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

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for  
TSG RAN WG4  
meeting: #95e**

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### 4.8 BS EMC [NR\_newRAT-Core]

### 4.9 RRM core maintenance (38.133/36.133) [NR\_newRAT-Core]

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

**Email discussion: [95e][201] NR\_NewRAT\_RRM\_Core**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][201] NR\_NewRAT\_RRM\_Core | R15 NR | RRM Core maintenance | 4.9 (except 4.9.2) |

**R4-2008490 Email discussion summary for [95e][201] NR\_NewRAT\_RRM\_Core** *Type: other For: Information  
 Source: Moderator (Huawei, HiSilicon)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009013 (from R4-2008490).**

**R4-2009013 Email discussion summary for [95e][201] NR\_NewRAT\_RRM\_Core** *Type: other For: Information  
 Source: Moderator (Huawei, HiSilicon)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

**Topic #1: UE measurement capability**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2007710 | Revised |
| R4-2007709 | Return to. Cat A CR to R4-2007710. |
| R4-2007638 | Return to. |
| R4-2007639 | Return to. Cat A CR to R4-2007638 |
| R4-2007961 | Return to.  If the additional changes are accepted, then the status of CR will be marked as “Merged” |
| R4-2007962 | Withdrawn. Cat A CR to R4-2007961. |
| R4-2006880 | Agreed. |
| R4-2006881 | Agreed. |

**Topic #2: RRM measurement and measurement gap**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| [R4-2006185](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006185.zip) | Revised.  Capture Ericsson’ comment “CSSFoutside\_gap,i =1 if only one SCell is configured” |
| R4-2006186 | Return to. Cat A CR to [R4-2006185](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006185.zip). |
| [R4-2007757](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007757.zip) | Agreed. |
| R4-2007758 | Agreed. |
| [R4-2007805](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007805.zip) | Agreed. |
| R4-2007806 | Agreed. |
| R4-2006602 | Agreed. |
| R4-2006603 | Agreed. |
| [R4-2007807](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007807.zip) | Agreed. |
| R4-2007808 | Agreed. |
| [R4-2007809](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007809.zip) | Agreed. |
| R4-2007810 | Agreed. |
| R4-2006878 | Agreed. |
| R4-2006879 | Agreed. |

**Topic #3: Connected state mobility**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| [R4-2006002](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006002.zip) | Return to. |
| [R4-2006003](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006003.zip) | Return to. |
| R4-2006004 | Return to. Cat A CR to [R4-200600](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006002.zip)3. |
| [R4-2007981](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007981.zip) | Agreed. |
| R4-2007982 | Agreed. |
| [R4-2006007](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006007.zip) | Return to. |
| R4-2006008 | Return to. Cat A CR to [R4-2006007](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006007.zip). |

**Topic #4: Timing**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2007712 | Agreed. |
| R4-2007711 | Agreed. |

**Topic #5: Signalling characteristics**

2nd round: Continue discussion based on moderator recommendation. Capture conclusions in WF

|  |  |  |
| --- | --- | --- |
| R4-2008527 | WF on maintenance topics for NR RRM signalling characteristics | Apple |

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2007659 | Revised.  Capture the comments from Ericsson and Nokia. To agree CR, try to convince Apple. |
| R4-2007660 | Return to. Cat A CR to R4-2007659. |
| R4-2007661 | Merged into revised version of R4-2007783  Capture the comments from Qualcomm, Mediatek, Huawei, and Nokia. To agree CR, try to convince Apple. |
| R4-2007662 | Withdrawn. |
| R4-2007783 | Revised.  Try to capture the new changes in R4-2007661 and comments from Qualcomm. |
| R4-2007784 | Return to. Cat A CR to R4-2007783 |
| R4-2007812 | Return to  To capture the tentative agreement for sub-topic 5-1 if agreed. If no agreement for sub-topic 5-1 was reached, then this endorsed CR can be formally agreed. |
| R4-2007813 | Return to. Cat A CR to R4-2007812. |
| R4-2007280 | Merged into revised version of R4-2007783. |
| R4-2006847 | Revised.  Have further discussion and try to capture comment from Huawei if agreed. |
| R4-2006848 | Return to. Cat A CR to R4-2006847. |
| R4-2007706 | Postponed. |
| R4-2007705 | Withdrawn. |
| R4-2007963 | Return to.  This one is related to CR R4-2007263 from Nokia and CR R4-2007698 and R4-2007699 from Huawei under NR-U RRM agenda. So R4-2007963 is expected to discuss with those Tdocs. Ericsson should provide the responses to companies’ comments on how to treat the CRs. |
| R4-2007964 | Return to. Cat A CR to R4-2007963 |
| R4-2007663 | Revised. (CR cover sheet issue) Formal CR of R4-2005835 (endosed in RAN4 #94-ebis)  This document is missing in the first round discussion. We have to go directly to 2nd round to collect comments. |
| R4-2007664 | Return to. Cat A CR to R4-2007663. |
| R4-2006177 | Merged into the revised CR R4-2006209. |
| R4-2006178 | Withdrawn. |
| R4-2006209 | Revised.  Try to capture the comments from Qualcomm, Ericsson. To agree CR, need convince Huawei. |
| R4-2006210 | Return to. Cat A CR to R4-2006209. |
| R4-2006465 | Return to  More discussion on the additional change compared to the endorsed one. |
| R4-2006466 | Return to. Cat A CR to R4-2006465. |
| R4-2007780 | Agreed. |
| R4-2007781 | Agreed |
| R4-2006891 | Revised  Change on the cover page for the change reason. |
| R4-2006892 | Return to. Cat A CR to R4-2006891. |
| R4-2007751 | Agreed. |
| R4-2007752 | Agreed. Cat A CR to R4-2007751. |
| R4-2006190 | Revised  Pending on the discussion for issue 5-3 |
| R4-2006191 | Return to. Cat A CR to R4-2006190. |
| R4-2007708 | Agreed. |
| R4-2007707 | Agreed. Cat A CR to R4-2007707 |

**Topic #6: Beam management**

Issue 6-1: Semi-persistent or aperiodic SSB based L1-RSRP reporting on PUSCH in FR2

Agreement: Scheduling restriction should apply once the SSB is configured for L1-RSRP measurement, no matter the reporting type is periodic, semi-persistent or aperiodic.

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2006187 | Merged into [R4-2006852](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006852.zip). |
| R4-2006188 | Withdrawn. Cat A CR to [R4-2006187](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006187.zip). |
| R4-2006852 | Revised  Capture comments from Ericsson and Nokia. Response to Nokia question is needed. |
| R4-2006853 | Return to. Cat A CR to [R4-2006852](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006852.zip). |
| R4-2006850 | Merged into [R4-2007815](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007815.zip).  Capture the agreement |
| R4-2006851 | Withdrawn. Cat A CR to [R4-2006850](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006850.zip). |
| R4-2007815 | Return to |
| R4-2007816 | Return to. Cat A CR to [R4-2007815](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007815.zip). |
| R4-2006854 | Agreed. |
| R4-2006855 | Agreed. |
| R4-2007492 | Revised.  Add the CR number in cover page. |
| R4-2007493 | Return to. |

2nd round email discussion conclusions

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**Email discussion: [95e][233] NR\_RRM\_maintenance**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][233] NR\_RRM\_maintenance | Misc | TS 38.133 specification clean up before ITU submission (R4-2006217, R4-2006218)  Rel-15 NR RRM editorial CRs  Rel-16 NR RRM maintenance | 4.9.2  4.10.2  6.21.3 |

**R4-2008522 Email discussion summary for [95e][233] NR\_RRM\_maintenance** *Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009095 (from R4-2008522).**

**R4-2009095 Email discussion summary for [95e][233] NR\_RRM\_maintenance** *Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

GTW session (May 29th)

Session chair: check possible issues with TS 38.133 spec clean up (Topic #5)

Apple: most TBD and [] resolved. V2X has some issues and are under discussion in 209/210.

LGE: V2X core part does not have issues. Perf part has some [].

1st round email discussion conclusions

**Topic #1: Modification on number of cells and number of SSB to be measured for FR2 intra-frequency measurement**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2006880 | Agreed |
| R4-2006881 | Agreed |

**Topic #2: measurement gap applicability in TS38.133 for R16**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2006184 | Not pursued |

**Topic #3: On intra frequency measurements without gaps**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2007657 | Agreed |

**Topic #5: Editorial CR for TS38.133 (R15/16)**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2006030 | Revised |
| R4-2006064 | Agreed |
| R4-2006027 | Revised |
| R4-2006029 | Agreed |
| R4-2006218 | Revised |
| R4-2007715 | Agreed |
| R4-2006217 | Revised |

**Topic #6: On replied LS on NeedForGap capability**

Session chair: based on moderator recommendation please continue the discussion in the thread 224.

2nd round email discussion conclusions

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**R4-2008527 WF on maintenance topics for NR RRM signalling characteristics**

*Type: other For: Approval  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2006602 Correction of CFRA RSRP threshold**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0679 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

CR implementing endorsed draftCR R4-2003395.

Parameter for RSRP CFRA threshold was changed on clause 6.3.2 of 38.331 after version 15.1.0.

**Discussion:**

**Decision: Agreed.**

**R4-2006603 Correction of CFRA RSRP threshold**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0680 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Mirror CR implementing endorsed draftCR R4-2003395.

Parameter for RSRP CFRA threshold was changed on clause 6.3.2 of 38.331 after version 15.1.0.

**Discussion:**

**Decision: Agreed.**

#### 4.9.1 General [NR\_newRAT-Core]

#### 4.9.2 Editorial CRs [NR\_newRAT-Core]

Session chair: AI treated under email thread [95e][233] NR\_RRM\_maintenance

**R4-2006027 [CR] Editorial corrections for 38.133 R15 Core Part**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0594 Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Abstract:**

As instructed by the editor before, we prepared this CR but didn't submit since no editorial CRs were allowed for the previous meetings.

**Discussion:**

**Decision: Revised to R4-2008660 (from R4-2006027).**

**R4-2008660 [CR] Editorial corrections for 38.133 R15 Core Part**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0594 Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Abstract:**

As instructed by the editor before, we prepared this CR but didn't submit since no editorial CRs were allowed for the previous meetings.

**Discussion:**

**Decision: Return to.**

**R4-2006028 [CR] Editorial corrections for 38.133 R16 Core Part - Cat A**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0595 Cat: A (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

As instructed by the editor before, we prepared this CR but didn't submit since no editorial CRs were allowed for the previous meetings.

**Discussion:**

**Decision: Return to.**

**R4-2006029 [CR] Editorial corrections for 38.133 R16 Core Part - Cat F**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0596 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

As instructed by the editor before, we prepared this CR but didn't submit since no editorial CRs were allowed for the previous meetings. The errors corrected in this CR don't exist in R15 so this is a Cat F CR for R16 only.

**Discussion:**

**Decision: Agreed.**

**R4-2006218 Rapportuer CR for TS38.133**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0633 Cat: D (Rel-15)  
  
 Source: Apple*

**Discussion:**

**Decision: Revised to R4-2008661 (from R4-2006218).**

**R4-2008661 Rapportuer CR for TS38.133**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0633 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

**Decision: Return to.**

**R4-2009106 Rapportuer CR for TS38.133**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-TBA Cat: A (Rel-16)  
  
 Source: Apple*

**Discussion:**

**Decision: Return to.**

**R4-2006880 CR on TS38.133 for modification on number of cells and number of SSB to be measured for FR2 intra-frequency measurement**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0705 Cat: F (Rel-15)  
  
 Source: Mediatek Inc., Huawei, Hisilicon, Apple, Intel*

**Discussion:**

**Decision: Agreed.**

**R4-2006881 CR on TS38.133 for modification on number of cells and number of SSB to be measured for FR2 intra-frequency measurement**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0706 Cat: A (Rel-16)  
  
 Source: Mediatek Inc., Huawei, Hisilicon, Apple, Intel*

**Discussion:**

**Decision: Agreed.**

**R4-2007715 Editorial CR on TS 38.133 Rel-15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0782 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007714 Editorial CR on TS 38.133 Rel-16 (Cat A)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0781 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

#### 4.9.3 UE measurement capability (38.133/36.133) [NR\_newRAT-Core]

**R4-2006878 CR on TS38.133 for modification of the layer 3 and layer 1 measurement sharing factor when both SSB and RSSI symbol to be measured are considered**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0703 Cat: F (Rel-15)  
  
 Source: Mediatek Inc., Huawei, Hisilicon, Apple*

**Discussion:**

**Decision: Agreed.**

**R4-2006879 CR on TS38.133 for modification of the layer 3 and layer 1 measurement sharing factor when both SSB and RSSI symbol to be measured are considered**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0704 Cat: A (Rel-16)  
  
 Source: Mediatek Inc., Huawei, Hisilicon, Apple*

**Discussion:**

**Decision: Agreed.**

**R4-2007638 CR to 36.133 on NR reporting criteria**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6862 Cat: F (Rel-15)  
  
 Source: ZTE*

**Discussion:**

**Decision: Revised to R4-2009122 (from R4-2007638).**

**R4-2009122 CR to 36.133 on NR reporting criteria**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6862 Cat: F (Rel-15)  
  
 Source: ZTE*

**Discussion:**

**Decision: Return to.**

**R4-2007639 CR to 36.133 on NR reporting criteria**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6863 Cat: F (Rel-16)  
  
 Source: ZTE*

**Discussion:**

**Decision: Return to.**

**R4-2007710 CR on NR reporting criteria for EN-DC**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0778 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008525 (from R4-2007710).**

**R4-2008525 CR on NR reporting criteria for EN-DC**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0778 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007709 CR on NR reporting criteria for EN-DC (Cat A)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0777 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007713 Discussion on reporting criteria for EN-DC**

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

**Discussion:**

**Decision: Noted.**

**R4-2007805 CR on FR2 measurement requirements outside gaps R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0820 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon, MediaTek, Ericsson, Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Agreed.**

**R4-2007806 CR on FR2 measurement requirements outside gaps R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0821 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon, MediaTek, Ericsson, Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Agreed.**

**R4-2007807 CR to remove RSTD requirements for NE-DC in 36.133 R15**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6881 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

.

**Decision: Agreed.**

**R4-2007808 CR to remove RSTD requirements for NE-DC in 36.133 R16**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6882 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007809 CR on inter-RAT RSTD requirements for NE-DC in 38.133 R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0822 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007810 CR on inter-RAT RSTD requirements for NE-DC in 38.133 R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0823 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007961 NR reporting criteria**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6903 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

NR reporting criteria

**Discussion:**

**Decision: Return to.**

**R4-2007962 NR reporting criteria**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6904 Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

NR reporting criteria

**Discussion:**

**Decision: Withdrawn.**

#### 4.9.4 RRM measurement and measurement gap (38.133/36.133) [NR\_newRAT-Core]

**R4-2006185 CR on CSSF correction for R15 TS38.133**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0619 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008526 (from R4-2006185).**

**R4-2008526 CR on CSSF correction for R15 TS38.133**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0619 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

**Decision: Return to.**

**R4-2006186 CR on CSSF correction for R16 TS38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0620 Cat: A (Rel-16)  
  
 Source: Apple*

**Discussion:**

**Decision: Return to.**

**R4-2007757 Correction on gap pattern applicability in TS 36.133 R15**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6879 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007758 Correction on gap pattern applicability in TS 36.133 R16**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6880 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

.

**Decision: Agreed.**

#### 4.9.5 Connected state mobility (38.133/36.133) [NR\_newRAT-Core]

**R4-2006002 [CR] RRC release with redirection 38.133 R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0590 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

**Decision: Return to.**

**R4-2006003 [CR] RRC release with redirection 36.133 R15**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6825 Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Discussion:**

**Decision: Return to.**

**R4-2006004 [CR] RRC release with redirection 36.133 R16 Cat A**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6826 Cat: A (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

**Decision: Return to.**

**R4-2006005 Discussion on RRC procedure delay in RRC release with redirection**

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

**Discussion:**

**Decision: Noted.**

**R4-2006006 Discussion on RRC re-establishment requirement**

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

**Discussion:**

**Decision: Noted.**

**R4-2006007 CR on RRC re-establishment requirements R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0591 Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Abstract:**

We still believe that the statement “There is no requirement if the target cell does not contain the UE context” should be removed since it's confusing and actually doesn't serve any need.

**Discussion:**

**Decision: Return to.**

**R4-2006008 CR on RRC re-establishment requirements R16 (Cat A)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0592 Cat: A (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

**Decision: Return to.**

**R4-2007981 Correction to RRC release with redirection requirements in 36.133 Rel-15**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6905 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Correction to RRC release with redirection requirements to align T\_prach with core spec (38.133).

**Discussion:**

**Decision: Agreed.**

**R4-2007982 Correction to RRC release with redirection requirements in 36.133 Rel-16**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6906 Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Correction to RRC release with redirection requirements to align T\_prach with core spec (38.133).

