. Based on HW and QC proposals it is still not clear which requirements are the bottleneck. In our view the key impact will be on interruptions. In our view the interruptions depend whether this is shared RFIC and not relevant to baseband constraints. Also, the baseband constraints depend on # of CCs and it is unclear how per BC indication can help. Ok to discuss in Rel-17.
    - E///: Similar view with Apple. This also may not be helpful for the network. It can be quite complicated for the network side. Ok to discuss in Rel-17.
    - QC: The feature is very implementation specific and we cannot provide all details. The per-FR gap feature in the current specs is becoming very complex and not RF relevant.
    - vivo: Understand the motivation to resolve UE complexity. We have a different view on the possible impact on RRM requirements and the respective impacts should be further discussed. We are ok to discuss in Rel-17.
    - Huawei: Share same view as QC. Disagree with NW complexity – the network can always use scheduling based on legacy capability signalling. We prefer to discuss in Rel-16.
    - Apple: We would like to understand the technical details. For per-BWP switching capability we can aim to address in Rel-16. We can see impact on the existing requirements for SCell activation since it has different requirements for per-UE and per-FR gap.
  + Session chair: Continue the discussion. Come back in the 2nd round. QC will lead WF discussion in the 2nd round.

**Topic#3: NR RRM requirement enhancement**

* Issue 3-1: Capability of ‘bwp-SwitchingMultiCCs-r16’
  + Proposal (Qualcomm): Change the current prerequisite for bwp-SwitchingMultiCCs-r16 to “The UE indicating support of this feature shall also support bwp-SwitchingDelay and/or bwp-SameNumerology and/or bwp-DiffNumerology.”
  + Discussion
    - Apple: support the proposal
  + Agreement
    - Change the current prerequisite for bwp-SwitchingMultiCCs-r16 to “The UE indicating support of this feature shall also support bwp-SwitchingDelay, bwp-SameNumerology and/or bwp-DiffNumerology.”

**Topic#4: Others**

* Issue 4-1: New UE feature on enhanced CSSF for SCell measurements outside gaps

GTW session (May 26th)

**Topic#1: NR support for high speed train scenario**

* Moderator: all issues resolved

**Topic#2: per-FR gap capability**

* Issue 2-1: Whether to introduce per-BC indication of per-FR measurement gap UE capabilities
  + Session chair: no consensus to define capabilities
  + Agreements:
    - Do not introduce per-BC indication of per-FR measurement gap UE capabilities in Rel-16.
    - RAN4 has a common understanding that further enhancements to the per-FR measurement gap UE capabilities to address UE implementation constraints can be further studied in future (e.g. in Rel-17) and the work is subject to RAN plenary approval and available time budget.

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108331 | WF on NR HST UE capabilities | CMCC |  |
| R4-2108332 | WF on per-BC indication of per-FR measurement gap UE capabilities | Qualcomm |  |
| R4-2108333 | LS on Rel-16 updated RAN4 UE features lists for LTE and NR | CMCC | To: RAN2, Cc: RAN1 |
| R4-2108334 | Updated RAN4 UE features list for Rel-16 | CMCC |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2109323 | CR on inter-RAT HST RRM measurement requirements R16 | Apple | Noted |  |
| [R4-2110368](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110368.zip) | CR on inter-RAT measurement in HST | Huawei, HiSilicon | Noted |  |
| R4-2109226 | CR on legacy Rel-16 HST NR UE measurement requirements | Intel Corporation | Revised |  |
| R4-2109227 | CR on legacy Rel-16 HST NR UE measurement requirements (R17) | Intel Corporation | Return to |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108331 | WF on NR HST UE capabilities | CMCC | Agreeable |  |
| R4-2108332 | WF on per-BC indication of per-FR measurement gap UE capabilities | Qualcomm | Noted |  |
| R4-2108333 | LS on Rel-16 updated RAN4 UE features lists for LTE and NR | CMCC | Agreeable |  |
| R4-2108334 | Updated RAN4 UE features list for Rel-16 | CMCC | Agreeable |  |
| R4-2108335 | CR on legacy Rel-16 HST NR UE measurement requirements (R16) | Intel Corporation | Agreeable |  |
| R4-2109227 | CR on legacy Rel-16 HST NR UE measurement requirements (R17) | Intel Corporation | Agreeable |  |

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**R4-2108331 WF on NR HST UE capabilities**

*Type: other For: Approval  
 Source: CMCC*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108332 WF on per-BC indication of per-FR measurement gap UE capabilities**

*Type: other For: Approval  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**R4-2108333 LS on Rel-16 updated RAN4 UE features lists for LTE and NR**

*Type: LS Out For: Approval  
To: RAN2, CC: RAN1  
Source: CMCC*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108334 Updated RAN4 UE features list for Rel-16**

*Type: other For: Approval  
 Source: CMCC*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108968 Discussion on Rel-16 Features**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2109225 Discussion on UE capabilities in Rel-16**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2110367 On UE behavior due to separate NR HST capability and on Per BC indication of per-FR gap**

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

**Decision: Noted.**

**R4-2111259 Discussion on addition of UE feature on enhanced CSSF for SCell measurements outside gaps**

*Type: discussion For: Approval  
 Source: vivo*

**Decision: Noted.**

**R4-2109226 CR on legacy Rel-16 HST NR UE measurement requirements (R16)**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1877 rev Cat: F (Rel-16)  
  
 Source: Intel Corporation*

**Decision: Revised to R4-2108335 (from R4-2109226).**

**R4-2108335 CR on legacy Rel-16 HST NR UE measurement requirements (R16)**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1877 rev Cat: F (Rel-16)  
  
 Source: Intel Corporation*

Session chair: CR coversheet error. Please update in revision if CR is agreeable.

**Decision: Agreed.**

**R4-2109227 CR on legacy Rel-16 HST NR UE measurement requirements (R17)**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1878 rev Cat: A (Rel-17)  
  
 Source: Intel Corporation*

**Decision: Agreed.**

**R4-2110368 CR on inter-RAT measurement in HST**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2038 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Postponed.**

**R4-2110369 CR on inter-RAT measurement in HST**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2039 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2109322 Clarification on NR-LTE inter-RAT HST RRM measurement requirements**

*Type: discussion For: (not specified)  
 Source: Apple*

Session chair: moved from 5.1.7.3

**Decision: Noted.**

**R4-2109323 CR on inter-RAT HST RRM measurement requirements R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1899 rev Cat: F (Rel-16)  
  
 Source: Apple*

Session chair: moved from 5.1.7.3

**Decision: Postponed.**

**R4-2109324 CR on inter-RAT HST RRM measurement requirements R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1900 rev Cat: A (Rel-17)  
  
 Source: Apple*

Session chair: moved from 5.1.7.3

**Decision: Withdrawn.**

## 6 Rel-16 non-spectrum related work items for NR

### 6.1 NR-based access to unlicensed spectrum

#### 6.1.5 RRM core requirements maintenance (38.133)

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**Email discussion: [99-e][209] NR\_unlic\_RRM\_1**

**R4-2108133 Email discussion summary: [99-e][209] NR\_unlic\_RRM\_1** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108381 (from R4-2108133).**

**R4-2108381 Email discussion summary: [99-e][209] NR\_unlic\_RRM\_1** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 20th)

**Topic #3: SCell activation/deactivation**

* Issue 3-1-1: Interruption length during intra-band CA
  + Proposals
    - Proposals 1 (Huawei, HiSilicon, Apple):
      * For intra-band CA, up to 1+L interruption windows are allowed during SCell activation. The length of up to L interruption windows shall be extended considering the RF tuning.
    - Proposal 2 (Qualcomm Incorporated, Ericsson):
      * There is no need to extend the interruption time because of DL LBT failure during intra-band SCell activation. No further clarification needed in the spec-text.
  + Discussion
    - QC: This is a corner case. Prefer not to introduce additional RF retuning.
    - Huawei: Proponents of Proposal 2 recognize that additional RF retuning may be needed. We need to define the requirements based on the worst case.
    - QC: The conditions for this to happen are. This is a very rare case and we should not penalize the performance under all conditions:
      * 1) The scheduled SSB index is the last one in the SSB burst and
      * 2) SMTC duration configured by the network is the shortest which just includes two candidate positions for the SSB index (which is very unlikely to happen) and
      * 3) CCA failure happens on both the candidate positions (As per discussion in the performance part, the probability of happening this is <10%) implying that the channel is extremely crowded (why would a network want to activate a CC in such a busy channel).
    - MTK: Agree with QC. We can go with Option 1 and list the specific conditions when this would apply.
    - Huawei: Suggest to agree that additional RF tuning is needed.
    - QC: we do not need additional interruption for RF retuning time. We do not support RF retuning.
    - Apple: Support proposal 1. If AGC estimation fails then UE needs to tune to single CC and it will cause interruption.
    - E///: We can compromise with proposal with MTK.
    - QC: we do not agree with RF retuning concept at all
    - HW: can compromise with MTK proposal
  + Agreements:
    - During SCell activation for intra-band CA
      * Additional relaxations apply for the following conditions
        + 1) The scheduled SSB index is the last one in the SSB burst and
        + 2) SMTC duration configured by the network includes two candidate positions for the SSB index
        + 3) CCA failure happens on both candidate positions
      * Candidate relaxations
        + Option 1: Extend the length of interruption window
        + Option 2: Allow a certain performance degradation
        + Option 3: Allow multiple interruptions due to RF tuning
      * Note: the agreement applies at least for unknown SCell activation case
* Issue 3-1-2: Inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown
  + Proposals
    - Proposals 1 (Huawei, HiSilicon, ZTE Corporation) More than one interruptions are allowed on the victim inter-band CCs.
      * 1a: (Huawei, HiSilicon): For inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown, more than one interruptions are allowed.
      * 1b (ZTE Corporation, ~~Ericsson~~): For scenarios with victims on inter-band CCs and intra-band CCs: more than one interruption can be allowed.
    - Proposal 2 (Qualcomm Incorporated, Mediatek, Ericsson): A single interruption is allowed on the victim inter-band CCs
      * 2a (Qualcomm): A single interruption applies to any victim cell outside the band with the (unknown) SCell being activated, irrespective of whether any intra-band victim cell is present or not and. No further clarification is needed in the spec text.
        + No need to consider RF retuning due to DL CCA failures in SCell activation/deactivation requirements.
      * 2b (MediaTek Inc.): A single interruption applies to any victim cell outside the band with the SCell being activated
  + Discussion
    - E///: Prefer Proposal 2
    - Huawei: This is relevant to Option 3 in the previous issue.
    - QC: Prefer no RF tuning. This is very implementation specific. The interruptions cause much throughput overhead
    - Huawei: typically RAN4 requirements are defined based on the worst case. In the past we did not consider possible constraints on number of CCs.
    - Apple: Share same view with Huawei. As a compromise we can also agree to specify that “some performance degradation can be expected”
    - E///: for inter-band CA case we have multiple chains. Do we really need interruptions.
      * Apple: the basic assumption is that UE has a shared IC for multiple RF chains and needs interruptions.
    - Session chair: Continue discussion. Come back in the 2nd round.

**Topic#4: Timing**

* Issue 4-2-1: Definition of the reference cell which is not available, with respect to MGs
  + Proposals
    - Proposal 1 (ZTE Corporation): No clarification related to gap is needed on the current definition of unavailability of a reference cell on a carrier frequency subject to CCA in section 7.1.1.
    - Proposal 2 (Huawei, HiSilicon): The availability of reference cell shall base on the SSB within the DL active BWP which is not overlapping with measurement gaps.
    - Proposal 3 (Apple, Ericsson, QC, MTK):
      * In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available for at least one SSB, at the UE due to DL CCA failures at gNB during the last X ms; otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.
      * X = 1280ms.
    - Proposal 4 (Ericsson):
      * In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available for at least one SSB, at the UE due to DL CCA failures at gNB during the last X ms; otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.
      * X is FFS, X>160ms.
  + Discussion
    - Huawei: ok with Proposal 3.
    - QC: we propose some clarification on Proposal 3
  + Agreements:
    - In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available during at least one discovery burst transmission window, at the UE due to DL CCA failures at gNB during the last X ms; otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.
    - X = 1280ms.
* Issue 4-1-1: Definition of the reference cell which is not available, with respect to DRX
  + Proposals
    - Proposal 1 (ZTE Corporation): SSB does not have to be within ON duration in a reference cell subject to DL CCA in order to meet UE timing requirements. No clarification related to DRX is needed on the current definition of unavailability of a reference cell on a carrier frequency subject to CCA in section 7.1.1.
    - Proposal 2 (Apple, Ericsson):
      * In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available for at least one SSB, at the UE due to DL CCA failures at gNB during the last X ms; otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.
      * X = 1280ms.
    - Proposal 4 (Ericsson):
      * In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available for at least one SSB, at the UE due to DL CCA failures at gNB during the last X ms; otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.
      * X is FFS, X>160ms.
  + Discussion
    - ZTE: How is 1280ms value derived?
      * Apple: we use same breakpoint between known and unknown conditions
      * ZTE: then the conditions is from legacy case?
      * Apple: this threshold is not an enhancement for UE
  + Agreements:
    - In the requirements of clause 7.1.2, the term reference cell on a carrier frequency subject to CCA is not available at the UE refers to when at least one SSB is configured by gNB, but the first two successive candidate SSB positions for the same SSB index within the discovery burst transmission window are not available during at least one discovery burst transmission window, at the UE due to DL CCA failures at gNB during the last X ms; otherwise the reference cell on the carrier frequency subject to CCA is considered as available at the UE.
    - X = 1280ms.

GTW session (May 26th)

* Issue 3-1-2: Inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown
  + Proposals
    - Proposals 1 (Huawei, HiSilicon, ZTE Corporation, Apple) More than one interruptions are allowed on the victim inter-band CCs.
      * 1a: (Huawei, HiSilicon): For inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and target SCell is unknown, more than one interruptions are allowed.
      * 1b (ZTE Corporation, ~~Ericsson~~): For scenarios with victims on inter-band CCs and intra-band CCs: more than one interruption can be allowed.
    - Proposal 2 (Qualcomm Incorporated, Mediatek, Ericsson): A single interruption is allowed on the victim inter-band CCs
      * 2a (Qualcomm): A single interruption applies to any victim cell outside the band with the (unknown) SCell being activated, irrespective of whether any intra-band victim cell is present or not and. No further clarification is needed in the spec text.
        + No need to consider RF retuning due to DL CCA failures in SCell activation/deactivation requirements.
      * 2b (MediaTek Inc.): A single interruption applies to any victim cell outside the band with the SCell being activated
    - Option 3 (Apple): single interruption on the victim inter-band CCs, but allow a certain performance degradation on the active serving cell in the same band with being-activated unknown SCell”
  + Discussion
    - Huawei: can compromise to Option 3. Does it mean that degradation is always allowed or is it related to the conditions we defined in the 1st round?
    - E///: How do we capture “certain performance degradation” in the specification?
    - Apple: Share same view as Huawei and would like to check the conditions. For degradation – we already have such description.
    - Huawei: we don’t need to define exact performance degradation
  + Agreements
    - For intra-band and inter-band CA allow single interruption on the victim CCs, but allow performance degradation on the active serving cell in the same band with being-activated unknown SCell and when L3,1 > 0
    - Note: Same conclusions apply for issues 3-1-1 and 3-1-2. The GTW agreement for 3-1-1 is revisited.
* Issue 3-1-3: Inter-band CA regardless of whether the victim cell is on an intra-band or inter-band CC and target SCell is known
  + Proposals
    - Proposals 1 (Huawei, HiSilicon, ZTE Corporation): More than one interruptions are allowed on the victim inter-band CCs.
      * 1a: (Huawei, HiSilicon): For inter-band CA where victims on inter-band CCs and intra-band CCs interruptions and when target SCell is known with measurement cycle larger greater than 160 ms, more than one interruptions are allowed.
      * 1b(ZTE Corporation): For scenarios with victims on inter-band CCs and intra-band CCs: more than one interruption can be allowed.
    - Proposal 2 (Qualcomm Incorporated, Ericsson, Mediatek, Apple):
      * 2a(Qualcomm, Ericsson): A single interruption applies to any victim cell outside the band with the (known) SCell being activated, irrespective of whether any intra-band victim cell is present or not and. No further clarification is needed in the spec text.
        + No need to consider RF retuning due to DL CCA failures in SCell activation/deactivation requirements.
      * 2b (MediaTek Inc., Ericsson): A single interruption applies to any victim cell outside the band with the SCell being activated
  + Agreements:
    - A single interruption applies to any victim cell outside the band with the SCell being activated

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108253 | WF on NR-U RRM Core Requirements | Ericsson | To capture the agreements and issues from this meeting. |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2109416 | Terminology update for NR-U | Nokia, Nokia Shanghai Bell | Agreeable |  |
| R4-2109274 | Terminology update for NR-U | Nokia, Nokia Shanghai Bell | Agreeable |  |
| R4-2111513 | SI reading time in RRC mobility control | Qualcomm Incorporated | ~~Agreeable~~ Revised |  |
| R4-2111514 | SI reading time in RRC mobility control | Qualcomm Incorporated | ~~Agreeable~~ Return to |  |
| R4-2110307 | CR on SCell activation and deactivation for NR-U R16 | Huawei, HiSilicon | Return to | Pending agreements in issues 3-1-2 and 3-1-3 |
| R4-2110308 | CR on SCell activation and deactivation for NR-U R17 | Huawei, HiSilicon | Return to |  |
| R4-2111254 | NR-U SCell activiation interruption requirements in 38.133 | Ericsson | Return to |  |
| R4-2111511 | Interruption during Scell activation requirements for SCells operating with CCA | Qualcomm Incorporated | Revised | Pending agreements in issues 3-1-2 and 3-1-3 |
| R4-2111512 | Interruption during Scell activation requirements for SCells operating with CCA | Qualcomm Incorporated | Return to |  |
| R4-2109298 | CR on reference cell availability for NR-U R16 | Apple, MediaTek, Ericsson | Revised |  |
| R4-2109299 | CR on reference cell availability for NR-U R17 | Apple, MediaTek, Ericsson | Return to |  |
| R4-2110310 | CR on timing requirements for NR-U R16 | Huawei, HiSilicon | Noted |  |
| R4-2110311 | CR on timing requirements for NR-U R17 | Huawei, HiSilicon | Withdrawn |  |
| R4-2109300 | CR on SCell activation requirement for NR-U R16 | Apple | Agreeable |  |
| R4-2109301 | CR on SCell activation requirement for NR-U R17 | Apple | Agreeable |  |
| R4-2110312 | CR on Active TCI state switching for NR-U R16 | Huawei, HiSilicon | Agreeable |  |
| R4-2110313 | CR on Active TCI state switching for NR-U R17 | Huawei, HiSilicon | Agreeable |  |
| R4-2110314 | CR on RLM requirements NR-U R16 | Huawei, HiSilicon | Agreeable |  |
| R4-2110315 | CR on RLM requirements NR-U R17 | Huawei, HiSilicon | Agreeable |  |
| R4-2110316 | CR on beam management requirements for NR-U R16 | Huawei, HiSilicon | Agreeable |  |
| R4-2110317 | CR on beam management requirements for NR-U R17 | Huawei, HiSilicon | Agreeable |  |
| R4-2110318 | CR on measurement requirements for NR-U R16 | Huawei, HiSilicon | Agreeable |  |
| R4-2110319 | CR on measurement requirements for NR-U R17 | Huawei, HiSilicon | Agreeable |  |
| R4-2110320 | CR on CSSF for NR-U R16 | Huawei, HiSilicon | Agreeable |  |
| R4-2110321 | CR on CSSF for NR-U R17 | Huawei, HiSilicon | Agreeable |  |
| R4-2110322 | CR on core requirements maintenance of IDLE mode inter-RAT measurement for NR-U R16 | Huawei, HiSilicon | Agreeable |  |
| R4-2110323 | CR on core requirements maintenance of IDLE mode inter-RAT measurement for NR-U R17 | Huawei, HiSilicon | Agreeable |  |
| R4-2110324 | CR on PSCell Addition requirements for NR-U R16 | Huawei, HiSilicon | Agreeable |  |
| R4-2110325 | CR on PSCell Addition requirements for NR-U R17 | Huawei, HiSilicon | Agreeable |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108168 | Terminology updates for NR-U in 38.133 | Ericsson | Agreeable | Endorsed CR, late submission. |
| R4-2108169 | Terminology updates for NR-U in 38.133 | Ericsson | Agreeable | Cat-A |
| R4-2108170 | Terminology updates for NR-U in 36.133 | Ericsson | Agreeable | Endorsed CR, late submission. |
| R4-2108171 | Terminology updates for NR-U in 36.133 | Ericsson | Agreeable | Cat-A |
| R4-2108172 | Updates in SCell activation in NR-U | Ericsson | Agreeable | Endorsed CR, late submission. |
| R4-2108173 | Updates in SCell activation in NR-U | Ericsson | Agreeable | Cat-A |
| R4-2108174 | NR-U bands | Ericsson | Agreeable | Endorsed CR, late submission. |
| R4-2108175 | NR-U bands | Ericsson | Agreeable | Cat-A |
| R4-2108253 | WF on NR-U RRM Core Requirements | Ericsson | Agreeable |  |
| R4-2110307 | CR on SCell activation and deactivation for NR-U R16 | Huawei, HiSilicon | Noted | Merged with R4-2108255 |
| R4-2110308 | CR on SCell activation and deactivation for NR-U R17 | Huawei, HiSilicon | Withdrawn |  |
| R4-2111254 | NR-U SCell activiation interruption requirements in 38.133 | Ericsson | Noted | Merged with R4-2108255 |
| R4-2108255 | Interruption during Scell activation requirements for SCells operating with CCA | Qualcomm Incorporated | Agreeable |  |
| R4-2111512 | Interruption during Scell activation requirements for SCells operating with CCA | Qualcomm Incorporated | Agreeable | Cat-A |
| R4-2108256 | CR on reference cell availability for NR-U R16 | Apple, MediaTek, Ericsson | Agreeable |  |
| R4-2109299 | CR on reference cell availability for NR-U R17 | Apple, MediaTek, Ericsson | Agreeable | Cat-A |
| R4-2108254 | SI reading time in RRC mobility control | Qualcomm Incorporated | Agreeable |  |
| R4-2111514 | SI reading time in RRC mobility control | Qualcomm Incorporated | Agreeable | Cat-A |

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**R4-2108253 WF on NR-U RRM Core Requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2110312 CR on Active TCI state switching for NR-U R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2019 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110313 CR on Active TCI state switching for NR-U R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2020 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110314 CR on RLM requirements NR-U R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2021 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110315 CR on RLM requirements NR-U R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2022 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110316 CR on beam management requirements for NR-U R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2023 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110317 CR on beam management requirements for NR-U R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2024 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110318 CR on measurement requirements for NR-U R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2025 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110319 CR on measurement requirements for NR-U R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2026 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110320 CR on CSSF for NR-U R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2027 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110321 CR on CSSF for NR-U R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2028 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110322 CR on core requirements maintenance of IDLE mode inter-RAT measurement for NR-U R16**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7084 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110323 CR on core requirements maintenance of IDLE mode inter-RAT measurement for NR-U R17**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7085 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110324 CR on PSCell Addition requirements for NR-U R16**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7086 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110325 CR on PSCell Addition requirements for NR-U R17**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7087 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2108168 Terminology updates for NR-U in 38.133**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-TBA rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Postponed.**

**R4-2108169 Terminology updates for NR-U in 38.133**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-TBA rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Postponed.**

**R4-2108170 Terminology updates for NR-U in 36.133**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-TBA rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2108171 Terminology updates for NR-U in 36.133**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-TBA rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2108172 Updates in SCell activation in NR-U**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-TBA rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2108173 Updates in SCell activation in NR-U**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-TBA rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2108174 NR-U bands**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-TBA rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2108175 NR-U bands**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-TBA rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

##### 6.1.5.1 General

**R4-2108759 On terminology updates for measurements in NR-U**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109293 Terminology update for NR-U**

*Type: CR For: Approval  
 38.133 v17.1.0 CR-1884 rev Cat: A (Rel-17)  
  
 Source: Nokia Belgium*

**Decision: Withdrawn.**

**R4-2109416 Terminology update for NR-U**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1909 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Agreed.**

**R4-2109274 Terminology update for NR-U**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1883 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Agreed.**

**R4-2110780 SSB monitoring capability for CBD**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the remaining open issuse for SSB monitoring capability.

**Decision: Noted.**

##### 6.1.5.2 RRC connection mobility control

**R4-2111513 SI reading time in RRC mobility control**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2164 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

This CR removes an editor's note from section 6.2.1A.2.1

**Decision: Revised to R4-2108254 (from R4-2111513).**

**R4-2108254 SI reading time in RRC mobility control**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2164 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

This CR removes an editor's note from section 6.2.1A.2.1

Session chair: CR coversheet error. Please update in revision if CR is agreeable.

**Decision: Agreed.**

**R4-2111514 SI reading time in RRC mobility control**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2165 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

This CR removes an editor's note from section 6.2.1A.2.1

**Decision: Agreed.**

##### 6.1.5.3 SCell activation/deactivation (delay and interruption)

**R4-2108757 On SCell activation in NR-U**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109300 CR on SCell activation requirement for NR-U R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1890 rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Agreed.**

**R4-2109301 CR on SCell activation requirement for NR-U R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1891 rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Agreed.**

**R4-2109851 Discussion on Scell activation requirement in NR-U**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2110306 Discussion on SCell activation requirements for NR-U**

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

**Decision: Noted.**

**R4-2110307 CR on SCell activation and deactivation for NR-U R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2015 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Postponed.**

**R4-2110308 CR on SCell activation and deactivation for NR-U R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2016 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2111223 On remaining issues for SCell activation in NR-U**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

There were good progress in the SCell activation requirements for NR-U at last meeting. The agreements and the open issues were captured in the way forward document [1]. But there are still a few remaining issues which are addressed in this contribution.

**Decision: Noted.**

**R4-2111238 On remaining issues for SCell activation in NR-U**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

There were good progress in the SCell activation requirements for NR-U at last meeting. The agreements and the open issues were captured in the way forward document [1]. But there are still a few remaining issues which are addressed in this contribution.

**Decision: Noted.**

**R4-2111254 NR-U SCell activiation interruption requirements in 38.133**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2123 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Interruption requiremnets during SCell acitvation is missing for NR-U.

Session chair: Cat A CR is missing?

**Decision: Postponed.**

**R4-2111511 Interruption during Scell activation requirements for SCells operating with CCA**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2162 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

The CR updates clause 8.3A based on agreements related to interruptions during Scell activation requirements.

**Decision: Revised to R4-2108255 (from R4-2111511).**

**R4-2108255 Interruption during Scell activation requirements for SCells operating with CCA**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2162 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

The CR updates clause 8.3A based on agreements related to interruptions during Scell activation requirements.

Session chair: CR coversheet error. Please update in revision if CR is agreeable.

**Decision: Agreed.**

**R4-2111512 Interruption during Scell activation requirements for SCells operating with CCA**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2163 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

The CR updates clause 8.3A based on agreements related to interruptions during Scell activation requirements.

**Decision: Agreed.**

**R4-2111515 Interruptions during SCell activation in NR-U**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Abstract:**

In this paper, we discuss remaining open issues interruptions during Scell activation in NR-U

**Decision: Noted.**

##### 6.1.5.4 Active TCI state switching

##### 6.1.5.5 RLM

##### 6.1.5.6 Beam management

##### 6.1.5.7 Measurement requirements

##### 6.1.5.8 Measurement capability and reporting criteria

##### 6.1.5.9 Timing

**R4-2108758 On remaining issues in Timing in NR-U**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109297 On reference cell availability for NR-U**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-16)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2109298 CR on reference cell availability for NR-U R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1888 rev Cat: F (Rel-16)  
  
 Source: Apple, MediaTek, Ericsson*

**Decision: Revised to R4-2108256 (from R4-2109298).**

**R4-2108256 CR on reference cell availability for NR-U R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1888 rev Cat: F (Rel-16)  
  
 Source: Apple, MediaTek, Ericsson*

**Decision: Agreed.**

**R4-2109299 CR on reference cell availability for NR-U R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1889 rev Cat: A (Rel-17)  
  
 Source: Apple, MediaTek, Ericsson*

**Decision: Agreed.**

**R4-2110309 Discussion on reference cell of timing requirements for NR-U**

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

**Decision: Noted.**

**R4-2110310 CR on timing requirements for NR-U R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2017 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Postponed.**

**R4-2110311 CR on timing requirements for NR-U R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2018 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2111303 Analysis of reference cell availability for UE transmit timing under DL LBT failure**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper discusses open issues on UE transmit timing under CCA

**Decision: Noted.**

##### 6.1.5.10 Other requirements

#### 6.1.6 RRM performance requirements (38.133)

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**Email discussion: [99-e][210] NR\_unlic\_RRM\_2**

**R4-2108134 Email discussion summary: [99-e][210] NR\_unlic\_RRM\_2** *Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108382 (from R4-2108134).**

**R4-2108382 Email discussion summary: [99-e][210] NR\_unlic\_RRM\_2** *Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 20th)

**Topic #2: CCA models**

* Issue 2-1-1: Principle for defining PCCA
  + Proposals
    - Proposal 1: Define PCCA that results in a large percentage of test runs with one or more CCA failures in each phase of a test run where CCA failures are modelled.
      * Proposal 1a (R4-2109275): Define PCCA\_DL that results in a 90% probability that at least 15 out of 33 test runs will have one or more LBT failures in a 200 ms interval.
      * Proposal 1b (R4-2109282): Define PCCA\_UL probabilities that ensure that at least 15 out of 33 test runs experience more than one CCA failure.
  + Discussion
    - QC: Understand the intention. Need to consider the deployment aspects. For FBE there will be control and CCA failure probability is low. FBE devices may not be optimized for large number of LBT failures.
    - E///: We have LBT in all DL test cases. We disagree that in FBE networks there will be no LBT failures. The proposal aims to verify core requirements.
    - Nokia: We are testing the min requirements and need to make sure there will be no problems.
    - QC: For FBE deployments based on specs there will be no WiFi deployed in the same proximity and no hidden node problems
    - Session chair: made an agreement for 2-2-1. No need to further discuss.
* Issue 2-1-2: PCCA dependency on Es/Iot
  + Proposals
    - Proposal 1a (R4-2109275, R4-2111304) CCA DL success probabilities are applicable to any value of Es/Iot.
    - Proposal 1b: CCA UL success probabilities are applicable to any value of Es/Iot.
  + Agreements:
    - CCA DL success probabilities are applicable to any value of Es/Iot.
    - CCA UL success probabilities are applicable to any value of Es/Iot.
* Issue 2-1-3: Requirement classification for statistical testing
  + Proposals
    - Proposal 1 (R4-2109275): Determine that TCs under CCA are subject to statistical testing.
  + Discussion
    - QC: RAN5 is in a better position to design these details.
    - Nokia: RAN5 is typically following what is defined in RAN4. So, need to have at least smth in RAN4. In RAN5 the tests which have a requirement for 90% of tests to be successful are repeated multiple times (at least 33 times).
    - QC: LTE LAA already had it. Leave it up to RAN5.
  + Session chair: continue discussion whether RAN4 can add specific clarifications on statistical testing and provide information to RAN5
* Issue 2-2-1: CCA success probabilities for DL CCA model in typical test cases
  + Proposals
    - Option 1 ([QC](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111516.zip))
      * For LBE: P1=0.75, P2=0.75
      * For FBE: P = 0.95
    - Option 2 ([Nokia](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109275.zip), [E///](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111304.zip))
      * For LBE: P1=0.75, P2=0.5
      * For FBE: P = 0.9
    - Option 3 ([Nokia](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109275.zip), MTK, E///)
      * For LBE: P1=0.75, P2=0.75
      * For FBE: P = 0.9
  + Agreements:
    - For LBE: P1 = 0.75, P2 = 0.75
    - For FBE: P = 0.9375
* Issue 2-2-2 DRX CCA model
  + Proposals
    - Proposal 1 (R4-2111304): The existing DL CCA model in non-DRX shall also apply when DRX is used.
    - Proposal 2 (R4-2111304): Regardless of whether DRX is used or not, prior to each DBT window, the test equipment shall determine whether the CCA attempt is successful.
  + Discussion
    - QC: Fine with proposals. UE is not required to determine the availability of SSB more frequent than once in a DRX cycle, it should be specified in the model to take that into account while testing a requirement involving DRX
  + Agreements:
    - The existing DL CCA model in non-DRX shall also apply when DRX is used.
    - Regardless of whether DRX is used or not, prior to each DBT window, the test equipment shall determine whether the CCA attempt is successful.
* Issue 2-3-1: CCA success probability in UL
  + Proposals
    - Option 1 ([Nokia](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109275.zip)): Define PCCA\_UL = 0.8 for both LBE and FBE modes.
    - Option 2 ([QC](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111516.zip)): RAN4 to adopt the following CCA success probabilities for UL CCA model in typical test cases
      * For LBE: P = 0.75
      * For FBE: P = 0.95
    - Option 3 (E///, Nokia): Typical value of the successful UL CCA probability is 75%.
  + Discussion
    - Nokia: probabilities > 0.8 may have issues from the statistical testing perspective. 0.95 is too low given 5 RACH retransmissions.
    - QC: We should align with DL. The UL probabilities of LBT failure will be even smaller than in UL.
    - E///: Agree that in UL there may be less failures. We are focusing on testing functionality and some values are fine to be selected artificially to simplify the test procedure.
    - Nokia: 5 RACH retransmissions come based on legacy test design.
  + Agreements:
    - RAN4 to adopt the following CCA success probabilities for UL CCA model in typical test cases
      * For LBE: P = 0.75
      * For FBE:
        + Option 1: P = 0.8
        + Option 2: P = 0.9375
        + FFS whether and how option 2 can ensure statistical reliability of UL requirements testing
* Issue 2-3-2: Limitation of CCA failures in UL
  + Proposals
    - Proposal 1 ([R4-2109275](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109275.zip)): Include limitation of the UL CCA failures LCCA\_UL on the UL CCA model.
  + Agreements:
    - Include limitation of the UL CCA failures LCCA\_UL on the UL CCA model.
* Issue 2-3-3 Test case list to include UL CCA failures
  + Proposals
    - Proposal 1 (R4-2108760): Specifying one test case with UL CCA failure for each of the cases below:
      * Proposal 1a: SCell activation
        + Additional delay in transmission of CSI reporting due to CCA failure
      * Proposal 1b: Event triggered measurement reporting delay
        + Additional delay due to UL LBT failure not defined
        + FFS: Assume it similar to above-mentioned SCell activation case
      * Proposal 1c (R4-2111304): MAC CE based TCI state switch delay
        + Delay in sending HARQ feedback transmissions
  + Discussion
    - QC: we already have some test cases. For 1b there additional delay is not defined.
    - E///: 1b is not needed. 1c is interesting.
    - Huawei: FR1 TCI state switch delay is not defined and not sure if it is testable. Need further discussions.
    - QC/MTK: agree with Huawei.
  + Agreements:
    - FFS: Define “MAC CE based TCI state switch delay” test case with UL CCA failure
* Issue 2-3-4 Noise pattern used for modeling UL CCA failures
  + Proposals
    - Proposal 1 (R4-2111304): OCNG pattern is used for noise generation during the UL CCA detection time (TCCA) within the UL resources where the UE needs to assess the UL CCA.
    - Proposal 2 (R4-2111304): During the UL CCA detection time the test equipment should generate energy level 3 dB above the energy detection threshold defined in TS 37.106.
  + Agreements:
    - OCNG pattern is used for noise generation during the UL CCA detection time (TCCA) within the UL resources where the UE needs to assess the UL CCA.
    - During the UL CCA detection time the test equipment should generate energy level 3 dB above the energy detection threshold defined in TS 37.106.

**Topic #3: Test case specific details**

Session chair: come back in the 2nd round

GTW session (May 25th)

* Issue 3-6-1: Configurations for BWP switch test cases
  + Proposals
    - Option 1: Endorse the configurations:

|  |  |  |
| --- | --- | --- |
| Active BWP in SpCell | PCCA\_UL | PCCA\_DL |
| UL active BWP before active BWP switching (UL BWP-1) | 0 | 1 |
| UL active BWP after active BWP switching (UL BWP-2) | 1 | 1 |
| DL active BWP before active BWP switching (DL BWP-1) | 1 | 1 |
| DL active BWP after active BWP switching (DL BWP-2) | 1 | 1 |

* + - Option 2: Endorse the configurations with consistent UL BWP switch on consistent UL LBT failure recovery:

|  |  |  |
| --- | --- | --- |
| Active BWP in SpCell | PCCA\_UL | PCCA\_DL |
| UL active BWP before active BWP switching (UL BWP-1) | 0 | 1 |
| UL active BWP after active BWP switching (UL BWP-2) | 1 | 1 |
| DL active BWP before active BWP switching (DL BWP-1) | 1 | 1 |
| DL active BWP after active BWP switching (DL BWP-2) | 1 | 1 |

* + Agreements:
    - Endorse the configurations with consistent UL BWP switch on consistent UL LBT failure recovery:

|  |  |  |
| --- | --- | --- |
| Active BWP in SpCell | PCCA\_UL | PCCA\_DL |
| UL active BWP before active BWP switching (UL BWP-1) | 0 | 1 |
| UL active BWP after active BWP switching (UL BWP-2) | 1 | 1 |
| DL active BWP before active BWP switching (DL BWP-1) | 1 | 1 |
| DL active BWP after active BWP switching (DL BWP-2) | 1 | 1 |

* Issue 3-7-1: CCA parameters for link recovery
  + Proposals
    - Option 1: Set the CCA parameters in the link recovery tests for NR-U as follows. For DL LBT parameters

**CCA parameters in link recovery tests for NR-U**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | T1 | T2 | T3 | T4 | T5 |
| PCCA\_DL | semi-static channel access | 1.0 | 0.9375 | 0.9375 | 0.9375 | 0.9375 |
| dynamic channel access (Note 1) | (0.75,0.5) | (0.75,0.5) | (0.75,0.5) | (0.75,0.5) | (0.75,0.5) |
| PCCA\_UL |  | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Note 1: For dynamic channel access, the probability (X,Y) indicates PCCA\_DL\_1=X and PCCA\_DL\_2=Y. | | | | | | |

* + Agreements:
    - Set the CCA parameters in the link recovery tests for NR-U as follows. For DL LBT parameters

**CCA parameters in link recovery tests for NR-U**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | T1 | T2 | T3 | T4 | T5 |
| PCCA\_DL | semi-static channel access | 1.0 | 0.9375 | 0.9375 | 0.9375 | 0.9375 |
| dynamic channel access (Note 1) | (0.75,0.75) | (0.75,0.75) | (0.75,0.75) | (0.75,0.75) | (0.75,0.75) |
| PCCA\_UL |  | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Note 1: For dynamic channel access, the probability (X,Y) indicates PCCA\_DL\_1=X and PCCA\_DL\_2=Y. | | | | | | |

* Issue 3-9-1: Timing difference between RSs in two TCI states
  + Proposals
    - Option 1: Introduce the timing difference between the RS in the two TCI states in the TCI state switching test cases, where the exact value needs further discussion.
      * Confirm on the testability of Proposal 1.
    - Option 2: Since TCI switching test case is low priority, not to include this test case.
  + Agreements:
    - Do not introduce test cases for TCI state switching
* Issue 3-4-2: Configuration of DL CCA for random access test cases
  + Tentative agreements:
    - NR-U random access procedure tests with dynamic channel access configuration do not need to configure DL LBT failure, i.e., set PCCA\_DL=1.0
  + Candidate options:
    - Option 1: NR-U random access procedure tests with semi-static channel access configuration do not need to configure DL LBT failure, i.e., set PCCA\_DL=1.0.
    - Option 2: Configure DL CCA failures for the random access test cases for semi-static channel access configuration.
  + Discussion
    - E///: fine with Option 1
  + Agreements:
    - Configure DL CCA failures for the random access test cases for semi-static channel access configuration
* Issue 3-4-3: Preamble received target power configuration
  + Proposals
    - Option 1: Test equipment to configure *preambleReceivedTargetPower* for msg1 and *msgA-PreambleReceivedTargetPower* for msgA to the highest value for UL LBT test cases.
    - Option 2: Test equipment to reuse NR configurations for *preambleReceivedTargetPower* for msg1 and *msgA-PreambleReceivedTargetPower* for msgA for RA test cases with UL CCA failures.
    - Option 3: Test equipment to increase by 6dB NR configurations for *preambleReceivedTargetPower* for msg1 and *msgA-PreambleReceivedTargetPower* for msgA for RA test cases with UL CCA failures.
  + Agreements:
    - Test equipment to increase by 6dB NR configurations for *preambleReceivedTargetPower* for msg1 and *msgA-PreambleReceivedTargetPower* for msgA for RA test cases with UL CCA failures.
* Issue 2-1-3: Requirement classification for statistical testing
  + Proposals
    - Option 1: Determine that TCs under CCA with 0 < PCCA <1 are subject to statistical testing.
      * Send LS to inform RAN5 about the RAN4 decision.
    - Option 2: Send LS to RAN5 with question(s) and an action for RAN5 to answer.
  + Agreements:
    - Determine that TCs under CCA with 0 < PCCA <1 are subject to statistical testing.
      * Send LS to inform RAN5 about the RAN4 decision.
* Issue 2-3-1: CCA success probability in UL
  + Proposals
    - FBE model
      * Option 1: PCCA\_UL = 0.8 (Nokia, ZTE)
      * Option 2: PCCA\_UL = 0.9375 (QC)
  + Agreements:
    - PCCA\_UL = 0.87

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108259 | WF on general test configurations for NR-U RRM performance requirements | Nokia |  |
| R4-2108260 | WF on LBT models for NR-U RRM performance requirements | Qualcomm |  |
| R4-2108261 | WF on test case list for NR-U | Ericsson |  |
| R4-2108262 | LS on NR-U Test Cases subject to statistical testing | Nokia | To: RAN\_5; Cc: |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2110962 | DraftCR 38.133 NR-U conditions | Ericsson | Return to | No comments in the 1st round |
| R4-2110968 | CR 36.133 Correction of accuracy requirements for NR-U bands | Ericsson | Return to | No comments in the 1st round |
| R4-2110326 | CR on inter-RAT measurement accuracy for NR-U R16 | Huawei | Return to | No comments in the 1st round |
| R4-2110781 | Draft CR: Update of RMC for NR-U test cases | Ericsson | Revised |  |
| [R4-2109278](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109278.zip) | Requirement classification for statistical testing for TCs with CCA | Nokia | Return to |  |
| [R4-2109276](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109276.zip) | Draft CR on CCA model for NR-U | Nokia | Revised | Content of R4-2111305 to be merged to this CR |
| [R4-2111305](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111305.zip) | Correction to DL/UL CCA models in 38.133 | Ericsson | Merged to [R4-2109276](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109276.zip) | As per comments of Ericsson and Nokia |
| [R4-2111242](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111242.zip) | Correction to cell reselection test cases for NR-U | Ericsson | Revised |  |
| R4-2109279 | Draft TC NR-U Handover test cases | Nokia | Return to |  |
| R4-2110329 | Draft CR on HO test cases for NR-U | Huawei | Revised |  |
| R4-2111243 | Correction to handover test cases for NR-U | Ericsson | Revised |  |
| R4-2109280 | Draft TC RRC re-establishment with CCA | Nokia | Revised |  |
| R4-2110330 | Draft CR on RRC Re-establishment for NR-U from NR to NRU | Huawei | Revised |  |
| R4-2110331 | Draft CR on TC of RRC connection release with redirection for NR-U | Huawei | Revised |  |
| R4-2111307 | RRC re-establishment tests from NR to NR-U in 38.133 | Ericsson | Revised |  |
| R4-2109281 | Random Access test cases with CCA | Nokia | Revised |  |
| R4-2110653 | Draft CR: Random access procedure test cases for NR-U | Ericsson | Revised |  |
| R4-2111308 | Correction to UE transmit timing tests | Ericsson | Revised |  |
| R4-2111309 | Correction to BWP switching with consistent UL LBT failures | Ericsson | Revised |  |
| R4-2110332 | Draft CR on PSCell addtion for NR-U | Huawei | Revised |  |
| R4-2110963 | NR-U SCell activation TC | Ericsson | Revised |  |
| R4-2110964 | NR-U Other interruption TC | Ericsson | Revised |  |
| R4-2110652 | Draft CR: Update of beam management test cases for NR-U | Ericsson | Revised |  |
| R4-2109277 | Draft TC NR-U inter-frequency measurements | Nokia | Return to |  |
| R4-2109853 | Draft CR of test cases on measurement accuracy under CCA for inter-frequency SS-RSRP and L1-RSRP | Mediatek | Merged with R4-2111245 |  |
| R4-2110333 | Draft CR of test cases for Inter-RAT measurement for NR-U | Huawei | Revised |  |
| R4-2110965 | NR-U SFTD procedure TC | Ericsson | Revised |  |
| R4-2110334 | Draft CR of test cases for Intra-frequency measurement accuracy for NR-U | Huawei | Merged with R4-2111245 |  |
| R4-2111245 | RSRP/RSRQ measurement accuracy test for NR-U in EN-DC | Ericsson | Revised | Content of R4-2110334 and R4-2109853 to be merged in this CR following Ericsson’s proposal on the first round. |
| R4-2109302 | TCs for RSSI and CO measurement accuracy in NR-U R16 | Apple | Revised |  |
| R4-2110966 | NR-U SFTD accuracy TC | Ericsson | Revised |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108259 | WF on general test configurations for NR-U RRM performance requirements | Nokia | Agreeable |  |
| R4-2108260 | WF on LBT models for NR-U RRM performance requirements | Qualcomm | Agreeable |  |
| R4-2108261 | WF on test case list for NR-U | Ericsson | Agreeable |  |
| R4-2108289 | Big CR: Introduction of Rel-16 NR-U RRM performance | Ericsson | Email approval | Cat.B (Rel-16) |
| R4-2108177 | Big CR: Introduction of Rel-16 NR-U RRM performance | Ericsson | Email approval | Cat.A (Rel-17) |
| R4-2108262 | LS on NR-U Test Cases subject to statistical testing | Nokia | Agreeable |  |
| R4-2110962 | DraftCR 38.133 NR-U conditions | Ericsson | Agreeable |  |
| R4-2110968 | CR 36.133 Correction of accuracy requirements for NR-U bands | Ericsson | Agreeable |  |
| R4-2110326 | CR on inter-RAT measurement accuracy for NR-U R16 | Huawei | Agreeable |  |
| R4-2108263 | Draft CR: Update of RMC for NR-U test cases | Ericsson | Agreeable |  |
| [R4-2109278](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109278.zip) | Requirement classification for statistical testing for TCs with CCA | Nokia | Agreeable |  |
| R4-2108264 | Draft CR on CCA model for NR-U | Nokia | Agreeable |  |
| R4-2111305 | Correction to DL/UL CCA models in 38.133 | Ericsson | Merged to [R4-2109276](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109276.zip) |  |
| R4-2108265 | Correction to cell reselection test cases for NR-U | Ericsson | Agreeable |  |
| R4-2109279 | Draft TC NR-U Handover test cases | Nokia | Agreeable |  |
| R4-2108266 | Draft CR on HO test cases for NR-U | Huawei | Agreeable |  |
| R4-2108267 | Correction to handover test cases for NR-U | Ericsson | Agreeable |  |
| R4-2108268 | Draft TC RRC re-establishment with CCA | Nokia | Agreeable |  |
| R4-2108269 | Draft CR on RRC Re-establishment for NR-U from NR to NRU | Huawei | Withdrawn |  |
| R4-2108270 | Draft CR on TC of RRC connection release with redirection for NR-U | Huawei | Agreeable |  |
| R4-2108271 | RRC re-establishment tests from NR to NR-U in 38.133 | Ericsson, Huawei, HiSilicon | Agreeable |  |
| R4-2108272 | Random Access test cases with CCA | Nokia | Agreeable |  |
| R4-2108273 | Draft CR: Random access procedure test cases for NR-U | Ericsson | Agreeable |  |
| R4-2108274 | Correction to UE transmit timing tests | Ericsson | Agreeable |  |
| R4-2108275 | Correction to BWP switching with consistent UL LBT failures | Ericsson | Agreeable |  |
| R4-2108276 | Draft CR on PSCell addtion for NR-U | Huawei | Agreeable |  |
| R4-2108277 | NR-U SCell activation TC | Ericsson | Agreeable |  |
| R4-2108278 | NR-U Other interruption TC | Ericsson | Agreeable |  |
| R4-2108279 | Draft CR: Update of beam management test cases for NR-U | Ericsson | Agreeable |  |
| R4-2109277 | Draft TC NR-U inter-frequency measurements | Nokia | Agreeable |  |
| R4-2109853 | Draft CR of test cases on measurement accuracy under CCA for inter-frequency SS-RSRP and L1-RSRP | Mediatek | Merged with R4-2111245 / R4-2108282 |  |
| R4-2108280 | Draft CR of test cases for Inter-RAT measurement for NR-U | Huawei | Agreeable |  |
| R4-2108281 | NR-U SFTD procedure TC | Ericsson | Agreeable |  |
| R4-2110334 | Draft CR of test cases for Intra-frequency measurement accuracy for NR-U | Huawei | Merged with R4-2111245 / R4-2108282 |  |
| R4-2108282 | RSRP/RSRQ measurement accuracy test for NR-U in EN-DC | Ericsson | Agreeable | . |
| R4-2108283 | TCs for RSSI and CO measurement accuracy in NR-U R16 | Apple | Agreeable |  |
| R4-2108284 | NR-U SFTD accuracy TC | Ericsson | Agreeable |  |

================================================================================

**R4-2108259 WF on general test configurations for NR-U RRM performance requirements**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108260 WF on LBT models for NR-U RRM performance requirements**

*Type: other For: Approval  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108261 WF on test case list for NR-U**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108262 LS on NR-U Test Cases subject to statistical testing**

*Type: LS Out For: Approval  
To: RAN5*

*Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108176 Big CR: Introduction of Rel-16 NR-U RRM performance**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2172 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108289 (from R4-2108176).**

**R4-2108289 Big CR: Introduction of Rel-16 NR-U RRM performance**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2172 rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2108177 Big CR: Introduction of Rel-16 NR-U RRM performance**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2173 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2108046 Big CR: Introduction of Rel-16 NR-U RRM performance**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7127 rev Cat: B (Rel-16)  
  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2108047 Big CR: Introduction of Rel-16 NR-U RRM performance**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7128 rev Cat: A (Rel-17)  
  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

##### 6.1.6.1 General

**R4-2109275 On remaining details of NR-U RRM test configurations**

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

**Decision: Noted.**

**R4-2110962 DraftCR 38.133 NR-U conditions**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Adding missing NR-U conditions.

**Decision: Endorsed.**

**R4-2110968 CR 36.133 Correction of accuracy requirements for NR-U bands**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7122 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Updates pertaining to supported NR-U band combinations, and to reference to NR band group definitions.

Session chair: Draft CR are used for ongoing WIs. Expected to be endorsed if agreeable. Big CR for 36.133 need to be created if there are more than 1 CRs.

**Decision: Endorsed.**

**R4-2110961 CR 36.133 Correction of accuracy requirements for NR-U bands**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7121 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Updates pertaining to supported NR-U band combinations, and to reference to NR band group definitions.

**Decision: Withdrawn.**

##### 6.1.6.2 Measurement accuracy requirements

**R4-2110326 CR on inter-RAT measurement accuracy for NR-U R16**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7088 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

Session chair: Draft CR are used for ongoing WIs. Expected to be endorsed if agreeable. Big CR for 36.133 need to be created if there are more than 1 CRs.

**Decision: Endorsed.**

**R4-2110327 CR on inter-RAT measurement accuracy for NR-U R17**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7089 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

##### 6.1.6.3 Test cases

**R4-2111516 Remaining issues on RRM performance requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Abstract:**

In this paper, we discuss remaining open issues on RRM performance requirements

**Decision: Noted.**

###### 6.1.6.3.1 General

**R4-2108760 On CCA models and applicability rules in test cases for NR-U**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109276 Draft CR on CCA model for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2108264 (from R4-2109276).**

**R4-2108264 Draft CR on CCA model for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2109852 Discussion on RRM test cases in NR-U**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2110781 Draft CR: Update of RMC for NR-U test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR updates RMCs used for NR-U RRM test cases.

**Decision: Revised to R4-2108263 (from R4-2110781).**

**R4-2108263 Draft CR: Update of RMC for NR-U test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR updates RMCs used for NR-U RRM test cases.

**Decision: Endorsed.**

###### 6.1.6.3.2 RRC IDLE cell re-selection

**R4-2108772 Remaining issues on RRC IDLE cell re-selection tests in NR-U**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2111227 Correction to cell reselection test cases for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR contains corrections to the cell reselection test case for NR-U.

**Decision: Noted.**

**R4-2111242 Correction to cell reselection test cases for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR contains corrections to the cell reselection test case for NR-U.

**Decision: Revised to R4-2108265 (from R4-2111242).**

**R4-2108265 Correction to cell reselection test cases for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR contains corrections to the cell reselection test case for NR-U.

**Decision: Endorsed.**

###### 6.1.6.3.3 HO (delay and interruptions)

**R4-2108773 Remaining issues on handover tests in NR-U**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109279 Draft TC NR-U Handover test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2110328 Discussion on HO test cases for NR-U**

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

**Decision: Noted.**

**R4-2110329 Draft CR on HO test cases for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108266 (from R4-2110329).**

**R4-2108266 Draft CR on HO test cases for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2111228 Correction to handover test cases for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR contains corrections to the handover test case for NR-U.

**Decision: Withdrawn.**

**R4-2111243 Correction to handover test cases for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR contains corrections to the handover test case for NR-U.

**Decision: Revised to R4-2108267 (from R4-2111243).**

**R4-2108267 Correction to handover test cases for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR contains corrections to the handover test case for NR-U.

**Decision: Endorsed.**

###### 6.1.6.3.4 RRC Re-establishment

**R4-2109280 Draft TC RRC re-establishment with CCA**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2108268 (from R4-2109280).**

**R4-2108268 Draft TC RRC re-establishment with CCA**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2110330 Draft CR on RRC Re-establishment for NR-U from NR to NRU**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Merged.**

**R4-2108269 Draft CR on RRC Re-establishment for NR-U from NR to NRU**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

###### 6.1.6.3.5 RRC Connection Release with Redirection

**R4-2110331 Draft CR on TC of RRC connection release with redirection for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108270 (from R4-2110331).**

**R4-2108270 Draft CR on TC of RRC connection release with redirection for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2111306 RRC re-establishment tests from NR to NR-U**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper describes test case on RRC re-establishment in NR-U when serving cell is NR

**Decision: Noted.**

**R4-2111307 RRC re-establishment tests from NR to NR-U in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR contains test case on RRC re-establishment in NR-U when serving cell is NR

**Decision: Revised to R4-2108271 (from R4-2111307).**

**R4-2108271 RRC re-establishment tests from NR to NR-U in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR contains test case on RRC re-establishment in NR-U when serving cell is NR

**Decision: Endorsed.**

###### 6.1.6.3.6 Random access

**R4-2108774 Remaining issues on random access tests in NR-U**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109281 Random Access test cases with CCA**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2108272 (from R4-2109281).**

**R4-2108272 Random Access test cases with CCA**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2109282 Discussion on Random access TC parameters**

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

**Decision: Noted.**

**R4-2110653 Draft CR: Random access procedure test cases for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR updates the test cases of random access procedure in NR-U.

**Decision: Revised to R4-2108273 (from R4-2110653).**

**R4-2108273 Draft CR: Random access procedure test cases for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR updates the test cases of random access procedure in NR-U.

**Decision: Endorsed.**

###### 6.1.6.3.7 Timing (transmit timing and TA)

**R4-2108770 Discussion on test cases for timing in NR-U**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2111308 Correction to UE transmit timing tests**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR defines LBT, FBE and LBE related parameters in the endorsed test cases on UE transmit timing

**Decision: Revised to R4-2108274 (from R4-2111308).**

**R4-2108274 Correction to UE transmit timing tests**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR defines LBT, FBE and LBE related parameters in the endorsed test cases on UE transmit timing

**Decision: Endorsed.**

###### 6.1.6.3.8 BWP switching delay and interruptions

**R4-2108775 Remaining issues on tests for BWP switch in NR-U**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2111309 Correction to BWP switching with consistent UL LBT failures**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR defines LBT, FBE and LBE related parameters in the endorsed test cases on consistent UL LBT failure.

**Decision: Revised to R4-2108275 (from R4-2111309).**

**R4-2108275 Correction to BWP switching with consistent UL LBT failures**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR defines LBT, FBE and LBE related parameters in the endorsed test cases on consistent UL LBT failure.

**Decision: Endorsed.**

###### 6.1.6.3.9 PSCell addition/release (delay and interruption)

**R4-2110332 Draft CR on PSCell addtion for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108276 (from R4-2110332).**

**R4-2108276 Draft CR on PSCell addtion for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

###### 6.1.6.3.10 SCell activation/deactivation (delay and interruption)

**R4-2110963 NR-U SCell activation TC**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Updates to SCell activation TC for NR-U

**Decision: Revised to R4-2108277 (from R4-2110963).**

**R4-2108277 NR-U SCell activation TC**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Updates to SCell activation TC for NR-U

**Decision: Endorsed.**

###### 6.1.6.3.11 Other interruptions

**R4-2110964 NR-U Other interruption TC**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Updates to Interruption TC for NR-U

**Decision: Revised to R4-2108278 (from R4-2110964).**

**R4-2108278 NR-U Other interruption TC**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Updates to Interruption TC for NR-U

**Decision: Endorsed.**

###### 6.1.6.3.12 RLM

###### 6.1.6.3.13 Beam management (BFD and link recovery)

**R4-2108776 On test cases for beam management in NR-U**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2110651 Open issues on link recovery and L1-RSRP reporting test cases for NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the open issues on the test cases for beam failure recovery and L1-RSRP reporting in NR-U.

**Decision: Noted.**

**R4-2110652 Draft CR: Update of beam management test cases for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the test cases for bean failure recovery and L1-RSRP reporting in NR-U.

**Decision: Revised to R4-2108279 (from R4-2110652).**

**R4-2108279 Draft CR: Update of beam management test cases for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the test cases for bean failure recovery and L1-RSRP reporting in NR-U.