**Discussion:**

**Decision: Agreed.**

#### 4.9.6 Timing (38.133/36.133) [NR\_newRAT-Core]

**R4-2007712 CR on UE transmit timing**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0780 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007711 CR on UE transmit timing (Cat A)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0779 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

#### 4.9.7 Signaling characteristics (38.133/36.133) [NR\_newRAT-Core]

**R4-2006174 Corrections to R15 MAC-CE based TCI state switching requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2006177 CR for correction to MAC-CE based TCI State switch timeline (Clause 8.10.3)**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0613 Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated, MediaTek*

**Abstract:**

This CR addresses a misalignment between RAN1 and RAN4 requirements in MAC-CE based TCI state switch

**Discussion:**

**Decision: Merged.**

**R4-2006178 CR for correction to MAC-CE based TCI State switch timeline (Clause 8.10.3)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0614 Cat: A (Rel-16)  
  
 Source: Qualcomm Incorporated, MediaTek*

**Abstract:**

This CR addresses a misalignment between RAN1 and RAN4 requirements in MAC-CE based TCI state switch

**Discussion:**

**Decision: Withdrawn.**

**R4-2006189 On issues of R15 BWP switching delay requirement**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Apple*

**Discussion:**

**Decision: Noted.**

**R4-2006190 CR on BWP switching delay requirement for R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0623 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008537 (from R4-2006190).**

**R4-2008537 CR on BWP switching delay requirement for R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0623 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

**Decision: Return to.**

**R4-2006191 CR on BWP switching delay requirement for R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0624 Cat: A (Rel-16)  
  
 Source: Apple*

**Discussion:**

**Decision: Return to.**

**R4-2006209 CR on Active TCI State Switching requirements - Rel15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0628 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

**Decision: Revised to R4-2008531 (from R4-2006209).**

**R4-2008531 CR on Active TCI State Switching requirements - Rel15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0628 Cat: F (Rel-15)  
  
 Source: Apple, Qualcomm*

**Discussion:**

**Decision: Return to.**

**R4-2006210 CR on Active TCI State Switching requirements - Rel16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0629 Cat: A (Rel-16)  
  
 Source: Apple, Qualcomm*

**Discussion:**

**Decision: Return to.**

**R4-2006465 CR on TCI state switch**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0662 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Revised to R4-2008535 (from R4-2006465).**

**R4-2008535 CR on TCI state switch**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0662 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Return to.**

**R4-2006466 CR on TCI state switch**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0663 Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Revised to R4-2008536 (from R4-2006466).**

**R4-2008536 CR on TCI state switch**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0663 Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Return to.**

**R4-2006847 CR for SCell activation delay in FR2**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0691 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Revised to R4-2008530 (from R4-2006847).**

**R4-2008530 CR for SCell activation delay in FR2**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0691 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Return to.**

**R4-2006848 CR for SCell activation delay in FR2**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0692 Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Return to.**

**R4-2006891 [CR] TCI state switch delay 38.133 R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0707 Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Discussion:**

**Decision: Revised to R4-2008532 (from R4-2006891).**

**R4-2008532 [CR] TCI state switch delay 38.133 R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0707 Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Discussion:**

**Decision: Return to.**

**R4-2006892 [CR] TCI state switch delay 38.133 R16 Cat A**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0708 Cat: A (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

**Decision: Return to.**

**R4-2007280 CR to T parameters in 8.3.2 of 38.133**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0721 Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Merged.**

**R4-2007659 CR on LTE SCell activation and deactivation delay**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6864 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008528 (from R4-2007659).**

**R4-2008528 CR on LTE SCell activation and deactivation delay**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6864 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007660 CR on LTE SCell activation and deactivation delay\_r16**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6865 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007661 CR on SCell activation and deactivation delay**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0745 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Merged.**

**R4-2007662 CR on SCell activation and deactivation delay\_r16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0746 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Withdrawn.**

**R4-2007663 CR on Psharingfactor**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0747 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008541 (from R4-2007663).**

**R4-2008541 CR on Psharingfactor**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0747 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007664 CR on Psharingfactor\_r16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0748 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007706 CR on CSI-RS based RLM requirement**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0774 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Postponed.**

**R4-2007705 CR on CSI-RS based RLM requirement (Cat A)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0773 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Withdrawn.**

**R4-2007707 CR on interruption due to Acitve BWP switch (Cat A)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0775 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007708 CR on interruption due to Acitve BWP switch**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0776 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007751 Correction onTCI state switching R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0798 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007752 Correction onTCI state switching R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0799 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007780 CR 38.133 (8.10.5) Corrections to RRC-based TCI state change**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0812 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Corresponding draft CR endorsed at RAN4#94-e-Bis (R4-2004417).

**Discussion:**

**Decision: Agreed.**

**R4-2007781 CR 38.133 (8.10.5) Corrections to RRC-based TCI state change**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0813 Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Mirror. Corresponding draft CR endorsed at RAN4#94-e-Bis (R4-2004417).

**Discussion:**

.

**Decision: Agreed.**

**R4-2007783 CR 38.133 (8.3.2) Corrections to SCell Activation delay requirements**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0815 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Revision of endorsed draft CR from RAN4#94-e-Bis (R4-2005426). The revised version takes into account the agreement made during the GTW meeting.

**Discussion:**

**Decision: Revised to R4-2008529 (from R4-2007783).**

**R4-2008529 CR 38.133 (8.3.2) Corrections to SCell Activation delay requirements**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0815 Cat: F (Rel-15)  
  
 Source: Ericsson, MediaTek*

**Abstract:**

Revision of endorsed draft CR from RAN4#94-e-Bis (R4-2005426). The revised version takes into account the agreement made during the GTW meeting.

**Discussion:**

**Decision: Return to.**

**R4-2007784 CR 38.133 (8.3.2) Corrections to SCell Activation delay requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0816 Cat: A (Rel-16)  
  
 Source: Ericsson, MediaTek*

**Abstract:**

Mirror. Revision of endorsed draft CR from RAN4#94-e-Bis (R4-2005426). The revised version takes into account the agreement made during the GTW meeting.

**Discussion:**

**Decision: Return to.**

**R4-2007811 Discussion on SCell activation requirements**

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

**Discussion:**

**Decision: Noted.**

**R4-2007812 CR on SCell activation requirements R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0824 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Revised to R4-2009125 (from R4-2007812).**

**R4-2009125 CR on SCell activation requirements R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0824 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007813 CR on SCell activation requirements R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0825 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007963 Clarification on RLM**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0866 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Clarification on RLM

**Discussion:**

**Decision: Return to.**

**R4-2007964 Clarification on RLM**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0867 Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Clarification on RLM

**Discussion:**

**Decision: Return to.**

#### 4.9.8 Beam management based on SSB and/or CSI-RS (38.133) [NR\_newRAT-Core]

**R4-2006187 CR on SMTC2 configuration in SSB based CBD for R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0621 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

**Decision: Merged.**

**R4-2006188 CR on SMTC2 configuration in SSB based CBD for R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0622 Cat: A (Rel-16)  
  
 Source: Apple*

**Discussion:**

**Decision: Withdrawn.**

**R4-2006849 Semi-persistent or aperiodic SSB based L1-RSRP reporting on PUSCH in FR2**

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

**Discussion:**

**Decision: Noted.**

**R4-2006850 CR for Semi-persistent or aperiodic SSB based L1-RSRP reporting on PUSCH in FR2**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0693 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Merged.**

**R4-2006851 CR for Semi-persistent or aperiodic SSB based L1-RSRP reporting on PUSCH in FR2**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0694 Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Withdrawn.**

**R4-2006852 CR on SMTC period for beam management requirements**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0695 Cat: F (Rel-15)  
  
 Source: MediaTek inc., Huawei, HiSilicon*

**Discussion:**

**Decision: Revised to R4-2008533 (from R4-2006852).**

**R4-2008533 CR on SMTC period for beam management requirements**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0695 Cat: F (Rel-15)  
  
 Source: MediaTek inc., Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2006853 CR on SMTC period for beam management requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0696 Cat: A (Rel-16)  
  
 Source: MediaTek inc., Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2006854 CR for CSI-RS based L1-RSRP measurement period**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0697 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Agreed.**

**R4-2006855 CR for CSI-RS based L1-RSRP measurement period**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0698 Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Agreed.**

**R4-2007492 Applicability of QCL**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0737 Cat: F (Rel-15)  
  
 Source: Qualcomm*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008534 (from R4-2007492).**

**R4-2008534 Applicability of QCL**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0737 Cat: F (Rel-15)  
  
 Source: Qualcomm*

**Discussion:**

**Decision: Return to.**

**R4-2007493 Applicability of QCL**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0738 Cat: F (Rel-16)  
  
 Source: Qualcomm*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2009105 (from R4-2007493).**

**R4-2009105 Applicability of QCL**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0738 Cat: F (Rel-16)  
  
 Source: Qualcomm*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Return to.**

**R4-2007814 Discussion on SSB based L1-RSRP measurement**

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

**Discussion:**

**Decision: Noted.**

**R4-2007815 CR on SSB based L1-RSRP measurement R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0826 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007816 CR on SSB based L1-RSRP measurement R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0827 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

#### 4.9.9 Other requirements [NR\_newRAT-Core]

### 4.10 RRM perf maintenance (38.133/36.133) [NR\_newRAT-Perf]

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**Email discussion: [95e][202] NR\_NewRAT\_RRM\_Perf**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][202] NR\_NewRAT\_RRM\_Core | R15 NR | RRM Per. maintenance | 4.10 (except 4.10.2) |

**R4-2008491 Email discussion summary for [95e][202] NR\_NewRAT\_RRM\_Perf** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009014 (from R4-2008491).**

**R4-2009014 Email discussion summary for [95e][202] NR\_NewRAT\_RRM\_Perf** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

**Topic #1: UE measurement capability**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2006467 (cat F) | Agreed |
| R4-2006468 (cat A) | Agreed |
| R4-2007665 (cat F) | Revised (CR cover sheet issue) |
| R4-2007666 (cat A) | Return to (CR cover sheet issue) |

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2007753 (cat F) | Agreed |
| R4-2007754 (cat A) | Agreed |

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2007667 (cat F) | Revised (CR cover sheet issue) |
| R4-2007668 (cat A) | Return to |
| R4-2006071 | Revised |
| R4-2006072 | Return to |
| R4-2006073 | Return to |
| R4-2006074 | Return to |
| R4-2006075 (cat F) | Agreed |
| R4-2006076 (cat A) | Agreed |
| R4-2006077 (cat F) | Agreed |
| R4-2006078 (cat A) | Agreed |
| R4-2006079 | Return to |
| R4-2006080 | Return to |
| R4-2006179 | Merged (R4-2007430, which covers these changes, is agreed) |
| R4-2006180 | Withdrawn |
| R4-2006387 (cat F) | Agreed |
| R4-2006388 (cat A) | Agreed |
| R4-2006389 (cat F) | Agreed |
| R4-2006391 (cat A) | Agreed |
| R4-2006436 (cat F) | Agreed |
| R4-2006437 (cat A) | Agreed |
| R4-2006438 (cat F) | Agreed |
| R4-2006439 (cat A) | Agreed |
| R4-2006441 (cat F) | Agreed |
| R4-2006442 (cat A) | Agreed |
| R4-2006443 (cat F) | Agreed |
| R4-2006444 (cat A) | Agreed |
| R4-2006856 (cat F) | Agreed |
| R4-2006857 (cat A) | Agreed |
| R4-2006988 (cat F) | Agreed |
| R4-2006989 (cat A) | Agreed |
| R4-2007391 (cat F) | Agreed |
| R4-2007392 (cat A) | Agreed |
| R4-2007428 | Return to |
| R4-2007430 (cat F) | Agreed |
| R4-2007431 (cat A) | Agreed |
| R4-2007432 (cat F) | Agreed |
| R4-2007433 (cat A) | Agreed |
| R4-2007434 (Cat F) | Return to.  Session chair: Agreeable but need to wait for MCC feedback on proper Rel-16 handling. |
| R4-2007435 (Cat A) | Return to.  Session chair: Agreeable but need to wait for MCC feedback on proper Rel-16 handling. |
| R4-2007669 (cat F) | Revised (CR cover sheet issue) |
| R4-2007670 (cat A) | Return to (CR cover sheet issue) |
| R4-2007671 (cat F) | Revised (CR cover sheet issue) |
| R4-2007672 (cat A) | Return to (CR cover sheet issue) |
| R4-2007673 (cat F) | Revised (CR cover sheet issue) |
| R4-2007674 (cat A) | Return to (CR cover sheet issue) |
| R4-2007675 (cat F) | Revised (CR cover sheet issue) |
| R4-2007676 (cat A) | Return to (CR cover sheet issue) |
| R4-2007677 (cat F) | Revised (CR cover sheet issue) |
| R4-2007678 (cat F) | Return to (CR cover sheet issue) |
| R4-2007679 (cat F) | Revised (CR cover sheet issue) |
| R4-2007717 (cat F) | Agreed |
| R4-2007716 (cat A) | Agreed |
| R4-2007719 (cat F) | Agreed |
| R4-2007718 (cat A) | Agreed |
| R4-2007721 (cat F) | Agreed |
| R4-2007720 (cat A) | Agreed |
| R4-2007723 (cat F) | Agreed |
| R4-2007722 (cat A) | Agreed |
| R4-2007817 (cat F) | Agreed |
| R4-2007818 (cat A) | Agreed |
| R4-2007819 (cat F) | Agreed |
| R4-2007820 (cat A) | Agreed |
| R4-2007821 (cat F) | Agreed |
| R4-2007822 (cat A) | Agreed |
| R4-2007823 (cat F) | Agreed |
| R4-2007824 (cat A) | Agreed |

Rough/fine beam assumption in RRM test cases

2nd round: Continue discussion based on moderator recommendation. Capture conclusions in WF

|  |  |  |
| --- | --- | --- |
| R4-2008538 | WF on rough/fine beam assumption | Anritsu |

2nd round email discussion conclusions

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**R4-2008538 WF on rough/fine beam assumption**

*Type: other For: Approval  
 Source: Anritsu*

**Abstract:**

**Discussion:**

**Decision: Return to.**

#### 4.10.1 General [NR\_newRAT-Perf]

**R4-2006467 CR on PDSCH RMC**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0664 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Agreed.**

**R4-2006468 CR on PDSCH RMC**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0665 Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Agreed.**

**R4-2007665 CR on E-UTRAN Serving Cell Parameters**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0749 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008542 (from R4-2007665).**

**R4-2008542 CR on E-UTRAN Serving Cell Parameters**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0749 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007666 CR on E-UTRAN Serving Cell Parameters\_r16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0750 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007667 CR on Modified parameters for BFD TCs with 4Rx antenna**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0751 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008543 (from R4-2007667).**

**R4-2008543 CR on Modified parameters for BFD TCs with 4Rx antenna**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0751 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007668 CR on Modified parameters for BFD TCs with 4Rx antenna\_r16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0752 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007753 Accuracy of carrier aggregation in NR R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0800 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007754 Accuracy of carrier aggregation in NR R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0801 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

#### 4.10.2 Editorial CRs [NR\_newRAT-Perf]

Session chair: AI treated under email thread [95e][233] NR\_RRM\_maintenance

**R4-2006030 [CR] Editorial corrections for 38.133 R15 Perf Part**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0597 Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Abstract:**

As instructed by the editor before, we prepared this CR but didn't submit since no editorial CRs were allowed for the previous meetings.

**Discussion:**

**Decision: Revised to R4-2008659 (from R4-2006030).**

**R4-2008659 [CR] Editorial corrections for 38.133 R15 Perf Part**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0597 Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Abstract:**

As instructed by the editor before, we prepared this CR but didn't submit since no editorial CRs were allowed for the previous meetings.

**Discussion:**

**Decision: Return to.**

**R4-2006031 [CR] Editorial corrections for 38.133 R16 Perf Part - Cat A**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0598 Cat: A (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

As instructed by the editor before, we prepared this CR but didn't submit since no editorial CRs were allowed for the previous meetings.

**Discussion:**

**Decision: Return to.**

**R4-2006064 [CR] Editorial corrections for 38.133 R16 Perf Part - Cat F**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0600 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

As instructed by the editor before, we prepared this CR but didn't submit since no editorial CRs were allowed for the previous meetings. The errors corrected in this CR don't exist in R15 so this is a Cat F CR for R16 only.

**Discussion:**

**Decision: Agreed.**

#### 4.10.3 RRM test cases [NR\_newRAT-Perf]

**R4-2006071 CR to Intra-frequency handover from FR1 to FR1**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0601 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

Deleted Event A3 related parameters of measurement object and report configuration in Table A.6.3.1.2.2-2

Deleted PRACH configuration index from Table A.6.3.1.1.2-2 and Table A.6.3.1.2.2-2.

**Discussion:**

**Decision: Revised to R4-2008539 (from R4-2006071).**

**R4-2008539 CR to Intra-frequency handover from FR1 to FR1**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0601 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

Deleted Event A3 related parameters of measurement object and report configuration in Table A.6.3.1.2.2-2

Deleted PRACH configuration index from Table A.6.3.1.1.2-2 and Table A.6.3.1.2.2-2.

**Discussion:**

**Decision: Return to.**

**R4-2006072 CR to Intra-frequency handover from FR1 to FR1**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0602 Cat: A (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

Deleted Event A3 related parameters of measurement object and report configuration in Table A.6.3.1.2.2-2

Deleted PRACH configuration index from Table A.6.3.1.1.2-2 and Table A.6.3.1.2.2-2.

**Discussion:**

**Decision: Return to.**

**R4-2006073 CR to SA event triggered reporting tests with per-UE gaps**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0603 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

For A.6.6.1.3/4/6 updated CSI-RS tables to match SSB parameters

**Discussion:**

**Decision: Return to.**

**R4-2006074 CR to SA event triggered reporting tests with per-UE gaps**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0604 Cat: A (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

For A.6.6.1.3/4/6 updated CSI-RS tables to match SSB parameters

**Discussion:**

**Decision: Return to.**

**R4-2006075 CR to A.6.1.2.1 Cell reselection to higher priority E-UTRAN**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0605 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

For A.6.1.2.1, A.6.1.2.2, update E-UTRAN PRACH configuration index is depending on duplex mode

**Discussion:**

**Decision: Agreed.**

**R4-2006076 CR to A.6.1.2.1 Cell reselection to higher priority E-UTRAN**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0606 Cat: A (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

For A.6.1.2.1, A.6.1.2.2, update E-UTRAN PRACH configuration index is depending on duplex mode

**Discussion:**

**Decision: Agreed.**

**R4-2006077 Correction to General test parameters in A.6.6.1.2**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0607 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

For A.6.6.1.2, Time offsets between serving and neighbour cells are corrected

**Discussion:**

**Decision: Agreed.**

**R4-2006078 Correction to General test parameters in A.6.6.1.2**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0608 Cat: A (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

For A.6.6.1.2, Time offsets between serving and neighbour cells are corrected

**Discussion:**

**Decision: Agreed.**

**R4-2006079 CR to E-UTRAN – NR PSCell FR2 DL active BWP switch with non-DRX in synchronous ENDC**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0609 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

For A.5.5.6.2, clarify how the BWP are switched in the section of “Test Purpose and Environment”

**Discussion:**

**Decision: Return to.**

**R4-2006080 CR to E-UTRAN – NR PSCell FR2 DL active BWP switch with non-DRX in synchronous ENDC**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0610 Cat: A (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

For A.5.5.6.2, clarify how the BWP are switched in the section of “Test Purpose and Environment”

**Discussion:**

**Decision: Return to.**

**R4-2006081 CR to SA NR- E-UTRAN event-triggered reporting in FR1**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0611 Cat: F (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

Replaces the missed upload of CR R4-1914427. Same content as the agreed Rel-15 CR R4-1914426.

**Discussion:**

**Decision: Withdrawn.**

**R4-2006179 Corrections to Inter-freq SMTC configurations in A.4.7.1.2 and A.4.7.2.2**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0615 Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

Correction on SMTC and timing offset configuration in A.4.7.1.2 and A.4.7.2.2

**Discussion:**

**Decision: Merged.**

**R4-2006180 Corrections to Inter-freq SMTC configurations in A.4.7.1.2 and A.4.7.2.2**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0616 Cat: A (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

Correction on SMTC and timing offset configuration in A.4.7.1.2 and A.4.7.2.2

**Discussion:**

**Decision: Withdrawn.**

**R4-2006387 Add UE Beam assumption for RRM Test cases in A.7.3, A.7.4, A.7.7**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0650 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

Add the assumption about the type of beam used by the UE for RRM test cases in A.7.3, A.7.4 and A.7.7.

All the “FFS” beam assumptions in the previous   
R4-2005285 endorsed at RAN4#94-e-bis have been replaced with “Rough”, based on the information in R4-1904

**Discussion:**

**Decision: Agreed.**

**R4-2006388 Add UE Beam assumption for RRM Test cases in A.7.3, A.7.4, A.7.7**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0651 Cat: A (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

Add the assumption about the type of beam used by the UE for RRM test cases in A.7.3, A.7.4 and A.7.7.

All the “FFS” beam assumptions in the previous R4-2005285 endorsed at RAN4#94-e-bis have been replaced with “Rough”, based on the information in R4-1904

**Discussion:**

**Decision: Agreed.**

**R4-2006389 Add UE Beam assumption for RRM Test cases in A.5.3, A.5.4, A.5.7**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0652 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

Add the assumption about the type of beam used by the UE for RRM test cases in A.5.3, A.5.4 and A.5.7.

**Discussion:**

**Decision: Agreed.**

**R4-2006391 Add UE Beam assumption for RRM Test cases in A.5.3, A.5.4, A.5.7**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0653 Cat: A (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

Add the assumption about the type of beam used by the UE for RRM test cases in A.5.3, A.5.4 and A.5.7.

**Discussion:**

**Decision: Agreed.**

**R4-2006436 Update of FR2 RLM Test cases with 2 Angles of Arrival**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0654 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

a) Add a diagram to each test case showing how the downlink transmissions are time multiplexed

b) Update the Test Purpose and Environment

c) Align the OTA related cell specific test parameter tables in SA test cases to NSA

d) Update CSI-RS Reference Measu

**Discussion:**

**Decision: Agreed.**

**R4-2006437 Update of FR2 RLM Test cases with 2 Angles of Arrival**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0655 Cat: A (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

a) Add a diagram to each test case showing how the downlink transmissions are time multiplexed

b) Update the Test Purpose and Environment

c) Align the OTA related cell specific test parameter tables in SA test cases to NSA

d) Update CSI-RS Reference Measu

**Discussion:**

**Decision: Agreed.**

**R4-2006438 Update of Tx Timing Test cases**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0656 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

a) Update FR2 Test cases to specify SSB.4 FR2, which has one SSB per SS-burst

b) Update TDD configuration for FR2 test cases

c) Update DRX configuration

d) Update slot offset for periodicityAndOffset-p for FR2 test cases

**Discussion:**

**Decision: Agreed.**

**R4-2006439 Update of Tx Timing Test cases**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0657 Cat: F (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

a) Update FR2 Test cases to specify SSB.4 FR2, which has one SSB per SS-burst

b) Update TDD configuration for FR2 test cases

c) Update DRX configuration

d) Update slot offset for periodicityAndOffset-p for FR2 test cases

**Discussion:**

**Decision: Agreed.**

**R4-2006441 Update of FR2 RLM and BFD-LR Test cases**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0658 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

Remove the row in each test case stating Correlation Matrix and Antenna Configuration = 2x2 low, as it does not make sense for over-the-air test cases.

**Discussion:**

**Decision: Agreed.**

**R4-2006442 Update of FR2 RLM and BFD-LR Test cases**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0659 Cat: A (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

Remove the row in each test case stating Correlation Matrix and Antenna Configuration = 2x2 low, as it does not make sense for over-the-air test cases.

**Discussion:**

**Decision: Agreed.**

**R4-2006443 Update of FR2 SS-RSRP Test cases**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0660 Cat: F (Rel-15)  
  
 Source: ANRITSU LTD*

**Abstract:**

Update SS-RSRP Test cases to specify SSB.3 FR2 or SSB.4 FR2, which have one SSB per SS-burst

**Discussion:**

**Decision: Agreed.**

**R4-2006444 Update of FR2 SS-RSRP Test cases**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0661 Cat: A (Rel-16)  
  
 Source: ANRITSU LTD*

**Abstract:**

Update SS-RSRP Test cases to specify SSB.3 FR2 or SSB.4 FR2, which have one SSB per SS-burst.

**Discussion:**

**Decision: Agreed.**

**R4-2006856 CR on RACH test cases with CSI-RS resource R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0699 Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Agreed.**

**R4-2006857 CR on RACH test cases with CSI-RS resource R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0700 Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Agreed.**

**R4-2006988 Correction of NR SA FR2 inter-freq measurement reporting**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0714 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Endorsed CR R4-2005276 without further changes

**Discussion:**

**Decision: Agreed.**

**R4-2006989 Correction of NR SA FR2 inter-freq measurement reporting**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0715 Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Endorsed CR R4-2005276 without further changes

**Discussion:**

**Decision: Agreed.**

**R4-2007176 UE Beam assumption for RRM Test cases in 38.133 Annex A**

*Type: discussion For: Endorsement  
 Source: ANRITSU LTD*

**Abstract:**

The information to choose UE Beam assumption for RRM Test cases in 38.133 Annex A was previously base on R4-1901179 at RAN4#90, but this was updated in R4-1904784 at RAN4#90bis together with chairman’s notes information in the meeting report R4-1905301.

**Discussion:**

**Decision: Noted.**

**R4-2007391 CR: Correction of L1-RSRP measurement period**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0726 Cat: F (Rel-15)  
  
 Source: Ericsson, Huawei, HiSilicon*

**Abstract:**

This CR corrects the L1-RSRP measurement period for FR2 EN-DC and SA.

**Discussion:**

**Decision: Agreed.**

**R4-2007392 CR: Correction of L1-RSRP measurement period**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0727 Cat: A (Rel-16)  
  
 Source: Ericsson, Huawei, HiSilicon*

**Abstract:**

This CR corrects the L1-RSRP measurement period for FR2 EN-DC and SA.

**Discussion:**

**Decision: Agreed.**

**R4-2007428 CR to TS 38.133: Correction to CSI-RS configurations in A.3.14 (Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0728 Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Discussion:**

**Decision: Revised to R4-2009115 (from R4-2007428).**

**R4-2009115 CR to TS 38.133: Correction to CSI-RS configurations in A.3.14 (Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0728 Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Discussion:**

**Decision: Return to.**

**R4-2007429 CR to TS 38.133: Correction to CSI-RS configurations in A.3.14 (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0729 Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Discussion:**

**Decision: Return to.**

**R4-2007430 CR to TS 38.133: Correction to SMTC configuration in measurement accuracy tests (Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0730 Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Discussion:**

**Decision: Agreed.**

**R4-2007431 CR to TS 38.133: Correction to SMTC configuration in measurement accuracy tests (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0731 Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Discussion:**

**Decision: Agreed.**

**R4-2007432 CR to TS 38.133: Clarifications to AoA setup Annex A.5 (Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0732 Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Discussion:**

**Decision: Agreed.**

**R4-2007433 CR to TS 38.133: Clarifications to AoA setup Annex A.5 (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0733 Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Discussion:**

**Decision: Agreed.**

**R4-2007434 CR to TS 38.133: Clarifications to AoA setup Annex A.7 (Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0734 Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Discussion:**

Session chair: CR is agreeable but suggest to wait for MCC feedback on how to handle Rel-16

**Decision: Return to.**

**R4-2007435 CR to TS 38.133: Clarifications to AoA setup Annex A.7 (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0735 Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Discussion:**

Session chair: CR is agreeable but suggest to wait for MCC feedback on how to handle Rel-16

**Decision: Return to.**

**R4-2007669 CR on BFD TCs**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0753 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008544 (from R4-2007669).**

**R4-2008544 CR on BFD TCs**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0753 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007670 CR on BFD TCs\_r16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0754 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007671 CR on UL carrier RRC reconfiguration Delay TC**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0755 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008545 (from R4-2007671).**

**R4-2008545 CR on UL carrier RRC reconfiguration Delay TC**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0755 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007672 CR on UL carrier RRC reconfiguration Delay TC\_r16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0756 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007673 CR to FR1 SCell activation delay test cases**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0757 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008546 (from R4-2007673).**

**R4-2008546 CR to FR1 SCell activation delay test cases**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0757 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007674 CR to FR1 SCell activation delay test cases\_r16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0758 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007675 CR to inter-frequency measurement TCs**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0759 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008547 (from R4-2007675).**

**R4-2008547 CR to inter-frequency measurement TCs**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0759 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007676 CR to inter-frequency measurement TCs\_r16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0760 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007677 CR to interruption TCs**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0761 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008548 (from R4-2007677).**

**R4-2008548 CR to interruption TCs**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0761 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007678 CR to interruption TCs\_r16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0762 Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008550 (from R4-2007678).**

**R4-2008550 CR to interruption TCs\_r16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0762 Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007679 CR to FR1 SA inter-RAT measurement TCs\_r16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0763 Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008549 (from R4-2007679).**

**R4-2008549 CR to FR1 SA inter-RAT measurement TCs\_r16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0763 Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007717 CR on RRC Connection Release with Redirection test cases**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0784 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007716 CR on RRC Connection Release with Redirection (Cat A)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0783 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007719 CR on RRC Re-establishment test cases**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0786 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007718 CR on RRC Re-establishment test cases (Cat A)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0785 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007721 CR on Timing advance test cases for EN-DC**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0788 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007720 CR on Timing advance test cases for EN-DC (Cat A)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0787 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007723 CR on Timing test cases for NR SA**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0790 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007722 CR on Timing test cases for NR SA (Cat A)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0789 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007817 CR on L1-RSRP delay tests for FR2 R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0828 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007818 CR on L1-RSRP delay tests for FR2 R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0829 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007819 CR to L1-RSRP accuracy TC for FR2 EN-DC R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0830 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007820 CR to L1-RSRP accuracy TC for FR2 EN-DC R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0831 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007821 CR to L1-RSRP accuracy TC for FR2 SA R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0832 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007822 CR to L1-RSRP accuracy TC for FR2 SA R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0833 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007823 CR to TCI state switch TC R15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0834 Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007824 CR to TCI state switch TC R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0835 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

### 4.11 Demodulation and CSI maintenance [NR\_newRAT-Perf]

### 4.12 Maintenance of the Positioning specs (36.171, 37.171 and 38.171) [NR\_newRAT-Perf or TEI]

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**Email discussion: [95e][203] NR\_NewRAT\_Positioning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][203] NR\_NewRAT\_Positioning | R15 NR | Maintenance of the Positioning specs (36.171, 37.171 and 36.171) | 4.12 |

**R4-2008492 Email discussion summary for [95e][203] NR\_NewRAT\_Positioning** *Type: other For: Information  
 Source: Moderator (Spirent)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009015 (from R4-2008492).**

**R4-2009015 Email discussion summary for [95e][203] NR\_NewRAT\_Positioning** *Type: other For: Information  
 Source: Moderator (Spirent)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

|  |  |
| --- | --- |
| **Tdoc** | **Decision** |
| R4-2006243 | Revised (editorial changes) |
| R4-2006244 | Revised (editorial changes) |

2nd round email discussion conclusions

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**R4-2006243 CR for TS36.171, Introduction of BDS B1C in A-GNSS**

*Type: CR For: Agreement  
 36.171 v16.0.0 CR-0020 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Revised to R4-2008551 (from R4-2006243).**

**R4-2008551 CR for TS36.171, Introduction of BDS B1C in A-GNSS**

*Type: CR For: Agreement  
 36.171 v16.0.0 CR-0020 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Return to.**

**R4-2006244 CR for TS38.171, Introduction of BDS B1C in A-GNSS**

*Type: CR For: Agreement  
 38.171 v15.3.0 CR-0011 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Revised to R4-2008540 (from R4-2006243).**

**R4-2008540 CR for TS38.171, Introduction of BDS B1C in A-GNSS**

*Type: CR For: Agreement  
 38.171 v15.3.0 CR-0011 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Return to.**

### 4.13 Testability Maintenance (38.810) [FS\_NR\_test\_methods]

## 5 Rel-16 Work Items for LTE

### 5.1 LTE intra-band Carrier Aggregation for x CC DL/y CC UL including contiguous and non-contiguous spectrum (x>=y) [LTE\_CA\_R16\_intra]

### 5.2 LTE inter-band Carrier Aggregation for 2 bands DL with 1 band UL [LTE\_CA\_R16\_2BDL\_1BUL]

### 5.3 LTE inter-band Carrier Aggregation for 3 bands DL with 1 band UL [LTE\_CA\_R16\_3BDL\_1BUL]

### 5.4 LTE inter-band Carrier Aggregation for x bands DL (x=4, 5) with 1 band UL [LTE\_CA\_R16\_xBDL\_1BUL]

### 5.5 LTE inter-band Carrier Aggregation for 2 bands DL with 2 band UL [LTE\_CA\_R16\_2BDL\_2BUL]

### 5.6 LTE inter-band Carrier Aggregation for x bands DL (x= 3, 4, 5) with 2 band UL [LTE\_CA\_R16\_xBDL\_2BUL]

### 5.7 RRM for LTE CA basket WI-s [LTE\_CA\_R16\_xxxx]

### 5.8 Additional LTE bands for UE category M1 and/or NB1 in Rel-16 [LTE\_bands\_R16\_M1\_NB1]

### 5.9 Additional LTE bands for UE category M2 and/or NB2 in in Rel-16 [LTE\_bands\_R16\_M2\_NB2]

### 5.10 Additional MTC enhancements for LTE [LTE\_eMTC5]

#### 5.10.1 General [LTE\_eMTC5]

#### 5.10.2 Coexistence with NR [LTE\_eMTC5]

#### 5.10.3 RRM core requirements (36.133) [LTE\_eMTC5-Core]

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**Email discussion: [95e][229] LTE\_eMTC5\_RRM**

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| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][229] LTE\_eMTC5\_RRM | R16 LTE eMTC | RRM Core requirements | 5.10.3 |

**R4-2008518 Email discussion summary for [95e][229] LTE\_eMTC5\_RRM** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009091 (from R4-2008518).**

**R4-2009091 Email discussion summary for [95e][229] LTE\_eMTC5\_RRM** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008641 | WF on Rel-16 MTC RRM requirements | Ericsson |

**Topic #1: Mobility enhancement**

Issue 1-2: IDLE mode neighbour cell measurement conditions

Agreement: Introduce capability signaling to indicate whether the UE is able to measure on neighbor cell RSS that is in the same NB that UE monitors.