**Decision: Endorsed.**

###### 6.1.6.3.14 SS-RSRP/SS-RSRQ/SS-SINR/L1-RSRP measurement procedure (intra-frequency, inter-frequency, inter-RAT)

**R4-2109277 Draft TC NR-U inter-frequency measurements**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2109853 Draft CR of test cases on measurement accuracy under CCA for inter-frequency SS-RSRP and L1-RSRP**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Merged.**

**R4-2110333 Draft CR of test cases for Inter-RAT measurement for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108280 (from R4-2110333).**

**R4-2108280 Draft CR of test cases for Inter-RAT measurement for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

###### 6.1.6.3.15 RSSI/CO measurement procedure (intra-frequency, inter-frequency, inter-RAT)

###### 6.1.6.3.16 SFTD measurement procedure

**R4-2110965 NR-U SFTD procedure TC**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Updates to SFTD measurement procedure TC for NR-U

**Decision: Revised to R4-2108281 (from R4-2110965).**

**R4-2108281 NR-U SFTD procedure TC**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Updates to SFTD measurement procedure TC for NR-U

**Decision: Endorsed.**

###### 6.1.6.3.17 SS-RSRP/SS-RSRQ/SS-SINR/L1-RSRP measurement accuracy (intra-frequency, inter-frequency, inter-RAT)

**R4-2110334 Draft CR of test cases for Intra-frequency measurement accuracy for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Merged.**

**R4-2111229 Discussions on RSRP/RSRQ measurement accuracy test for NR-U in EN-DC**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution, we discuss RSRP/RSRQ measurement accuracy test for NR-U in EN-DC.

**Decision: Noted.**

**R4-2111230 RSRP/RSRQ measurement accuracy test for NR-U in EN-DC**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR contains test case for RSRP/RSRQ measurement accuracy for NR-U in EN-DC.

**Decision: Withdrawn.**

**R4-2111244 Discussions on RSRP/RSRQ measurement accuracy test for NR-U in EN-DC**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution, we discuss RSRP/RSRQ measurement accuracy test for NR-U in EN-DC.

**Decision: Noted.**

**R4-2111245 RSRP/RSRQ measurement accuracy test for NR-U in EN-DC**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR contains test case for RSRP/RSRQ measurement accuracy for NR-U in EN-DC.

**Decision: Revised to R4-2108282 (from R4-2111245).**

**R4-2108282 RSRP/RSRQ measurement accuracy test for NR-U in EN-DC**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR contains test case for RSRP/RSRQ measurement accuracy for NR-U in EN-DC.

**Decision: Endorsed.**

###### 6.1.6.3.18 RSSI/CO measurement accuracy (intra-frequency, inter-frequency, inter-RAT)

**R4-2109302 TCs for RSSI and CO measurement accuracy in NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Apple*

**Decision: Revised to R4-2108283 (from R4-2109302).**

**R4-2108283 TCs for RSSI and CO measurement accuracy in NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Apple*

**Decision: Endorsed.**

###### 6.1.6.3.19 SFTD measurement accuracy

**R4-2110966 NR-U SFTD accuracy TC**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Updates to SFTD measurement accuracy TC for NR-U

**Decision: Revised to R4-2108284 (from R4-2110966).**

**R4-2108284 NR-U SFTD accuracy TC**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Updates to SFTD measurement accuracy TC for NR-U

**Decision: Endorsed.**

###### 6.1.6.3.20 Other

**R4-2108777 On test cases for TCI state switch in NR-U**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109278 Requirement classification for statistical testing for TCs with CCA**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2111304 Analysis of open issues related to DL and UL CCA models**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper addresses open issues related to the DL CCA and UL CCA models used in RRM tests

**Decision: Noted.**

**R4-2111305 Correction to DL/UL CCA models in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The draft CR updates and corrects open issues related to the DL CCA and UL CCA models used in RRM tests

**Decision: Merged.**

### 6.2 5G V2X with NR sidelink

#### 6.2.2 RRM core requirements maintenance (38.133)

#### 6.2.3 RRM performance requirements maintenance (38.133)

**R4-2109565 CR: RRM congestion control test cases for NR V2X**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1920 rev Cat: F (Rel-16)  
  
 Source: Qualcomm, Inc.*

**Decision: Agreed.**

**R4-2111498 (R17mirror) CR: RRM congestion control test cases for NR V2X**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2159 rev Cat: A (Rel-17)  
  
 Source: Qualcomm, Inc.*

**Decision: Agreed.**

**R4-2109568 On NR V2X Core and Accuracy Requirement Remaining Issues**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

### 6.3 Integrated Access and Backhaul for NR

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**Email discussion: [99-e][211] NR\_IAB\_RRM**

**R4-2108135 Email discussion summary: [99-e][211] NR\_IAB\_RRM** *Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108383 (from R4-2108135).**

**R4-2108383 Email discussion summary: [99-e][211] NR\_IAB\_RRM** *Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108285 | WF on RRM test cases for IAB-MT | ZTE Corporation |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2110335 | CR on maintenance of side conditions for IAB-MT R16 | Huawei, HiSilicon | merged |  |
| R4-2110336 | CR on maintenance on sharing factor of RLM and link recovery for IAB-MT R16 | Huawei, HiSilicon | agreeable |  |
| R4-2111300 | Side conditions in IAB-MT RRC connection mobility requirements in TS 38.174 | Ericsson | ~~Agreeable~~ Postponed |  |
| R4-2110337 | Draft CR on maintenance of IAB test cases | Huawei, HiSilicon | agreeable |  |
| R4-2111299 | Draft Big CR: IAB-MT RRM test cases in 38.174 | Ericsson | ~~Agreeable~~ Revised |  |
| R4-2111302 | Correction to CSI-RS based RLM tests for LA IAB-MT in TS 38.174 | Ericsson | revised |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108285 | WF on test cases for IAB-MT | ZTE Corporation | Agreeable |  |
| R4-2108287 | Correction to CSI-RS based RLM tests for LA IAB-MT in TS 38.174 | Ericsson | Agreeable |  |

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#### 6.3.3 RRM core requirement maintenance

**R4-2110335 CR on maintenance of side conditions for IAB-MT R16**

*Type: CR For: Agreement  
 38.174 v16.2.0 CR-0014 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Merged.**

**R4-2110336 CR on maintenance on sharing factor of RLM and link recovery for IAB-MT R16**

*Type: CR For: Agreement  
 38.174 v16.2.0 CR-0015 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2111300 Side conditions in IAB-MT RRC connection mobility requirements in TS 38.174**

*Type: CR For: Agreement  
 38.174 v16.2.0 CR-0019 rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR on side conditions (SSB Es/Iot and SSP\_RP) for IAB-MT requirements

Session chair: CR has 3 errors on the coversheet and will be postponed. If needed the respective changes can be merged to another CR.

**Decision: Postponed.**

#### 6.3.4 RRM performance requirements

**R4-2108285 WF on RRM test cases for IAB-MT**

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

**Abstract:**

**Discussion:**

**Decision: Approved.**

##### 6.3.4.1 General

**R4-2110337 Draft CR on maintenance of IAB test cases**

*Type: draftCR For: Endorsement  
 38.174 v16.2.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2111299 Draft Big CR: IAB-MT RRM test cases in 38.174**

*Type: CR For: Agreement  
 38.174 v16.2.0 CR-0018 rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The big CR IAB-MT RRM test cases. Last version was endorsed in R4-2105730 (RAN4#98bis-e)

**Decision: Revised to R4-2108286 (from R4-2111299).**

**R4-2108286 Big CR: IAB-MT RRM test cases in 38.174**

*Type: CR For: Agreement  
 38.174 v16.2.0 CR-0018 rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The big CR IAB-MT RRM test cases. Last version was endorsed in R4-2105730 (RAN4#98bis-e)

**Decision: Agreed.**

##### 6.3.4.2 Test cases

###### 6.3.4.2.1 RRC Re-establishment

###### 6.3.4.2.2 RRC Connection Release with Redirection

###### 6.3.4.2.3 IAB-MT transmit timing

###### 6.3.4.2.4 RLM

**R4-2111301 Further analysis of CSI-RS based RLM tests for LA IAB-MT**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The document describes test cases to verify IAB-MT CSI-RS based RLM requirements for IAB-MT LA class

**Decision: Noted.**

**R4-2111302 Correction to CSI-RS based RLM tests for LA IAB-MT in TS 38.174**

*Type: draftCR For: Endorsement  
 38.174 v16.2.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The updates in draft CR on IAB-MT CSI-RS based RLM tests for IAB-MT LA class

**Decision: Revised to R4-2108287 (from R4-2111302).**

**R4-2108287 Correction to CSI-RS based RLM tests for LA IAB-MT in TS 38.174**

*Type: draftCR For: Endorsement  
 38.174 v16.2.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The updates in draft CR on IAB-MT CSI-RS based RLM tests for IAB-MT LA class

**Decision: Endorsed.**

###### 6.3.4.2.5 Beam Failure Detection and Link Recovery

### 6.4 Multi-RAT Dual-Connectivity and Carrier Aggregation enhancements

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**Email discussion: [99-e][212] LTE\_NR\_DC\_CA\_RRM\_1\_NWM**

**R4-2108136 Email discussion summary: [99-e][212] LTE\_NR\_DC\_CA\_RRM\_1\_NWM** *Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108384 (from R4-2108136).**

**R4-2108384 Email discussion summary: [99-e][212] LTE\_NR\_DC\_CA\_RRM\_1\_NWM** *Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 20th)

**R4-2111277 Draft CR for Idle Mode measurements of inter-RAT CA candidate cells for early reporting (TC#3)**

* Discussion
  + Anritsu: Additional comments need to be taken into account (provided additional information in NWM)
    - Nokia: we can look further.
  + Huawei: Need to have a single sub-test. No need to have multiple.
    - Nokia: open to discuss how to capture the test.
  + Apple: There may be different Noc, Es for different band groups. The performance was verified in other tests. We suggest to simplify the test and no need to specify the exact values. Need to make sure UE can make detection.
    - Nokia: We prefer to have poor conditions, but can discuss if we should use same values.
    - Apple: The current value is TBD. We have quite similar requirement in LTE spec and there we have a simple design without differentiation of power levels for different bands.
    - Nokia: We can use EUTRAN as baseline.

1st round email discussion conclusions

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2111277 | Draft CR for IdleMode measurements of inter-RAT CA candidate cells for early reporting (TC#3) | Nokia, Nokia shanghai Bell | Revised |  |
| R4-2110856 | CR on LTE-NR EMR requirements 36133 | Huawei, HiSilicon | Agreeable |  |
| R4-2110858 | CR on EMR requirements correction 38133 | Huawei, HiSilicon | Agreeable |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2111277 | Draft CR for Idle Mode measure ments of inter-RAT CA candidate cells for early reporting (TC#3) | Nokia, Nokia shanghai Bell | postponed | Return to in next meeting |
| R4-2110860 | Big CR: Intro duction of Rel-16 MR-DC EMR RRM performance requirements (TS 36.133) | Huawei, HiSilicon | agreeable | no comments re ceived |
| R4-2108182 | Big CR: Intro duction of Rel-16 MR-DC EMR RRM performance requirements (TS 38.133) | Nokia | agreeable | no comments received. No need for email approval (this version is the same as was endorsed in RAN4#98bis) |

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**Email discussion: [99-e][213] LTE\_NR\_DC\_CA\_RRM\_2**

**R4-2108137 Email discussion summary: [99-e][213] LTE\_NR\_DC\_CA\_RRM\_2** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108385 (from R4-2108137).**

**R4-2108385 Email discussion summary: [99-e][213] LTE\_NR\_DC\_CA\_RRM\_2** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 20th)

* Issue 1-3-1: Measurement periods threshold value for requirement branching in NR FR1
  + Proposals
    - Option 1 (Nokia): Increase the measurement period threshold for Direct SCell Activation in FR1 from 1280ms to [5]s.
  + Discussion
    - Nokia: The issue is that for 1280ms threshold, the network will need to use shorter DRX cycles. There is impact on both NW and UEs.
    - E///: Agree with Nokia. The current assumptions limit the set of DRX cycles which we use. 1280ms will allow only 1 SCell to be measured. Need to further discuss exact value. The intention is not to tighten.
    - Apple: for 1280ms there will be constraints on the configuration. All of this was discussed in Rel-15. We prefer not to reopen the discussion.
    - Intel: Rel-15 assumption of 160ms sampling interval. We acknowledge E/// comments that current assumption limit the flexibility (i.e. 1 SCell measurement). We are open to discuss improvements.
    - Huawei: Understand the concern from the network side. However, AGC reliability needs to be considered. For 5sec it is not possible to guarantee AGC validity and activation process can fail. We are open to discuss some values in the middle.
    - Apple: We think that another SMTC for AGC will be required and SCell activation delay will be longer.
    - QC: Understand the issue from NW side. UE power consumption can be improved in case of enhancements. Open to further discussion.
    - MediaTek: It is difficult for UE to differentiate conditions. Can we always follow the longer requirement instead?
    - QC: there may be additional requirements affected by this change. Need to further discuss if we should consistently update other requirements
  + Sessions chair: Continue discussion. Come back in the 2nd round.
* Topic #2: Test cases
  + Sessions chair: Continue discussion. Further check in the 2nd round.
* Issue 1-2-1: Removal of bracket for SCell known condition in NR FR1
  + Proposals
    - Option 1 (Nokia): Remove bracket around [5] seconds in SCell known condition requirement for Direct SCell Activation in NR FR1.
  + Discussion
    - TBA
  + Agreements:
    - TBA

GTW session (May 26th)

* Issue 1-3-1 Measurement period threshold value for requirement branching in NR FR1
  + Proposals
    - Option 1 (Nokia): Increase the measurement period threshold for Direct SCell Activation in FR1 from 1280ms to [5]s.
    - Option 2 (Ericsson): Use the threshold [1280ms]×CSSFinter in the Direct SCell activation delay requirement.
    - Option 3 (MediaTek): Do not use a threshold in the Direct SCell activation delay requirement. Always assume the longer activation procedure (TFirstSSB\_MAX + Trs + 5ms) is needed.
    - Option 4 (Nokia)
      * Case 1: Activation delay for an SCell which was a deactivated SCell prior to e.g. HO and now target for the direct SCell activation.
        + Reuse requirements in 8.2.3
      * Case 2: Other cells (i.e. cells which were not deactivated SCell prior to being target SCell in the direct activation)
        + If the SCell is known and belongs to FR1, TCSI\_Reporting is specified in clause 8.3.2 and Tactivation\_time is defined as:

TFirstSSB+ 5ms, if the measurement period is equal to or smaller than [1280ms][xCSSF].

TFirstSSB\_MAX + Trs + 5ms, if measurement period is larger than [1280]ms.

* + Discussion
    - Moderator (E///): there is a new proposal from Nokia
    - Apple: We should keep existing agreements 1280ms threshold. Ok with Option 3 as well.
    - Nokia: suggest alternative Option 4
    - E///: Agree with Nokia proposal
    - Huawei: when will case 1 happen for Option 4? For Rel-15 we are discussing the conditions for branching the requirements and further alignment is needed. We prefer to keep the last meeting agreements.
      * Nokia: The reason why we make proposals is that we have discussion on this in Rel-15. Prefer not to change R15.
    - Apple: Case 1 should be valid and we can reuse requirements. For Case 2 – CSSF scaling factor shall be removed.
      * Nokia: CSSF – we are open to discuss
    - Apple: we have R15 CR to update the spec but the motivation is to clarify rather than change the requirement.
      * E///: we disagree on this aspect and it was decided in San Diego in 2018. It should be meas cycle.
      * Apple: we have different understanding
    - Apple: we should apply the same principles with R15.
  + Session chair: continue discussion.
* Topic #2: Test cases
  + Moderator: No issues and everything can be completed.

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108290 | WF on core requirement maintenance of Direct SCell Activation | Ericsson | To capture agreements pertaining to Issues 1-1-1 and 1-3-1. |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2110862 | CR on direct SCell activation | Huawei, HiSilicon | Agreeable |  |
| R4-2110864 | CR on SCell dormancy requirements | Huawei, HiSilicon | Agreeable |  |
| R4-2111285 | CR Correction of activation delay for Direct activated Scell | Nokia, Nokia Shanghai Bell | ~~Agreeable~~ Revised |  |
| R4-2109881 | CR on TS38.133 for direct Scell activation | MediaTek Inc. | Revised | Revision needed as there are formatting issues, and Issue 1-3-1 is not yet settled. |
| R4-2111275 | CR for Direct SCell activation delay | Nokia, Nokia Shanghai Bell | Revised | Revision needed as Issue 1-2-1 is not yet settled and original proposal seems not agreeable to the group. |
| R4-2110967 | Big CR 38.133: Introduction of Rel-16 MR-DC Direct SCell activation and SCell dormancy RRM performance requirements | Ericsson | Return to in second round | No comments received in first round. |
| R4-2110975 | DraftCR 38.133: Corrections to test cases for SCell dormancy | Ericsson | Return to in second round | No comments received in first round. |
| R4-2108180 | CR for core requirement maintenance on direct SCell activation R16 | Apple | Return to in second round | CR based on previously endorsed R4-2105739 added for handling in second round. |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2110862 | CR on direct SCell activation | Huawei, HiSilicon | Agreeable |  |
| R4-2110864 | CR on SCell dormancy requirements | Huawei, HiSilicon | Agreeable |  |
| R4-2108291 | CR Correction of activation delay for Direct activated Scell | Nokia, Nokia Shanghai Bell | Agreeable | Revision of R4-2111285 |
| R4-2108292 | CR on TS38.133 for direct Scell activation | MediaTek Inc. | Agreeable | Revision of R4-2109881 |
| R4-2108293 | CR for Direct SCell activation delay | Nokia, Nokia Shanghai Bell | Agreeable | Revision of R4-2111275 |
| R4-2110967 | Big CR 38.133: Introduction of Rel-16 MR-DC Direct SCell activation and SCell dormancy RRM performance requirements | Ericsson | Agreeable | Leave to vice chair to decide whether to revise to include DraftCR R4-2110975. |
| R4-2110975 | DraftCR 38.133: Corrections to test cases for SCell dormancy | Ericsson | Agreeable |  |
| R4-2108180 | CR for core requirement maintenance on direct SCell activation R16 | Apple | Agreeable |  |
| R4-2108290 | WF on core requirement maintenance of Direct SCell Activation | Ericsson | Agreeable |  |

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#### 6.4.1 RRM core requirement maintenance (38.133/36.133)

**R4-2108290 WF on core requirement maintenance of Direct SCell Activation**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2110856 CR on LTE-NR EMR requirements 36133**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7114 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110857 CR on LTE-NR EMR requirements 36133 R17**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7115 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110858 CR on EMR requirements correction 38133**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2079 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110859 CR on EMR requirements correction 38133 R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2080 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110862 CR on direct SCell activation**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2081 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110863 CR on direct SCell activation R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2082 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110864 CR on SCell dormancy requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2083 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110865 CR on SCell dormancy requirements R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2084 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2111285 CR Correction of activation delay for Direct activated Scell**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2130 rev Cat: F (Rel-16)  
  
 Source: Nokia Corporation*

**Decision: Revised to R4-2108291 (from R4-2111285).**

**R4-2108291 CR Correction of activation delay for Direct activated Scell**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2130 rev Cat: F (Rel-16)  
  
 Source: Nokia Corporation*

Session chair: CR coversheet error. Please update in revision.

**Decision: Agreed.**

**R4-2111286 CR Correction of activation delay for Direct activated SCell**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2131 rev Cat: A (Rel-17)  
  
 Source: Nokia Corporation*

**Decision: Agreed.**

##### 6.4.1.1 Early Measurement reporting

##### 6.4.1.2 Efficient and low latency serving cell configuration, activation and setup

**R4-2109881 CR on TS38.133 for direct Scell activation**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1941 rev Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2108292 (from R4-2109881).**

**R4-2108292 CR on TS38.133 for direct Scell activation**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1941 rev Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Agreed.**

**R4-2109882 CR on TS38.133 for direct Scell activation**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1942 rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Agreed.**

**R4-2110277 Discussion on direct Scell activation**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2111274 Direct SCell activation delay**

*Type: discussion For: Agreement  
 38.133 v CR- rev Cat: (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2111275 CR for Direct SCell activation delay**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2126 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2108293 (from R4-2111275).**

**R4-2108293 CR for Direct SCell activation delay**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2126 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

Session chair: CR coversheet error. Please update in revision if CR is agreeable.

**Decision: Agreed.**

**R4-2111276 CR for Direct SCell activation delay**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2127 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Agreed.**

**R4-2108180 CR for core requirement maintenance on direct SCell activation R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-TBA rev Cat: F (Rel-16)  
  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2108181 CR for core requirement maintenance on direct SCell activation R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-TBA rev Cat: A (Rel-17)  
  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

#### 6.4.2 RRM performance requirements (38.133)

##### 6.4.2.1 Early Measurement reporting

###### 6.4.2.1.1 General

**R4-2110860 Big CR: Introduction of Rel-16 MR-DC EMR RRM performance requirements (TS 36.133)**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7116 rev Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

Session chair: No new draft CRs to TS 36.133 in this meeting. Is the CR agreeable?

**Decision: Agreed.**

**R4-2110861 Big CR: Introduction of Rel-16 MR-DC EMR RRM performance requirements (TS 36.133) R17**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7117 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2108182 Big CR: Introduction of Rel-16 MR-DC EMR RRM performance requirements (TS 38.133)**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2176 rev Cat: B (Rel-16)  
  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2108183 Big CR: Introduction of Rel-16 MR-DC EMR RRM performance requirements (TS 38.133)**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2177 rev Cat: A (Rel-17)  
  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

###### 6.4.2.1.2 Measurement accuracy requirements

###### 6.4.2.1.3 Test cases

**R4-2111277 Draft CR for Idle Mode measurements of inter-RAT CA candidate cells for early reporting (TC#3)**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Postponed.**

**R4-2108288 Draft CR for Idle Mode measurements of inter-RAT CA candidate cells for early reporting (TC#3)**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Withdrawn.**

##### 6.4.2.2 Efficient and low latency serving cell configuration, activation and setup

###### 6.4.2.2.1 General

**R4-2110967 Big CR 38.133: Introduction of Rel-16 MR-DC Direct SCell activation and SCell dormancy RRM performance requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2104 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Big CR with test cases for Direct SCell activation and SCell Dormancy

**Decision: Revised to R4-2108035 (from R4-2110967).**

**R4-2108035 Big CR 38.133: Introduction of Rel-16 MR-DC Direct SCell activation and SCell dormancy RRM performance requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2104 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Big CR with test cases for Direct SCell activation and SCell Dormancy

**Decision: Agreed.**

**R4-2110969 Big CR 38.133: Introduction of Rel-16 MR-DC Direct SCell activation and SCell dormancy RRM performance requirements**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2105 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Big CR with test cases for Direct SCell activation and SCell Dormancy

**Decision: Agreed.**

###### 6.4.2.2.2 Test cases for direct SCell activation

###### 6.4.2.2.3 Test case for SCell Dormancy

**R4-2110975 DraftCR 38.133: Corrections to test cases for SCell dormancy**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Corrections pertaining to triggering inside/outside initial 3 OFDM symbols in a slot, and to new CORESET RMC to be used for the latter case.

**Decision: Endorsed.**

### 6.5 NR Positioning Support

#### 6.5.1 RRM core requirement maintenance (38.133)

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**Email discussion: [99-e][214] NR\_pos\_1**

**R4-2108138 Email discussion summary: [99-e][214] NR\_pos\_1**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108386 (from R4-2108138).**

**R4-2108386 Email discussion summary: [99-e][214] NR\_pos\_1**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108036 (from R4-2108386).**

**R4-2108036 Email discussion summary: [99-e][214] NR\_pos\_1**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 25th)

* Issue 1-2-2: Relation between the observation windows of Lprs and UE processing capability ‘N’
  + Proposals
    - Option 1 (Nokia)
      * A UE needs to use the observation window for *N* same as LPRS,i observation window that was agreed as the aggregating duration of all the PRS resources that fall within MGs and are not muted.
      * If the window *T* ms is not set same as the window LPRS,i, the requirement applies another scaler as , where is the observation window of LPRS,i counting.
    - Option 2 (CATT, HW, QC, vivo)
      * No relation between the two observation windows. Keep the existing requirement.
    - ~~Option 3 (vivo)~~
      * ~~Keep current scaling factor~~
  + Discussion
    - Nokia: We would like to check if companies confirm the issue is valid.
    - QC: Option 2.
    - vivo: There is some dependency on *N* and LPRS,i. However it is ok to use the existing requirement.
    - Nokia: If this is not an issue, then we would like to hear companies views. Prefer to keep it open. RAN1 is discussing.
* Issue 1-3-1: PRS-RSRP configured for a different method than DL-TDOA
  + Proposals
    - Option 1a (ZTE, OPPO)
      * RSTD measurement period is not impacted by the PRS-RSRP measurement configured for another positioning method, if they are measured on the same set of PRS resources.
    - Option 1b (CATT, Nokia, vivo, OPPO, Intel)
      * RSTD measurement period is not impacted by PRS-RSRP measurement.
    - Option 2a (HW)
      * When UE is configured measurement for more than one positioning requests, the measurement period for each requests can be longer than measurement period when UE is configured measurement for that single positioning request.
    - Option 2b (Ericsson)
      * When PRS-RSRP and RSTD are configured using separate OTDOA assistance data then the measurement periods of RSTD and PRS-RSRP may be different.
    - Option 2c (QC)
      * RAN4 not to specify requirements for scenarios involving concurrent NR positioning methods in Rel-16.
      * Measurement period requirements in TS 38.133 sections 9.9.2.5, 9.9.3.5 and 9.9.4.5 do not apply when there are concurrent positioning requests. If there are concurrent positioning requests the starting point and duration of the measurement period may be different.
    - Option 2d (OPPO)
      * PRS measurement requirements do not apply when UE is configured PRS measurement for more than one positioning methods with different sets of PRS resources to measure.
  + Discussion
    - Huawei: 2a or 2c
    - E///: 2a and 2b
    - Nokia: PRS-RSRP can be used for different purposes. There are separate UE capabilities.
    - QC: Ok with 2a and 2c.
    - vivo: Measurements will be processed independently. Ok to keep requirements for the case of single method in Rel-16 and leave up to implementation for multiple measurements.
    - Intel: Do not define requirements in Rel-16. Option 2c.
  + Agreements:
    - Rel-16 RAN4 requirements are defined for the case of single configured NR positioning method. Rel-16 requirements do not cover scenarios involving concurrent NR positioning methods.
      * When UE is configured with measurement for more than one positioning requests, the measurement period for each request may be longer than measurement period when UE is configured with measurement for single positioning request
  + Session chair: it is common understanding that PRS-RSRP measurements can be configured as a part of DL-TDOA, Multi-RTT, DL AOD measurements and it is already covered by the Rel-16 requirements.

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108294 | WF on UE PRS measurement requirements | Huawei, HiSilicon |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| [R4-2109089](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109089.zip) | CR on PRS RSTD measurement requirements | CATT | ~~Revised~~ Postponed | Endorsed CR from last meeting, revised to capture new changes in this meeting for RSTD section |
| [R4-2109090](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109090.zip) | CR on PRS PRS RSTD measurement requirements | CATT | Merged |  |
| [R4-2109175](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109175.zip) | CR to update RSTD measurement requirements | Nokia, Nokia Shanghai Bell | Merged |  |
| [R4-2110871](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110871.zip) | CR to update RSTD measurement requirements | Huawei, HiSilicon | Merged |  |
| [R4-2111332](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111332.zip) | Updates to measurement requirements in TS 38.133 | Ericsson | Merged |  |
| [R4-2111334](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111334.zip) | Updates to measurement requirements in TS 36.133 | Ericsson | Merged |  |
| [R4-2110008](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110008.zip) | CR to update PRS-RSRP measurement requirements | Nokia, Nokia Shanghai Bell | Merged |  |
| [R4-2110874](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110874.zip) | CR to update PRS-RSRP measurement requirements | Huawei, HiSilicon | Merged |  |
| [R4-2111337](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111337.zip) | PRS-RSRP measurement requirements | Ericsson | Revised | Endorsed CR from last meeting, revised to capture new changes in this meeting for PRS-RSRP section |
| [R4-2110010](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110010.zip) | CR to update UE Rx-Tx time difference measurement requirements | Nokia, Nokia Shanghai Bell | Merged |  |
| [R4-2110122](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110122.zip) | CR on UE Rx-Tx time difference measurement period | OPPO | Revised | Endorsed CR from last meeting, revised to capture new changes in this meeting for UE Rx-Tx section |
| [R4-2110877](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110877.zip) | CR to update UE Rx-Tx time difference measurement requirements | Huawei, HiSilicon | Merged |  |
| [R4-2111340](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111340.zip) | UE Rx-Tx measurement requirements | Ericsson | Merged |  |
| [R4-2110880](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110880.zip) | CR on CSSF and measurement capability for PRS measurement 38.133 | Huawei, HiSilicon | Revised | Revised to capture changes for general applicability |
| [R4-2109931](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109931.zip) | CR to 38.133 correction on CCSF for NR measurements for positioning | vivo | Revised | Endorsed CR from last meeting, revised to capture new changes in this meeting for CSSF section |
| [R4-2110866](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110866.zip) | CR on MG for PRS measurement 38.133 R16 | Huawei, HiSilicon | Agreeable | Endorsed CR from last meeting |
| [R4-2110868](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110868.zip) | CR on MG for PRS measurement 36.133 R16 | Huawei, HiSilicon | Agreeable | Endorsed CR from last meeting |
|  |  |  |  |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108414 | CR on PRS RSTD measurement requirements | CATT | Agreeable |  |
| R4-2108295 | PRS-RSRP measurement requirements | Ericsson | Agreeable |  |
| R4-2108296 | CR on UE Rx-Tx time difference measurement period | OPPO | Agreeable |  |
| R4-2108297 | CR on CSSF and measurement capability for PRS measurement 38.133 | Huawei, HiSilicon | Agreeable |  |
| R4-2108298 | CR to 38.133 correction on CCSF for NR measurements for positioning | vivo | Agreeable |  |
| R4-2108294 | WF on UE PRS measurement requirements | Huawei, HiSilicon | Agreeable |  |

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**R4-2108294 WF on UE PRS measurement requirements**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

Nokia: There is some contradiction in agreed CRs. Suggest to capture additional agreement “Lprs is calculated by referring to PRS duration K defined in TS 38.214”

Agreement: Lprs is calculated by referring to PRS duration K defined in TS 38.214

**Decision: Approved.**

**R4-2109089 CR on PRS RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1870 rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Revised to R4-2108414 (from R4-2109089).**

**R4-2108414 CR on PRS RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1870 rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Agreed.**

**R4-2109091 CR on PRS RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1872 rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Agreed.**

**R4-2109931 CR to 38.133 correction on CCSF for NR measurements for positioning**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1953 rev Cat: F (Rel-16)  
  
 Source: vivo*

**Decision: Revised to R4-2108298 (from R4-2109931).**

**R4-2108298 CR to 38.133 correction on CCSF for NR measurements for positioning**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1953 rev Cat: F (Rel-16)  
  
 Source: vivo*

**Decision: Agreed.**

**R4-2109932 CR to 38.133 correction on CCSF for NR measurements for positioning**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1954 rev Cat: A (Rel-17)  
  
 Source: vivo*

**Decision: Agreed.**

**R4-2110866 CR on MG for PRS measurement 38.133 R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2085 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110867 CR on MG for PRS measurement 38.133 R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2086 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110868 CR on MG for PRS measurement 36.133 R16**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7118 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110869 CR on MG for PRS measurement 36.133 R17**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7119 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

##### 6.5.1.1 PRS-RSTD measurement requirements

**R4-2108778 On UE PRS-RSTD measurements**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109087 Discussion on PRS RSTD measurement requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109090 CR on PRS PRS RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1871 rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Merged.**

**R4-2109092 CR on PRS PRS RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1873 rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Withdrawn.**

**R4-2109175 CR to update RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1874 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

There are some remaining open issues in RSTD measurement period.