Issue 1-4: CONNECTED mode neighbour cell measurement conditions

Agreement: RSS frequency location of the cell being measured occurs in the NB(s) that UE monitors for MPDDCH for the *N* number of samples

Session chair: word “consecutive” samples removed and shall be further discussed

P2: RSS time location of the cell being measured does not coincide with UE’s measurement gap (if configured)

P3: RSS power offset of the cell being measured is not smaller than 0 dB

RSS location in frequency with respect to measured neighbor cell:

* Follow the similar agreement from IDLE mode

Minimum/maximum distance:

* Follow the agreement from issue 1-1.

**Issue 1-5: Measurement delays in IDLE mode**

RSS-based measurement period is not longer than CRS-based measurement period.

**Issue 1-7: Concurrent CRS and RSS measurements**

The UE is not expected to measure on both RSS and CRS for RSRP measurements.

In idle mode, UE is not required to concurrently measure based on RSS and CRS.

UE is required to meet the current CRS based requirements for cells which cannot be measured based on RSS.

UE is not required to measure both CRS and RSS for the same serving or neighbour cell.

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008642 | LS on capability signaling for RSS neighbor cell measurements | Qualcomm |

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007886 | Revised |
| R4-2007887 | Revised |

**Topic #2: Preconfigured uplink resources**

Issue 2-1 and Issue 2-2:

Agreement: Do not specify the exact time duration for synchronization and Tserach times for normal DRX and eDRX, instead it is stated that the UE shall be synchronized towards the serving cell prior to the transmission, and otherwise UE shall not transmit (drop or postpone).

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007919 | Revised |
| R4-2007873 | Revised |
| R4-2007874 | Not pursued |

**Topic #3: MPDCCH Improvement**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007368 | Revised |

**Topic #4: DL Quality reporting**

Agreements

Use the same 2-bit report mapping from Rel-14 NB-IoT for eMTC.

RAN4 reuse the downlink channel quality measurement report mapping of CQI-NPDCCH-Short-NB for eMTC short downlink channel quality report in MAC CE.

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006181 | Not pursued |
| R4-2007370 | Revised |

**Topic #5: Performance Requirements**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007889 | Postponed |

2nd round email discussion conclusions

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**R4-2008641 WF on Rel-16 MTC RRM requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2008642 LS on capability signaling for RSS neighbor cell measurements**

*Type: LS out For: Approval  
 to [RAN2], cc TBD  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Return to.**

##### 5.10.3.1 DL quality report in MSG3 and connected mode [LTE\_eMTC5-Core]

**R4-2006181 Corrections to DCQR in eMTC and introduction of 2-bit DCQR**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6838 Cat: B (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

Corrections on endorsed CR terminology and introduction of 2-bit DCQR

**Discussion:**

**Decision: Not pursued.**

**R4-2007369 2-bit reporting table on eMTC DL quality report**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the report values for 2-bit channel quality reporting table for DL channel quality report for eMTC.

**Discussion:**

**Decision: Noted.**

**R4-2007370 Introduction of DL channel quality report for eMTC**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6857 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR introduces channel quality report mapping table and reporting accuracy requirements for eMTC.

**Discussion:**

**Decision: Revised to R4-2008648 (from R4-2007370).**

**R4-2008648 Introduction of DL channel quality report for eMTC**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6857 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR introduces channel quality report mapping table and reporting accuracy requirements for eMTC.

**Discussion:**

**Decision: Return to.**

**R4-2007870 Discussion on quality reporting in Rel-16 eMTC**

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

**Discussion:**

**Decision: Noted.**

**R4-2007871 CR on for quality reporting**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6888 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

##### 5.10.3.2 WUS [LTE\_eMTC5-Core]

##### 5.10.3.3 MPDCCH performance improvement [LTE\_eMTC5-Core]

**R4-2007367 RLM for enhanced MPDCCH**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the RLM requirements due to the MPDCCH performance improvement.

**Discussion:**

**Decision: Noted.**

**R4-2007368 Introduction of RLM requirements with enhanced MPDCCH**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6856 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR introduces the RLM requirements due to the MPDCCH performance improvement.

**Discussion:**

**Decision: Revised to R4-2008647 (from R4-2007368).**

**R4-2008647 Introduction of RLM requirements with enhanced MPDCCH**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6856 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR introduces the RLM requirements due to the MPDCCH performance improvement.

**Discussion:**

**Decision: Return to.**

##### 5.10.3.4 PUR [LTE\_eMTC5-Core]

**R4-2006164 Remaining issues in PUR for eMTC**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2007872 Discussion on capturing RRM requirements for PUR in Rel-16 eMTC**

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

**Discussion:**

**Decision: Noted.**

**R4-2007873 CR to add additional timing requirements for PUR**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6889 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Revised to R4-2008646 (from R4-2007873).**

**R4-2008646 CR to add additional timing requirements for PUR**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6889 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007874 CR on RRM requirements for PUR**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6890 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Not pursued.**

**R4-2007883 Overview of the PUR agreements for Rel-16 MTC**

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

**Abstract:**

In this contribution, we walk through all the agreements that have been made in RAN4 for PUR and provide our view on how to capture them in the specification.

**Discussion:**

**Decision: Noted.**

**R4-2007884 Introduction of requirements for preconfigured uplink resource transmission for cat-M1**

*Type: draftCR For: Endorsement  
 36.133 v16.5.0  
 Source: Ericsson, Nokia, Nokia Shanghai Bell*

**Abstract:**

This CR introduces the support for transmissions using preconfigured uplink resources.

**Discussion:**

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

**R4-2007919 Introduction of requirements for preconfigured uplink resource transmission for cat-M1**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6902 Cat: B (Rel-16)  
  
 Source: Ericsson, Nokia, Nokia Shanghai Bell*

**Abstract:**

This CR introduces the support for transmissions using preconfigured uplink resources.

**Discussion:**

**Decision: Revised to R4-2008645 (from R4-2007919).**

**R4-2008645 Introduction of requirements for preconfigured uplink resource transmission for cat-M1**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6902 Cat: B (Rel-16)  
  
 Source: Ericsson, Nokia, Nokia Shanghai Bell*

**Abstract:**

This CR introduces the support for transmissions using preconfigured uplink resources.

**Discussion:**

**Decision: Revised to R4-2009137 (from R4-2008645).**

**R4-2009137 Introduction of requirements for preconfigured uplink resource transmission for cat-M1**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6902 Cat: B (Rel-16)  
  
 Source: Ericsson, Nokia, Nokia Shanghai Bell*

**Abstract:**

This CR introduces the support for transmissions using preconfigured uplink resources.

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

##### 5.10.3.5 Mobility enhancement [LTE\_eMTC5-Core]

**R4-2006165 Remaining issues on RSS-based measurements in eMTC**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2007875 Discussion on remaining issues in RSS measurement**

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

**Discussion:**

**Decision: Noted.**

**R4-2007885 Remaining discussions on RSS measurement support for Rel-16 MTC**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we continue the discussion on RSS based RSRP measurement adressing the open issues identified at last meeting.

**Discussion:**

**Decision: Noted.**

**R4-2007886 RSS based RSRP measurement to IDLE mode for eMTC in normal coverage**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6894 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR to capture the RSS measurement conditions in normal coverage.

**Discussion:**

**Decision: Revised to R4-2008643 (from R4-2007886).**

**R4-2008643 RSS based RSRP measurement to IDLE mode for eMTC in normal coverage**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6894 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR to capture the RSS measurement conditions in normal coverage.

**Discussion:**

**Decision: Return to.**

**R4-2007887 RSS based RSRP measurement to IDLE mode for eMTC in enhanced coverage**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6895 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR to capture the RSS measurement conditions in enhanced coverage.

**Discussion:**

**Decision: Revised to R4-2008644 (from R4-2007887).**

**R4-2008644 RSS based RSRP measurement to IDLE mode for eMTC in enhanced coverage**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6895 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR to capture the RSS measurement conditions in enhanced coverage.

**Discussion:**

**Decision: Return to.**

**R4-2007888 RSS based RSRP measurement to CONNECTED mode for eMTC**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6896 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR to capture the RSS measurement conditions in CONNECTED mode.

**Discussion:**

**Decision: Revised to R4-2009117 (from R4-2007888).**

**R4-2009117 RSS based RSRP measurement to CONNECTED mode for eMTC**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6896 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR to capture the RSS measurement conditions in CONNECTED mode.

**Discussion:**

**Decision: Return to.**

**R4-2007889 Introduction of measurement accuracy requirements for RSS based RSRP measurements for cat-M1/M2**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6897 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR to capture the RSS measurement accuracy requirements.

**Discussion:**

**Decision: Postponed.**

##### 5.10.3.6 Others [LTE\_eMTC5-Core]

#### 5.10.4 Demodulation and CSI requirements (36.101/36.104) [LTE\_eMTC5-Perf]

### 5.11 Additional enhancements for NB-IoT [NB\_IOTenh3]

#### 5.11.1 General [NB\_IOTenh3]

#### 5.11.2 Coexistence with NR [NB\_IOTenh3]

#### 5.11.3 RRM core requirements (36.133) [NB\_IOTenh3-Core]

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**Email discussion: [95e][230] NB\_IOTenh3\_RRM**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][230] NB\_IOTenh3\_RRM | R16 NB-IOT | RRM Core requirements | 5.11.3 |

**R4-2008519 Email discussion summary for [95e][230] NB\_IOTenh3\_RRM** *Type: other For: Information  
 Source: Moderator (Huawei, HiSilicon)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009092 (from R4-2008519).**

**R4-2009092 Email discussion summary for [95e][230] NB\_IOTenh3\_RRM** *Type: other For: Information  
 Source: Moderator (Huawei, HiSilicon)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008649 | WF on Rel-16 NB-IoT RRM requirements | Huawei, HiSilicon |

Issue 1-2-1: Condition on filtering and combination of NRSRP measurement between anchor carrier and non-anchor carrier in enhanced coverage.

There is no prerequisite or condition for UE in enhanced coverage when filtering the measurement between anchor and non-anchor carriers.

Issue 1-2-2: Whether to introduce conditions on filtering and combination of NRSRP measurement between anchor carrier and non-anchor carrier in normal coverage.

NRSRP measurements on non-anchor carrier can be filtered or combined with NRSRP measurement on anchor carrier after translating the non-anchor carrier measurement with parameter nrs-PowerOffsetNonAnchor, provided that

* + SINR ≥ -6 dB on the non-anchor carrier
  + the comparison of NRSRP samples between anchor and non-anchor carrier accounting for the signal power offset, yields a difference within a margin M dB

Issue 1-2-3: The SINR for qualifying a measurement for combining and filtering is on the anchor carrier or non-anchor carrier.

SINR ≥ -6 dB on the non-anchor carrier

Issue 1-2-4: The value of the margin M dB and the method for definition.

Agreement: The margin M dB is predefined in 36.133.

Issue 1-3-1: Nserv for measurement of serving cell

Nserv = 2 for normal coverage and Nserv = 4 for enhanced coverage

Issue 1-3-2: WUS reception (clause 4.6.2.9)

Same requirements for WUS for shorter DRX cycles as in DRX cycles ≤ 5.12s

Issue 1-3-4: Intra-frequency and inter-frequency neighbour cell measurement with eDRX:

In normal coverage, the same existing requirements should apply for Tdetect with 1 DRX cycle for measurement and 2 DRX cycles for evaluation for both intra-frequency and inter-frequency neighbour cells.

In enhance coverage, the same existing requirements should apply for Tdetect with 1 DRX cycle for measurement.

Issue 1-3-5: Measurement of Serving with WUS :

Use the same requirements as in DRX cycle of 1.28s for shorter DRX cycles of 320/640ms when eDRX is and is not configured.

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007688 | Revised |
| R4-2007114 | Agreed |
| R4-2007685 | Agreed |
| R4-2007686 | Revised |
| R4-2007687 | Revised |
| R4-2007689 | Revised |
| R4-2007976 | Revised |

GTW session

**Issue 1-2-3: UE behavior on comparison of NRSRP measurements of anchor and non-anchor carriers**

Option 1: If the measurement samples for comparison satisfy the inequality, UE is allowed to perform RRM measurements on the non-anchor carrier until the next comparison takes place or until the relaxed monitoring criteria is no longer met. (Qualcomm, Huawei, Ericsson)

| NRSRPanchor – (NRSRPnon-anchor + nrs-PowerOffsetNonAnchor) | < M  dB

Option 2: A certain number of samples (2 or 3) is needed for the comparison. (Nokia)

Discussion

HW: long time issue

Nokia: equation is not a part of Option 1. Are we defining a min requirements for measurement of 2 carriers? If this is the case, then the margin M = 12 dB is quite conservation. Increasing number of samples will reduce the margin.

QC: the value was not arbitrary chosen. In 8.14.2.2 the meas period takes 5 DRX cycles but est accuracy for RSRP is +- 6dB. This is the reason M = 12 dB was proposed. Increasing the number of sample will not improve the performance.

HW: same view. In margin for cell reselection we have side conditions for serv and neighbour cells. For this case we have side conditions for non-anchor carrier only.

Nokia: in relaxed monitoring mode, UE would rely on measurement on non-anchor carrier and in this case there will be performance loss due to poor accuracy. Margin is too high and would allow UE to always stay on non-anchor carrier.

Nokia: no problem if we make the margin lower

Nokia: can we go to 10dB?

HW: can compromise to 10dB

QC: this violates min requirements for RSRP accuracy.

E///: can compromise to 10dB

**Issue 1-2-1 The value of the margin M dB**

Option 1: 8 dB (Nokia)

Option 2: 12 dB (Qualcomm, Huawei, Ericsson)

**Issue 1-2-2 The periodicity of NRSRP comparison.**

Option 1: at least once every one hour (Qualcomm, Huawei, Ericsson)

Option 2: one hour for long DRX cycle; shorter periodicity for short DRX cycle (Nokia)

Agreement

If the measurement samples for comparison satisfy the inequality, UE is allowed to perform RRM measurements on the non-anchor carrier until the next comparison takes place or until the relaxed monitoring criteria is no longer met

| NRSRPanchor – (NRSRPnon-anchor + nrs-PowerOffsetNonAnchor) | < M  dB

The value of the margin M = 10 dB

The periodicity of NRSRP comparison is at least once every one hour

For comparison the number of samples for non-anchor carrier is same as number of samples for anchor carrier

2nd round email discussion conclusions

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**R4-2008649 WF on Rel-16 NB-IoT RRM requirements**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009242 (from R4-2008649).**

**R4-2009242 WF on Rel-16 NB-IoT RRM requirements**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

##### 5.11.3.1 Group WUS [NB\_IOTenh3-Core]

##### 5.11.3.2 PUR [NB\_IOTenh3-Core]

**R4-2007688 CR on measurement requriements for RSRP change based TA validation**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6869 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008650 (from R4-2007688).**

**R4-2008650 CR on measurement requriements for RSRP change based TA validation**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6869 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2009243 (from R4-2008650).**

**R4-2009243 CR on measurement requriements for RSRP change based TA validation**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6869 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

##### 5.11.3.3 Multi-carrier operations [NB\_IOTenh3-Core]

**R4-2006166 Remaining issues on RRM measurements in non-anchor carrier for NB-IoT**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2007113 On NRSRP processing in multicarrier operation**

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

**Abstract:**

Discussion on combining and filtering of NRSRP in MC operation.

**Discussion:**

**Decision: Noted.**

**R4-2007685 CR on downlink channel quality measurement requirement for Rel-16 NB IoT**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6866 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007686 CR on non-anchor RRM measurement requirements in enhanced coverage for Rel-16 NB IoT**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6867 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008651 (from R4-2007686).**

**R4-2008651 CR on non-anchor RRM measurement requirements in enhanced coverage for Rel-16 NB IoT**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6867 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007687 CR on non-anchor RRM measurement requirements in normal coverage for Rel-16 NB IoT**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6868 Cat: B (Rel-16)  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008652 (from R4-2007687).**

**R4-2008652 CR on non-anchor RRM measurement requirements in normal coverage for Rel-16 NB IoT**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6868 Cat: B (Rel-16)  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2009241 (from R4-2008652).**

**R4-2009241 CR on non-anchor RRM measurement requirements in normal coverage for Rel-16 NB IoT**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6868 Cat: B (Rel-16)  
 Source: Huawei, Hisilicon*

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

**R4-2007690 Discussion on filtering of samples between carriers for Rel-16 NB-IoT**

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

**Discussion:**

**Decision: Noted.**

**R4-2007890 Changes on the S criterion for non-anchor carrier measurements in enhanced coverage for Rel-16 NB IoT**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6898 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Changes to the already endorsed CR to clarify the S-criterion applicability in enhanced coverage.

**Discussion:**

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

**R4-2007891 Changes on the S criterion for non-anchor carrier measurements in normal coverage for Rel-16 NB IoT**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6899 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Changes to the already endorsed CR to clarify the S-criterion applicability in normal coverage.

**Discussion:**

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

**R4-2007976 Changes on the S criterion for non-anchor carrier measurements in enhanced coverage for Rel-16 NB IoT**

*Type: draftCR For: Endorsement  
 36.133 v16.5.0  
 Source: Ericsson*

**Abstract:**

Changes to the already endorsed CR to clarify the S-criterion applicability in enhanced coverage.