**Decision: Merged.**

**R4-2110007 CR to update RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1964 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Withdrawn.**

**R4-2109234 Discussion on NR PRS RSTD measurement report requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2109858 On PRS-RSTD measurement requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2109934 Further discussion on PRS RSTD measurement requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2110012 On PRS-RSTD measurement period definition**

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

**Decision: Noted.**

**R4-2110039 Discussion on the measurement period for RSTD**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110870 Discussion on remaining issues for RSTD measurement requirements**

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

**Decision: Noted.**

**R4-2110871 CR to update RSTD measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2087 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Merged.**

**R4-2110872 CR to update RSTD measurement requirements R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2088 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2111331 On RSTD measurement requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On RSTD measurement requirements

**Decision: Noted.**

**R4-2111332 Updates to measurement requirements in TS 38.133**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2150 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Positioning measurement requirements for DL DTOA and DL AOD are updated. Gap pattern # 25 is removed for LTE measurements

**Decision: Merged.**

**R4-2111333 Updates to measurement requirements in TS 38.133**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2151 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Positioning measurement requirements for DL DTOA and DL AOD are updated. Gap pattern # 25 is removed for LTE measurements as agreed at RAN4#98bis-e.

**Decision: Withdrawn.**

**R4-2111334 Updates to measurement requirements in TS 36.133**

*Type: CR For: Agreement  
 36.133 v16.9.0 CR-7123 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Gap pattern # 25 is removed for LTE measurements as agreed at RAN4#98bis-e

**Decision: Merged.**

**R4-2111335 Updates to measurement requirements in TS 36.133**

*Type: CR For: Agreement  
 36.133 v17.1.0 CR-7124 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Gap pattern # 25 is removed for LTE measurements as agreed at RAN4#98bis-e

**Decision: Withdrawn.**

##### 6.5.1.2 PRS-RSRP measurement requirements

**R4-2108779 Remaining issues on PRS-RSRP measurements**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109859 On PRS-RSRP measurement requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2109935 Further discussion on PRS-RSRP measurement requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2110008 CR to update PRS-RSRP measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1965 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Merged.**

**R4-2110009 CR to update PRS-RSRP measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1966 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Withdrawn.**

**R4-2110013 On PRS-RSRP measurement period definition**

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

**Decision: Noted.**

**R4-2110045 Discussion on the measurement period for PRS-RSRP**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110873 Discussion on remaining issues for PRS-RSRP measurement requirements**

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

**Decision: Noted.**

**R4-2110874 CR to update PRS-RSRP measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2089 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Merged.**

**R4-2110875 CR to update PRS-RSRP measurement requirements R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2090 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2111336 On PRS-RSRP measurement requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On PRS-RSRP measurement requirements

**Decision: Noted.**

**R4-2111337 PRS-RSRP measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2152 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

PRS-RSRP measurement requirements. The CR was endorsed in R4-2105745 at RAN4#98bis-e

**Decision: Revised to R4-2108295 (from R4-2111337).**

**R4-2108295 PRS-RSRP measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2152 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

PRS-RSRP measurement requirements. The CR was endorsed in R4-2105745 at RAN4#98bis-e

**Decision: Agreed.**

**R4-2111338 PRS-RSRP measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2153 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

PRS-RSRP measurement requirements. The CR was endorsed in R4-2105745 at RAN4#98bis-e

**Decision: Agreed.**

##### 6.5.1.3 UE Rx-Tx time difference measurement requirements

**R4-2108780 On UE Rx-Tx time difference measurement requirements**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109088 Discussion on UE Rx-Tx time difference measurement requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109236 Discussion on UE RX-TX time difference measurement requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2109860 On UE Rx-Tx measurement requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2109936 Further discussion on UE RX-TX timing difference measurement requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2110010 CR to update UE Rx-Tx time difference measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1967 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Merged.**

**R4-2110011 CR to update UE Rx-Tx time difference measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1968 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Withdrawn.**

**R4-2110014 On UE RX-TX measurement period definition**

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

**Decision: Noted.**

**R4-2110046 Discussion on the measurement period for UE Rx-Tx time difference**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110122 CR on UE Rx-Tx time difference measurement period**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1976 rev Cat: F (Rel-16)  
  
 Source: OPPO*

**Decision: Revised to R4-2108296 (from R4-2110122).**

**R4-2108296 CR on UE Rx-Tx time difference measurement period**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1976 rev Cat: F (Rel-16)  
  
 Source: OPPO*

**Decision: Agreed.**

**R4-2110123 CR on UE Rx-Tx time difference measurement period**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1977 rev Cat: A (Rel-17)  
  
 Source: OPPO*

**Decision: Agreed.**

**R4-2110876 Discussion on remaining issues for UE Rx-Rx time difference measurement requirements**

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

**Decision: Noted.**

**R4-2110877 CR to update UE Rx-Tx time difference measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2091 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Merged.**

**R4-2110878 CR to update UE Rx-Tx time difference measurement requirements R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2092 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2111339 On UE Rx-Tx measurement requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On UE Rx-Tx measurement requirements, which are updated to include past agreements and further updates are done to complete the requirements

**Decision: Noted.**

**R4-2111340 UE Rx-Tx measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2154 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

UE Rx-Tx measurement requirements are updated to include past agreements and further updates are done to complete the requirements

**Decision: Merged.**

**R4-2111341 UE Rx-Tx measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2155 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

UE Rx-Tx measurement requirements are updated to include past agreements and further updates are done to complete the requirements

**Decision: Withdrawn.**

##### 6.5.1.4 Other requirements

**R4-2108781 Discussion on impact of CSSF to positioning measurements**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109861 On general PRS measurement requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2109937 Further discussion on general requirements for NR positioning**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2110015 Discussion on other NR positioning requirements**

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

**Decision: Noted.**

**R4-2110124 Discussion on general PRS measurement requirements**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110879 Discussion on CSSF and measurement capability for PRS measurement**

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

**Decision: Noted.**

**R4-2110880 CR on CSSF and measurement capability for PRS measurement 38.133**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2093 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108297 (from R4-2110880).**

**R4-2108297 CR on CSSF and measurement capability for PRS measurement 38.133**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2093 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110881 CR on CSSF and measurement capability for PRS measurement 38.133 R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2094 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

#### 6.5.2 RRM performance requirements (38.133)

================================================================================

**Email discussion: [99-e][215] NR\_pos\_2**

**R4-2108139 Email discussion summary: [99-e][215] NR\_pos\_2**

*Type: other For: Information  
 Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108387 (from R4-2108139).**

**R4-2108387 Email discussion summary: [99-e][215] NR\_pos\_2**

*Type: other For: Information  
 Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 21st)

* Sub-topic 2-1 Applicable propagation channel for accuracy requirement
  + Proposals
    - Option 1 (vivo, Intel, OPPO, CATT, HW).
      * No need to define the additional accuracy requirement for AWGN
    - Option 2 (QC, E///, Nokia):
      * Define separated set requirements for AWGN beside the requirements for the fading channels
    - Option 2a (Huawei, QC, E///):
      * Define additional set requirements for AWGN
      * Captured in the specification the propagation channel models based on which the accuracy requirements are derived
  + Discussion
    - E///: Test cases will be done in AWGN but requirements are based on fading. So, the test cases become less useful. Not convinced we need to skip. In the past we had some measurements defined for AWGN (e.g. LTE Pos measurements).
    - QC: Do not oppose defining requirements for fading. Prefer to have additional set of AWGN requirements.
    - vivo: Industry refers to the RAN4 requirements as the baseline. AWGN requirements can be misleading and too optimistic. For fading channels, we may need to further discuss the accuracy since there may be some issues with the definition of the reference point.
    - QC: for AWGN requirements we can add some clarifications that the requirements are optimistic. We do not want to create confusion. We can also further discuss which requirement is further used.
    - Session chair: the agreement below may be adjusted based on outcome of the fading channel accuracy discussion.
  + Agreements:
    - PRS-RSTD and UE Rx-Tx measurement accuracy requirements
      * Define an additional set of accuracy requirements for AWGN
      * Capture in the specification the propagation channel models based on which the accuracy requirements are derived
    - Test cases for PRS-RSTD, PRS-RSRP and UE Rx-Tx accuracy requirements
      * Test cases are defined for AWGN conditions
      * AWGN accuracy requirements are used for the accuracy test cases for PRS-RSTD and UE Rx-Tx.
    - Test cases for measurement delay requirements
      * FFS if fading conditions can be used for FR1 measurement delay tests cases.
      * AWGN conditions will be used for FR2 measurement delay test cases.
* Sub-topic 2-5 RSTD accuracy requirements for FR1/FR2
  + Proposal 2: RSTD accuracy requirements under AWGN:

**Table 1: RSTD accuracy in FR1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Accuracy,**  **Tc** | **PRS BW,**  **PRB** | **PRS SCS,**  **kHz** | **Repetition factor**  ***(*** |
| [181+margin] | ≥ [24] | 15 | ≥4 |
| [104+margin] | ≥ [52] | All |
| [43+margin] | ≥ [104] | All |
| [TBD+margin] | ≥ [24] | 30 | ≥4 |
| [52+margin] | ≥ [48] | All |
| [24+margin] | ≥ [132] | All |
| [59+margin] | ≥ [24] | 60 | ≥4 |
| [27+margin] | ≥ [64] | All |

**Table 2: RSTD accuracy in FR2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Accuracy,**  **Tc** | **PRS BW,**  **PRB** | **PRS SCS,**  **kHz** | **Repetition factor**  ***(*** |
| [53+margin] | ≥ [24] | 60/120 | ≥4 |
| [57+margin] | ≥ [64] | All |
| [37+margin] | ≥ [132] | All |

* + Proposal 1: RSTD accuracy requirements under the fading channels:

**Table 1: RSTD accuracy in FR1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Accuracy,**  **Tc** | **PRS BW,**  **PRB** | **PRS SCS,**  **kHz** | **Repetition factor**  ***(*** |
| [247+margin] | ≥ [24] | 15 | ≥4 |
| [128+margin] | ≥ [52] | All |
| [75+margin] | ≥ [104] | All |
| [TBD+margin] | ≥ [24] | 30 | ≥4 |
| [98+margin] | ≥ [48] | All |
| [31+margin] | ≥ [132] | All |
| [120+margin] | ≥ [24] | 60 | ≥4 |
| [26+margin] | ≥ [64] | All |

**Table 2: RSTD accuracy in FR2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Accuracy,**  **Tc** | **PRS BW,**  **PRB** | **PRS SCS,**  **kHz** | **Repetition factor**  ***(*** |
| [53+margin] | ≥ [24] | 60/120 | ≥4 |
| [57+margin] | ≥ [64] | All |
| [37+margin] | ≥ [132] | All |

* + Discussion
    - Session chair: encourage companies to double check the simulation results
    - QC: for fading channel what is the reference time? We assumed the 1st tap in multi-path channel.
      * vivo: reference time is first detectable path
  + Agreements:
    - Reference point of ideal RX time for RSTD accuracy requirements is the absolute arrival time of the first path of the receive signal
    - Accuracy requirements will be finalized once the simulation results collection is finalized
    - RSTD accuracy requirements under AWGN:
      * [Requirements are based on the average of companies simulation results]
      * Margin value is FFS

**Table 1: RSTD accuracy in FR1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Accuracy,**  **Tc** | **PRS BW,**  **PRB** | **PRS SCS,**  **kHz** | **Repetition factor**  ***(*** |
| [TBD + margin] | ≥ [24] | 15 | ≥4 |
| [TBD + margin] | ≥ [52] | All |
| [TBD + margin] | ≥ [104] | All |
| [TBD + margin] | ≥ [24] | 30 | ≥4 |
| [TBD + margin] | ≥ [48] | All |
| [TBD + margin] | ≥ [132] | All |
| [TBD + margin] | ≥ [24] | 60 | ≥4 |
| [TBD + margin] | ≥ [64] | All |

**Table 2: RSTD accuracy in FR2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Accuracy,**  **Tc** | **PRS BW,**  **PRB** | **PRS SCS,**  **kHz** | **Repetition factor**  ***(*** |
| [TBD + margin] | ≥ [24] | 60 | All |
| [TBD + margin] | ≥ [64] | All |
| [TBD + margin] | ≥ [132] | All |
| [TBD + margin] | ≥ [32] | 120 | All |
| [TBD + margin] | ≥ [64] | All |
| [TBD + margin] | ≥ [128] | All |

* + - RSTD accuracy requirements under fading conditions:
      * Margin value is FFS

**Table 1: RSTD accuracy in FR1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Accuracy,**  **Tc** | **PRS BW,**  **PRB** | **PRS SCS,**  **kHz** | **Repetition factor**  ***(*** |
| [TBD + margin] | ≥ [24] | 15 | ≥4 |
| [TBD + margin] | ≥ [52] | All |
| [TBD + margin] | ≥ [104] | All |
| [TBD + margin] | ≥ [24] | 30 | ≥4 |
| [TBD + margin] | ≥ [48] | All |
| [TBD + margin] | ≥ [132] | All |
| [TBD + margin] | ≥ [24] | 60 | ≥4 |
| [TBD + margin] | ≥ [64] | All |

**Table 2: RSTD accuracy in FR2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Accuracy,**  **Tc** | **PRS BW,**  **PRB** | **PRS SCS,**  **kHz** | **Repetition factor**  ***(*** |
| [TBD + margin] | ≥ [24] | 60 | ≥4 |
| [TBD + margin] | ≥ [64] | All |
| [TBD + margin] | ≥ [132] | All |
| [TBD + margin] | ≥ [32] | 120 | ≥4 |
| [TBD + margin] | ≥ [64] | All |
| [TBD + margin] | ≥ [128] | All |

* Sub-topic 4-5 UE Rx-Tx time difference measurement accuracy requirements
  + Proposals
    - Proposal 1: UE Rx-TX time difference measurement accuracy requirements under the fading channels can be:

**Table 1: UE Rx-Tx time difference accuracy in FR1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Accuracy,**  **Tc** | **Es/Iot,**  **dB** | **PRS BW,**  **PRB** | **PRS SCS,**  **kHz** | **Repetition factor**  ***(*** |
| [114+margin] | **-3** | ≥[24] | 15 | ≥4 |
| [83+margin] | ≥[52] | All |
| [47+margin] | >[104] | All |
| [TBD+margin] | ≥[24] | 30 | ≥4 |
| [51+margin] | ≥[48] | All |
| [41+margin] | ≥[132] | All |
| [53+margin] | ≥[24] | 60 | ≥4 |
| [31+margin] | ≥[64] | All |
| [135+margin] | **-13** | ≥[24] | 15 | ≥4 |
| [86+margin] | ≥[52] | All |
| [52+margin] | >[104] | All |
| [TBD+margin] | ≥[24] | 30 | ≥4 |
| [72+margin] | ≥[48] | All |
| [40+margin] | ≥[132] | All |
| [118+margin] | ≥[24] | 60 | ≥4 |
| [43margin] | ≥[64] | All |

* **Table 2: : UE Rx-Tx time difference accuracy in FR2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Accuracy,**  **Tc** | **Es/Iot,**  **dB** | **PRS BW,**  **PRB** | **PRS SCS,**  **kHz** | **Repetition factor**  ***(*** |
| [55+margin] | **-3** | ≥[24] | 60/120 | ≥4 |
| [47+margin] | ≥[64] | All |
| [30+margin] | ≥[132] | All |
| [59+margin] | **-13** | ≥[24] | 60/120 | ≥4 |
| [60+margin] | ≥[64] | All |
| [31+margin] | ≥[128] | All |

* + - Proposal 2: UE Rx-Tx time difference accuracy requirements under AWGN:

**Table 1: UE Rx-Tx time difference accuracy in FR1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Accuracy,**  **Tc** | **Es/Iot,**  **dB** | **PRS BW,**  **PRB** | **PRS SCS,**  **kHz** | **Repetition factor**  ***(*** |
| [99+margin] | **-3** | ≥[24] | 15 | ≥4 |
| [66+margin] | ≥[52] | All |
| [32+margin] | >[104] | All |
| [TBD+margin] | ≥[24] | 30 | ≥4 |
| [34+margin] | ≥[48] | All |
| [15+margin] | ≥[132] | All |
| [29+margin] | ≥[24] | 60 | ≥4 |
| [15+margin] | ≥[64] | All |
| [9+margin] | ≥[132] | All |
| [90+margin] | **-13** | ≥[24] | 15 | ≥4 |
| [79+margin] | ≥[52] | All |
| [39+margin] | >[104] | All |
| [TBD+margin] | ≥[24] | 30 | ≥4 |
| [39+margin] | ≥[48] | All |
| [18+margin] | ≥[132] | All |
| [40+margin] | ≥[24] | 60 | ≥4 |
| [18+margin] | ≥[64] | All |
| [9+margin] | ≥[132] | All |

**Table 2: UE Rx-Tx time difference accuracy in FR2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Accuracy,**  **Tc** | **Es/Iot,**  **dB** | **PRS BW,**  **PRB** | **PRS SCS,**  **kHz** | **Repetition factor**  ***(*** |
| [22+margin] | **-3** | ≥[24] | 60 | All |
| [14+margin] | ≥[64] | All |
| [9+margin] | ≥[132] | All |
| [14+margin] | ≥[24] | 120 | All |
| [8+margin] | ≥[64] | All |
| [4+margin] | ≥[128] | All |
| [32+margin] | **-13** | ≥[24] | 60 | All |
| [15+margin] | ≥[64] | All |
| [9+margin] | ≥[132] | All |
| [15+margin] | ≥[24] | 120 | All |
| [10+margin] | ≥[64] | All |
| [4+margin] | ≥[128] | All |

* + Discussion
    - TBA
  + Agreements:
    - TBA

GTW session (May 25th)

* Sub-topic#2-2-1 Applicable accuracy requirement in case of PRS resources with different SCSs
  + Candidate options:
    - Option 1 (OPPO)
      * For RSTD measured with PRS resources with different SCSs, UE follows the accuracy requirements for the smaller SCS
    - Option 2 (Intel, CATT, Huawei)
      * For RSTD measured with PRS resources with different SCSs, UE follows the accuracy requirements which is looser
  + Recommendations for 2nd round: Can be FFS. And check the following proposals is agreeable.
    - “In case of RSTD measurements on the different PFL, the PRS configuration parameters (e.g. FR, SCS, PRS BW) for the reference cell and neighbor cell are different. RAN4 can FFS the applicability rules of RSTD accuracy requirements for this scenario in TEI stage if no consensus achieved in this meeting.
    - Option 1. For RSTD measured with PRS resources with different SCSs, UE follows the accuracy requirements for the smaller SCS.
    - Option 2. when the PRS resources with different SCSs, UE follows the accuracy requirements which is looser
    - Other options are not precluded”
  + Discussion
    - OPPO: we are fine with Option 2. The part “requirements which is looser” is unclear. We define accuracy for limited PRS configuration sets. What happens if both BW and SCS are different.
    - QC: Similar concerns. The issue applies to the situation with measurements on different PFL.
    - Huawei: Option 2 should apply for the cases with different BW/SCS.
    - E///: Prefer to have more general statement “When UE measures RSTD on PRS resources belonging to different PFLs, then the RSTD accuracy is defined as the accuracy corresponding to the largest accuracy value among different PFLs”
    - Intel: E/// proposal is acceptable to us
    - vivo: agree with E/// wording. We also need to clarify in the spec that the tables apply for the case when the measurements are done within a single PFL.
    - QC: E/// wording is ok. Need to account possibility of measurements on different PFLs in the margins. Why is this urgent?
      * Intel: we have some test cases with different PFLs
    - E///: we need to have applicability disregards whether we have a test
  + Agreements:
    - When UE measures RSTD on PRS resources belonging to different PFLs, then the RSTD accuracy is defined as the accuracy corresponding to the largest accuracy value among different PFLs.
      * Note: margins for measurements on different PFLs shall be considered in the group delay margin
* Sub-topic#5-8 Muting pattern
  + Candidate options:
    - Option 1 (OPPO)
      * PRS configuration should be defined for core requirements test cases.
      * Non-muting PRS configuration should be defined for performance requirements test cases.
    - Option 1a (Qualcomm): type 1 PRS muting for RSTD measurement period report testing cases
    - Option 1b. (Intel):
      * For the core requirements test cases the following muting PRS configuration will be used.
        + Cell 1: ‘11110000’
        + Cell 2: ‘00001111’
        + Cell 3: ‘11110000’
    - Option 2 (Huawei): No
    - Option 3
      * + Cell 1: ‘10’
        + Cell 2: ‘01’
        + Cell 3: ‘10’
  + Discussion
    - Huawei: Option 3 is ok.
    - QC: Option 3 is ok.
  + Agreements:
    - Muting pattern
      * Cell 1: ‘10’
      * Cell 2: ‘01’
      * Cell 3: ‘10’
    - Cell 1 and Cell 3 will be configured with different Comb patterns or resource offsets
* Sub-topic 4-3 Applicable accuracy requirement in case of other (non-HO) serving cell changes
  + Candidate options:
    - Option 1 (vivo, OPPO, Huawei, Ericsson, Intel): The UE shall continue and complete a UE Rx-Tx measurement while meeting UE Rx-Tx measurement accuracy requirements in clause 10.1.23, when a non-HO serving cell change occurs during the measurement, provided the cell change does not impact the configuration of the SRS used for the measurement.
    - Option 2(CATT): Accuracy requirements apply with serving cell change, provided that the serving cell change does not impact the UL timing. No need to capture this in the spec.
    - Option 3 (Qualcomm): FFS
  + Recommendations for 2nd round: Can be FFS. Check whether Option 1 supported by majority companies view can be agreeable.
  + Discussion
    - CATT: fine with Option 1. No need to capture in the spec.
    - E///: Need to guarantee that UE continues measurements. Need to define UE behavior.
    - QC: Do we assume that parameters do not change.
    - E///: We may need to check in Core part for the measurement delay
  + Agreements:
    - The UE shall continue and complete a UE Rx-Tx measurement while meeting UE Rx-Tx measurement accuracy requirements in clause 10.1.23, when a non-HO serving cell change occurs during the measurement, provided the cell change does not impact the configuration of the SRS used for the measurement.
    - FFS if any clarifications are needed for the UE Rx-Tx measurements delay for this case in the Core requirements.
* Sub-topic 3-3-1 Applicability of the relative PRS RSRP accuracy requirements
  + Proposals
    - Option 1 (vivo):
      * For PRS-RSRP measurement from one TRP and PRS-RSRP measurement from another TRP on the same PFL in FR1, or PRS-RSRP measurements between any two PRS-RSRP levels on the same TRP in FR1, no RF calibration margin is added in the relative accuracy requirements.
      * For PRS-RSRP measurements from one TRP on one PFL in FR1 and PRS-RSRP measurements from another TRP on a different PFL in FR1, 2.5dB RF calibration margin is added in the relative accuracy requirements.
      * For all PRS-RSRP measurements in FR2, 4dB RF calibration margin is added in the relative accuracy requirements.
      * Antenna gain and beamforming gain uncertainty for PRS-RSRP measurement in FR2 are accounted in the test.
    - Option 3. (Huawei, Intel, CATT):
      * Relative PRS-RSRP accuracy requirements only apply for PRS-RSRP measured from resources in the same resource set, and with same Rx beam in case of FR2.
    - Option 4 (OPPO):
      * Relative PRS-RSRP accuracy requirements apply to any two PRS-RSRP:
        + The PRS-RSRP could be measured from the same TRP or different TRPs,
        + The PRS-RSRP could be measured in the same PFL or different PFLs,
        + The PRS-RSRP could be measured in the same FR range,
        + The difference between two PRS-RSRP should be no larger than X, |PRS\_RP1dBm - PRS\_RP2dBm| ≤ X dB

FFS: the value of X

* + - * The following rules should be considered for relative PRS-RSRP accuracy requirements:
        + The parameter PRS Es/Iot is the minimum PRS Es/Iot of the pair of TRPs to which the requirement applies.
        + The parameter PRS BW is the minimum PRS BW of the pair of PRS resources to which the requirement applies.
  + Discussion
    - vivo: We propose same margin as for SSB-RSRP.
    - QC: for us the question is whether there are any case where we can tighten the requirements. For us the margins can be tightened for the case of measurements are done using same RX beam for DL AOD.
    - Huawei: Is QC proposal to define some additional requirements? If so, then further discussion is needed.
    - E///: is the resource set corresponds to a single TRP?
      * Huawei: the scenario in Option 3 is most critical in our view. Other scenarios with multiple TRPs are possible but we do not see very relevant case. We can define a general requirement with existing margin. Alternatively, we can define Relative RSRP for this case only.
  + Agreements:
    - Relative PRS-RSRP accuracy requirements apply for the cases when PRS-RSRP is measured from resources in the same resource set, and PRS-RSRP is measured with same Rx beam in case of FR2.
  + Session chair: companies can bring additional scenarios in the WI maintenance stage.

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108299 | WF on NR RRM UE performance requirements | Intel Corporation |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2111330 |  | Ericsson, Intel | ~~Revised~~ Noted | Session chair: new CR is allocated |
| R4-2110884 |  | (Huawei, Hi Silicon) | Revised |  |
| R4-2111344 |  | (Ericsson) | Revised |  |
| R4-2109096 |  | (CATT) | Revised |  |
| R4-2110126 |  | OPPO | Merged | combined with [R4-2110884](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\99e\Docs\R4-2110884.zip). |
| R4-2109940 |  | vivo | Return |  |
| R4-2108765 |  | ZTE | Revised |  |
| R4-2109232 |  | Intel | Revised |  |
| R4-2109233 |  | Intel | Revised |  |
| R4-2111346 |  | Ericsson | Revised |  |
| R4-2111347 |  | Ericsson | Revised |  |
| R4-2110888 |  | Huawei | Revised |  |
| R4-2110889 |  | Huawei | Revised |  |
| R4-2110890 |  | Huawei | Revised |  |
| R4-2109097 |  | CATT | Return |  |
| R4-2110055 |  | OPPO | Merged | combined with [R4-2109232](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\99e\Docs\R4-2109232.zip) |
| R4-2109238 |  | Intel | Revised |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc No. | Revision from | Source company | Recommendation | Remarks |
| Big CR | | | | |
| R4-2108300 | [R4-211130](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\98e-b\Docs\R4-2107158.zip) | Ericsson, Intel | For email approval |  |
| CR for accuracy requirements | | | | |
| R4-2108302 | [R4-2110884](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\99e\Docs\R4-2110884.zip) | (Huawei, Hi Silicon) | Agreeable |  |
| R4-2108303 | [R4-2111344](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\99e\Docs\R4-2111344.zip) | (Ericsson) | Agreeable |  |
| R4-2108304 | [R4-2109096](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\99e\Docs\R4-2109096.zip) | (CATT) | Agreeable |  |
| R4-2108422 | [R4-2109940](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\99e\Docs\R4-2109096.zip) | vivo | Agreeable |  |
|  |  |  |  |  |
| CR for TC | | | | |
| R4-2108305 | [R4-2108765](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\99e\Docs\R4-2108765.zip) | ZTE | Agreeable | TC9-10 |
| R4-2108306 | [R4-2109232](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\99e\Docs\R4-2109232.zip) | Intel | Agreeable | TC0-PRS |
| R4-2108307 | [R4-2109233](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\99e\Docs\R4-2109233.zip) | Intel | Agreeable | TC1-2 |
| R4-2108308 | [R4-2111346](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\99e\Docs\R4-2111346.zip) | Ericsson | Agreeable | TC5-6 |
| R4-2108309 | [R4-2111347](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\99e\Docs\R4-2111347.zip) | Ericsson | Agreeable | TC11-12 |
| R4-2108310 | [R4-2110888](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\99e\Docs\R4-2110888.zip) | Huawei | Withdraw. The original version can be agreeable. |  |
| R4-2108311 | [R4-2110889](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\99e\Docs\R4-2110889.zip) | Huawei | Agreeable | TC3 |
| R4-2108312 | [R4-2110890](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\99e\Docs\R4-2110889.zip) | Huawei | Agreeable | TC7-8 |
| R4-2108424 | [R4-2109097](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\99e\Docs\R4-2109097.zip) | CATT | Agreeable | TC4 |
| WF | | | | |
| R4-2108299 | New | Intel | Return | Slide 4 – Num repetitions for “AWGN, FR2, PRB = 24,32” -> add brackets [All].  Slide 9 – same revisions as for slide 4. |
| Simulation result collection and full set of the simulation parameter list | | | | |
| R4-2108313 | R4-2109238 | Intel | For information |  |

================================================================================

##### 6.5.2.1 General

**R4-2108299 WF on NR RRM UE performance requirements**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108040 (from R4-2108299).**

**R4-2108040 WF on NR RRM UE performance requirements**

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

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2111330 Draft Big CR: Introduction of Rel-16 NR Positioning RRM performance requirements and test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson, Intel*

**Abstract:**

Draft Big CR: Introduction of Rel-16 NR Positioning RRM performance requirements and test cases. Last version was endorsed in R4-2105751 (RAN4#98bis-e).