**Discussion:**

**Decision: Revised to R4-2008654 (from R4-2007976).**

**R4-2008654 Changes on the S criterion for non-anchor carrier measurements in enhanced coverage for Rel-16 NB IoT**

*Type: draftCR For: Endorsement  
 36.133 v16.5.0  
 Source: Ericsson*

**Abstract:**

Changes to the already endorsed CR to clarify the S-criterion applicability in enhanced coverage.

**Discussion:**

**Decision: Return to.**

**R4-2007977 Changes on the S criterion for non-anchor carrier measurements in normal coverage for Rel-16 NB IoT**

*Type: draftCR For: Endorsement  
 36.133 v16.5.0  
 Source: Ericsson*

**Abstract:**

Changes to the already endorsed CR to clarify the S-criterion applicability in normal coverage.

**Discussion:**

**Decision: Noted.**

##### 5.11.3.4 Others [NB\_IOTenh3-Core]

**R4-2006167 On shorter DRX cycles for NB-IoT**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

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**Decision: Noted.**

**R4-2007114 NTA\_offset setting for NR coexistence with NB-IoT**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0717 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell, Ericsson*

**Abstract:**

CR on TA offset configuration for NB-IoT

**Discussion:**

**Decision: Agreed.**

**R4-2007689 CR on updating RRM requirement for new introduced UE specific DRX cycles for Rel-16 NB-IoT**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6870 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008653 (from R4-2007689).**

**R4-2008653 CR on updating RRM requirement for new introduced UE specific DRX cycles for Rel-16 NB-IoT**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6870 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007691 Discussion on updating RRM requirement for new introduced UE specific DRX cycles for Rel-16 NB-IoT**

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

**Discussion:**

**Decision: Noted.**

#### 5.11.4 Demodulation and CSI requirements (36.101/36.104) [NB\_IOTenh3-Perf]

### 5.12 Even further Mobility enhancement in E-UTRAN [LTE\_feMob]

#### 5.12.1 RRM core requirements (36.133) [LTE\_feMob-Core]

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**Email discussion: [95e][231] LTE\_feMob\_RRM**

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| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][231] LTE\_feMob\_RRM | R16 LTE Mob Enh | RRM Core requirements | 5.12.1 |

**R4-2008520 Email discussion summary for [95e][231] LTE\_feMob\_RRM** *Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009093 (from R4-2008520).**

**R4-2009093 Email discussion summary for [95e][231] LTE\_feMob\_RRM** *Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008655 | WF on test cases for LTE feMob | Nokia |

**Topic #1: Conditional Handover**

Tdoc decisions

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| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2008193 | Agreed |

**Topic #2: DAPS handover**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006982 | Return to |
| R4-2007750 | Return to |

2nd round email discussion conclusions

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**R4-2008655 WF on test cases for LTE feMob**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009135 (from R4-2008655).**

**R4-2009135 WF on test cases for LTE feMob**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Return to.**

##### 5.12.1.1 Conditional handover [LTE\_feMob-Core]

**R4-2008193 CR on 36133 LTE CHO**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6910 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Resubmission of endorsed Draft CR R4-2005295 for LTE CHO.

**Discussion:**

**Decision: Agreed.**

##### 5.12.1.2 Reduction of user data interruption [LTE\_feMob-Core]

**R4-2006981 Sync side conditions for LTE DAPS handover**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

DAPS handover discussion

**Discussion:**

**Decision: Noted.**

**R4-2006982 Correction to DAPS HO requirements in 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6847 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Technically endorsed CR CR R4-2005425 with further updates to capture threshold between sync and async source and target cell

**Discussion:**

**Decision: Return to.**

**R4-2007750 CR on DAPS handover**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6877 Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2009110 (from R4-2007750).**

**R4-2009110 CR on DAPS handover**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6877 Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

##### 5.12.1.3 Others [LTE\_feMob-Core]

### 5.13 LTE-based 5G terrestrial broadcast [LTE\_terr\_bcast]

#### 5.13.1 Demodulation and CSI requirements (36.101) [LTE\_terr\_bcast -Perf]

#### 5.13.2 Others [LTE\_terr\_bcast -Core/Perf]

### 5.14 R16 LTE maintenance [WI code]

#### 5.14.1 RF [WI code]

#### 5.14.2 RRM [WI code]

#### 5.14.3 Demodulation and CSI requirements [WI code]

## 6 Rel-16 non-spectrum related work items for NR

### 6.1 NR-based access to unlicensed spectrum [NR\_unlic]

#### 6.1.1 System Parameters [NR\_unlic-Core]

#### 6.1.2 UE RF requirements [NR\_unlic-Core]

#### 6.1.3 Band combination related (Analysis, TPs, etc.) [NR\_unlic-Core]

#### 6.1.4 BS RF requirements [NR\_unlic-Core]

#### 6.1.5 RRM core requirements (38.133) [NR\_unlic-Core]

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

**Email discussion: [95e][204] NR\_unlic\_RRM\_1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][204] NR\_unlic\_RRM\_1 | R16 NR-U | RRM Core: General (spec structure, applicability), HO, RRC connection mobility, Scell activation/deactivation, PSCell addition/release, Active TCI state switching | 6.1.5.1  6.1.5.3  6.1.5.4  6.1.5.5  6.1.5.6  6.1.5.7 |

**R4-2008493 Email discussion summary for [95e][204] NR\_unlic\_RRM\_1** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2008524 (from R4-2008493).**

**R4-2008524 Email discussion summary for [95e][204] NR\_unlic\_RRM\_1** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009016 (from R4-2008524).**

**R4-2009016 Email discussion summary for [95e][204] NR\_unlic\_RRM\_1** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009250 (from R4-2009016).**

**R4-2009250 Email discussion summary for [95e][204] NR\_unlic\_RRM\_1** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

**Topic #1: General**

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006010 | Revised |
| R4-2006976 | Revised, to include reference for TS 37.213 |
| R4-2006977 | Revised, to include reference for TS 37.213 |

Tdoc decisions

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008552 | WF on NR-U RRM part 1 | Ericsson |
| R4-2008553 | Analysis of missing NR-U sections for TS 38.133 | ZTE |
| R4-2008554 | Analysis of missing NR-U sections for TS 36.133 | Ericsson |
| R4-2008555 | CR for spec structure to address NR-U in 36.133 | Ericsson |

**Topic #2: Handover requirements**

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007259 | Revised |
| R4-2007260 | Revised |
| R4-2007979 | Postponed |
| R4-2007980 | Postponed |

**Topic #3: RRC connection mobility control**

Issue 3-1-1: The impact of UL LBT failure detection procedure impact on RRC re-establishment requirements

Agreement: No new UE behaviour needs to be defined due to consistent LBT failures under any stage of the RRC connection re-establishment procedure. The existing UE behaviour upon expiry of T311 defined in 38.331 shall apply under consistent LBT failures experienced by the UE over the RRC connection re-establishment delay.

Issue 3-1-2: L\*,max values for RRC connection re-establishment

Agreement: Previous agreement from RAN4#94-e (in R4-2002336) related to RRC connection re-establishment requirements is still valid, i.e., K1,max, K2i,max, KSI,max and K3,max are not needed in the requirements.

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006563 | Revised |
| R4-2007988 | Revised |
| R4-2007989 | Revised |

**Topic #4: SCell Activation and Deactivation**

Issue 4-2-1: Interruption window length

Agreement: Interruption window length at SCell deactivation does not depend on LBT failures

Issue 4-2-2: Interruption window starting point

Agreement: The starting point of deactivation interruption on PCell or PSCell or any activated SCell shall not occur before slot n+1+THARQ/*NR\_slot\_length* and not occur after slot n+1+(THARQ +3ms)/ *NR\_slot\_length*, where THARQ is as agreed in RAN4#94-e (R4-2002336)

Issue 4-4-1: Need for gain resetting when the total delay for all HARQ transmissions/retransmissions is too long due to LBT failures

Agreement: No consensus in RAN4 on this issue. No need to further discuss.

Issue 4-4-2: Compensation for the additional gain resetting when the total delay for all HARQ transmissions/retransmissions is too long due to LBT failures

Agreement: No consensus in RAN4 on this issue. No need to further discuss.

Issue 4-4-3: How to compensate for the additional gain resetting when the total delay for all HARQ transmissions/retransmissions is too long due to LBT failures

Agreement: No consensus in RAN4 on this issue. No need to further discuss.

Issue 4-5-4: Values for L3,1 and L3,2

Agreement:

* + L3,1,max = [2] if TSMTC\_max ≤ 40ms and L2,1,max = [1] if TSMTC\_max  > 40ms
  + L3,2,max = [2] if Trs ≤ 40ms and L3,2,max = [1] if Trs > 40ms

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006175 | Revised |

**Topic #5: PSCell addition and release**

Issue 5-1-1: UE behavior related to L1,max and L2,max

Agreement: Do not define L1,max and L2,max and the corresponding UE behavior.

Issue 5-3-1: Requirements applicability when UE is not provided with SMTC configuration or measurement object on this frequency

Agreement: If UE is not provided SMTC configuration or measurement object on this frequency: the requirement in this clause is applied with Trs =5 ms assuming the SSB transmission periodicity is 5ms; there is no requirement if the SSB transmission periodicity is not 5ms.

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006176 | Revised |

**Topic #6: Active TCI state switching**

Issue 6-3-1: Definition of Tfirst-SSB

Agreement: Tfirst-SSB is the time to the first SSB transmission occasion (“occasion” means the transmission is configured but may or may not come)

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007694 | Revised |

GTW session (June 1-2)

**Topic #2: Handover requirements**

Issue 2-1-1: Is there a need to account for UL LBT failure detection in HO interruption requirements?

* FFS: The impact of UL LBT failure detection/recovery on HO requirements for UE which is configured with *both* the UL BWP with PRACH occasion on the target cell and UL LBT failure detection/recovery.
  + **Option 1**: do not define requirements for the FFS case
  + **Option 2**: do not specify the exact requirements for the FFS case, only say that that the interruption can be longer for UE which is configured with *both* the UL BWP with PRACH occasion on the target cell and UL LBT failure detection/recovery
  + **Option 3**: specify the exact requirements for the FFS case (FFS: based on proposal 2 or other approach)

Discussion

QC: we already sent LS to RAN2 and RAN2 clarified that UL LBT failure detection applies to HO as well. We are open to different solutions to resolve it. Ok not to specify exact delay.

Apple: agree with QC that we need to handle this case but it is difficult to specify exact delay. Option 2.

MTK: Option 2 is ok

Nokia: agree with QC that it should be captured. But RAN2 is discussing a new scenario. Prefer to wait for RAN2 conclusions.

E///: this is optional capability (UL LBT detection) and in this case we can end up with 2 set of requirements. Can compromise to the wording proposed by Apple and MTK (i.e. longer delay can be expected).

HW: Same view with Nokia and need to check with RAN2.

E///: are we expecting any LS from RAN2?

Nokia: no LS but RAN2 discussion is ongoing

Conclusion:

Nokia and Huawei will double check with RAN2.

Come back in this meeting

**Topic #3 - RRC connection mobility control**

Issue 3-2-1: The need for L2,max and clarification of the UE behaviour upon exceeding L2,max

* Option 1 (ZTE, Ericsson): L2,max and the clarification on the corresponding UE behavior is needed
* Option 2 (Qualcomm, Nokia, Apple, MTK): RAN4 to not define L2,max . Existing UE behavior when exceeding *preambleTransMax* applies to RRC release with redirection.

Discussion:

Nokia: Option 2. Can reuse the existing behavior.

Apple/MTK: Option 2.

HW: for Option 2 does it mean that UE will keep preamble transmission upon exceeding *preambleTransMax*?

QC: yes.

ZTE: We would like to optimize NR-U behavior

E///: L2max and preambleTransMax are different things. RAN2 did not indicate us anything in the LS.

Nokia: we received this answer before. Issue 3-2-1

QC: the RAN2 agreement is

*The PREAMBLE\_TRANSMISSION\_COUNTER is not increased if the preamble is not transmitted due to LBT failure and lbt-FailureRecoveryConfig is configured, otherwise it is increased.*

E///: this may not apply to RA in RRC release procedure and will check.

Conclusion: E/// will check the agreement

Issue 3-2-2: If needed, what is the clarification on the UE behaviour upon exceeding L2,max

* Proposal 1 (ZTE): When L2 exceeds L2,max, the UE is allowed to camp on any NR cell. The delay requirement shall be similar to the case when L1 exceeds L1,max.
* Proposal 2 (Ericsson): When the number of UL LBT failures (L2) during RACH transmission exceeds the maximum allowed number of missed PRACH occasions (L2, max), the UE shall initiate cell selection procedures for the selected PLMN as defined in TS 38.304.

Issue 3-2-3: If L2,max is needed, what is the value?

* Proposal 1 (Ericsson): Parameter, L2, max, which is the maximum allowed number of missed PRACH occasions in RRC connection release with redirection, is defined in the table below:

|  |  |
| --- | --- |
| **PRACH configuration period (Tconfig)** | **Maximum allowed number of missed PRACH occasions (L**2, max**)** |
| **Tconfig** ≤ 40 ms | 16 |
| **Tconfig** > 40 ms | 4 |

**Topic #6 – active TCI state switching**

Issue 6-2-1: UE behavior in MAC-CE based active TCI state switching

* For MAC-CE based switching, confirm that the UE shall stay in the old state upon exceeding LMAC,known,max (for known state) and upon exceeding L1MAC,unknown,max or L2MAC,unknown,max (for unknown state)

Discussion

ZTE: MAC-CE TCI state switch and RRC based switch shall be discussed jointly. Going to the old state is not a good solution. We also have concerns on RRC based switch. Declaring BF is not a good solution. Prefer to investigate other options.

Nokia: we have another Rel-15 discussion on TCI state switch. This also needs to be considered here. Partially share the view from ZTE. Staying in old state does not help. Need to wait for RAN2 feedback on previous LS on RRC based TCI state switch.

E///: On the LS – it was RRC based switching and no questions for MAC CE based case. For MAC CE – we already agreed to keep the Rel-15 solution. If Rel-15 is updated then we can update accordingly.

Agreement

* For MAC-CE based switching, confirm that the UE shall stay in the old state upon exceeding LMAC,known,max (for known state) and upon exceeding L1MAC,unknown,max or L2MAC,unknown,max (for unknown state)
  + Note: if Rel-15 behavior is modified then the agreement can be updated

**Topic #4 SCell Activation and Deactivation**

* Issue 4-3-1: Do the SCell activation/deactivation requirements apply for the case when sCellDeactivationTimer is not configured?
  + Option 1 (Qualcomm, Ericsson, MediaTek, Huawei): The SCell activation/deactivation requirements for NR-U do not apply when the sCellDeactivationTimer is not configured.
  + Option 2 (Apple, Nokia): The UE requirements apply regardless whether the sCellDeactivationTimer is configured or not.
  + Option 3 (compromise?): The delays can be longer for SCell activation when the sCellDeactivationTimer is not configured, without specifying the exact requirement.

Discussion

E///: Option 1 agreeable for SCell activation based on 2nd round. At least to Apple. FFS if Option 1 is applicable to deactivation case.

Apple: Option 1 was Scell deactivation is fine. Activation not ok. Timer is not related to activation. Timer cannot be used to terminate the procedure.

Nokia: Option 1 is not agreeable. UE needs to follow NW configuration. We may need to check with RAN2. Timer is not related to delay.

E///: timer is optionally configured for both activation/deactivation. In this case there is no NW control of the UE.

Agreement

The SCell deactivation requirements for NR-U do not apply when the sCellDeactivationTimer is not configured.

Further discuss whether the SCell activation requirements for NR-U apply when the sCellDeactivationTimer is not configured.

* Issue 4-5-1: Definition of L1
  + Updated Proposal 1 (Ericsson): L1 is the number of configured SSB transmission occasions not available at the UE ~~due to DL CCA~~ (reference TBD)
    - TBD refers to the definition of “not available at the UE” which is a common issue for NR-U (see also issue 1-2-1)
  + Proposal 2 (Qualcomm): L1 is the number of SSB occasions not available.

Discussion:

QC: Updated Proposal 1 is ok.

Agreement:

* + L1 is the number of configured SSB transmission occasions not available at the UE(reference TBD)
    - TBD refers to the definition of “not available at the UE” which is a common issue for NR-U (see also issue 1-2-1)
* Issue 4-5-2: Definitions of L2,1 and L2,2
  + Updated Proposal 1 (Ericsson): L2,1 and L2,2 are the respective numbers of configured SSB transmission occasions not available at the UE (reference TBD)
    - TBD refers to the definition of “not available at the UE” which is a common issue for NR-U (see also issue 1-2-1)
  + Proposal 2 (Qualcomm): For NR-U known SCell activation, if the SCell measurement cycle is larger than 160ms, Tactivation\_time = TFirstSSB\_MAX + L2,1\* TSMTC\_MAX + (1 + L2,2)\* Trs + 5ms .
    - L2,2 (L2,2 L2,2,max) refers to the number of unavailable SSB occasions in the SCell being activated
    - In inter-band scenarios,
      * L2,1 (L2,1 L2,1,max) refers to the number of unavailable SSB occasions in the SCell being activated
    - In intra-band scenarios,
      * L2,1 (L2,1 L2,1,max) refers to the number of occasions that at least one SSB from SCells already activated or SCell being activated is not available

Discussion:

QC: Updated Proposal 1 is not specific enough. Need to differentiate inter-band and intra-band separately.

E///: inter-band scenario is not yet agreed in RF room.

Chair: what is inter-band?

QC: we mean licensed + unlicensed (not unlicensed + unlicensed)

E///: need to go scenario by scenario

E///: there are no such inter-band scenarios so far

E///: need more clarification on scenario for “inter-band” in Proposal 2. Can accept inter-band for Scenario A but need to work on the wording.

Conclusion: continue discussion in the 2nd round on 4-5-2/4-5-3/4-5-4.

* Issue 4-5-3: Definitions of L3,1 and L3,2
  + Updated Proposal 1 (Ericsson): L3,1 and L3,2 are the respective numbers of configured SSB transmission occasions not available at the UE (reference TBD)
    - TBD refers to the definition of “not available at the UE” which is a common issue for NR-U (see also issue 1-2-1)
  + Proposal 2 (Qualcomm; R4-2003552 and R4-2006155): For NR-U unknown SCell activation, if the SCell measurement cycle is larger than 160ms, Tactivation\_time = TFirstSSB\_MAX + (1+L3,1)\* TSMTC\_MAX + (2 + L3,2)\* Trs + 5ms

where

* + - L3,2 refer to the number of occasions the reference signal, as indicated by SMTC of the SCell being activated, is not available L3,2 L3,2,max
    - In inter-band scenarios,
      * L3,1 refers to the number of occasions the reference signal, as indicated by SMTC of the SCell being activated, is not available in unknown cell conditions and L3,1 L3,1,max
    - In intra-band scenarios,
      * L3,1 refers to the number of occasions that at least one SMTC from SCells already activated or SCell being activated is not available in unknown cell conditions and L3,1 L3,1,max
* Issue 4-5-5: Definition of TFirstSSB\_MAX
  + Updated Proposal 1 (Ericsson):
    - TFirstSSB\_MAX: Is the time to first configured SSB indicated by the SMTC after slot n + THARQ+3ms, when all active serving cells and SCells being activated or released have configured SSB bursts in the same slot.
  + Proposal 2 (Qualcomm):
    - TFirstSSB\_MAX: is the time to first SSB indicated by the SMTC after n + THARQ+3ms.
      * In case of intra-band SCell activation, the occasion when all active serving cells and SCells being activated or released are *scheduled* to transmit SSB bursts in the same slot.
      * In case of inter-band SCell activation, the first occasion when the SCell being activated is *scheduled* to transmit SSB burst.

2nd round email discussion conclusions

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**Email discussion: [95e][205] NR\_unlic\_RRM\_2**

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| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][205] NR\_unlic\_RRM\_2 | R16 NR-U | RRM Core: Cell re-selection, Interruptions, Active BWP switching, RLM, Timing | 6.1.5.2 6.1.5.8 6.1.5.9 6.1.5.10 6.1.5.13 |

**R4-2008494 Email discussion summary for [95e][205] NR\_unlic\_RRM\_2** *Type: other For: Information  
 Source: Moderator (MediaTek)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009017 (from R4-2008494).**

**R4-2009017 Email discussion summary for [95e][205] NR\_unlic\_RRM\_2** *Type: other For: Information  
 Source: Moderator (MediaTek)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008567 | WF on NR-U RRM requirements (part 2) | MediaTek |

**Topic #1: Cell re-selection (AI 6.1.5.2)**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007696 | Revised |
| R4-2007697 | Revised. |
| R4-2007895 | Withdrawn |
| R4-2007896 | Revised |
| R4-2007978 | Not pursued |

**Topic #3: Active BWP switching (AI 6.1.5.9)**

Issue 3-2: Whether to introduce any non-overlapping condition for the old and new UL BWPs

Agreement: No condition to be added on the relative frequency location of new UL BWP when UE is performing UL BWP switching upon detection of consistent UL LBT failure.

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007693 | Revised |
| R4-2007984 | Agreed. |
| R4-2007985 | Agreed |

**Topic #4: RLM and link recovery procedures (AI 6.1.5.10)**

Issue 4-4 Availability of Q factor

Agreement: Except for initial access, Q factor is always known to UE.

Issue 4-9 CSI-RS based CBD requirement

Agreement: RAN4 start to discuss CSI-RS based BFD requirement after RAN1 conclude on CSI-RS validation.

Tdoc decisions

|  |  |
| --- | --- |
| Tdoc | Tdoc decision |
| R4-2007263 | Not pursued |
| R4-2007388 | Revised. |
| R4-2007698 | Not pursued |
| R4-2007699 | Not pursued |
| R4-2007971 | Revised |

**Topic #5: Timing (AI 6.1.5.13)**

Tdoc decisions

|  |  |
| --- | --- |
| Tdoc | Tdoc decision |
| R4-2006863 | Revised |
| R4-2007097 | Not pursued |

GTW session (June 1-2)

Issue 4-2: Whether UE is able to distinguish the unavailable RLM-RS in low SNR in NR-U

* Proposals
  + Option 1: (Huawei)
    - UE is not able to distinguish the unavailable RLM-RS in low SNR in NR-U
  + Option 2: (Ericsson)
    - If needed, detection based on multiple samples could be assumed at low SINRs (e.g., Es/Iot<-6 dB), to facilitate the UE ability to determine the presence of SSBs
* Status:
  + 5 companies support Option 1 (UE cannot)
  + 2 companies support Option 2 (UE can)
  + 1 company suggest to clarify the SNR side condition
* Recommendations for 2nd round: Continue discussion. There are 2 sub issues that may need to be clarified first.
  + The level of low SNR is not clear (mentioned by OPPO)
  + What happens if all used samples go through LBT failure (mentioned by Qualcomm)

Discussion

Chair: what is low SNR

QC: anything below in-sync RLM level

Intel: there is some gap between in-sync and out-sync levels. Not sure if we can use only SNR.

MTK: need to go with simulation results.

ZTE: sim results depend on UE RX assumptions?

MTK: yes. We can make some baseline assumptions

Huawei: we are fine to discuss sim assumptions.

E///: can support QC view. -6dB is ok.

Apple: support QC understanding. In current test -7dB is used.

Chair: is -7dB ok?

MTK: no we need more simulations since the problem is different

Intel: in our view UE should be able to distinguish in-sync and out-of-sync and lower SNR shall be considered.

E///: let’s focus on the question. How to deal with out-of-sync is a separate issues.

E///: we can support -7dB.

MTK: we need margin for SNR

Apple: -7dB is for SNR2

ZTE: we can support -7dB as a threshold

MTK: we need to further check in this meeting

Agreement

* Option 1: UE is not able to distinguish the unavailable RLM-RS for Es/Iot ≤ -7dB in NR-U
* Option 2: UE is not able to distinguish the unavailable RLM-RS for Es/Iot ≤ -XdB in NR-U. X is FFS based on simulation results.

Issue 4-3: SSB-based OOS evaluation period

* Background: 2 options in agreed WF R4-2005367 in last meeting
  + Option 2: OOS evaluation is based on Lout, where Lout ≤Lout,max is the number of SSBs not available at the UE during TEvaluate\_out\_SSB
  + Option 3: The evaluation period is scaled by a fixed scaler
    - FFS: excluding samples whose SNR is higher than X dB
* Proposals
  + Option 1a: (Qualcomm)
    - The OOS evaluation period is scaled by a fixed scalar of 1.0.
  + Option 1b (Nokia)
    - Extend the SSB based RLM OOS evaluation period by a fixed factor.
    - Define the SSB based RLM OOS evaluation period based on a fixed extension as follows:
      * L = 14 for max(TSSB, TDRX) ≤ 40,
      * L = 10 for 40 <Max(TDRX, TSSB)≤320
      * L = 6 for TDRX >320
  + Option 2: (Ericsson, [ZTE])
    - Evaluation period depends on Lout (Lout ≤ Lout,max), where Lout is the number of SSBs not available at the UE during TEvaluate\_out\_SSB
      * Lout,max = 14 for Max(TDRX,TSSB)≤40 where TDRX=0 for non-DRX
      * Lout,max = 10 for 40<Max(TDRX,TSSB)≤320
      * Lout,max = 6 for TDRX>320
    - Upon exceeding Lout,max for one RLM-RS resource the UE behaviour is the same as if the radio link quality for this RLM-RS resource were below Qout.
  + Option 3a: (MediaTek)
    - The OOS evaluation period is scaled by a fixed scaler and the samples whose SNR is higher than X dB will be excluded for OOS evaluation
    - OOS evaluation period is based on (10 + L) samples, where L is:
      * L = 14 for Max(TDRX,TSSB)≤40 where TDRX =0 for non-DRX
      * L = 10 for 40<Max(TDRX, TSSB)≤320
      * L = 6 for TDRX >320
  + Option 3b: (OPPO)
    - The evaluation period for OOS is scaled by a fixed scaling factor excluding samples whose SNR is higher than [-3] dB
  + Option 3c: (Huawei)
    - The OOS evaluation period is extended as: (NExpected-navailable)\*M+ navailable, where NExpected is the expected number of samples, which could be same as that in licensed band; navailable is the number of available samples (SNR>X dB) within the evaluation period; M is a fixed scaler.
* Status:
  + 4 companies support Option 1a or 1b
  + 3 companies support Option 3a, 3b or 3c
  + 2 companies support Option 2

Discussion:

QC: based on previous agreement is it right understanding the Option 2 is no longer valid?

MTK: we may need to estimate OOS even for high SNR due to LBT failure

E///: we can potentially go with Option 3c but use not a fixed scaling but scaling based on Option 2.

Apple: Support 1a and 1b. Do not understand MTK and E/// scenario. If NW does not send SSB, then UE cannot identify the SNR level.

Intel: this is the scenario we mentioned above. Option 3 can be valid. Support Option 1a or 1b as more reliable.

QC: we also support Option 1. Option 3c is very complicated for UEs which have sliding window implementation

MTK: no major difference between UE implementations for Option 1 and 3 in high SNR

Agreement

* + For SINREST ≤ X dB the OOS evaluation period
    - Option 1: Keep unchanged
    - Option 2: Fixed extension of number of samples as follows:
      * L = TBD for max(TSSB, TDRX) ≤ 40,
      * L = TBD for 40 <Max(TDRX, TSSB)≤320
      * L = TBD for TDRX >320
  + For SINREST > X dB the OOS evaluation period is FFS
  + X = [-7dB]
  + SINREST is the estimated SINR at the UE side
    - Option 1: Filtered SINR estimate over evaluation period
    - Option 2: Current SSB SINR estimate
    - Option 3: last available SSB SINR
    - Other options are not precluded

Issue 5-2: If a reference cell on a carrier frequency belonging to the PTAG/STAG, which is subject to CCA, is unavailable at the UE for more than 160 ms then the UE [is allowed to or shall] use any of available activated SCell(s) at the UE in PTAG/STAG as a new reference cell

* Proposals
  + Option 1: (ZTE, Qualcomm, MediaTek)
    - ‘is allowed’
  + Option 2: (Ericsson)
    - ‘shall’
* Status:
  + 5 companies support Option 1 (is allowed)
  + 1 company support Option 2 (shall)

Agreement:

If a reference cell on a carrier frequency belonging to the PTAG/STAG, which is subject to CCA, is unavailable at the UE for more than 160 ms then the UE is allowed to use any of available activated SCell(s) at the UE in PTAG/STAG as a new reference cell

Note: UE not precluded to go back to PCell or PSCell if the SCell used for reference timing becomes deactivated or SSB becomes unavailable for more than 160ms. Further discuss if any behavior shall be specified.

2nd round email discussion conclusions

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**Email discussion: [95e][206] NR\_unlic\_RRM\_3**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][206] NR\_unlic\_RRM\_3 | R16 NR-U | RRM Core: Measurement requirements, Measurement capability and reporting criteria | 6.1.5.11 6.1.5.12 |

**R4-2008495 Email discussion summary for [95e][206] NR\_unlic\_RRM\_3** *Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009018 (from R4-2008495).**

**R4-2009018 Email discussion summary for [95e][206] NR\_unlic\_RRM\_3** *Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008575 | WF on NR-U RRM requirements (part 3) | Nokia |
| R4-2008576 | LS on Clarification on UE behavior after receiving the MAC CE deactivation command for semi-persistent CSI reporting in NR-U | Nokia |

**Topic #1: SFTD measurements**

Tdoc decisions

|  |  |
| --- | --- |
| Tdoc | Tdoc decision |
| R4-2006020 | Return to.  Session chair: CR marked as Return to since it included TBD. Recommend to remove TBDs or we can technically endorse it |
| R4-2006025 | Return to.  Session chair: CR marked as Return to since it included TBD. Recommend to remove TBDs or we can technically endorse it. |

**Topic #2: Remaining issues in intra and inter-frequency measurements**

Issue 2-3-1: Assumption of Q in PBCH reading

Agreement: Except for initial access, Q can be assumed to be always known at the UE

Issue 2-5-2: L1-RSRP reporting delay for semi-persistent CSI reporting with PUSCH

Agreement: For semi-persistent CSI (L1-RSRP) reporting, reuse the Rel-15 reporting delay

Issue 2-6-1 Event triggered reporting delay

Agreement: Reuse Rel-15 delay, clarifying that this measurement reporting delay excludes a delay, which is caused by no UL resources being available for UE to send the measurement report on, and all delays due to UL LBT failures until the successful transmission of the report.

Issue 2-6-2 Event triggered periodic, and periodic reporting delay

Agreement: Reuse Rel-15 delay, clarifying that this measurement reporting delay excludes a delay, which is caused by no UL resources being available for UE to send the measurement report on, and all delays due to UL LBT failures until the successful transmission of the report.

Tdoc decisions

|  |  |
| --- | --- |
| Tdoc | Tdoc decision |
| R4-2007261 | Revised |
| R4-2007262 | Revised |
| R4-2006183 | Return to |
| R4-2007695 | Revised |
| [R4-2007390](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007390.zip) | Revised |
| R4-2007692 | Revised |

**Topic #3: RSSI and CO measurements in NR-U**

Issue 3-4-2: Requirements for different RMTC configurations

Agreement: RAN4 requirements will be defined for all RMTC configurations

GTW session (June 1-2)

Issue 3-1-1: Intra-frequency and inter-frequency RSSI definition

* Candidate options
  + An intra-frequency RSSI measurement is defined when:
  + Condition 1:
    - Option 1a: Measurement BW is contained within the active BWP of the serving cell.
    - Option 1b: Subband configured for RSSI is contained within the channel/carrier BW of the UE
    - Option 1c: The center frequency of the RSSI measurement is aligned with the center frequency of a [channel] serving cell
  + Condition 2:
    - Option 2a: RMTC configured SCS is the same as the SCS of active BWP
    - Option 2b: the SCS of the RSSI measurement is the same as the SCS of an intra-frequency SSB or CSI-RS
    - Option 2c: No additional condition is needed.
    - Option 2d: the SCS configured for the RSSI measurement is the same as the SCS of a serving cell, where the SCS of a serving cell is FFS.

Discussion:

Condition 1:

MTK: Meas BW is undefined and that’s why we suggested 1b

QC: Meas BS is defined in MO

QC: agree that BWP is dynamic

* + - Option 1d: Measurement BW configured for RSSI is contained within the channel/carrier BW of the UE.

HW: we are fine with 1d. Does it mean that we need to use MG in both intra-freq and inter-freq?

QC: original intention of 1a was to avoid MG for intra-freq but since it is coupled with Active BWP it becomes challenging. In L3 CSI-RS it was decided not to use BWP in definition but limit test cases for the scenarios when CSI-RS is within BWP.

E///: Cannot accept 1a. Prefer 1c.

Apple: Prefer 1c but center freq shall be clarified. Center freq of serving cell is the Center of active BWP.

To Nokia and E///, if the Active BWP can contain the RSSI meas BW but center freq is different, then this is like a legacy inter-freq case but without MG.

MTK: MO configuration does not include the Meas BW. Need further clarification.

Apple: we can compromise to 1d.

Condition 2 / SCS

E///: need similar condition for SCS

HW: need to understand if UE needs to use SCS for the measurement. UE may use different SCS for making the measurement.

` Apple: meas granularity can be 1 symbol. So in case the SCS is different there may be challenges for measurements.

Nokia: same view as HW.

QC/MTK: same view as Apple

MTK: the question on how to handle different SCS

Agreement

* + An intra-frequency RSSI measurement is defined when:
    - RSSI channel BW is contained within the channel/carrier BW of the UE.
    - Further study whether to include SCS conditions into the definition and how to handle RSSI measurements under assumption of different SCS in RSSI, active BWP, etc.

Issue 2-4-1: To define scheduling restrictions during SS-RSRP, SS-SINR and SS-RSRQ measurement

* Candidate Options:
  + Option 1: RAN4 to define scheduling restrictions during SS-RSRP, SS-SINR and SS-RSRQ measurements in NR-U
  + Option 2: No need to define scheduling restrictions for SS-RSRP, SS-RSRQ and SS-SINR in NR-U.
* Recommendations for 2nd round: Agree on option 1

Discussion

E///: Prefer Option 2. If we consider async networks and neighbor cell measurements there will be big impact on performance. For serving cell measurements – we can follow the existing procedures.

Nokia: what is UE behavior in case there are no scheduling restriction?