Session chair: Given that this is the last meeting of the WI, the plan it to agree on the CRs. Original Draft CR is noted. New CRs are allocated (R4-2108300/01).

**Decision: Noted.**

**R4-2108300 Big CR: Introduction of Rel-16 NR Positioning RRM performance requirements and test cases**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2183 rev Cat: B (Rel-16)  
 Source: Ericsson, Intel*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2108301 Big CR: Introduction of Rel-16 NR Positioning RRM performance requirements and test cases**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2184 rev Cat: A (Rel-17)  
 Source: Ericsson, Intel*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2111342 On Methodology for estimating UE positioning measurement results**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper discusses methodology for derving link level simulation results for RSTD, PRS RSRP and UE Rx-Tx time difference based on agreements in RAN4#98bis-e

**Decision: Noted.**

**R4-2111343 Link level simulation results for RSTD, PRS RSRP and UE Rx-Tx time difference**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Link level simulation results for RSTD, PRS RSRP and UE Rx-Tx time difference based on agreements in RAN4#98bis-e

**Decision: Noted.**

##### 6.5.2.2 UE requirements and test cases

###### 6.5.2.2.1 General

**R4-2108783 Design principles for test cases**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2110882 Additional simulation results for PRS measurement performance**

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

**Decision: Noted.**

###### 6.5.2.2.2 Measurement accuracy requirements

**R4-2109238 Summary of link level simulation result for RSTD, PRS RSRP and UE Rx-Tx time difference**

*Type: other For: Information  
 Source: Intel Corporation*

**Decision: Revised to R4-2108313 (from R4-2109238).**

**R4-2108313 Summary of link level simulation result for RSTD, PRS RSRP and UE Rx-Tx time difference**

*Type: other For: Information  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2109866 NR Pos performance simulation results**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2109943 link level simulation result of RSTD, PRS RSRP and UE Rx-Tx time difference**

*Type: other For: Information  
 Source: vivo*

**Decision: Noted.**

6.5.2.2.2.1 PRS RSTD

**R4-2108784 On Measurement Accuracy Requirements for RSTD**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109093 Discussion on PRS RSTD accuracy requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109235 Discussion on NR PRS RSTD measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2109862 On PRS-RSTD measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2109938 Further discussion on PRS RSTD accuracy requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2110125 Discussion on the accuracy requirements for RSTD measurement**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110126 CR on the accuracy requirements for RSTD measurement**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1978 rev Cat: B (Rel-16)  
  
 Source: OPPO*

**Decision: Merged.**

**R4-2110883 Discussion on accuracy requirements for RSTD measurement**

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

**Decision: Noted.**

**R4-2110884 draftCR to introduce accuracy requirements for RSTD measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108302 (from R4-2110884).**

**R4-2108302 draftCR to introduce accuracy requirements for RSTD measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

6.5.2.2.2.2 PRS RSRP

**R4-2109094 Discussion on PRS RSRP accuracy requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109096 draftCR on PRS-RSRP accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: CATT*

**Decision: Revised to R4-2108304 (from R4-2109096).**

**R4-2108304 draftCR on PRS-RSRP accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2109863 On PRS-RSRP measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2109939 Further discussion on PRS-RSRP accuracy requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2109940 CR to 38.133 Introduction of Gain to PRS-RSRP measurement point for FR2 in Annex B**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1955 rev Cat: F (Rel-16)  
  
 Source: vivo*

Session chair: Draft CR are used for ongoing WIs. Expected to be endorsed if agreeable.

**Decision: Revised to R4-2108422 (from R4-2109940).**

**R4-2108422 CR to 38.133 Introduction of Gain to PRS-RSRP measurement point for FR2 in Annex B**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1955 rev Cat: F (Rel-16)  
  
 Source: vivo*

Session chair: Draft CR are used for ongoing WIs. Expected to be endorsed if agreeable.

**Decision: Endorsed.**

**R4-2109941 CR to 38.133 Introduction of Gain to PRS-RSRP measurement point for FR2 in Annex B**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1956 rev Cat: A (Rel-17)  
  
 Source: vivo*

**Decision: Withdrawn.**

**R4-2110127 Discussion on the accuracy requirements for PRS-RSRP measurement**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110885 Discussion on accuracy requirements for PRS-RSRP measurement**

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

**Decision: Noted.**

6.5.2.2.2.3 UE Rx-Tx time difference

**R4-2108782 Measurement Accuracy Requirements for UE Rx-Tx time difference**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109095 Discussion on UE Rx-Tx time difference accuracy requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109237 Discussion on UE RX-TX time difference measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2109864 On UE Rx-Tx measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2109942 Further discussion on UE Rx-Tx timing difference accuracy requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2110053 Discussion on the accuracy requirements for UE Rx-Tx time difference measurement**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110886 Discussion on accuracy requirements for UE Rx-Tx time difference measurement**

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

**Decision: Noted.**

**R4-2111344 UE Rx-Tx measurement accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

UE Rx-Tx measurement accuracy requirement are updated to completed remaining issues

**Decision: Revised to R4-2108303 (from R4-2111344).**

**R4-2108303 UE Rx-Tx measurement accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

UE Rx-Tx measurement accuracy requirement are updated to completed remaining issues

**Decision: Revised to R4-2108041 (from R4-2108303).**

**R4-2108041 UE Rx-Tx measurement accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

UE Rx-Tx measurement accuracy requirement are updated to completed remaining issues

**Decision: Endorsed.**

###### 6.5.2.2.3 Test cases

**R4-2109231 Discussion on NR Positioning test cases configuration**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

6.5.2.2.3.1 General

**R4-2109232 [draftCR] PRS configurations for NR Pos RRM tests**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Decision: Revised to R4-2108306 (from R4-2109232).**

**R4-2108306 [draftCR] PRS configurations for NR Pos RRM tests**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Decision: Endorsed.**

**R4-2109865 Design of test cases for NR positioning**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2110054 Discussion on remaining issues for NR\_pos test cases**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110055 CR for PRS configurations for NR\_pos RRM tests**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1971 rev Cat: B (Rel-16)  
  
 Source: OPPO*

**Decision: Merged.**

**R4-2110887 Discussion on RRM test case for UE positioning requirements**

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

**Decision: Noted.**

**R4-2110888 draftCR to introduce reference configuration for SRS for positioning tests**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2108310 draftCR to introduce reference configuration for SRS for positioning tests**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2111345 Analysis of UE positioning test cases**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On positioning test cases

**Decision: Noted.**

6.5.2.2.3.2 Measurement requirements

**R4-2109097 draftCR on test case for PRS-RSRP measurement requirements for FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: CATT*

**Decision: Revised to R4-2108424 (from R4-2109097).**

**R4-2108424 draftCR on test case for PRS-RSRP measurement requirements for FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2109233 [draftCR] Test case of RSTD measurement requirements reporting in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Decision: Revised to R4-2108307 (from R4-2109233).**

**R4-2108307 [draftCR] Test case of RSTD measurement requirements reporting in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Decision: Endorsed.**

**R4-2110889 draftCR to introduce TC for PRS-RSRP measurement requirements for FR1 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108311 (from R4-2110889).**

**R4-2108311 draftCR to introduce TC for PRS-RSRP measurement requirements for FR1 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2111346 TC5 and TC6: UE Rx-Tx time difference measurement requirements for FR1 and FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

TC5 and TC6: UE Rx-Tx time difference measurement requirements for FR1 and FR2 in SA

**Decision: Revised to R4-2108308 (from R4-2111346).**

**R4-2108308 TC5 and TC6: UE Rx-Tx time difference measurement requirements for FR1 and FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

TC5 and TC6: UE Rx-Tx time difference measurement requirements for FR1 and FR2 in SA

**Decision: Endorsed.**

**R4-2111347 TC11 and TC12: UE Rx-Tx time difference measurement accuracy for FR1 and FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

TC11 and TC12: UE Rx-Tx time difference measurement accuracy for FR1 and FR2 in SA

**Decision: Revised to R4-2108309 (from R4-2111347).**

**R4-2108309 TC11 and TC12: UE Rx-Tx time difference measurement accuracy for FR1 and FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

TC11 and TC12: UE Rx-Tx time difference measurement accuracy for FR1 and FR2 in SA

**Decision: Endorsed.**

6.5.2.2.3.3 Accuracy requirements

**R4-2108765 [draft CR] Test cases for PRS-RSRP measurement accuracy**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2108305 (from R4-2108765).**

**R4-2108305 [draft CR] Test cases for PRS-RSRP measurement accuracy**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: ZTE Corporation*

**Decision: Endorsed.**

**R4-2110890 draftCR to introduce TC for RSTD measurement accuracy for FR1 and FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108312 (from R4-2110890).**

**R4-2108312 draftCR to introduce TC for RSTD measurement accuracy for FR1 and FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

###### 6.5.2.2.4 Other

##### 6.5.2.3 gNB requirements

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**Email discussion: [99-e][216] NR\_pos\_3**

**R4-2108140 Email discussion summary: [99-e][216] NR\_pos\_3**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108388 (from R4-2108140).**

**R4-2108388 Email discussion summary: [99-e][216] NR\_pos\_3**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 21st)

* Issue 1-1-1: Beam sweeping during gNB measurement
  + Proposals
    - Option 1: ZTE, Huawei, E///
      * gNB accuracy requirements do not mandate gNB RX beam sweeping is captured only in the WF.
    - Option 2: Nokia
      * gNB accuracy requirements do not mandate gNB RX beam sweeping is included in the accuracy side conditions.
  + Discussion
    - HW: this is not a side condition but rather a RX assumption
    - Nokia: Prefer to add to the spec
    - ZTE: this is not a side condition. This is not necessary to put it to the spec.
    - E///: same view as ZTE and HW
  + Session chair: Continue discussion. Consider of other alternative how to capture in the spec.
* Issue 2-1-1: SRS BW grouping for defining SRS-RSRP accuracy requirements
  + Proposals
    - Option 1: Huawei

|  |  |  |
| --- | --- | --- |
| SRS bandwidth in RB | SRS-RSRP measurement accuracy [dB] | |
| Ês/Iot ≥ -13dB | Ês/Iot ≥ +3dB |
| 24 ≤ BW < 32 (FFS) | TBD | TBD |
| 32 ≤ BW < 48 | TBD |
| 48 ≤ BW < 132 | TBD |
| 132 ≤ BW | TBD |

* + - Option 2: Nokia
      * Define SRS-RSRP accuracy based on SRS BW grouping according to Tables 3-7 in R4-2110272.
    - Option 3:
      * Table 13.3.2.2-1 gNB SRS-RSRP absolute accuracy requirements in FR1 for gNB type 1-C

|  |  |  |
| --- | --- | --- |
| Accuracy | Conditions | |
| SRS Ês/Iot | SRS bandwidth range |
|
| dB | dB | RB |
| ± [TBD] | Ês/Iot ≥ -13 | 24 ≤ BW ≤ [40] |
| ± [TBD] | [40] ≤ BW ≤ [84] |
| ± [TBD] | [88] ≤ BW ≤ [168] |
| ± [TBD] | [176] ≤ BW ≤ [272] |
| ± [TBD] | Ês/Iot ≥ +3 | [24] ≤ BW ≤ [40] |
| ± [TBD] | [40] ≤ BW ≤ [84] |
| ± [TBD] | [88] ≤ BW ≤ [168] |
| ± [TBD] | [176] ≤ BW ≤ [272] |

* + - * Table 13.3.2.2-2 gNB SRS-RSRP absolute accuracy requirements in FR1 for gNB type 1-H and 1-O

|  |  |  |
| --- | --- | --- |
| Accuracy | Conditions | |
| SRS Ês/Iot | SRS bandwidth range |
|
| dB | dB | RB |
| ± [TBD] | Ês/Iot ≥ -13 | 24 ≤ BW ≤ 40 |
| ± [TBD] | 40 ≤ BW ≤ 84 |
| ± [TBD] | 88 ≤ BW ≤ 168 |
| ± [TBD] | 176 ≤ BW ≤ 272 |
| ± [TBD] | Ês/Iot ≥ +3 | 24 ≤ BW ≤ 40 |
| ± [TBD] | 40 ≤ BW ≤ 84 |
| ± [TBD] | 88 ≤ BW ≤ 168 |
| ± [TBD] | 176 ≤ BW ≤ 272 |

* + - * Table 13.3.2.2-3 gNB SRS-RSRP absolute accuracy requirements in FR2 for gNB type 2-O

|  |  |  |
| --- | --- | --- |
| Accuracy | Conditions | |
| SRS Ês/Iot | SRS bandwidth range |
|
| dB | dB | RB |
| ± [TBD] | Ês/Iot ≥ -13 | 32 ≤ BW ≤ 40 |
| ± [TBD] | 40 ≤ BW ≤ 84 |
| ± [TBD] | BW ≥ 88 |
| ± [TBD] | Ês/Iot ≥ +3 | 32 ≤ BW ≤ 40 |
| ± [TBD] | 40 ≤ BW ≤ 84 |
| ± [TBD] | BW ≥ 88 |

* + Discussion
    - TBA
  + Agreements:
    - SRS BW grouping for defining SRS-RSRP accuracy requirements
      * FR1
        + 24 ≤ BW < 32 (requirements will be defined for Ês/Iot ≥ 3dB only)
        + 32 ≤ BW < 48
        + 48 ≤ BW < 132
        + 132 ≤ BW
      * FR2
        + 32 ≤ BW < 64 (requirements will be defined for Ês/Iot ≥ 3dB only)
        + 64 ≤ BW < 132
        + 132 ≤ BW
* Issue 3-1-1: SRS BW grouping for defining gNB Rx-Tx accuracy requirements
  + Proposals
    - Option 1: Nokia
      * Define gNB Rx-Tx accuracy based on SRS BW grouping according to Tables 2-6 in R4-2110273.
    - Option 2: Huawei

|  |  |  |  |
| --- | --- | --- | --- |
| **SRS bandwidth in RB** | **SCS [kHz]** | **gNB TOA measurement accuracy [Tc]** | |
| **Ês/Iot ≥ -13dB** | **Ês/Iot ≥ +3dB** |
| **24≤ BW ≤ 40** | **15** | **TBD** | **TBD** |
| **44 ≤ BW ≤ 84** | **TBD** | **TBD** |
| **88 ≤ BW ≤ 168** | **TBD** | **TBD** |
| **176≤ BW** | **TBD** | **TBD** |
| **48≤ BW ≤ 84** | **30** | **TBD** | **TBD** |
| **88≤ BW ≤ 168** | **TBD** | **TBD** |
| **176≤ BW** | **TBD** | **TBD** |
| **48≤ BW ≤ 84** | **60** | **TBD** | **TBD** |
| **88≤ BW ≤ 168** | **TBD** | **TBD** |
| **176≤ BW** | **TBD** | **TBD** |
| **32≤ BW ≤ 40** | **120** | **TBD** | **TBD** |
| **44≤ BW ≤ 84** | **TBD** | **TBD** |
| **88≤ BW** | **TBD** | **TBD** |

* + Discussion
    - TBA
  + Agreements:
    - SRS BW grouping for defining gNB Rx-Tx time difference accuracy requirements
      * FR1

|  |  |
| --- | --- |
| **SRS bandwidth in RB** | **SCS [kHz]** |
|
| 24≤ BW ≤ 40 | 15 |
| 44 ≤ BW ≤ 84 |
| 88 ≤ BW ≤ 168 |
| [176]≤ BW |
| 48≤ BW ≤ 84 | 30 |
| 88≤ BW ≤ 168 |
| [176]≤ BW |
| 48≤ BW ≤ 84 | 60 |
| 88≤ BW |

* + - * FR2

|  |  |
| --- | --- |
| **SRS bandwidth in RB** | **SCS [kHz]** |
|
| 132 ≤ BW ≤ 168 | 60 |
| [176] ≤ BW |
| 32 ≤ BW ≤ 40 | 120 |
| 44 ≤ BW ≤ 84 |
| 88 ≤ BW |

* Note: compiled results in R4-2108184

GTW session (May 25th)

* Issue 1-1-1: Beam sweeping during gNB measurement
  + Proposals
    - Option 1: ZTE, Huawei, E///
      * gNB accuracy requirements do not mandate gNB RX beam sweeping is captured only in the WF.
    - Option 2: Nokia
      * gNB accuracy requirements do not mandate gNB RX beam sweeping is included in the accuracy side conditions.
    - Option 3: E///
      * Capture following as side condition:
        + “The measurement accuracy requirements apply given the assumption that the gNB does not perform any receiver beam sweeping.”
  + Discussion
    - Nokia: ok with Option 3.
    - Huawei: this is quite similar to Option 1. We cannot verify it.
    - ZTE: Do not agree with Option 3.
  + Agreements
    - Capture following note in the specification:
      * Note: The measurement accuracy requirements are defined under an assumption that gNB is not mandated to perform receive beam sweeping.
  + Session chair: Capture the note outside the table with side conditions and requirements
* Issue 2-3-1: RF margin for SRS-RSRP accuracy for different gNB types
  + Proposals
    - Option 1: Huawei, Ericsson
      * RF calibration margin differs between gNB type 1-C and other gNB types:
      * X=2.5dB for gNB type 1-C
      * X=4dB for gNB type 1-H, 1-O and 2-O
    - Option 2: Nokia
      * Need further discussion
  + Discussion
    - Nokia: need more time
  + Agreements
    - RF calibration margin differs between gNB type 1-C and other gNB types:
      * X = [2.5] dB for gNB type 1-C
      * X = [4] dB for gNB type 1-H, 1-O and 2-O

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108314 | WF on gNB positioning measurement requirements | Ericsson | To capture all agreements on gNB positioning requirements |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2110228 | gNB SRS-RSRP measurement | Ericsson | Revised |  |
| R4-2110894 | draftCR to introduce SRS-RSRP requirements | Huawei, HiSilicon | Not Pursued |  |
| R4-2110230 | gNB Rx-Tx measurement | Ericsson | Not Pursued |  |
| R4-2110897 | draftCR to introduce gNB Rx-Tx time difference requirements | Huawei, HiSilicon | Revised |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108314 | WF on gNB positioning measurement requirements | Ericsson | Agreeable |  |
| R4-2108315 | gNB SRS-RSRP measurement | Ericsson | Agreeable | Revision of R4-2110228 |
| R4-2108316 | draftCR to introduce gNB Rx-Tx time difference requirements | Huawei, HiSilicon | Agreeable | Revision of R4-2110897 |

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**R4-2108314 WF on gNB positioning measurement requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108184 Collection of link level simulation results of SRS RSRP and gNB TOA**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Noted.**

###### 6.5.2.3.1 General

**R4-2108766 Beam configuration and samples for gNB measurement accuracy**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2110225 gNB link level simulation results**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution summarizes and analyses the link level simulation results for gNB TOA and SRS-RSRP

**Decision: Noted.**

**R4-2110226 gNB Pos performance simulation results collection**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This contribution displays the link level simulation results for gNB TOA and SRS-RSRP

**Decision: Noted.**

**R4-2110271 General aspects for gNB measurement accuracy requirements**

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

**Abstract:**

Discussion on general aspects for gNB measurement accuracy requirements

**Decision: Noted.**

**R4-2110891 Discussion on general issues for gNB positioning measurement requirements**

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

**Decision: Noted.**

###### 6.5.2.3.2 SRS-RSRP requirements

**R4-2110227 SRS-RSRP requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This discussion paper further analyzes the SRS-RSRP link level simulation results and proposes requirement definition structure and side conditions

**Decision: Noted.**

**R4-2110228 gNB SRS-RSRP measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR implements the finalized side conditions and also proposes requirements structure based on link level simulation results SRS-RSRP discussion paper

**Decision: Revised to R4-2108315 (from R4-2110228).**

**R4-2108315 gNB SRS-RSRP measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR implements the finalized side conditions and also proposes requirements structure based on link level simulation results SRS-RSRP discussion paper

**Decision: Endorsed.**

**R4-2110272 Link simulation results for SRS-RSRP accuracy**

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

**Abstract:**

Link simulation results for SRS-RSRP accuracy for agreed SRS configurations

**Decision: Revised to R4-2108178 (from R4-2110272).**

**R4-2108178 Link simulation results for SRS-RSRP accuracy**

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

**Abstract:**

Link simulation results for SRS-RSRP accuracy for agreed SRS configurations

**Decision: Noted.**

**R4-2110892 Discussion on SRS-RSRP requirements**

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

**Decision: Noted.**

**R4-2110893 Additional link level simulation results for SRS-RSRP**

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

**Decision: Noted.**

**R4-2110894 draftCR to introduce SRS-RSRP requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Not pursued.**

###### 6.5.2.3.3 gNB Rx-Tx time difference requirements

**R4-2110229 gNB Rx-Tx time difference requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This discussion paper further analyzes the gNB TOA link level simulation results and proposes requirement definition structure and side conditions

**Decision: Noted.**

**R4-2110230 gNB Rx-Tx measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR implements the finalized side conditions and also proposes requirements structure based on link level simulation results gNB Rx-Tx time difference requirements discussion paper

**Decision: Not pursued.**

**R4-2110273 Link simulation results for gNB Rx-Tx time difference accuracy**

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

**Abstract:**

Link simulation results for gNB Rx-Tx time difference accuracy for agreed SRS configurations

**Decision: Revised to R4-2108179 (from R4-2110273).**

**R4-2108179 Link simulation results for gNB Rx-Tx time difference accuracy**

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

**Abstract:**

Link simulation results for gNB Rx-Tx time difference accuracy for agreed SRS configurations

**Decision: Noted.**

**R4-2110895 Discussion on gNB Rx-Tx time difference requirements**

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

**Decision: Noted.**

**R4-2110896 Additional link level simulation results for gNB TOA measurement**

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

**Decision: Noted.**

**R4-2110897 draftCR to introduce gNB Rx-Tx time difference requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108316 (from R4-2110897).**

**R4-2108316 draftCR to introduce gNB Rx-Tx time difference requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

### 6.6 NR RRM requirements for CSI-RS based L3 measurement

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**Email discussion: [99-e][217] NR\_CSIRS\_L3meas\_1**

**R4-2108141 Email discussion summary: [99-e][217] NR\_CSIRS\_L3meas\_1**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108389 (from R4-2108141).**

**R4-2108389 Email discussion summary: [99-e][217] NR\_CSIRS\_L3meas\_1**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 24th)

* Issue 2-1: How to specify valid condition of CSI-RS configuration condition for accuracy requirements?
  + Proposals
    - Option 1: (Huawei, CATT, OPPO, Xiaomi, Qualcomm, MTK, Apple, CMCC, vivo)
      * The accuracy requirements in Table 10.1.2.3.2-1 are valid under the following conditions:
        + The bandwidth of CSI-RS resource is no less than 48PRB when density is 3.
    - Option 2: (Nokia)
      * The accuracy requirements in Table 10.1.2.3.2-1 are valid under the following conditions:
        + The bandwidth of CSI-RS resource is 48PRB when density is 3.
  + Discussion
    - Nokia: Do not understand why we need to change the wording. We follow exactly the existing spec for L1-RSRP measurement and CLI measurement
    - vivo: Option 1. Requirements shall be specified as general as possible.
  + Agreements:
    - The accuracy requirements in Table 10.1.2.3.2-1 are valid under the following conditions:
      * The bandwidth of CSI-RS is 48 PRBs and the density is 3.
      * The performance with larger bandwidth of CSI-RS is equal to or better than the accuracy requirements in Table 10.1.2.3.2-1.
* Sub-topic 1-1 Time domain restriction for CSI-RS configuration
  + Proposals
    - Option 1: (OPPO, Xiaomi, vivo, MTK, CATT Qualcomm, Intel, Apple)
      * Rel-16 L3 CSI-RS requirements are defined under assumption that all CSI-RS resources in the same MO are configured in the same 5ms window
        + Note: It is up to the network whether to configure all CSI-RS in the 5ms window and if CSI-RS resources are configured outside then UE may not measure it and the requirements do not apply.
    - Option 2: (Huawei, Nokia, CATT, Qualcomm, Intel, Apple)
      * For inter-frequency measurements, Rel-16 L3 CSI-RS requirements are defined under assumption that all CSI-RS resources in the same MO are configured in the same 5ms window
      * For intra-frequency measurements: Rel-16 L3 CSI-RS requirements are defined under assumption that CSI-RS resources in the same MO can be configured in up to two separated 5ms windows during one CSI-RS resource period
        + The overlapping status with MG is same for the two windows.
        + The minimum periodicity of the configured CSI-RS resources is 20ms.
        + Measurement requirements are not impacted by separated 5ms windows.
  + Discussion
    - CATT: Option 1 is already in the spec
    - Huawei: This was discussed for several meetings. Option 2 is already a compromise. The current spec is not fully clear.
    - Apple: Our preference is Option 1, but we can compromise to go with Option 2 to address network vendors flexibility.
    - Nokia: Agree with Huawei.
    - OPPO: Current requirement is defined based on 5ms window assumption. In case the changes are made the performance may be affected.
    - MTK: Option 2 can add some complexity for UE. Compromise solution is unclear. Why NW does not have issues for inter-frequency but has issue for intra-frequency.
    - vivo: Option 1. For Option 2 we need clarification on “the overlapping status with MG is same for the two windows”
    - Intel: Original preference is Option 1. Can compromise to Option 2. Agree with MTK that starting point needs some clarifications.
    - Nokia: not clear on MTK comments on starting point. For all CSI-RS resources in one cell there will be same starting point.
      * MTK: in the last meeting we agreed that UE will check all configurations and will choose the earliest one. It will be used as the starting point of the window. If we have multiple windows, then do we need to select several? For UE complexity – Option 2 does not allow simple reuse of SSB-based implementation.
      * Nokia: We should have a separate starting point for each window.
      * Huawei: we have 20ms periodicity and it will simplify the search. For complexity – no matter SSB or CSI-RS UE needs to measure multiple occasions.
    - Session chair: Option 2 is already a compromise from one camp. Can we agree on this?
      * MTK, OPPO: Need to further check. Can come back later this week.
    - vivo: Still not clear on “overlapping status”. Option 2 is agreeable if we remove it.
      * Huawei: this was added based on MTK/Intel.
    - Session chair: Come back on Tue GTW.
* Sub-topic 1-2 UE behavior when the timing offset exceeds the threshold with single FFT assumption
  + Proposals
    - Option 1: (Nokia, Intel, Apple)
      * For intra-frequency measurement, the UE is not required to measure the configured CSI-RS resources of a neighbour cell if the symbol level misalignment between serving and the corresponding neighbour cell exceeds the threshold.
      * For inter-frequency measurement, UE can pick up any cell as the reference cell per frequency layer. UE is not required to measure the configured CSI-RS resources of a neighbour cell if the symbol level misalignment between the reference cell and the corresponding neighbour cell belonging to the same frequency layer exceeds the threshold.
    - Option 2: (Huawei, CATT, OPPO, Xiaomi, Qualcomm, MTK, Intel, vivo)
      * No spec updates are needed.
  + Discussion
    - Nokia: Our intention is that UE does not perform the measurement when the condition is not good. The network does not have such information and it could help the NW to make mobility decisions.
    - Apple: Option 2 is unclear. We have single FFT assumption but it is not clearly captured in the specification. Option 1 provides a clarification on UE assumptions.
    - vivo: We agree with issue that there is some ambiguity on NW sides. The solution in Option 1 is not good. If UE always does not report the measurement result, the network will not know why UE does not report (large time different or due to the fact that condition is not satisfied). For Rel-16 it is better to leave up to UE implementation.
    - CATT: current requirements assume single FFT assumption.
    - QC: We have other side conditions with similar issue (e.g. Es/Iot). How does the NW address it? We think that there may be some other alternatives which need to have some investigation (not in Rel-16). The spec implications are not clear (e.g. whether we need test).
      * Nokia: This is different from Es/Iot, which does not have impact on NW side. For timing – UE will always send report disregards the actual timing value. Some impact on UE implementation can be expected, but we think it is the most easy one. We are not sure we can use L3 CSI-RS in case we do not have reliable data on the measurements.
    - Xiaomi: Agree with QC that timing is the only side condition.

GTW session (May 25th)

* Sub-topic 1-3 Time validity of the detected associatedSSB
  + Proposals
    - Option 1: (Huawei, CATT, OPPO, Qualcomm)
      * The associatedSSB is detected if it has been meeting the relevant cell identification requirement during the last 5 seconds.
    - Option 2: (Huawei, Qualcomm, Apple)
      * The timing information of CSI-RS resources for L3 measurement can be assumed as known if the associatedSSB has been detectable during the last 5 seconds.
    - Option 3: (Huawei, Nokia, MTK)
      * Adding the time validity of detected associatedSSB and SFN information in 9.10.2.5 section:
        + If the associatedSSB which has been detectable at least for the time period Tidentify\_intra\_with\_index defined in clause 9.2.5.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again with the same spatial reception parameter provided the timing to that cell has not changed more than ± 3200 Tc, PSS/SSS detection time of associatedSSB and time period used to acquire the SFN information are equal to 0.
  + Discussion
    - Huawei: Some companies had comments on Option 1. So we came up with Option 3. We are ok with all options.
    - vivo: Option 1 and 2 are more simple. Option 3 is unclear: Why the cell has to become undetectable and then detectable? Where does 3200Tc come from?
    - MTK: We proposed Option 3 in the last meeting. This is similar to the existing requirement in 9.2.4.3 and we prefer to keep the same requirements for the same UE procedures. For the spatial filter – this is very important condition. If beam changes, then additional time will be required.
    - Nokia: Option 3 better reflects the conditions. Agree with MTK. Option 1 – current spec says “cell is detected”, while Option 1 says “associatedSSB is detected”.
    - vivo: what is the intention of “becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable”. For 3200Tc – this information is not know to the network.
      * Huawei: For the conditions – this is realistic situation that UE becomes undetectable/detectable. For 3200Tc – this is reused from SSB based requirements.
      * Vivo: current wording precludes the situations when cell keeps detectable. Such case shall be included.
      * Huawei: It is common understanding that this requirement also applies for the case when the cell remains detectable
  + Agreements:
    - Adding the time validity of detected associatedSSB and SFN information in 9.10.2.5 section:
      * If the associatedSSB which has been detectable at least for the time period Tidentify\_intra\_with\_index defined in clause 9.2.5.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again with the same spatial reception parameter provided the timing to that cell has not changed more than ± 3200 Tc, PSS/SSS detection time of associatedSSB and time period used to acquire the SFN information are equal to 0.
    - The same requirements apply for the case when the associatedSSB remains detectable. FFS how to capture this in the specification.
* Sub-topic 1-1 Time domain restriction for CSI-RS configuration
  + Proposals
    - Option 1: (OPPO, Xiaomi, vivo, MTK, CATT Qualcomm, Intel, Apple)
      * Rel-16 L3 CSI-RS requirements are defined under assumption that all CSI-RS resources in the same MO are configured in the same 5ms window
        + Note: It is up to the network whether to configure all CSI-RS in the 5ms window and if CSI-RS resources are configured outside then UE may not measure it and the requirements do not apply.
    - Option 2: (Huawei, Nokia, CATT, Qualcomm, Intel, Apple)
      * For inter-frequency measurements, Rel-16 L3 CSI-RS requirements are defined under assumption that all CSI-RS resources in the same MO are configured in the same 5ms window
      * For intra-frequency measurements: Rel-16 L3 CSI-RS requirements are defined under assumption that CSI-RS resources in the same MO can be configured in up to two separated 5ms windows during one CSI-RS resource period
        + The overlapping status with MG is same for the two windows.
        + The minimum periodicity of the configured CSI-RS resources is 20ms.
        + Measurement requirements are not impacted by separated 5ms windows.
  + Discussion (May 24th)
    - MTK: For Option 2 we need to have a condition that 1) “the gap between two 5ms windows shall be half of the CSI-RS periodicity”; 2) Option 2 is applicable to FR1 only.
    - vivo: We are fine with the condition.
    - OPPO: we can agree
    - Nokia: Ok for FR1. Not sure on FR2. For FR2 CSI-RS UE is not supposed to make beam sweeping.
      * MTK: It was discussed in Rel-15. This is relevant for CA scenarios when we have requirements for PSCell and SCell.
    - Huawei: We are fine with the first condition. For FR2 we would like to further check. FR2 can be more problematic for NW side.
    - Intel: To MTK the “overlapping status” proposal can potentially resolve MTK concerns.
    - CMCC: will the constraint on CSI-RS periodicity apply to different windows or the same window?
  + Agreement
    - FR1
      * For inter-frequency measurements, Rel-16 L3 CSI-RS requirements are defined under assumption that all CSI-RS resources in the same MO are configured in the same 5ms window
      * For intra-frequency measurements: Rel-16 L3 CSI-RS requirements are defined under assumption that CSI-RS resources in the same MO can be configured in up to two separated 5ms windows during one CSI-RS resource period
        + 1/ The overlapping status with MG is same for the two windows.

FFS how to capture this in the specification

* + - * + 2/ The periodicity of the configured CSI-RS resources is 20ms or 40ms.
        + 3/ The gap between two 5ms windows shall be half of the CSI-RS periodicity
        + 4/ Measurement requirements are not impacted by separated 5ms windows.
        + FFS whether the conditions 1, 2, 3, 4 apply for the case of two separated 5ms windows during one CSI-RS period only or apply for all cases
    - FFS for FR2

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108317 | WF on CSI-RS based L3 measurement requirements | CATT |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2109078 | CR on CSI-RS intra-frequency requirement and scheduling restriction | CATT | Revised |  |
| R4-2109927 | CR to 38.133 Correction on core requirements for CSI-RS based measurement | vivo | Revised |  |
| R4-2110386 | Adding intra-frequency CSI-RS measurement in CSSF | Huawei | Agreeable | The comment seems not for the CR contents. |
| R4-2109079 | CR on CSI-RS based measurement requirements | CATT | Revised |  |
| R4-2109177 | CR for clarification on frequency layer merging R16 | MTK | Return to | Check whether it is OK after clarification. If no further comments, it will be agreed in 2nd round. |
| R4-2109553 | 38.133 CR on the CSI-RS based measurement requirements | Nokia | ~~Revised~~ Postponed |  |
| R4-2110365 | CR on time validity of the detected associatedSSB | Huawei | Revised |  |
| R4-2110903 | CR on CSI-RS measurement window | Huawei | Revised |  |
| R4-2111412 | CR on CSSF for CSI-RS L3 RRM R16 | Apple | Revised |  |
| R4-2109082 | draft CR on performance requirement for CSI-RSRQ | CATT | Revised |  |
| R4-2109083 | draft CR on performance requirement for CSI-SINR | CATT | Merged |  |
| R4-2110057 | CR to TS 38.133 on performance requirements for CSI-RS based L3 measurement | OPPO | Revised |  |
| R4-2110906 | draftCR on CSI-SINR accuracy requirements | Huawei | Revised |  |
| R4-2109929 | CR to 38.133 on SA event triggered reporting tests with gap for NR neighbor cell in FR2 | vivo | Not pursued |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108317 | WF on CSI-RS based L3 measurement requirements | CATT | Agreeable |  |
| R4-2108318 | CR on CSI-RS intra-frequency requirement and scheduling restriction | CATT | Agreeable |  |
| R4-2108319 | CR to 38.133 Correction on core requirements for CSI-RS based measurement | vivo | Agreeable |  |
| R4-2108320 | CR on CSI-RS based measurement requirements | CATT | Agreeable |  |
| R4-2109177 | CR for clarification on frequency layer merging R16 | MTK | Agreeable |  |
| R4-2109553 | 38.133 CR on the CSI-RS based measurement requirements | Nokia | Postponed |  |
| R4-2108322 | CR on time validity of the detected associatedSSB | Huawei | Agreeable |  |
| R4-2108323 | CR on CSI-RS measurement window | Huawei | Agreeable |  |
| R4-2111412 | CR on CSSF for CSI-RS L3 RRM R16 | Apple | Postponed |  |
| R4-2108324 | CR on CSSF for CSI-RS L3 RRM R16 | Apple | Withdrawn |  |
| R4-2108325 | draft CR on performance requirement for CSI-RSRQ | CATT | Agreeable |  |
| R4-2108326 | CR to TS 38.133 on performance requirements for CSI-RS based L3 measurement | OPPO | Agreeable |  |
| R4-2108327 | draftCR on CSI-SINR accuracy requirements | Huawei | Agreeable |  |

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**Email discussion: [99-e][218] NR\_CSIRS\_L3meas\_2**

**R4-2108142 Email discussion summary: [99-e][218] NR\_CSIRS\_L3meas\_2**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108390 (from R4-2108142).**

**R4-2108390 Email discussion summary: [99-e][218] NR\_CSIRS\_L3meas\_2**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 25th)

* CR status: No issues identified

1st round email discussion conclusions

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| [R4-2109084](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109084.zip) | draft CR on test case for intra-frequency CSI-RS based measurement | CATT | Agreeable | No comments received. |
| [R4-2109085](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109085.zip) | draft CR on test case for inter-frequency CSI-RS based measurement | CATT | Agreeable | No comments received. |
| [R4-2109555](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109555.zip) | 38.133 CR on the test case of EN-DC event triggered reporting for intra-frequency CSI-RS based measurements in FR1 | Nokia, Nokia Shanghai Bell | To be revised | To capture the comments in 1st round |
| R4-2109556 | 38.133 CR on the test case of EN-DC event triggered reporting for intra-frequency CSI-RS based measurements in FR1 | Nokia, Nokia Shanghai Bell | Withdrawn | R17 Cat A CR can go to big CR approach. |
| [R4-2109735](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109735.zip) | Draft test case of CSI-RS based intra-frequency test for EN-DC event triggered reporting tests without gap for NR neighbor cell in FR2 | Qualcomm CDMA Technologies | To be revised | The test delay X needs be further clarified why the value is updated. |
| [R4-2110058](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110058.zip) | CR to TS 38.133 on test cases for CSI-RS based L3 measurement | OPPO | To be revised | Remove the conflicted clause A.4.6.6.1.1. |
| [R4-2110907](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110907.zip) | draft CR to update FR1 inter-frequency CSI-RS accuracy test | Huawei, HiSilicon | Agreeable | No comments received. |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| [R4-2108321](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109555.zip) | 38.133 CR on the test case of EN-DC event triggered reporting for intra-frequency CSI-RS based measurements in FR1 | Nokia, Nokia Shanghai Bell | Agreeable | To capture the comments in 1st round |
| [R4-2109735](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109735.zip) | Draft test case of CSI-RS based intra-frequency test for EN-DC event triggered reporting tests without gap for NR neighbor cell in FR2 | Qualcomm CDMA Technologies | Noted |  |
| R4-2108328 | Draft test case of CSI-RS based intra-frequency test for EN-DC event triggered reporting tests without gap for NR neighbor cell in FR2 | Qualcomm CDMA Technologies | Withdrawn |  |
| R4-2108329 | CR to TS 38.133 on test cases for CSI-RS based L3 measurement | OPPO | Agreeable | Remove the conflicted clause A.4.6.6.1.1. |

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**R4-2108317 WF on CSI-RS based L3 measurement requirements**

*Type: other For: Approval  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2109078 CR on CSI-RS intra-frequency requirement and scheduling restriction**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1865 rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Revised to R4-2108318 (from R4-2109078).**

**R4-2108318 CR on CSI-RS intra-frequency requirement and scheduling restriction**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1865 rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Agreed.**

**R4-2109080 CR on CSI-RS intra-frequency requirement and scheduling restriction**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1867 rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Agreed.**

**R4-2109927 CR to 38.133 Correction on core requirements for CSI-RS based measurement**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1949 rev Cat: F (Rel-16)  
  
 Source: vivo*

**Decision: Revised to R4-2108319 (from R4-2109927).**

**R4-2108319 CR to 38.133 Correction on core requirements for CSI-RS based measurement**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1949 rev Cat: F (Rel-16)  
  
 Source: vivo*

**Decision: Agreed.**

**R4-2109928 CR to 38.133 Correction on core requirements for CSI-RS based measurement**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1950 rev Cat: A (Rel-17)  
  
 Source: vivo*

**Decision: Agreed.**

**R4-2109929 CR to 38.133 on SA event triggered reporting tests with gap for NR neighbor cell in FR2**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1951 rev Cat: F (Rel-16)  
  
 Source: vivo*

**Decision: Not pursued.**

**R4-2109930 CR to 38.133 on SA event triggered reporting tests with gap for NR neighbor cell in FR2**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1952 rev Cat: A (Rel-17)  
  
 Source: vivo*

**Decision: Withdrawn.**

**R4-2110386 Adding intra-frequency CSI-RS measurement in CSSF**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2044 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110387 Adding intra-frequency CSI-RS measurement in CSSF**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2045 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

#### 6.6.1 RRM core requirements maintenance (38.133)

**R4-2109077 Discussion on core part maintenance open issues**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109079 CR on CSI-RS based measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1866 rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Revised to R4-2108320 (from R4-2109079).**

**R4-2108320 CR on CSI-RS based measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1866 rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Agreed.**

**R4-2109081 CR on CSI-RS based measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1868 rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Agreed.**

**R4-2109177 CR for clarification on frequency layer merging R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1875 rev Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Agreed.**

**R4-2109178 CR for clarification on frequency layer merging R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1876 rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Agreed.**

**R4-2109239 Discussion on NR CSI-RS L3 measurements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2109376 On remaining issues of RRM core requirements for CSI-RS based L3 measurement**

*Type: discussion For: Agreement  
 Source: Apple*

**Decision: Noted.**

**R4-2109552 Open issues on the CSI-RS based measurement requirements**

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

**Decision: Noted.**

**R4-2109553 38.133 CR on the CSI-RS based measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1915 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

Session chair: CR has 2 errors on the coversheet and will be postponed. If needed the respective changes can be merged to another CR.

**Decision: Postponed.**

**R4-2109554 38.133 CR on the CSI-RS based measurement requirements**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1916 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Withdrawn.**

**R4-2109933 Remaining issues on CSI-RS L3 measurement core requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2110056 On core part maintenance of CSI-RS based L3 measurement**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110364 Discussion on remaining issues for CSI-RS based L3 measurement**

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

**Decision: Noted.**

**R4-2110365 CR on time validity of the detected associatedSSB**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2036 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108322 (from R4-2110365).**

**R4-2108322 CR on time validity of the detected associatedSSB**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2036 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110366 CR on time validity of the detected associatedSSB**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2037 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110695 NR-U - System parameters**

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

**Decision: Withdrawn.**

**R4-2110903 CR on CSI-RS measurement window**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2099 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108323 (from R4-2110903).**

**R4-2108323 CR on CSI-RS measurement window**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2099 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2110904 CR on CSI-RS measurement window R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2100 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2111412 CR on CSSF for CSI-RS L3 RRM R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2156 rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Postponed.**

**R4-2108324 CR on CSSF for CSI-RS L3 RRM R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2156 rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Withdrawn.**

**R4-2111413 CR on CSSF for CSI-RS L3 RRM R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2157 rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Withdrawn.**

#### 6.6.2 RRM performance requirements (38.133)

**R4-2109086 Big CR: Introduction of Rel-16 CSI-RS based L3 measurement RRM performance requirements**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1869 rev Cat: B (Rel-16)  
  
 Source: CATT,OPPO*

**Decision: Agreed.**

**R4-2108330 Big CR: Introduction of Rel-16 CSI-RS based L3 measurement RRM performance requirements**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2182 rev Cat: A (Rel-17)  
  
 Source: CATT,OPPO*

**Decision: Agreed.**

**.**

##### 6.6.2.1 General

**R4-2110057 CR to TS 38.133 on performance requirements for CSI-RS based L3 measurement**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1972 rev Cat: B (Rel-16)  
  
 Source: OPPO*

**Decision: Revised to R4-2108326 (from R4-2110057).**

**R4-2108326 CR to TS 38.133 on performance requirements for CSI-RS based L3 measurement**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1972 rev Cat: B (Rel-16)  
  
 Source: OPPO*

**Decision: Endorsed.**

##### 6.6.2.2 Measurement accuracy requirements

###### 6.6.2.2.1 CSI-RSRP requirements

###### 6.6.2.2.2 CSI-RSRQ requirements

**R4-2109082 draft CR on performance requirement for CSI-RSRQ**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: CATT*

**Decision: Revised to R4-2108325 (from R4-2109082).**

**R4-2108325 draft CR on performance requirement for CSI-RSRQ**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

###### 6.6.2.2.3 CSI-SINR requirements

**R4-2109083 draft CR on performance requirement for CSI-SINR**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: CATT*

**Decision: Merged.**

**R4-2109179 Discussion on CSI-SINR measurement accuracy**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2109507 Discussion on side condition for CSI-SINR measurement**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2110905 Discussion on CSI-SINR accuracy requirements**

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

**Decision: Noted.**

**R4-2110906 draftCR on CSI-SINR accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2108327 (from R4-2110906).**

**R4-2108327 draftCR on CSI-SINR accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

##### 6.6.2.3 Test cases

###### 6.6.2.3.1 General

**R4-2110058 CR to TS 38.133 on test cases for CSI-RS based L3 measurement**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1973 rev Cat: B (Rel-16)  
  
 Source: OPPO*

**Decision: Revised to R4-2108329 (from R4-2110058).**

**R4-2108329 CR to TS 38.133 on test cases for CSI-RS based L3 measurement**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1973 rev Cat: B (Rel-16)  
  
 Source: OPPO*

Session chair: Draft CR are used for ongoing WIs. Expected to be endorsed if agreeable.

**Decision: Endorsed.**

###### 6.6.2.3.2 Intra-frequency measurement

**R4-2109084 draft CR on test case for intra-frequency CSI-RS based measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2109555 38.133 CR on the test case of EN-DC event triggered reporting for intra-frequency CSI-RS based measurements in FR1**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1917 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2108328 (from R4-2109555).**

**R4-2108321 38.133 CR on the test case of EN-DC event triggered reporting for intra-frequency CSI-RS based measurements in FR1**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-1917 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

Session chair: Draft CR are used for ongoing WIs. Expected to be endorsed if agreeable.

**Decision: Endorsed.**

**R4-2109556 38.133 CR on the test case of EN-DC event triggered reporting for intra-frequency CSI-RS based measurements in FR1**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1918 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Withdrawn.**

**R4-2109735 Draft test case of CSI-RS based intra-frequency test for EN-DC event triggered reporting tests without gap for NR neighbor cell in FR2**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: (Rel-16)  
  
 Source: Qualcomm CDMA Technologies*

**Decision: Postponed.**

**R4-2108328 Draft test case of CSI-RS based intra-frequency test for EN-DC event triggered reporting tests without gap for NR neighbor cell in FR2**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: (Rel-16)  
  
 Source: Qualcomm CDMA Technologies*

**Decision: Withdrawn.**

###### 6.6.2.3.3 Inter-frequency measurement

**R4-2109085 draft CR on test case for inter-frequency CSI-RS based measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: B (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

###### 6.6.2.3.4 Measurement performance

**R4-2110907 draft CR to update FR1 inter-frequency CSI-RS accuracy test**

*Type: draftCR For: Endorsement  
 38.133 v16.7.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

### 6.7 R16 TEI

**R4-2110296 CR on MRTD requirements for FR1 intra-band NR CA in non-co-located deployment R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2010 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Not pursued.**

**R4-2110297 CR on MRTD requirements for FR1 intra-band NR CA in non-co-located deployment R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2011 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2110298 CR on MRTD requirements for FR1 intra-band EN-DC in non-co-located deployment R16**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2012 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Not pursued.**

**R4-2110299 CR on MRTD requirements for FR1 intra-band EN-DC in non-co-located deployment R17**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2013 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2110372 Discussion on the needforgap measurement and on FR1 intra-band non-co-located NR-CA/EN-DC**

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

**Decision: Noted.**

**R4-2110373 CR on the measurement requirements of needforgap**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2042 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Not pursued.**

**R4-2110374 CR on the measurement requirements of needforgap**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2043 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2110393 TDD UL-DL and DL-UL switching in DAPS handover**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Further clarification on DL-to-UL and UL-to-DL switching time

**Decision: Noted.**

**R4-2110394 CR on TS38.133 for dual active protocol stack handover**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2047 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Add conditions for not expected to transmit / not expected to receive covering both source and target cell. Add autonomous interruption allowance if these conditions are unspecified.Correct Ntx-rx and Nrx-tx to 25600 Tc

**Decision: Postponed.**

**R4-2110395 CR on TS38.133 for dual active protocol stack handover**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2048 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Add conditions for not expected to transmit / not expected to receive covering both source and target cell. Add autonomous interruption allowance if these conditions are unspecified.Correct Ntx-rx and Nrx-tx to 25600 Tc

**Decision: Withdrawn.**

**R4-2110401 MRTD and MTTD in non-contiguous CA in FR1**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

MRTD and MTTD in non-contiguous CA in FR1. This is based on an issue initiated by Huawei to allow non-colocated NCCA deployments.

**Decision: Noted.**

**R4-2110402 MRTD and MTTD in non-contiguous CA in FR1**

*Type: CR For: Agreement  
 38.133 v16.7.0 CR-2049 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

MRTD and MTTD in non-contiguous CA in FR1. This is based on an issue initiated by Huawei to allow non-colocated NCCA deployments.

**Decision: Not pursued.**

**R4-2110409 MRTD and MTTD in non-contiguous CA in FR1**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2050 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

MRTD and MTTD in non-contiguous CA in FR1. This is based on an issue initiated by Huawei to allow non-colocated NCCA deployments.

**Decision: Withdrawn.**

## 7 Rel-17 maintenance for both NR and LTE

================================================================================

**Email discussion: [99-e][219] Spectrum\_RRM**

**R4-2108143 Email discussion summary: [99-e][219] Spectrum\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108391 (from R4-2108143).**

**R4-2108391 Email discussion summary: [99-e][219] Spectrum\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108336 | Draft CR on RRM core requirements for PC1/2/4 for band n262 | Huawei, HiSilicon | Related to topic #1: AI: 8.2.4.  REFSENS and EIRP spherical coverage requirements for band n262 PC1/PC2/PC4 are likely to be agreed by RF |
| R4-2108337 | Draft CR on RRM performance requirements for PC1/2/4 for band n262 | Ericsson | Related to topic #1: AI: 8.2.4.  REFSENS and EIRP spherical coverage requirements for band n262 PC1/PC2/PC4 are likely to be agreed by RF |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2111310 | Draft Big CR: RRM requirements for band n262 in 38.133 | Ericsson | Revised | For email approval.  Can be approved at June plenary.  CR number might be needed if all PC1/2/4 are agreed. |
| R4-2110300 | CR on maintaining condition requirements for UE power class 5 | Huawei, HiSilicon | Agreeable |  |
| R4-2110098 | CR to TS 38.133: Introduction of band n67 | Ericsson | Return To | RRM agreement depends on UE RF agreements on n67. |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108336 | Draft CR on RRM core requirements for PC1/2/4 for band n262 | Huawei, HiSilicon | Agreeable |  |
| R4-2108337 | Draft CR on RRM performance requirements for PC1/2/4 for band n262 | Ericsson | Agreeable |  |
| [R4-2110098](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110098.zip) | CR to TS 38.133: Introduction of band n67 | Ericsson | Agreeable |  |
| R4-2108338 | Draft Big CR: RRM requirements for band n262 in 38.133 | Ericsson | For email approval | Revision of R4-2111310. Need also CR number since all RRM requirements are completed. |

================================================================================

### 7.1 Introduction of FR2 FWA UE with maximum TRP of 23dBm for n257 and n258

#### 7.1.1 UE RF requirements

#### 7.1.2 RRM core requirements

#### 7.1.3 RRM performance requirements

**R4-2110300 CR on maintaining condition requirements for UE power class 5**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2014 rev Cat: F (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed.**

## 8 Rel-17 spectrum related Work Items for NR

### 8.2 Introduction of NR 47 GHz band

#### 8.2.4 RRM requirements (38.133)

**R4-2111310 Draft Big CR: RRM requirements for band n262 in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v17.1.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This is big CR on RRM core and performance requirements for all power classes for new band in 47 GHz. Last version was endorsed in R4-2105858 (RAN4#98bis-e).

**Decision: Endorsed.**

**R4-2108338 Draft Big CR: RRM requirements for band n262 in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v17.1.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This is big CR on RRM core and performance requirements for all power classes for new band in 47 GHz. Last version was endorsed in R4-2105858 (RAN4#98bis-e).

**Decision: Withdrawn.**

**R4-2108042 Big CR: RRM requirements for band n262 in 38.133**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-2185 rev Cat: B (Rel-17)  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

**R4-2108336 Draft CR on RRM core requirements for PC1/2/4 for band n262**

*Type: draftCR For: Endorsement  
 38.133 v17.1.0 CR- rev Cat: B (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Endorsed.**

**R4-2108337 Draft CR on RRM performance requirements for PC1/2/4 for band n262**

*Type: draftCR For: Endorsement  
 38.133 v17.1.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Endorsed.**

### 8.3 Introduction of NR band n67

#### 8.3.3 RRM requirements (38.133)

**R4-2110098 CR to TS 38.133: Introduction of band n67**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1974 rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR introduces band n67 in NR RRM specifications

**Decision: Agreed.**

### 8.4 Introduction of NR band n85

#### 8.4.3 RRM requirements (38.133)

**R4-2110110 CR to TS 38.133: Introduction of band n85**

*Type: CR For: Agreement  
 38.133 v17.1.0 CR-1975 rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR introduces band n85 in NR RRM specifications

**Decision: Agreed.**

## 9 Rel-17 non-spectrum related work items for NR

### 9.3 RF requirements enhancement for NR frequency range 1 (FR1)

#### 9.3.3 RRM core requirements

================================================================================

**Email discussion: [99-e][220] NR\_RF\_FR1\_enh\_RRM\_NWM**

**R4-2108144 Email discussion summary: [99-e][220] NR\_RF\_FR1\_enh\_RRM\_NWM**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108392 (from R4-2108144).**

**R4-2108392 Email discussion summary: [99-e][220] NR\_RF\_FR1\_enh\_RRM\_NWM**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108339 | WF on Rel-17 FR1 RF: RRM Tx switching enhancements | Huawei, HiSilicon |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108339 |  |  | Agreeable |  |

================================================================================

**R4-2108339 WF on Rel-17 FR1 RF: RRM Tx switching enhancements**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2109478 RRM DL interruption requirements at UE switching between two uplink carriers and two uplink bands**

*Type: discussion For: Decision  
 Source: CMCC*

**Decision: Noted.**

**R4-2110384 Discussion on RF requirements enhancement for NR frequency range 1 (FR1)-RRM**

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

**Decision: Noted.**

### 9.4 NR RF requirement enhancements for frequency range 2 (FR2)

#### 9.4.7 RRM core requirements

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**Email discussion: [99-e][221] NR\_RF\_FR2\_req\_enh2\_RRM**

**R4-2108145 Email discussion summary: [99-e][221] NR\_RF\_FR2\_req\_enh2\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108393 (from R4-2108145).**

**R4-2108393 Email discussion summary: [99-e][221] NR\_RF\_FR2\_req\_enh2\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 27th)

* Issue 1-1-1: MRTD value for FR2 inter-band CA
  + Views after 2nd round comments:
    - ~~Option 1: Do not define any requirements for CBM UEs for FR2 inter-band CA (Ericsson, Mediatek, Xiaomi, Huawei, Vivo, Qualcomm, LG, Docomo, OPPO)~~
    - Option 2: Introduce UE capability (vivo, Intel)
      * Option 2a: Introduce UE capability to support MRTD = 260ns and MRTD = 3us (vivo)
      * Option 2b: Introduce UE capability to support MRTD = 3us (Intel, NEC)
      * RAN4 to agree on the baseline implementation which should be considered for CBM UEs which support capability of MRTD = 3us (Intel)
    - ~~Option 3: MRTD = 260ns (Xiaomi, Vivo, LG, Mediatek, OPPO, Xiaomi)~~
    - ~~Option 4: MRTD = 3us (Docomo, ZTE, NEC, Huawei, Ericsson, Nokia)~~ 
      * ~~3us if there are no critical issues such as connectivity problem or significant throughput degradation (Docomo)~~
      * ~~An agreed and approved UE capability indication, as in the bullet above, is a precondition for proposals in this document. (Ericsson)~~
    - Option 5: MRTD shall not be larger than “CP length - UE Rx beam switch time - 2 x DL timing error” (Qualcomm, MediaTek, vivo, Apple, Xiaomi, LGE, OPPO)
    - ~~Option 6: MRTD =3us allowing certain performance degradation (Nokia, Ericsson, ZTE, NEC, Huawei, Docomo)~~
    - Option 7: MRTD of 3us for inter-band CA in FR2 under CBM with a note to stating if the MRTD exceed [TBD us or CP or CP/2] a performance degradation is expected. Illustrated as below. (Nokia, Huawei, NEC, E///, NTT Docomo)

|  |  |
| --- | --- |
| Frequency Range of the pair of carriers | Maximum receive timing difference (µs) |
| FR1 | 33 |
| FR2 | 8 note1 |
| FR2 | 3note2 |
| Between FR1 and FR2 | 25 |
| Note1:      This requirement applies to the UE capable of independent beam management for FR2 inter-band CA.  Note2:      This requirement applies to the UE capable of common beam management for FR2 inter-band CA. If the receive time difference exceeds [the cyclic prefix length of that SCS], demodulation performance degradation is expected for the first symbol of the slot. | |