E///: UE prioritize UL TX over neighbor cell measurements

MTK: support Option 1. Don’t understand why we need to deprioritize meas. In Rel-15 we already have async scenarios.

QC: Same view as MTK. The restrictions apply for 1 symbol before and after SMTC.

Apple: Same view as MTK and QC. What about mixed numerology case?

E///: for NR-U the async is more typical. If different cells have different SMTC then there may be too many dropping occasions.

Apple: One carrier may have one SMTC

E///: but are they aligned in async NW.

Apple: yes they shall be aligned

Nokia: if UE prioritizes UL TX, does it mean that we need to extend meas period

E///: SMTC will not be aligned across different cells.

Apple: SMTC is the serving cell configuration and it is NW responsibility to ensure that UE can see other cell SSBs inside.

Agreement

RAN4 to define scheduling restrictions during SS-RSRP, SS-SINR and SS-RSRQ measurements in NR-U

Issue 1-1: Maximum scaling of inter-RAT SFTD measurements

* Candidate options:
  + Option 1: k = 3
  + Option 2: k = 4
* Recommendations for 2nd round:
  + Continue the discussions. Would companies agree to k = 4? The original proposals were k = 10 and k =2, so these options are already a compromise.

Issue 2-4-2: Applicability of the signaling of SMTC2 to NR-U

* Candidate Options:
  + Option 1: The signaling of smtc2 is not applicable in unlicensed band.
  + Option 2: Signaling of smtc2 is applicable to unlicensed band.
  + Option 3: Send a LS to RAN1/RAN2 about this issue.
* Recommendations for 2nd round: Continue the discussions. As most companies can’t agree on Option 1, discuss preferences on a final decision with Option 2 or gathering more information from RAN1/2 with Option 3.

Issue 2-4-3: Different scheduling restriction when deriveSSB\_IndexFromCell is enabled, or not enabled, during SS-RSRQ measurements. & Issue 2-4-4: Different scheduling restriction when deriveSSB\_IndexFromCell is enabled during SS-RSRP and SS-SINR measurements.

* Candidate Options:
  + Option 1: In NR-U, scheduling restriction should depend on the signaling of deriveSSB\_IndexFromCell.
  + Option 2: No differentiation on the scheduling restriction for when deriveSSB\_IndexFromCell is enabled or not.

Issue 2-4-5: Scheduling restriction of UE performing measurements with a different subcarrier spacing than PDSCH/PDCCH.

* Candidate Options:
  + Option 1: In NR-U, the scheduling restriction of UE performing measurements with a different subcarrier spacing than PDSCH/PDCCH (clause 9.2.5.3.2 in TS 38.133) is applicable.
  + FFS: scheduling restriction to intra-band and inter-band CA.

2nd round email discussion conclusions

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**R4-2008552 WF on NR-U RRM Requirements (Part 1)**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2008567 WF on NR-U RRM Requirements (Part 2)**

*Type: other For: Approval  
 Source: MediaTek*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2008575 WF on NR-U RRM Requirements (Part 3)**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009249 (from R4-2008575).**

**R4-2009249 WF on NR-U RRM Requirements (Part 3)**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

**R4-2008553 Analysis of missing NR-U sections for TS 38.133**

*Type: other For: Approval  
 Source: ZTE*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2008554 Analysis of missing NR-U sections for TS 36.133**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2008576 LS on Clarification on UE behavior after receiving the MAC CE deactivation command for semi-persistent CSI reporting in NR-U**

*Type: LS out For: Approval  
 to [RAN1], cc TBD  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Return to.**

##### 6.1.5.1 General (specification structure, etc) [NR\_unlic-Core]

**R4-2006010 CR for spec structure to address NR-U in 38.133 v3**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0593 Cat: B (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

.

**Decision: Revised to R4-2008556 (from R4-2006010).**

**R4-2008556 CR for spec structure to address NR-U in 38.133 v3**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0593 Cat: B (Rel-16)  
  
 Source: ZTE Corporation*

**Discussion:**

.

**Decision: Return to.**

**R4-2008555 CR for spec structure to address NR-U in 36.133**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2006011 Discussion on approaches to address NR-U in 38.133 v3**

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

**Discussion:**

.

**Decision: Noted.**

**R4-2006976 Updates to general section for NR-U in 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6846 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Technically endorsed CR R4-2005362 with additional minor updates based on agreements in RAN4#94bis-e

**Discussion:**

.

**Decision: Revised to R4-2008557 (from R4-2006976).**

**R4-2008557 Updates to general section for NR-U in 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6846 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Technically endorsed CR R4-2005362 with additional minor updates based on agreements in RAN4#94bis-e

**Discussion:**

.

**Decision: Return to.**

**R4-2006977 Updates to general section for NR-U in 38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0710 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Technically endorsed CR R4-2005361 with additional minor updates based on agreements in RAN4#94bis-e

**Discussion:**

**Decision: Revised to R4-2008558 (from R4-2006977).**

**R4-2008558 Updates to general section for NR-U in 38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0710 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Technically endorsed CR R4-2005361 with additional minor updates based on agreements in RAN4#94bis-e

**Discussion:**

**Decision: Revised to R4-2009251 (from R4-2008558).**

**R4-2009251 Updates to general section for NR-U in 38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0710 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Technically endorsed CR R4-2005361 with additional minor updates based on agreements in RAN4#94bis-e

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

**R4-2008012 On NR-U terminology**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

NR-U terminology

**Discussion:**

.

**Decision: Noted.**

##### 6.1.5.2 Cell re-selection [NR\_unlic-Core]

**R4-2006152 Remaining issues on cell reselection in NR-U**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

.

**Decision: Noted.**

**R4-2007696 CR on introduction of RRC\_IDLE state moblity requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0769 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008568 (from R4-2007696).**

**R4-2008568 CR on introduction of RRC\_IDLE state moblity requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0769 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007697 CR on introduction of RRC\_INACTIVE state moblity requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0770 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008569 (from R4-2007697).**

**R4-2008569 CR on introduction of RRC\_INACTIVE state moblity requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0770 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007701 Discussion on cell reselection for NR-U**

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

**Discussion:**

**Decision: Noted.**

**R4-2007894 Remaining discussions on IDLE mode cell re-selection requirements for NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss the remaining issues of IDLE mode requirements.

**Discussion:**

**Decision: Noted.**

**R4-2007895 UE behaviour after measurement failure due to LBT for RRC\_IDLE state mobility requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0855 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR to capture the UE behaviour for the IDLE mode requirements.

**Discussion:**

**Decision: Withdrawn.**

**R4-2007896 UE behaviour after measurement failure due to LBT for RRC\_IDLE state inter-RAT mobility requirements for NR-U**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6900 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR to capture the UE behaviour for the inter-RAT requirements.

**Discussion:**

**Decision: Revised to R4-2008570 (from R4-2007896).**

**R4-2008570 UE behaviour after measurement failure due to LBT for RRC\_IDLE state inter-RAT mobility requirements for NR-U**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6900 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR to capture the UE behaviour for the inter-RAT requirements.

**Discussion:**

**Decision: Return to.**

**R4-2007978 UE behaviour after measurement failure due to LBT for RRC\_IDLE state mobility requirements for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: Ericsson*

**Abstract:**

CR to capture the UE behaviour for the IDLE mode requirements.

**Discussion:**

**Decision: Not pursued.**

##### 6.1.5.3 Handover [NR\_unlic-Core]

**R4-2006153 Remaining issues in NR-U HO requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2007259 CR to TS 36.133: adding handover to NR-U**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6854 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This document introduces a new clause to TS 36.133, for the requirements of handover to NR-U. And propose editorial corrections for clause 5.3.4. This is the formal CR submission from the endorsed draft CR: R4-2005363.

**Discussion:**

**Decision: Revised to R4-2008559 (from R4-2007259).**

**R4-2008559 CR to TS 36.133: adding handover to NR-U**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6854 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This document introduces a new clause to TS 36.133, for the requirements of handover to NR-U. And propose editorial corrections for clause 5.3.4. This is the formal CR submission from the endorsed draft CR: R4-2005363.

**Discussion:**

**Decision: Return to.**

**R4-2007260 CR to TS 38.133: adding NR-U Handover.**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0718 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This CR introduces a new clause to TS 38.133, which captures the NR-U handover agreements. This is the formal CR submission from the endorsed draft CR: R4-2005364.

**Discussion:**

**Decision: Revised to R4-2008560 (from R4-2007260).**

**R4-2008560 CR to TS 38.133: adding NR-U Handover.**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0718 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This CR introduces a new clause to TS 38.133, which captures the NR-U handover agreements. This is the formal CR submission from the endorsed draft CR: R4-2005364.

**Discussion:**

**Decision: Revised to R4-2009138 (from R4-2008560).**

**R4-2009138 CR to TS 38.133: adding NR-U Handover.**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0718 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This CR introduces a new clause to TS 38.133, which captures the NR-U handover agreements. This is the formal CR submission from the endorsed draft CR: R4-2005364.

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

**R4-2007897 Remaining discussions on handover requirements for NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss the remaining issues of handover requirements.

**Discussion:**

**Decision: Noted.**

**R4-2007898 Removal of editor’s note in NR-U inter-RAT handover requirements**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6901 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Changes to remove editors note in inter-RAT requirements CR.

**Discussion:**

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

**R4-2007899 Removal of Editor’s note in NR-U handover requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0856 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Changes to remove editors note in IDLE mode requirements CR.

**Discussion:**

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

**R4-2007979 Removal of editor’s note in NR-U inter-RAT handover requirements**

*Type: draftCR For: Endorsement  
 36.133 v16.5.0  
 Source: Ericsson*

**Abstract:**

Changes to remove editors note in inter-RAT requirements CR.

**Discussion:**

**Decision: Postponed.**

**R4-2007980 Removal of Editor’s note in NR-U handover requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: Ericsson*

**Abstract:**

Changes to remove editors note in IDLE mode requirements CR.

**Discussion:**

**Decision: Postponed.**

##### 6.1.5.4 RRC connection mobility control [NR\_unlic-Core]

**R4-2006009 UE behavior in RRC release with re-direction in NR-U**

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

**Abstract:**

This paper discusses UE behavior when L2,max is exceeded in release with re-direction.

**Discussion:**

**Decision: Noted.**

**R4-2006154 On RRC release with redirection in NR-U**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2006563 CR to TS 38.133: RRC re-establishment with CCA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0676 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

**Decision: Revised to R4-2008561 (from R4-2006563).**

**R4-2008561 CR to TS 38.133: RRC re-establishment with CCA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0676 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

**Decision: Return to.**

**R4-2007986 Further analysis of RRC re-establishment requirements in NR-U**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

This paper provides further analysis of RRC re-establishment requirements in NR-U based on latest RAN2 LS in R2-2003973.

**Discussion:**

**Decision: Noted.**

**R4-2007987 Further analysis of RRC release with redirection requirements in NR-U**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

This paper provides further analysis of RRC release with redirection requirements in NR-U based on latest RAN2 LS in R2-2003973.

**Discussion:**

**Decision: Noted.**

**R4-2007988 RRC release with redirection requirements in NR-U in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: Ericsson*

**Abstract:**

This CR contains RRC release with redirection requirements in NR-U in 38.133

**Discussion:**

**Decision: Revised to R4-2008562 (from R4-2007988).**

**R4-2008562 RRC release with redirection requirements in NR-U in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: Ericsson*

**Abstract:**

This CR contains RRC release with redirection requirements in NR-U in 38.133

**Discussion:**

**Decision: Return to.**

**R4-2007989 RRC release with redirection requirements in NR-U in 36.133**

*Type: draftCR For: Endorsement  
 36.133 v16.5.0  
 Source: Ericsson*

**Abstract:**

This CR contains RRC release with redirection requirements in NR-U in 36.133

**Discussion:**

**Decision: Revised to R4-2008563 (from R4-2007989).**

**R4-2008563 RRC release with redirection requirements in NR-U in 36.133**

*Type: draftCR For: Endorsement  
 36.133 v16.5.0  
 Source: Ericsson*

**Abstract:**

This CR contains RRC release with redirection requirements in NR-U in 36.133

**Discussion:**

**Decision: Return to.**

##### 6.1.5.5 SCell activation/deactivation (delay and interruption) [NR\_unlic-Core]

**R4-2006155 On Scell activation and deactivation requirements in NR-U**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2006175 Introduction of activation and deactivation delay requirements for SCells operating with CCA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0612 Cat: B (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

This CR introduces Scell activation/deactivation requirements for NR-U

**Discussion:**

**Decision: Revised to R4-2008564 (from R4-2006175).**

**R4-2008564 Introduction of activation and deactivation delay requirements for SCells operating with CCA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0612 Cat: B (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

This CR introduces Scell activation/deactivation requirements for NR-U

**Discussion:**

**Decision: Return to.**

**R4-2007968 On SCell activation delay in NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On SCell activation delay in NR-U

**Discussion:**

**Decision: Noted.**

##### 6.1.5.6 PSCell addition/release (delay and interruption) [NR\_unlic-Core]

**R4-2006156 Remaining issues on PSCell addition and release in NR-U**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2006176 Introduction of addition and release of NR PSCell operating with CCA in EN-DC**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6837 Cat: B (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

This CR introduces PSCell addition/release requirements for NR-U

**Discussion:**

**Decision: Revised to R4-2008565 (from R4-2006176).**

**R4-2008565 Introduction of addition and release of NR PSCell operating with CCA in EN-DC**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6837 Cat: B (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

This CR introduces PSCell addition/release requirements for NR-U

**Discussion:**

**Decision: Revised to R4-2009252 (from R4-2008565).**

**R4-2009252 Introduction of addition and release of NR PSCell operating with CCA in EN-DC**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6837 Cat: B (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Abstract:**

This CR introduces PSCell addition/release requirements for NR-U

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

**R4-2007972 On PSCell addition in NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On PSCell addition in NR-U

**Discussion:**

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

##### 6.1.5.7 Active TCI state switching [NR\_unlic-Core]

**R4-2007143 TCI state switching under NR-U**

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

**Abstract:**

Though we are waiting for RAN2 reply LS on this matter, we propose to re-think the options and discuss in RAN4 internally because declaring beam failure might not be of help to solve the problem.

**Discussion:**

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

**R4-2007694 CR on introduction of Active TCI state switching delay with CCA Requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0767 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008566 (from R4-2007694).**

**R4-2008566 CR on introduction of Active TCI state switching delay with CCA Requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0767 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007704 Discussion on TCI state switch for NR-U**

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

**Discussion:**

**Decision: Noted.**

**R4-2007969 On active TCI state switching requirements in NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On active TCI state switching requirements in NR-U

**Discussion:**

**Decision: Noted.**

**R4-2008280 TCI state switching under NR-U**

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

**Abstract:**

Though we are waiting for RAN2 reply LS on this matter, we propose to re-think the options and discuss in RAN4 internally because declaring beam failure might not be of help to solve the problem.

**Discussion:**

**Decision: Noted.**

##### 6.1.5.8 Interruptions due to operation in non-NR-U serving cells [NR\_unlic-Core]

##### 6.1.5.9 Active BWP switching [NR\_unlic-Core]

**R4-2006012 On BWP switch in NR-U**

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

**Discussion:**

.

**Decision: Noted.**

**R4-2006157 Remaining issues on new UL BWP switching requirements in NR-U**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2007693 CR on introduction of Active BWP switching delay requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0766 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008571 (from R4-2007693).**

**R4-2008571 CR on introduction of Active BWP switching delay requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0766 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007700 Discussion on Active BWP switch delay for NR-U**

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

**Discussion:**

**Decision: Noted.**

**R4-2007983 Analysis of open issues in BWP switching requirement due to consistent UL failure**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

This paper analyzes remaining issues related to delay requirements for BWP switching in NR-U under consistent LBT failures

**Discussion:**

**Decision: Noted.**

**R4-2007984 BWP switching interruption requirement due to consistent UL failure in 38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0869 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR on interruption requirements on NR serving cells for BWP switching in NR-U under consistent LBT failures. This CR was endorsed in R4-2004404 in RAN4#94-ebis.

**Discussion:**

**Decision: Agreed.**

**R4-2007985 Interruption due to BWP switching at consistent UL failure in 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6907 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR on interruption requirements on LTE serving cells for BWP switching in NR-U under consistent LBT failures in 36.133. This CR was endorsed in R4-2004405 in RAN4#94-ebis.

**Discussion:**

**Decision: Agreed.**

##### 6.1.5.10 RLM and link recovery procedures [NR\_unlic-Core]

**R4-2006014 Discussion on RLM in NR-U**

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

**Discussion:**

**Decision: Noted.**

**R4-2006158 On RLM requirements in NR-U**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2006858 Discussion on RLM requirement for NR-U**

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

**Discussion:**

**Decision: Noted.**

**R4-2007263 CR to 38.133: clarification of RLM requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0720 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This CR removes the word "candidates" from the RLM requirements, following the recomendation in the incoming RAN1 LS: R4-2006124

**Discussion:**

**Decision: Not pursued.**

**R4-2007264 Discussion on RLM requirements in NR-U**

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

**Abstract:**

This document discusses RLM requirements for NR-U

**Discussion:**

**Decision: Noted.**

**R4-2007341 On RLM for NR-U**

*Type: discussion For: Approval  
 Source: OPPO*

**Discussion:**

**Decision: Noted.**

**R4-2007387 Beam management in NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the BFD and CBD requirements in NR-U.