* + - * RAN4 would then next discuss the condition of when the performance degradation may be expected:
        + a fixed time limit if [x]us
        + CP/2
        + CP/2 – additional latencies as proposed by QC
        + CP as used for intra-band non-contiguous CA
        + Other
    - Moderator’s comments:
      * It was encouraged to comment on compromised solutions i.e. Option 2/5/6/7 in the 2nd round. Majority companies could compromise to Option 6. One company disagrees with Option 6 but can compromise to Option 5. Some companies also support Option 7.
  + Discussion
    - MTK: Support Options 1/3/5
    - vivo: Same view with MTK and can support Option 5. Option 2 is also possible solution based on UE capabilities.
    - Nokia: Option 7 can be a compromise
    - E///: Option 6. Can go with Option 7 as well
    - Apple: Ok with Option 5. For Option 7 – not sure how we can guarantee that there is only 1 symbol loss. For performance degradation – it is unclear to us what this means. Shall we specify any requirements?
    - Xiaomi: Option 5. Disagree with Option 7.
    - Huawei: Option 6 and 7.
    - Intel: Performance degradation can be significant and simple note does not work. Need to consider some scheduling restrictions. Prefer UE capabilities as compromise.
    - LGE: Same view with Apple
    - QC: For performance degradation – in FR1 the 3us is << than symbol length. For FR2 the impact will be much larger. UE capabilities will bring fragmentation. We think NW will configure CA only if they can keep certain TAE.
    - Nokia: Agree that impact on performance can be higher. Agree that NW will not use it performance is bad. Can put 1 symbol in [].
    - MTK: Scheduling restrictions will limit UE’s possibility to make RX beam tuning and AGC
    - DCM: Option 6 or 7
    - QC: FR2 CA has very complicated implementation. We would like to know how degradation can be minimized. What happens in case of fast UE rotations.
      * E///: We analyzed the impact of UE rotations on the performance. No big impact is observed if we restrict UE beam tuning periodicity.
    - OPPO: Option 5.
    - Intel: For Option 7 – we agree with QC that this means no requirements and nobody will implement this. Option 2 is better. We have created a lot of capabilities and it did not cause fragmentation.
      * QC: Not sure how Option 2 works.
    - QC: To Nokia and E/// - the question how often UE beam tuning happens and restrictions may affect performance.
      * Apple: We agree with E/// analysis that there will be no problems due to UE rotation. RX beam tuning happens for many purposes (RLM, BM) and now this is purely UE implementation issue.
    - Apple: For Option 2 – capabilities will require 2 sets of requirements. It is unclear how we define the requirements for the case of large MRTD.
    - Nokia: We agree that UE RX beam switch
  + Agreements
    - Candidate options
      * Option 1: MRTD shall not be larger than “CP length - UE Rx beam switch time - 2 x DL timing error” and the max SCS is 120kHz
      * Option 2: MRTD of 3us for inter-band CA in FR2 under CBM with a note to stating if the MRTD exceed [TBD us or CP or CP/2] a performance degradation is expected for the first N symbols of the slot
        + N is FFS
        + FFS if degradation applies to each slot
        + Example requirement:

|  |  |
| --- | --- |
| Frequency Range of the pair of carriers | Maximum receive timing difference (µs) |
| FR1 | 33 |
| FR2 | 8 note1 |
| FR2 | 3 note2 |
| Between FR1 and FR2 | 25 |
| Note1:      This requirement applies to the UE capable of independent beam management for FR2 inter-band CA.  Note2:      This requirement applies to the UE capable of common beam management for FR2 inter-band CA. If the receive time difference exceeds [the cyclic prefix length of that SCS], demodulation performance degradation is expected for the first N symbols of the slot. | |

* + - * Option 3: Introduce UE capability to support MRTD = [260ns] and/or MRTD = [3us]
    - Further study the candidate options and investigate at least the following open issues
      * Impact of UE RX beam switching and AGC periodicity restrictions on the performance
      * Candidate RRM requirements and performance impacts for the case of MRTD larger than “CP length - UE Rx beam switch time - 2 x DL timing error” and below 3us
* Issue 1-1-4: Performance degradation due to Rx beam switching
  + Views after 1st round comments:
    - Option 1: UE can switch RX beams without major performance degradation even if MRTD is larger than CP length (NEC, Huawei, Ericsson, ZTE)
      * Option 1a: It can switch during start of UL to DL transition (NEC)
      * Option 1b: UE could perform Rx beam switching within UL-DL switching period or the non-scheduled symbols without causing performance degradation (Huawei)
      * Option 1c: A beam switch could be performed safe within the DL2UL guard if properly performed (Ericsson, Nokia)
    - Option 2: Any timing impacts should be identified and should need to be accounted in the UE requirements (OPPO, Nokia, Vivo, Qualcomm, Vivo).
      * Option 2a: Demodulation performance degradation due to Rx beam switch should be noted in MRTD requirements for CBM UE if MRTD is larger than CP. (OPPO, Nokia)
      * With a note stating ‘This requirement applies to the UE capable of common beam management for FR2 inter-band CA. If the receive time difference exceeds the cyclic prefix length of that SCS, demodulation performance degradation is expected for the first symbol of the slot.’ (Nokia)
      * Option 2b: For CBM Ues in FR2 inter-band CA, if MRTD is larger than CP length with respect to serving cell numerology, serving cell(s) shouldn’t expect the UE to be able to receive/detect PDCCH(s) on search spaces including at least the first or last OFDM symbol of slot in a band where beam management reference resource(s) it not configured. FFS on multiple numerologies. FFS on further scheduling restrictions on PDCCH and/or PDSCH. (vivo)
      * Option 2c: For CBM Ues in FR2 inter-band CA, if MRTD is larger than “CP length – UE Rx beam switch time – 2 x DL timing error”, serving cell(s) shouldn’t expect the UE to be able to receive/detect PDCCH(s) on search spaces including at least the first or last OFDM symbol of slot in a band where beam management reference resource(s) it not configured. FFS on multiple numerologies. FFS on further scheduling restrictions on PDCCH and/or PDSCH (Qualcomm)
      * Option 2d: If the receive time difference exceeds the cyclic prefix length of that SCS, demodulation performance degradation is expected for the first symbol of the slot. (Nokia)
    - Option 3: The performance degradation is significant and unacceptable (Xiaomi, Vivo, Mediatek, Qualcomm, LG, OPPO, Intel).
      * Option 3a: When the MRTD is larger than CP, the demodulation performance can be significantly degraded at any DL symbol(s) due to the unpredictable UE Rx beam switching (Xiaomi, vivo)
      * Option 3b: AGC adjustment will cause unexpected interruption when MRTD is more than CP length (Mediatek)
    - Option 4: RAN4 needs to identify the scenarios where UE Rx beam switching is needed and study whether there have performance impacts due to Rx beam switching for each scenario. (Huawei)
    - Option 5: RAN4 should evaluate on the feasibility of UE to perform Rx beam switch within the DL2UL guard period for CBM capable UE in inter-band CA (Nokia)
  + Discussion
  + Agreements

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108340 | WF on RRM requirements for FR2 Inter-band DL CA and UL CA | Nokia |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108340 | WF on RRM requirements for FR2 Inter-band DL CA and UL CA | Nokia | Revised |  |

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**R4-2108340 WF on RRM requirements for FR2 Inter-band DL CA and UL CA**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Session chair: come back in GTW**

**Decision: Revised to R4-2108037 (from R4-2108340).**

**R4-2108037 WF on RRM requirements for FR2 Inter-band DL CA and UL CA**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Approved.**

##### 9.4.7.1 Inter-band DL CA enhancements

**R4-2108969 FR2 Inter-band DL CA**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2109256 Further discussion on RRM requirements for FR2 inter-band DL CA**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2109546 Discussions on Inter-band DL CA enhancements**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Decision: Noted.**

**R4-2109613 For RRM requirements for inter-band DL CA in NR FR2**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2109706 Discussion on MRTD for FR2 inter-band CA based on CBM**

*Type: discussion For: (not specified)  
 Source: LG Electronics Polska*

**Abstract:**

It discusses MRTD requirements for FR2 inter-band CA based on CBM.

**Decision: Noted.**

**R4-2109751 Discussion on MRTD requirements for inter-band DL CA in FR2**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109854 Discussion on CBM MRTD requirement for FR2 inter-band DL CA**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2109888 Discussion on FR2 inter-band DL CA enhancements**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

We provide our views on some of the FR2 enhancements and MRTD requirement for FR2 inter-band CA

**Decision: Noted.**

**R4-2110059 RRM requirements for FR2 inter-band DL CA enhancements**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110301 Discussion on FR2 inter-band DL CA enhancement**

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

**Decision: Noted.**

**R4-2110419 Support up to 3 us MRTD**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this contribution we develop why at least 3us MRTD is feasible from both from a network perspective and a UE perspective, for co-located deployments.

**Decision: Noted.**

**R4-2110949 MRTD requirements for CBM UEs**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2111280 Discussion on FR2 RF RRM**

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

**Decision: Noted.**

##### 9.4.7.2 Inter-band UL CA for IBM capable UEs

**R4-2111281 UL CA for IBM**

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

**Decision: Noted.**

### 9.7 Enhancement for NR high speed train scenario in FR1

#### 9.7.1 General

#### 9.7.2 RRM core requirements

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**Email discussion: [99-e][222] NR\_HST\_FR1\_enh\_RRM**

**R4-2108146 Email discussion summary: [99-e][222] NR\_HST\_FR1\_enh\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108394 (from R4-2108146).**

**R4-2108394 Email discussion summary: [99-e][222] NR\_HST\_FR1\_enh\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108341 | WF on RRM for FR1 HST | CMCC |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108341 | WF on RRM for FR1 HST | CMCC | Agreeable |  |

================================================================================

**R4-2108341 WF on RRM for FR1 HST**

*Type: other For: Approval  
 Source: CMCC*

**Abstract:**

**Discussion:**

**Decision: Approved.**

##### 9.7.2.1 UE RRM core requirements for CA scenario

###### 9.7.2.1.1 General

**R4-2109562 On NR FR1 HST RRM Requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2109061 General discussion on RRM requirements for NR FR1 HST**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109514 Discussion on general requirements for FR1 HST RRM**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2109633 Discussion on Rel-17 HST in FR1 for general issue**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2110060 RRM requirement for Rel17 FR1 HST**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110212 On SCell general RRM requirements enhancement for NR HST in FR1**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

General RRM requirement for HST FR1 CA case

**Decision: Noted.**

**R4-2110377 Discussion on Enhancement for NR high speed train scenario in FR1**

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

**Decision: Noted.**

**R4-2111252 Discussion on general RRM aspects for FR1 HST CA**

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

**Abstract:**

The document has addressed several RRM open issues related to enhancements for CA under HST scenarios.

**Decision: Noted.**

**R4-2111261 Discussion on R17 NR FR1 HST RRM requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

###### 9.7.2.1.2 Intra-frequency measurements

**R4-2109062 Discussion on intra-frequency measurement for NR FR1 HST RRM enhancement**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109248 Discussion on intra-frequency measurements requirement for R17 FR1 HST**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2109316 On R17 FR1 HST intra-frequency measurement**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2109516 Discussion on NR HST RRM enhancement for CA**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2109634 Discussion on Rel-17 HST in FR1 for intra-frequency measurement**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2110214 On SCell intra-frequency measurements for NR HST in FR1**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Intra-frequency measurements for HST FR1 CA case

**Decision: Noted.**

**R4-2110220 On SCell intra-frequency measurements for NR HST in FR1**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Intra-frequency measurements for HST FR1 CA case

**Decision: Noted.**

**R4-2111262 Discussion on intra-frequency measurement requirements for NR FR1 HST**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

###### 9.7.2.1.3 Inter-frequency measurements

**R4-2109063 Discussion on inter-frequency measurement for NR FR1 HST RRM enhancement**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109249 Discussion on inter-frequency measurements requirement for R17 FR1 HST**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2109317 On R17 FR1 HST inter-frequency measurement**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2109515 Discussion on NR HST RRM enhancement for inter-frequency measurement**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2109635 Discussion on Rel-17 HST in FR1 for inter-frequency measurement**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2110213 On SCell inter-frequency measurements for NR HST in FR1**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Inter-frequency measurements for HST FR1 CA case

**Decision: Noted.**

**R4-2110219 On SCell inter-frequency measurements for NR HST in FR1**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Inter-frequency measurements for HST FR1 CA case

**Decision: Noted.**

**R4-2111256 Discussion on inter-frequency measurements for FR1 HST CA**

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

**Abstract:**

The document has discussed and proposed a possible enhancement for inter-frequency measurement for FR1 HST CA.

**Decision: Noted.**

**R4-2111263 Discussion on inter-frequency measurement requirements for NR FR1 HST**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

### 9.8 NR support for high speed train scenario in FR2

#### 9.8.4 RRM core requirements

================================================================================

**Email discussion: [99-e][223] NR\_HST\_FR2\_RRM**

**R4-2108147 Email discussion summary: [99-e][223] NR\_HST\_FR2\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108395 (from R4-2108147).**

**R4-2108395 Email discussion summary: [99-e][223] NR\_HST\_FR2\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108342 | WF on FR2 HST RRM requirements | Nokia |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108342 | WF on FR2 HST RRM requirements | Nokia, Nokia Shanghai Bell | Agreeable |  |

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**R4-2108342 WF on FR2 HST RRM requirements**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Approved.**

##### 9.8.4.1 General

**R4-2109572 On NR FR2 HST RRM Requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2109064 General discussion on RRM for NR FR2 HST**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109365 Discussion on FR2 HST RRM requirement - geneal**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2110215 General RRM requirements for HST FR2**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

General RRM requirements for HST FR2

**Decision: Noted.**

**R4-2110221 General RRM requirements for HST FR2**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

General RRM requirements for HST FR2

**Decision: Noted.**

**R4-2110378 General aspects of RRM requirements for HST in FR2**

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

**Decision: Noted.**

**R4-2111168 Further simulation analysis for HST in FR2**

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

**Abstract:**

Further simulation analysis related to deployment scenarios and RRM requirements.

**Decision: Noted.**

##### 9.8.4.2 Number of RX beams

**R4-2109065 Discussion on number of RX beams for NR FR2 HST**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109366 Discussion on number of Rx beam for FR2 HST**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2110216 RX beam number for HST FR2**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

RX beam number for HST FR2

**Decision: Noted.**

**R4-2110222 RX beam number for HST FR2**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

RX beam number for HST FR2

**Decision: Noted.**

**R4-2110954 Discussion on the number of RX beams for FR2 HST**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

##### 9.8.4.3 RRM requirements impacts

**R4-2109066 Discussion on RRM requirements impacts for NR FR2 HST**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109367 Discussion on RRM requirement for FR2 HST**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2109509 Discussion on RRM requirements for FR2 HST**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2110217 RRM requirements impacted for HST FR2**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

RRM requirements impacted for HST FR2

**Decision: Noted.**

**R4-2110223 RRM requirements impacted for HST FR2**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

RRM requirements impacted for HST FR2

**Decision: Noted.**

**R4-2110238 Further discussion on RRM requirements for FR2 HST**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2110379 Discussion on RRM requirements for high speed train scenario in FR2**

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

**Decision: Noted.**

**R4-2110955 Discussion on the RRM requirements impact of FR2 HST**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2111171 Discussion on RRM requirements for FR2 HST**

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

**Abstract:**

The document has discussed possible RRM enhancements for FR2 HST.

**Decision: Noted.**

### 9.9 Further RRM enhancement for NR and MR-DC

#### 9.9.1 General

#### 9.9.2 RRM core requirements

##### 9.9.2.1 SRS antenna port switching

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**Email discussion: [99-e][224] NR\_RRM\_enh2\_1**

**R4-2108148 Email discussion summary: [99-e][224] NR\_RRM\_enh2\_1**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108396 (from R4-2108148).**

**R4-2108396 Email discussion summary: [99-e][224] NR\_RRM\_enh2\_1**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108343 | WF on further RRM enhancement for NR and MR-DC - SRS antenna port switching | Apple |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108343 | WF on further RRM enhancement for NR and MR-DC - SRS antenna port switching | Apple | Agreeable |  |

================================================================================

**R4-2108343 WF on further RRM enhancement for NR and MR-DC - SRS antenna port switching**

*Type: other For: Approval  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2109050 Further discussion on SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109243 Discussion on SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2109247 Further discussion on SRS antenna switching RRM requirements**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2109308 On SRS antenna port switching**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2109520 Discussion on SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2109549 Discussion on the interruption requirements at SRS antenna port switching**

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

**Decision: Noted.**

**R4-2109563 On SRS antenna switching**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2109632 Discussion on SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2109717 Discussion on interruption due to SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2109890 Discussion on SRS antenna port switching**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

We analyze the interruption requirements for SRS antenna port switching

**Decision: Noted.**

**R4-2110061 RRM requirements for SRS ant port switch**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110343 Discussion on requirements for SRS antenna switching**

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

**Decision: Noted.**

**R4-2110976 On RRM requirements for SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on RRM requirements for antenna port switching

**Decision: Noted.**

**R4-2111264 Discussion on RRM requirements for SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

##### 9.9.2.2 HO with PSCell

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**Email discussion: [99-e][225] NR\_RRM\_enh2\_2**

**R4-2108149 Email discussion summary: [99-e][225] NR\_RRM\_enh2\_2**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108397 (from R4-2108149).**

**R4-2108397 Email discussion summary: [99-e][225] NR\_RRM\_enh2\_2**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108344 | WF on further RRM enhancement for NR and MR-DC – HO with PSCell | vivo |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108344 | WF on further RRM enhancement for NR and MR-DC – HO with PSCell | vivo | Revised | The WF is to be aligned with 2nd round summary in section 1.6. |

================================================================================

**R4-2108344 WF on further RRM enhancement for NR and MR-DC – HO with PSCell**

*Type: other For: Approval  
 Source: vivo*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108045 (from R4-2108344).**

**R4-2108045 WF on further RRM enhancement for NR and MR-DC – HO with PSCell**

*Type: other For: Approval  
 Source: vivo*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108768 Discussion on handover with PSCell**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109051 Further discussion on HO with PSCell**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109244 Discussion on HO with PSCell**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2109250 Further discussion on RRM requirements for handover with PSCell**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2109309 On RRM requirement for handover with PSCell**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2109510 Discussion on HO with PSCell**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2109732 Further views on timeline assumptions for HO with PSCell**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Views on parallel v.s. sequential operations

**Decision: Noted.**

**R4-2109885 Discussion on HO with PSCell**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2109891 Discussion on PSCell HO**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

We analyze the requirements for HO with PSCell

**Decision: Noted.**

**R4-2110062 RRM requirements for HO with PSCell**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110147 Views on HO with PSCell**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Decision: Noted.**

**R4-2110344 Discussion on requirements for HO with PSCell**

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

**Decision: Noted.**

**R4-2110971 On handover with PSCell**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on handover with PSCell

**Decision: Noted.**

**R4-2111042 discussion on HO with PSCell**

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

**Abstract:**

discussion on HO with PSCell

**Decision: Noted.**

**R4-2111265 Discussion on RRM requirements for HO with PSCell**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

##### 9.9.2.3 PUCCH SCell activation/deactivation

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**Email discussion: [99-e][226] NR\_RRM\_enh2\_3**

**R4-2108150 Email discussion summary: [99-e][226] NR\_RRM\_enh2\_3**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108398 (from R4-2108150).**

**R4-2108398 Email discussion summary: [99-e][226] NR\_RRM\_enh2\_3**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108345 | WF on further RRM enhancement for NR and MR-DC - PUCCH SCell activation/deactivation requirements | CATT |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108345 | WF on further RRM enhancement for NR and MR-DC - PUCCH SCell activation/deactivation requirements | CATT | Agreeable |  |

================================================================================

**R4-2108345 WF on further RRM enhancement for NR and MR-DC - PUCCH SCell activation/deactivation requirements**

*Type: other For: Approval  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108970 Discussion on PUCCH SCell Activation**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2109052 Further discussion on PUCCH SCell activation\_deactivation**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109251 Further discussion on SCell activation and deactication requirements for PUCCH SCell**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2109310 On PUCCH SCell activation and deactivation**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2109518 Discussion on PUCCH SCell activation/deactivation**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2109545 Discussions on PUCCH SCell Activation/Deactivation delay requirements**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Decision: Noted.**

**R4-2109548 Discussion on the activation delay for deactivated PUCCH SCell**

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

**Decision: Noted.**

**R4-2109617 On PUCCH SCell activation and deactivation**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2109631 Discussion on PUCCH SCell activation and deactivation**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2109892 Discussion on PUCCH SCell activation**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

We analyze the requirements for PUCCH SCell activation/deactivation for single and multiple SCells

**Decision: Noted.**

**R4-2110063 RRM requirements for PUCCH SCell ActivationDeactivation**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110345 Discussion on requirements for PUCCH SCell activation**

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

**Decision: Noted.**

**R4-2110972 On SCell (de)activation with PUCCH**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on SCell activation and deactivation for PUCCH SCell.

**Decision: Noted.**

### 9.10 NR and MR-DC measurement gap enhancements

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**Email discussion: [99-e][227] NR\_MG\_enh\_1**

**R4-2108151 Email discussion summary: [99-e][227] NR\_MG\_enh\_1**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108399 (from R4-2108151).**

**R4-2108399 Email discussion summary: [99-e][227] NR\_MG\_enh\_1**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108346 | WF on R17 NR MG enhancements - Multiple concurrent and independent MG patterns | Mediatek Inc |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108346 | WF on R17 NR MG enhancements - Multiple concurrent and independent MG patterns | Mediatek Inc | Agrreable |  |

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**Email discussion: [99-e][228] NR\_MG\_enh\_2**

**R4-2108152 Email discussion summary: [99-e][228] NR\_MG\_enh\_2**

*Type: other For: Information  
 Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108400 (from R4-2108152).**

**R4-2108400 Email discussion summary: [99-e][228] NR\_MG\_enh\_2**

*Type: other For: Information  
 Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108347 | WF on R17 NR MG enhancements – Pre-configured MG | Intel |  |
| R4-2108348 | WF on R17 NR MG enhancements – NCSG | Intel |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108034 | WF on R17 NR MG enhancements – Pre-configured MG | Intel | Agreeable |  |
| R4-2108348 | WF on R17 NR MG enhancements – NCSG | Intel | Agreeable |  |

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#### 9.10.1 General

#### 9.10.2 RRM core requirements

##### 9.10.2.1 Pre-configured MG pattern(s)

**R4-2108347 WF on R17 NR MG enhancements – Pre-configured MG**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108034 (from R4-2108347).**

**R4-2108034 WF on R17 NR MG enhancements – Pre-configured MG**

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

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2109098 Discussion on pre-configured MG pattern**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109180 Discussion on pre-configured gap**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2109228 Discussion on pre-configured measurement gap**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2109252 Further discussion on pre-configured MG pattern for NR**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2109313 Further consideration on Pre-MG pattern**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2109517 Discussion on pre-configured MG pattern(s)**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2109614 Views on pre configured MG patterns**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2109730 Views on the basic pre-configured MG configuration**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

It is important to establish a BASIC version of pre-configured gap for the 1st phase discussion.

**Decision: Noted.**

**R4-2109759 Views on pre-configured MG patterns**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109894 Discussion on preconfigured measurement gap**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

We provide our view on the definition of pre-configured MG and their activation and deactivation procedures

**Decision: Noted.**

**R4-2110064 On pre-configured MG pattern(s) for NR\_MG\_enh**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110269 Discussion on Pre-configured MG patterns**

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

**Abstract:**

Discussion on pre-configured MG patterns for NR

**Decision: Noted.**

**R4-2110911 Discussion on pre-configured MG**

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

**Decision: Noted.**

**R4-2111311 Further analysis of pre-configured measurement gap pattern**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

This document further analyzes RRM requirements for pre-configured MG in NR and MR-DC

**Decision: Noted.**

##### 9.10.2.2 Multiple concurrent and independent MG patterns

**R4-2108346 WF on R17 NR MG enhancements - Multiple concurrent and independent MG patterns**

*Type: other For: Approval  
 Source: Mediatek Inc*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2109099 Discussion on multiple concurrent and independent MG patterns**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109181 Discussion on concurrent gaps**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2109229 Discussion on multiple and independent concurrent measurement gaps in NR**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2109253 Further discussion on multiple concurrent and independent MG patterns for NR**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2109314 On multiple concurrent and independent MG patterns**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2109511 Discussion on multiple concurrent and independent MG patterns**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2109615 Further consideration on multiple concurrent and independent MG patterns**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2109707 Discussion on multiple concurrent and independent MG patterns**

*Type: discussion For: (not specified)  
 Source: LG Electronics Polska*

**Abstract:**

It discusses issues for multiple concurrent and independent MG patterns.

**Decision: Noted.**

**R4-2109729 Views on key issues of multiple concurrent and independent MG patterns**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Views on configuration and activation/deactivation procedures

**Decision: Noted.**

**R4-2109760 Views on multiple concurrent and independent MGs**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109893 Discussion on concurrent and independent MG**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

We discuss the principle for defining requirements for multiple concurrent and independent MG patterns

**Decision: Noted.**

**R4-2109992 Discussion on Multiple concurrent MG patterns**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses RRM requirements for multiple concurrent MGPs

**Decision: Noted.**

**R4-2110065 On multiple concurrent and independent MG patterns for NR\_MG\_enh**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110912 Discussion on multiple concurrent MGs**

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

**Decision: Noted.**

**R4-2111279 Discussion on concurrent measurement gaps**

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

**Decision: Noted.**

##### 9.10.2.3 Network Controlled Small Gap

**R4-2108348 WF on R17 NR MG enhancements – NCSG**

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

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2109100 Discussion on Network Controlled Small Gap (NCSG)**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109182 Discussion on NCSG**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2109230 Discussion on NCSG in NR**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2109315 On network controlled small gap**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2109512 Discussion on Network Controlled Small Gap**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2109616 Views on network controlled small gap**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2109731 Discussions on open issues of network controlled small gap**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Choice of VIL and other key issues

**Decision: Noted.**

**R4-2109761 Views on NCSG**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2110066 On NCSG for NR\_MG\_enh**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110270 Discussion on Network Controlled Small Gaps for NR**

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

**Abstract:**

Discussion on introduction of NCSG for NR

**Decision: Noted.**

**R4-2110913 Discussion on NCSG**

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

**Decision: Noted.**

**R4-2111312 Further analysis of network controlled small gap**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

This document further analyzes RRM requirements for NCSG in NR and MR-DC

**Decision: Noted.**

### 9.12 Solutions for NR to support non-terrestrial networks (NTN)

#### 9.12.4 RRM core requirements

================================================================================

**Email discussion: [99-e][229] NR\_NTN\_solutions\_RRM\_1**

**R4-2108153 Email discussion summary: [99-e][229] NR\_NTN\_solutions\_RRM\_1**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108401 (from R4-2108153).**

**R4-2108401 Email discussion summary: [99-e][229] NR\_NTN\_solutions\_RRM\_1**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108349 | WF on general, GNSS and measurement-related NR NTN RRM requirements | Fraunhofer |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108349 | WF on general, GNSS & measurement-related NR NTN RRM requirements | Fraunhofer | Revised to R4-2108033 |  |
| R4-2108033 | WF on general, GNSS & measurement-related NR NTN RRM requirements | Fraunhofer | Agreeable |  |

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**Email discussion: [99-e][230] NR\_NTN\_solutions\_RRM\_2**

**R4-2108154 Email discussion summary: [99-e][230] NR\_NTN\_solutions\_RRM\_2**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108402 (from R4-2108154).**

**R4-2108402 Email discussion summary: [99-e][230] NR\_NTN\_solutions\_RRM\_2**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108350 | WF on timing requirements for NR NTN | Xiaomi |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108350 | WF on timing requirements for NR NTN | Xiaomi | Agreeable |  |

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**R4-2108349 WF on general, GNSS and measurement-related NR NTN RRM requirements**

*Type: other For: Approval  
 Source: Fraunhofer*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108033 (from R4-2108349).**

**R4-2108033 WF on general, GNSS and measurement-related NR NTN RRM requirements**

*Type: other For: Approval  
 Source: Fraunhofer*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108350 WF on timing requirements for NR NTN**

*Type: other For: Approval  
 Source: Xiaomi*

**Abstract:**

**Discussion:**

**Decision: Approved.**

##### 9.12.4.1 General

**R4-2109056 Discussion on RRM requirements for NTN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

##### 9.12.4.2 GNSS-related requirements

**R4-2109057 Discussion on GNSS-related requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109492 Discussion on NTN GNSS related issues**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2110418 UE positioning and timing requirements**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion about impact on total timing error budget due to positioning.

**Decision: Noted.**

**R4-2110914 Discussion on GNSS for NTN RRM**

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

**Decision: Noted.**

##### 9.12.4.3 Timing requirements

**R4-2108971 Timing requirements in NTN Systems**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2109058 Discussion on timing requirements for NTN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109059 Response LS on NTN UL time synchronization requirements**

*Type: LS out For: Approval  
 to RAN1  
 Source: CATT*

**Decision: Noted.**

**R4-2109220 Discussion on NTN timing requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2109254 Further discussion on timing requirements for NR NTN**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2109493 Discussion on NTN timing requirements**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2109714 Discussion on timing requirements for NR NTN**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2109752 Discussion on timing requirements for NTN**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109855 Discussion on timing requirements in NTN**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2109896 Discussion on RRM timing related requirements for NTN**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

In this contribution we provide our views on the RRM timing requirements for NTN UE

**Decision: Noted.**

**R4-2110302 Discussion on NTN timing related requirements**

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

**Decision: Noted.**

**R4-2110416 Timing requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

RRM timing requirements for UE.

**Decision: Noted.**

**R4-2110417 Reply LS to RAN1: LS on NTN UL time and frequency synchronization requirements (Timing)**

*Type: LS out For: Approval  
 to RAN1  
 Source: Ericsson*

**Abstract:**

Draft Reply LS to RAN1 regarding UE timing requirements.

**Decision: Noted.**

**R4-2111075 On timing requirements for NR NTN**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2111271 NTN - On UE timing requirements**

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

**Abstract:**

This contribution addresses timing issues.

**Decision: Noted.**

**R4-2111477 NTN UL Timing Accuracy**

*Type: discussion For: Discussion  
 Source: THALES*

**Abstract:**

The goal of this contribution is to further clarify NTN UL timing synchronization requirements to be considered by NTN RAN4 work.

**Decision: Noted.**

##### 9.12.4.4 Measurement requirements

**R4-2108972 Measurement requirements in NTN Systems**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2109060 Discussion on Measurement requirements for NTN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109255 Further discussion on measurement requirements for NR NTN**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2109483 Discussion on NTN RRM measurement requirements**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2109949 Discussion on measurement requirements for NTN**

*Type: discussion For: (not specified)  
 Source: LG Electronics UK*

**Decision: Noted.**

**R4-2110218 RRM Measurement requirements for NTN**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

RRM Measurement requirements for NTN

**Decision: Noted.**

**R4-2110224 RRM Measurement requirements for NTN**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

RRM Measurement requirements for NTN

**Decision: Noted.**

**R4-2110382 Discussion on measurement in NTN**

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

**Decision: Noted.**

**R4-2111270 NTN - On measurement requirements**

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

**Abstract:**

The paper discusses RRM measurement requirements.

**Decision: Noted.**

### 9.13 UE Power Saving Enhancements

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**Email discussion: [99-e][231] NR\_UE\_pow\_sav\_enh\_RRM**

**R4-2108155 Email discussion summary: [99-e][231] NR\_UE\_pow\_sav\_enh\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108403 (from R4-2108155).**

**R4-2108403 Email discussion summary: [99-e][231] NR\_UE\_pow\_sav\_enh\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108351 | WF on RLM/BFD relaxation for UE Power Saving enhancements | MTK |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108351 | WF on RLM/BFD relaxation for UE Power Saving enhancements | Mediatek | Agreeable |  |

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#### 9.13.1 General and work plan

**R4-2111266 Discussion on work split between RAN2 and RAN4 on R17 RLM and BFD relaxation for NR**

*Type: discussion For: Approval  
 Source: vivo*

**Decision: Noted.**

#### 9.13.2 UE measurements relaxation for RLM and/or BFD

**R4-2108351 WF on RLM/BFD relaxation for UE Power Saving enhancements**

*Type: other For: Approval  
 Source: MediaTek*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108764 On RLM and RLF relaxation for UE power saving**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109067 Further discussion on RLM/BFD relaxation measurement**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109242 Discussion on UE power saving for RLM and BM**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2109246 Further discussion on UE measurements relaxation for RLM and/or BFD**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2109364 UE measurements relaxation for RLM and/or BFD**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2109494 Discussion on RLM/BFD relaxation for NR power saving enhancement**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2109550 Discussion about RLM/BFD measurement relaxation**

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

**Decision: Noted.**

**R4-2109551 Simulation results for UE power saving enhancements**

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

**Decision: Noted.**

**R4-2109561 On Power Saving RRM Requirement**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2109886 Evaluation on Rel-17 RLM/BFD measurement relaxation**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2110303 Further discussion on RLM/BFD measurement relaxation**

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

**Decision: Noted.**

**R4-2111233 Simulation results on UE power saving for RLM and BM**

*Type: discussion For: Information  
 Source: Ericsson*

**Abstract:**

In this contribution we present the SINR difference (delta SINR) for RLM-RS based on SSB for different relaxation factors and UE speeds as in agreed in previous meeting.

**Decision: Noted.**

**R4-2111234 Discussions on UE power saving for RLM and BM**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The RRM impact of release 17 work item on UE power saving enhancements for NR was discussed at previous meeting and the outcome of the discussions were summarized in [1]. In this contribution we further discuss and provide our view on the open issues.

**Decision: Noted.**

**R4-2111248 Simulation results on UE power saving for RLM and BM**

*Type: discussion For: Information  
 Source: Ericsson*

**Abstract:**

In this contribution we present the SINR difference (delta SINR) for RLM-RS based on SSB for different relaxation factors and UE speeds as in agreed in previous meeting.

**Decision: Noted.**

**R4-2111249 Discussions on UE power saving for RLM and BM**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The RRM impact of release 17 work item on UE power saving enhancements for NR was discussed at previous meeting and the outcome of the discussions were summarized in [1]. In this contribution we further discuss and provide our view on the open issues.

**Decision: Noted.**

**R4-2111267 Discussion on R17 RLM and BFD relaxation for NR**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

### 9.14 NR Sidelink enhancement

================================================================================

**Email discussion: [99-e][232] NR\_SL\_enh\_RRM**

**R4-2108156 Email discussion summary: [99-e][232] NR\_SL\_enh\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108404 (from R4-2108156).**

**R4-2108404 Email discussion summary: [99-e][232] NR\_SL\_enh\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108352 | WF on NR SL enhancements RRM requirements | LG Electronics |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2109704 | Work Plan of RRM requirements for Rel-17 SL enhancement | LG Electronics | Agreeable |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108352 | WF on NR SL enhancements RRM requirements | LG Electronics | Agreeable |  |

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#### 9.14.1 General and work plan

**R4-2109704 Work Plan of RRM requirements for Rel-17 SL enhancement**

*Type: Work Plan For: Approval  
 Source: LG Electronics Polska*

**Abstract:**

It discusses work plan on RRM requirement for SL enhancement.

**Decision: Approved.**

#### 9.14.8 RRM core requirements

**R4-2108352 WF on NR SL enhancements RRM requirements**

*Type: other For: Approval  
 Source: LG Electronics*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2109068 Preliminary discussion on RRM requirements for Sidelink enhancement**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109715 Impact on RRM core requirements for NR SL enhancement**

*Type: discussion For: (not specified)  
 Source: LG Electronics Polska*

**Abstract:**

It discusses impact on RRM core requirements for Rel-17 NR SL enhancement.

**Decision: Noted.**

**R4-2109946 RRM impacts overview for sidelink enhancement**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2110304 Discussion on RRM impacts for R17 NR V2X**

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

**Decision: Noted.**

**R4-2111107 On NR SL RRM Requirement Scope**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

### 9.15 Extending current NR operation to 71GHz

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**Email discussion: [99-e][233] NR\_ext\_to\_71GHz\_RRM**

**R4-2108157 Email discussion summary: [99-e][233] NR\_ext\_to\_71GHz\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108405 (from R4-2108157).**

**R4-2108405 Email discussion summary: [99-e][233] NR\_ext\_to\_71GHz\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108354 | WF on NR extension to 71 GHz - RRM | Qualcomm | All agreements to be captured in this document |
| R4-2108353 | Work plan for NR extension to 71 GHz - RRM | Qualcomm | Agreed work plan to be captured in this document |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108354 | WF on NR extension to 71 GHz - RRM | Qualcomm | Agreeable |  |
| R4-2108353 | Work plan for NR extension to 71 GHz - RRM | Qualcomm | Agreeable |  |

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#### 9.15.1 General and work plan

**R4-2110950 NR 52.6 -71 GHz workplan (RRM)**

*Type: Work Plan For: Approval  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2108353 Work plan for NR extension to 71 GHz - RRM**

*Type: other For: Approval  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Approved.**

#### 9.15.6 RRM core requirements

**R4-2108354 WF on NR extension to 71 GHz - RRM**

*Type: other For: Approval  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2109291 RRM considerations for extension to 71 GHz**

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

**Decision: Noted.**

**R4-2109480 Discussion on RRM impacts for 52.6GHz ~ 71GHz**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2109944 RRM impacts overview for extending NR operation to 71GHz**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2110348 Discussion on RRM impact of Rel-17 NR\_ext\_to\_71GHz**

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

**Decision: Noted.**

**R4-2110410 UE timing**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Analysis of UE TDD ON/OFF timing.

**Decision: Noted.**

**R4-2110414 Reply LS to RAN1: LS on beam switching gap for 60 GHz band**

*Type: LS out For: Approval  
 to RAN1  
 Source: Ericsson*

**Abstract:**

Feedback to RAN1 on TDD ON/OFF switch time.

**Decision: Noted.**

**R4-2110951 Discussion on the RRM scope for NR 52.6 – 71 GHz support**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2111517 RRM requirements for NR operation in 57-71GHz**

*Type: Work Plan For: Approval  
 Source: Qualcomm Incorporated*

**Abstract:**

In this paper we discuss the RRM impact and work plan for the core part

**Decision: Noted.**

### 9.16 Enhancements to Integrated Access and Backhaul (IAB) for NR

================================================================================

**Email discussion: [99-e][234] NR\_IAB\_enh\_RRM**

**R4-2108158 Email discussion summary: [99-e][234] NR\_IAB\_enh\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108406 (from R4-2108158).**

**R4-2108406 Email discussion summary: [99-e][234] NR\_IAB\_enh\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108355 | WF on eIAB RRM | ZTE Corporation |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108355 | WF on eIAB RRM | ZTE Corporation | Agreeable |  |

================================================================================

#### 9.16.1 General and work plan

**R4-2110002 Updated workplan for Rel-17 IAB**

*Type: other For: Information  
 Source: Samsung,Qualcomm*

**Decision: Noted**

#### 9.16.3 RRM core requirements

**R4-2108355 WF on NR eIAB RRM**

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

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2109001 on eIAB RRM**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2110174 RRM requirements for IAB enhancement in Rel-17**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2110347 Discussion on RRM impact of R17 IAB**

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

**Decision: Noted.**

**R4-2111110 General Considerations on Rel. 17 IAB RRM Core Requirements**

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

**Abstract:**

In this contribution, we make an overview of the IAB Rel.16 RRM specification changes, discuss the overall status of the WI in the other 3GPP RAN working groups, and make an initial evaluation if any additional impact on the RRM core requirement in NR-IAB

**Decision: Noted.**

### 9.18 Rel-17 enhancements on MIMO for NR

================================================================================

**Email discussion: [99-e][235] NR\_feMIMO\_RRM**

**R4-2108159 Email discussion summary: [99-e][235] NR\_feMIMO\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108407 (from R4-2108159).**

**R4-2108407 Email discussion summary: [99-e][235] NR\_feMIMO\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108356 | Reply LS on L1/L2 centric inter-cell mobility | Samsung | To: RAN1, RAN2 |
| R4-2108357 | Reply LS on timing assumption for inter-cell DL measurement | Samsung | To: RAN1; Cc: RAN2 |
| R4-2108358 | Work plan for Rel-17 FeMIMO RRM | Samsung |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108356 | Response LS on L1/L2 centric inter-cell mobility … | Samsung | Agreeable |  |
| R4-2108357 | Response LS on timing assumption for inter-cell DL measurement… | Samsung | Return to |  |
| R4-2108358 | WF on work plan for REl-17 FeMIMO RRM | Samsung | Agreeable |  |

================================================================================

#### 9.18.2 General and work plan for RRM core requirements

**R4-2108356 Reply LS on L1/L2 centric inter-cell mobility**

*Type: LS Out For: Approval  
To: RAN1, RAN2   
Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108357 Reply LS on timing assumption for inter-cell DL measurement**

*Type: LS Out For: Approval  
To: RAN1 CC: RAN2   
Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108043 (from R4-2108357).**

**R4-2108043 Reply LS on timing assumption for inter-cell DL measurement**

*Type: LS Out For: Approval  
To: RAN1 CC: RAN2   
Source: Samsung*

**Abstract:**

**Discussion:**

QC: original version was ok. For new version we suggest to add the case of “For the case when the measurement RS from the non-serving cell is outside SMTC in FR1”

vivo: The issue raised by QC was discussed in the 2nd round. It can be covered by the “other cases” bullet

Samsung: agree with vivo. From moderator perspective QC’s proposal was not agreeable.

Nokia/MTK: Same view as vivo

QC: Original version was general enough.

**Decision: Revised to R4-2108044 (from R4-2108043).**

**R4-2108044 Reply LS on timing assumption for inter-cell DL measurement**

*Type: LS Out For: Approval  
To: RAN1 CC: RAN2   
Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108358 Work plan for Rel-17 FeMIMO RRM**

*Type: other For: Approval  
 Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108771 on Timing Assumption for Inter-Cell DL Measurement**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109360 Discussion on reply LS on TCI State Update for L1/L2-Centric Inter-Cell Mobility and DL timing**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2109361 Discussion on LS reply on Timing Assumption for Inter-Cell DL Measurement**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2109508 Discussion on L1/L2-Centric Inter-Cell Mobility**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2109636 Discussion on L1/L2-centric inter-cell mobility and inter-cell mTRP for R17 feMIMO**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2109733 Views on the scope and potential RRM impacts of feMIMO WI**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Views on feMIMO scope, impacts

**Decision: Noted.**

**R4-2109837 Impact to RRM requirements for further enhancements on MIMO**

*Type: discussion For: Approval  
 Source: Samsung*

**Abstract:**

Initial analysis on impac to RRM requirements and work plan

**Decision: Noted.**

**R4-2110017 Discussion on Rel-17 FeMIMO LS replies**

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

**Decision: Noted.**

**R4-2110018 Work plan on Rel-17 FeMIMO RRM and LS discussion**

*Type: Work Plan For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2110037 Discussion on RAN1 LS for L1/L2 inter-cell mobility**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2110067 Discussion on LS for FeMIMO inter cell mobility**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110305 Discussion on RRM impacts for R17 NR FeMIMO**

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

**Decision: Noted.**

**R4-2110383 [Draft] Reply LS to RAN1 on TCI State Update for L1/L2-Centric Inter-Cell Mobility**

*Type: LS out For: Approval  
 to RAN1, cc RAN2,RAN3  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2110974 On L1/L2 centric mobility**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Further discussions related to the LS received by RAN4 previous meeting.

**Decision: Noted.**

**R4-2111268 Discussion on R17 feMIMO RRM impacts including TCI State Update for L1/L2-Centric Inter-Cell Mobility**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2111269 Reply LS on Timing Assumption for Inter-Cell DL Measurement**

*Type: LS out For: Approval  
 to RAN1  
 Source: vivo*

**Decision: Noted.**

**R4-2109734 Discussion on incoming RAN1 LS for Timing Assumption for Inter-Cell DL Measurement**

*Type: discussion For: Discussion  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Recommended answers to RAN1 LSin

Session chair: moved from AI 13.1.

**Decision: Noted.**

**R4-2110069 Reply LS on timing assumption for inter-cell DL measurement**

*Type: discussion For: Discussion  
 Source: OPPO*

Session chair: moved from AI 13.1.

**Decision: Noted.**

### 9.19 Support of reduced capability NR devices

#### 9.19.2 General and work plan for RRM core requirements

================================================================================

**Email discussion: [99-e][236] NR\_redcap\_RRM**

**R4-2108160 Email discussion summary: [99-e][236] NR\_redcap\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108408 (from R4-2108160).**

**R4-2108408 Email discussion summary: [99-e][236] NR\_redcap\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108359 | WF on RedCap RRM requirements | Ericsson | WF to capture the agreements/issues from the discussions. |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2111247 | WI RRM work plan for RedCap | Ericsson | Agreeable |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108359 | WF on RedCap RRM requirements | Ericsson | Agreeable |  |

================================================================================

**R4-2111247 WI RRM work plan for RedCap**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This document presents a work plan for the RAN4 RRM parts of the Rel-17 work item (WI) on support of reduced capability (“RedCap”) NR devices taking into account the overall RAN meeting plan and time unit (TU) allocations.

**Decision: Approved.**

**R4-2108359 WF on RedCap RRM requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2109221 General aspects of RRM requirements for RedCap UE**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2109311 Impact of RedCap on RRM requirements**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2109485 Discussion on RRM impacts for reduced capability NR devices**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2109618 Initial discussion on RRM impacts for Redcap**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2110274 On the scope of work on RRM core requirements for RedCap**

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

**Abstract:**

Discussion on RRM core requirements for NR\_redcap

**Decision: Noted.**

**R4-2110385 Discussion on RRM impact of reduced capability NR devices**

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

**Decision: Noted.**

**R4-2110809 Discussion on RRM core requirements impact for RedCap**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Withdrawn.**

**R4-2110812 Discussion on RRM core requirements impact for RedCap**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Withdrawn.**

**R4-2110845 Discussion on RRM core requirements impact for RedCap**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2111231 Overview of RRM requirements for RedCap**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this contribution we go through the objectives, discuss and identify the type of RRM requirements that RAN4 need to develop for the release 17 RedCap UEs.

**Decision: Noted.**

**R4-2111232 WI RRM work plan for RedCap**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This document presents a work plan for the RAN4 RRM parts of the Rel-17 work item (WI) on support of reduced capability (“RedCap”) NR devices taking into account the overall RAN meeting plan and time unit (TU) allocations.

**Decision: Withdrawn.**

**R4-2111246 Overview of RRM requirements for RedCap**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this contribution we go through the objectives, discuss and identify the type of RRM requirements that RAN4 need to develop for the release 17 RedCap UEs.

**Decision: Noted.**

**R4-2111518 RRM requirements for RedCap UE**

*Type: Work Plan For: Approval  
 Source: Qualcomm Incorporated*

**Abstract:**

In this paper we discuss the RRM impact and work plan for the core part

**Decision: Noted.**

### 9.20 Positioning enhancements for NR

#### 9.20.1 General and work plan for RRM core requirements

================================================================================

**Email discussion: [99-e][237] NR\_pos\_enh\_RRM**

**R4-2108161 Email discussion summary: [99-e][237] NR\_pos\_enh\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108409 (from R4-2108161).**

**R4-2108409 Email discussion summary: [99-e][237] NR\_pos\_enh\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (TBA)

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108360 | WF on Rel-17 positioning enhancements | Ericsson | WF document to capture agreements from thread |
| R4-2108361 | Reply LS on gNB/UE Rx/Tx timing error mitigation | CATT | To: RAN\_1; In regard to LS in R4-2107610. Only applicable if issue 2-1-1 is resolved and sending reply LS is agreed. |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| [R4-2110232](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110232.zip) | Work plan for RRM core requirements | Ericsson | Revised | Add revision to allow proposed changes by companies addressed in Topic #3 |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108360 | WF on Rel-17 positioning enhancements | Ericsson | Agreeable |  |
| R4-2108361 | Reply LS on gNB/UE Rx/Tx timing error mitigation | CATT | Postponed |  |
| R4-2108362 | Work plan for RRM core requirements | Ericsson | Agreeable | Revision of R4-2110232 |

================================================================================

**R4-2108360 WF on Rel-17 positioning enhancements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108361 Reply LS on gNB/UE Rx/Tx timing error mitigation**

*Type: LS Out For: Approval  
To: RAN1  
Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**R4-2110232 Work plan for RRM core requirements**

*Type: Work Plan For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present a RAN4 work plan for WI NR\_pos\_enh-Core.

**Decision: Revised to R4-2108362 (from R4-2110232).**

**R4-2108362 Work plan for RRM core requirements**

*Type: Work Plan For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present a RAN4 work plan for WI NR\_pos\_enh-Core.

**Decision: Approved.**

**R4-2109101 Discussion on UE/TRP Rx-Tx timing error**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109102 Reply LS on UE/TRP Rx-Tx timing error**

*Type: LS out For: Approval  
 to RAN1  
 Source: CATT*

**Decision: Noted.**

**R4-2109103 Discussion on RRM core requirements of R17 positioning enhancement**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2109172 Discussion on LS on UE/TRP Tx/Rx Timing Errors**

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

**Abstract:**

Discussion about LS reply on UE/TRP Tx/Rx Timing Errors

**Decision: Noted.**

**R4-2109224 General RRM aspects for Rel-17 positioning enhancement**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2109945 RRM impacts overview for positioning enhancement**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2110016 Work plan on Rel-17 NR Positioning Enhancements and LS discussion**

*Type: Work Plan For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2110231 General issues regarding RRM core requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this paper, we present our view on the issues regarding Rel-17 positioning

**Decision: Noted.**

**R4-2110233 Reply LS on on UE/TRP Tx/Rx Timing Errors**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we review RAN1 agreements on TEGs for UE/TRP Tx/Rx Timing Error mitigation

**Decision: Noted.**

**R4-2110917 Initial discussion on Rel-17 positioning RRM**

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

**Decision: Noted.**

### 9.21 Multi-Radio Dual-Connectivity enhancements

#### 9.21.1 General and work plan for RRM core requirements

================================================================================

**Email discussion: [99-e][238] LTE\_NR\_DC\_enh2\_RRM**

**R4-2108162 Email discussion summary: [99-e][238] LTE\_NR\_DC\_enh2\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108410 (from R4-2108162).**

**R4-2108410 Email discussion summary: [99-e][238] LTE\_NR\_DC\_enh2\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
|  | WF on R17 Multi-RAT Dual-Connectivity enhancements | Huawei, HiSilicon |  |
|  | Reply LS on temporary RS for efficient SCell activation in NR CA | Huawei, HiSilicon | To: RAN\_1 |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108363 | WF on R17 Multi-RAT Dual-Connectivity enhancements | Huawei, HiSilicon | Agreeable |  |
| R4-2108364 | Reply LS on temporary RS for efficient SCell activation in NR CA | Huawei, HiSilicon | Agreeable |  |

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**R4-2108363 WF on R17 Multi-RAT Dual-Connectivity enhancements**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108364 Reply LS on temporary RS for efficient SCell activation in NR CA**

*Type: LS Out For: Approval  
To: RAN1, RAN2  
Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108769 On temporary RS for efficient SCell activation**

*Type: LS out For: Approval  
 to RAN1  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2109222 Discussion on MR-DC enhancement in RRM**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2109318 Remaining issues on temporary RS for efficient SCell activation**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2110068 Discussion on LS for efficient SCell activation in LTE\_NR\_DC\_enh2**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2110380 Discussion on R17 Multi-RAT Dual-Connectivity enhancements**

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

**Decision: Noted.**

**R4-2110381 Draft LS on RS for efficient SCell activation in NR CA**

*Type: LS out For: Approval  
 to RAN1, RAN2  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2110973 On RRM requirements for MR-DC enhancements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on RRM requirements for MR-DC enhancements.

**Decision: Noted.**

**R4-2111283 Discussion on LTE\_NR\_DC\_enh2-Core**

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

Session chair: moved from AI 9.21. Please submit tdocs to the low-level AI.

**Decision: Noted.**

**R4-2108973 Discussion on temporary RS for efficient SCell activation in NR CA**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

Session chair: moved from AI 13.1.

**Decision: Noted.**

**R4-2109612 Further considerations on temporary RS for efficient SCell activation in NR CA**

*Type: discussion For: Discussion  
 Source: vivo*

Session chair: moved from AI 13.1.

**Decision: Noted.**

**R4-2109887 Discussion on temporary RS**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

Session chair: moved from AI 13.1.

**Decision: Noted.**

### 9.22 Enhanced IIoT and URLLC support

#### 9.22.1 General and work plan for RRM core requirements

================================================================================

**Email discussion: [99-e][239] NR\_IIOT\_URLLC\_enh\_RRM**

**R4-2108163 Email discussion summary: [99-e][239] NR\_IIOT\_URLLC\_enh\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108411 (from R4-2108163).**

**R4-2108411 Email discussion summary: [99-e][239] NR\_IIOT\_URLLC\_enh\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

GTW session (May 26th)

* Issue 2-2: Define the conditions when is the signal is ‘detectable’ or ‘detected’ or ‘truly arrived’ at the UE.
  + Discussion
    - Session chair: The purpose is to clarify the definition and do not change anything on test procedure.
    - E///: Detectable or First path are ok
    - MTK: Need to align with test procedures. No need to change anything.
    - QC: We are not arguing for changing the requirement. The question is how RAN1 interprets it. They may use our information to derive the budget.
    - Intel: The main question is whether the wording is related to UE behavior or whether it is relevant to test procedure relevant part. We prefer to remove the word detectable. For Nokia proposal we prefer to remove “ideal” part. To QC – RAN1 should use our LS as reference.
    - R&S: We should include RAN5 to clarify how this is tested.
    - vivo: need to discuss how to handle NLOS fading channels. Need very clear definition of the first path.
    - E///: It is ok to get the feedback from RAN5. But RAN4 Core requirement is the key and we need to focus on it.
  + Tentative agreements
    - The downlink timing is defined as the time, when the first path in time of the corresponding downlink frame from the reference cell [arrives/is received] at the UE antenna

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108366 | Work plan for NR\_IIOT\_URLLC\_enh\_RRM | Nokia, Nokia Shanghai Bell | draft workplan for discussion during 2nd round. |
| R4-2108367 | LS on the definition of Reference point for Te requirements | Huawei, HiSilicon | Possible LS response to RAN1 based on RAN4 discussion agreements |
| R4-2108368 | WF on RRM for NR IIoT and URLLC | Nokia, Nokia Shanghai Bell | WF for collecting the status of the ongoing discussion |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2110927 (only change #5) | CR on Rel-15 SCell activation, SMTC determination and UL timing 38133 | Huawei, HiSilicon | Merged (only change #5) |  |
| R4-2111313 | Correction to reference point defintion for UE timing in TS 38.133 | Ericsson, Nokia, Intel | Revised |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108365 | Correction to reference point defintion for UE timing in TS 38.133 | Ericsson, Nokia, Intel | Revised |  |
| R4-2108366 | Work plan for NR\_IIOT\_URLLC\_enh\_RRM | Nokia, Nokia Shanghai Bell | Agreeable |  |
| R4-2108367 | LS on the definition of Reference point for Te requirements | Huawei, HiSilicon | Revised |  |
| R4-2108368 | WF on RRM for NR IIoT and URLLC | Nokia, Nokia Shanghai Bell | Revised |  |

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**R4-2108366 Work plan for NR\_IIOT\_URLLC\_enh\_RRM**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2108367 LS on the definition of Reference point for Te requirements**

*Type: LS Out For: Approval  
To: RAN1  
Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**R4-2108368 WF on RRM for NR IIoT and URLLC**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2109223 Discussion on IIoT and URLLC enhancement in RRM**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2109495 Discussion on reference point of UE transmit timing error**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2109895 Discussion for reply LS of UE transmit timing error**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

We discuss the further RAN4 response to RAN1 LS R4-2102245

**Decision: Noted.**

**R4-2110415 Propagation Delay Compensation Enhancements for Time Synchronization**

*Type: discussion For: Approval  
 Source: Ericsson*

**Abstract:**

Analysis of different propagation delay methods using delay budgets. In particular TA based and RTT based methods.

**Decision: Noted.**

**R4-2110915 Initial discussion on Rel-17 URLLC RRM**

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

**Decision: Noted.**

**R4-2110916 LS on the definition of Reference point for Te requirements**

*Type: LS out For: Approval  
 to RAN1  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2111153 Work Plan for Enhanced IIOT and URLLC support**

*Type: Work Plan For: Approval  
 Source: Nokia*

**Decision: Noted.**

**R4-2111316 LS response on UE transmit timing error**

*Type: LS out For: Approval  
 to RAN1  
 Source: Ericsson, Nokia, Intel*

**Abstract:**

This document further analyze the remaining issue of the reference point definition for UE timing error requirements. It is continuation of LS response to RAN1 in R4-2105850.

**Decision: Noted.**

**R4-2110850 Discussion on the reference point for the UE transmit timing error**

*Type: discussion For: Discussion  
 Source: MediaTek Inc.*

Session chair: moved from AI 9.22. Please submit tdocs to the low-level AI.

**Decision: Noted.**

## 11 Rel-17 Work Items for LTE

### 11.9 Additional enhancements for NB-IoT and LTE-MTC

#### 11.9.4 RRM requirements

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**Email discussion: [99-e][240] NB\_IOTenh4\_LTE\_eMTC6\_RRM**

**R4-2108164 Email discussion summary: [99-e][240] NB\_IOTenh4\_LTE\_eMTC6\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2108412 (from R4-2108164).**

**R4-2108412 Email discussion summary: [99-e][240] NB\_IOTenh4\_LTE\_eMTC6\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Noted.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2108369 | WF on RRM requirements of Rel-17 Additional enhancements for NB-IoT and LTE-MTC | Huawei, HiSilicon |  |

2nd round email discussion conclusions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tdoc number | Title | Source | Recommendation | Comments |
| R4-2108369 | WF on RRM requirements of Rel-17 Additional enhancements for NB-IoT and LTE-MTC | Huawei, HiSilicon | Agreeable |  |

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**R4-2108369 WF on RRM requirements of Rel-17 Additional enhancements for NB-IoT and LTE-MTC**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2110275 On the scope of work on RRM core requirements for Additional enhancements for NB-IoT and LTE-MTC**

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

**Abstract:**

Discussion on RRM core requirements for NB\_IOTenh4\_LTE\_eMTC6

**Decision: Noted.**

**R4-2110346 Discussion on neibour cell measurement in CONNECTED state for NB-IoT Rel-17**

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

**Decision: Noted.**

**R4-2111235 Discussions on RRM requirements for release 17 WI on eMTC and NB-IoT**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The work item on NR support of reduced capability NR devices has been approved. This work item contains objective that has RRM impact that are discussed in this contribution.

**Decision: Noted.**

**R4-2111250 Discussions on RRM requirements for release 17 WI on eMTC and NB-IoT**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

The work item on NR support of reduced capability NR devices has been approved. This work item contains objective that has RRM impact that are discussed in this contribution.

**Decision: Noted.**

**R4-21AAAAA Way forward on XXXX**

*Type: other For: Approval  
 Source: TBA*

**Abstract:**

**Discussion:**

**Decision: Return to.**