**Discussion:**

**Decision: Noted.**

**R4-2007388 CR: Introduction of link recovery requirements with CCA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0724 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the BFD/CBD requirements with CCA.

**Discussion:**

**Decision: Revised to R4-2008572 (from R4-2007388).**

**R4-2008572 CR: Introduction of link recovery requirements with CCA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0724 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the BFD/CBD requirements with CCA.

**Discussion:**

**Decision: Return to.**

**R4-2007698 CR on removing candidate in RLM requirements in Rel-15**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0771 Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Not pursued.**

**R4-2007699 CR on removing candidate in RLM requirements in Rel-16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0772 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Not pursued.**

**R4-2007703 Discussion on RLM and link recovery for NR-U**

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

**Discussion:**

**Decision: Noted.**

**R4-2007970 On RLM in NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On RLM in NR-U

**Discussion:**

**Decision: Noted.**

**R4-2007971 Introduction of RLM requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0868 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Introduction of RLM requirements for NR-U

**Discussion:**

**Decision: Revised to R4-2008573 (from R4-2007971).**

**R4-2008573 Introduction of RLM requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0868 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Introduction of RLM requirements for NR-U

**Discussion:**

**Decision: Return to.**

##### 6.1.5.11 Measurement requirements [NR\_unlic-Core]

**R4-2006019 Discussion on inter-RAT SFTD measurement towards NR-U**

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

**Abstract:**

This paper discusses some pending issues in inter-RAT SFTD measurement in NR-U.

**Discussion:**

**Decision: Noted.**

**R4-2006020 CR to address NR-U in inter-RAT SFTD measurements in 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6827 Cat: B (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

Formal version of draft CR R4-2005376, which was endorsed in the last meeting.

**Discussion:**

**Decision: Revised to R4-2009101 (from R4-2006020).**

**R4-2009101 CR to address NR-U in inter-RAT SFTD measurements in 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6827 Cat: B (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

Formal version of draft CR R4-2005376, which was endorsed in the last meeting.

**Discussion:**

**Decision: Return to.**

**R4-2006021 L1-RSRP measurement in NR-U**

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

**Abstract:**

This paper discusses some pending issues in L1-RSRP measurement in NR-U

**Discussion:**

**Decision: Noted.**

**R4-2006022 UE behaviour under successive UL LBT failures during event-triggered reporting**

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

**Abstract:**

This paper discusses some pending issues left from last meeting

**Discussion:**

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

**R4-2006023 PBCH payload reading for SSB index identification in NR-U**

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

**Discussion:**

**Decision: Noted.**

**R4-2006025 CR to address NR-U in EN-DC SFTD measurements in 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6828 Cat: B (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

Formal version of draft CR R4-2004845, which was endorsed in the last meeting.

**Discussion:**

**Decision: Revised to R4-2009102 (from R4-2006025).**

**R4-2009102 CR to address NR-U in EN-DC SFTD measurements in 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6828 Cat: B (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

Formal version of draft CR R4-2004845, which was endorsed in the last meeting.

**Discussion:**

**Decision: Return to.**

**R4-2006026 Pending issues on cell detection and serving cell measurement under NR-U**

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

**Abstract:**

This paper discusses some pending issues left from last meeting

**Discussion:**

**Decision: Noted.**

**R4-2006159 Remaining issues on measurement requirements in NR-U**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2006160 On RSSI and CO measurements in NR-U**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2006182 Remaining issues on serving cell evaluation in RRC connected mode for NR-U**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Apple*

**Discussion:**

**Decision: Noted.**

**R4-2006859 Discussion on SFTD measurements towards NR-U with LBT**

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

**Discussion:**

**Decision: Noted.**

**R4-2006860 Discussion on Scheduling Restriction for NR-U**

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

**Discussion:**

**Decision: Noted.**

**R4-2006861 Discussion on RSSI measurement for NR-U**

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

**Discussion:**

**Decision: Noted.**

**R4-2007261 CR to TS 38.133: adding NR-U inter-frequency measurements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0719 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This CR introduces a new clause to TS 38.133, which captures the NR-U inter-frequency measurement agreements.

**Discussion:**

**Decision: Revised to R4-2008577 (from R4-2007261).**

**R4-2008577 CR to TS 38.133: adding NR-U inter-frequency measurements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0719 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This CR introduces a new clause to TS 38.133, which captures the NR-U inter-frequency measurement agreements.

**Discussion:**

**Decision: Return to.**

**R4-2007262 CR to TS 36.133: adding inter-RAT NR-U measurements**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6855 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This CR introduces new clauses to TS 36.133, to add inter-RAT NR-U measurement requiremetns.

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008578 (from R4-2007262).**

**R4-2008578 CR to TS 36.133: adding inter-RAT NR-U measurements**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6855 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This CR introduces new clauses to TS 36.133, to add inter-RAT NR-U measurement requiremetns.

**Discussion:**

**Decision: Return to.**

**R4-2007265 RSSI and Channel Occupancy Measurements in NR-U**

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

**Abstract:**

This document discusses RSSI and CO measurements in NR-U

**Discussion:**

**Decision: Noted.**

**R4-2007266 SSB measurements in NR-U**

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

**Abstract:**

This document discusses SSB measurements in NR-U.

**Discussion:**

**Decision: Noted.**

**R4-2007267 On the impact of UL LBT failure in measurement reporting**

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

**Abstract:**

This document discusses the effect of UL LBT failure during measurement reporting

**Discussion:**

**Decision: Noted.**

**R4-2007268 Discussion on L1-RSRP measurements in NR-U**

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

**Abstract:**

This document discusses L1-RSRP measurements in NR-U

**Discussion:**

**Decision: Noted.**

**R4-2007389 L1-RSRP measurements in NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the L1-RSRP measurement requirements in NR-U.

**Discussion:**

**Decision: Noted.**

**R4-2007390 CR: Introduction of L1-RSRP measurement requirements with CCA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0725 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the L1-RSRP measurement requirements with CCA.

**Discussion:**

**Decision: Revised to R4-2008580 (from R4-2007390).**

**R4-2008580 CR: Introduction of L1-RSRP measurement requirements with CCA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0725 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the L1-RSRP measurement requirements with CCA.

**Discussion:**

**Decision: Return to.**

**R4-2007692 CR on introduction of intra-frequency measurements requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0765 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008581 (from R4-2007692).**

**R4-2008581 CR on introduction of intra-frequency measurements requirements for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0765 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007702 Discussion on measurement requirements for NR-U**

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

**Discussion:**

**Decision: Noted.**

**R4-2007967 On RSSI and channel occupancy measurement requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On RSSI and channel occupancy measurement requirements

**Discussion:**

**Decision: Noted.**

**R4-2007973 On intra-frequency measurements in NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On intra-frequency measurements in NR-U

**Discussion:**

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

**R4-2007974 On inter-frequency measurements in NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On inter-frequency measurements in NR-U

**Discussion:**

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

**R4-2008011 On intra-frequency and inter-frequency measurements in NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On intra-frequency and inter-frequency measurements in NR-U

**Discussion:**

**Decision: Noted.**

##### 6.1.5.12 Measurement capability and reporting criteria [NR\_unlic-Core]

**R4-2006161 On measurement capabilities and reporting criteria in NR-U**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2006183 CR on UE measurements capability and reporting criteria for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0617 Cat: B (Rel-16)  
  
 Source: Apple*

**Discussion:**

**Decision: Return to.**

**R4-2006775 On pending issues of reporting delay in NR-U**

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

**Discussion:**

**Decision: Noted.**

**R4-2007695 CR on introduction of reporting criteria for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0768 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008579 (from R4-2007695).**

**R4-2008579 CR on introduction of reporting criteria for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0768 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2009255 (from R4-2008579).**

**R4-2009255 CR on introduction of reporting criteria for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0768 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

**R4-2007975 On measurement reporting criteria for NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On measurement reporting criteria for NR-U

**Discussion:**

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

##### 6.1.5.13 Timing [NR\_unlic-Core]

**R4-2006013 on uplink transmit timing requirements for NR-U**

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

**Discussion:**

.

**Decision: Noted.**

**R4-2006162 Remaining issues in NR-U timing requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2006862 Discussion on timing requirement for NR-U**

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

**Discussion:**

**Decision: Noted.**

**R4-2006863 CR for timing requirement for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0701 Cat: B (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Revised to R4-2008574 (from R4-2006863).**

**R4-2008574 CR for timing requirement for NR-U**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0701 Cat: B (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Return to.**

**R4-2007094 On the timing reference cell adaptation under DL LBT failure in reference cell**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

We provide our reasoning for the undecided texts in this contribution.

**Discussion:**

**Decision: Noted.**

**R4-2007097 Draft CR on UE transmit timing accuracy and timing reference cell under DL LBT failure**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: Ericsson*

**Abstract:**

A draft CR has been approved in last meeting, for which some texts were in brackets. We provide our opinion in these sentences in brackets.

**Discussion:**

**Decision: Not pursued.**

##### 6.1.5.14 Others [NR\_unlic-Core]

**R4-2007787 On inter-RAT SFTD for NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we are providing input to remaining issues for inter-RAT SFTD in NR-U.

**Discussion:**

**Decision: Noted.**

### 6.2 Cross Link Interference (CLI) handling and Remote Interference Management (RIM) for NR [NR\_CLI\_RIM]

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**Email discussion: [95e][207] NR\_CLI\_RIM\_RRM**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][207] NR\_CLI\_RIM\_RRM | R16 NR CLI | RRM Core maintenance | 6.2 |

**R4-2008496 Email discussion summary for [95e][207] NR\_CLI\_RIM\_RRM** *Type: other For: Information  
 Source: Moderator (LGE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009019 (from R4-2008496).**

**R4-2009019 Email discussion summary for [95e][207] NR\_CLI\_RIM\_RRM** *Type: other For: Information  
 Source: Moderator (LGE)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

**Topic #1: CLI core requirement maintenance**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007825 | Agreed |

**Topic #2: CLI performance requirements**

Issue 2-1: Define AoA setup for FR2 tests

Agreements: AoA setup#1 for FR2 test cases

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007826 | Revised (need to remove [ ] and change the TBD) |
| R4-2006692 | Agreed |
| R4-2007828 | Agreed |
| R4-2007829 | Revised (need to capture AoA setup) |
| R4-2007830 | Agreed |
| R4-2007831 | Revised (need to capture AoA setup) |

2nd round email discussion conclusions

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#### 6.2.1 General [NR\_CLI\_RIM-Core]

#### 6.2.2 RRM core requirements maintenance (38.133) [NR\_CLI\_RIM-Core]

**R4-2007825 CR on CLI measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0836 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

#### 6.2.3 RRM perf. requirements (38.133) [NR\_CLI\_RIM-Perf]

##### 6.2.3.1 CLI measurement accuracy [NR\_CLI\_RIM-Perf]

**R4-2007826 CR on CLI measurement performance requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0837 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Revised to R4-2008582 (from R4-2007826).**

**R4-2008582 CR on CLI measurement performance requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0837 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

##### 6.2.3.2 Test cases [NR\_CLI\_RIM-Perf]

**R4-2006691 Discussion on test setup for FR2**

*Type: discussion For: (not specified)  
 Source: LG Electronics Inc.*

**Discussion:**

**Decision: Noted.**

**R4-2006692 CR for event triggered reporting tests for CLI**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0682 Cat: B (Rel-16)  
  
 Source: LG Electronics Inc.*

**Discussion:**

**Decision: Agreed.**

**R4-2007827 Discussion on AoA setup for CLI test cases**

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

**Discussion:**

**Decision: Noted.**

**R4-2007828 CR on test cases for SRS-RSRP measurement accuracy in FR1**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0838 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Agreed.**

**R4-2007829 CR on test cases for SRS-RSRP measurement accuracy in FR2**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0839 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008583 (from R4-2007829).**

**R4-2008583 CR on test cases for SRS-RSRP measurement accuracy in FR2**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0839 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007830 CR on test cases for CLI-RSSI measurement accuracy in FR1**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0840 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Agreed.**

**R4-2007831 CR on test cases for CLI-RSSI measurement accuracy in FR2**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0841 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008584 (from R4-2007831).**

**R4-2008584 CR on test cases for CLI-RSSI measurement accuracy in FR2**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0841 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2008131 On choice of CLI test setup**

*Type: discussion For: Agreement  
 38.133 v..  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

More comments are provided on choice of test setup for CLI

**Discussion:**

**Decision: Noted.**

##### 6.2.3.3 Others [NR\_CLI\_RIM-Perf]

### 6.3 NR mobility enhancement [NR\_Mob\_enh]

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

**Email discussion: [95e][208] NR\_Mob\_enh\_RRM**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][208] NR\_Mob\_enh\_RRM | R16 NR Mob Enh | RRM Core requirements | 6.3 |

**R4-2008497 Email discussion summary for [95e][208] NR\_Mob\_enh\_RRM** *Type: other For: Information  
 Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009020 (from R4-2008497).**

**R4-2009020 Email discussion summary for [95e][208] NR\_Mob\_enh\_RRM** *Type: other For: Information  
 Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

**General**

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008585 | WF on NR Mobility Enhancements | Intel |

**Topic #1: DAPS handover**

Issue 1-4 Definition of asynchronous DAPS HO for intra-frequency or intra-band scenarios shall be based on:

Agreement: If side condition for sync is not met, async DAPS HO is assumed. (agreement in RNA4#94-e-bis)

Issue 1-5 Additional note for sync condition:

Agreement: 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. (agreement in RNA4#94-e-bis)

Issue 1-6 Response to RAN1 LS (R1-2003058):

Agreement: RAN4 doesn’t need to reply RAN1 LS

Issue 1-7 LS to RAN2 on misalignment between RAN2 and RAN4 on the following capabilities:

Agreement: Since RAN2 is already aware of this, it is not necessary to send this LS.

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006979 | Revised |
| R4-2006544 | Merged |
| R4-2007760 | Merged |
| R4-2008194 | Merged |

**Topic #2: Conditional handover**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006546 | Return to  Session chair: CR marked as return to since it includes []. Recommend to remove [] or we can technically endorse it. |

**Topic #3: Conditional PSCell addition/change**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007762 | Agreed |

2nd round email discussion conclusions

GTW session (June 3, 2020)

**Issue 1-3:** definition of **synchronous** DAPS HO for intra-frequency or intra-band scenarios shall be based on:

Option 1: 3us MRTD and 5.21 us MTTD between source and target cells. (QC, MTK, Intel, Apple, E///)

Option 2: 6us MRTD and 7.6 us MTTD between source and target cells. (HW, China Telecom, E///)

Option 3: further split the capability for sync into:

1) Support of tight synchronous (co-located source and target cells) DAPS handover

2) Support of loose sync (non-co-located source and target cells) and async DAPS handover

Discussion

HW: During 2nd round MTK said they can compromise to Option 2 under assumption of certain performance degradation. CMCC also accepted Option 2. Option 2 is already a compromise. Do not want to limit DAPS HO to co-located scenarios.

China Telecom: Option 1 will limit DAPS applicability to co-located scenario. Option 2 can be implemented based on single FFT. We do not agree with additional interruption with Option 2. Demod impact can be expected but cell-edge UEs already have low MCS and impact on performance

QC: Disagree that O1 limits applicability to co-located deployments. For homogeneous deployments UE triggers HO when the difference b/w the 2 cells is comparable and MRTD/MTTD is close to co-located case. Don’t think MTK proposal is helpful

E///: UE performance when MRTD/MTTD exceed CP the performance will be affected. We can agree on O2 with additional clarifications but in the end it will almost similar to O1.

MTK: for O2 we suggested a note that 1) if MRTD exceeds CP then there will be performance loss. 2) UE is not required to complete UL/DL transmission less than particular period of time.

Intel: for 2nd note from MTK, this is quite similar to interruption.

Note 2 from MTK

A UE is not expected to transmit in the uplink earlier than after the end of the last received downlink symbol in the same cell where is given by Table 1.

A UE is not expected to receive in the downlink earlier than after the end of the last transmitted uplink symbol in the same cell where is given by Table 1.

Tentative agreement

Option 1: Definition of **synchronous** DAPS HO for intra-frequency or intra-band scenarios shall be based on

6us MRTD and 7.6us MTTD between source and target cells.

Note 1:

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

Note 2:

A UE is not expected to transmit in the uplink earlier than after the end of the last received downlink symbol in the same cell where is given by Table 1.

A UE is not expected to receive in the downlink earlier than after the end of the last transmitted uplink symbol in the same cell where is given by Table 1.

~~Option 2: further split the capability for sync into the following~~

1. ~~Support of tight synchronous (co-located source and target cells) DAPS handover~~ 
   1. ~~i.e. up to 3us MRTD and 5.21 us MTTD between source and target cells~~
2. ~~Support of loose sync (non-co-located source and target cells) DAPS handover~~
   1. ~~i.e up to 6us MRTD and 7.6 us MTTD between source and target cells~~
3. ~~Support of async DAPS handover~~
   1. ~~i.e above 6us MRTD and 7.6 us MTTD between source and target cells~~

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

**R4-2008585 WF on MR Mobility Enhancements**

*Type: other For: Approval  
 Source: Intel*

**Abstract:**

**Discussion:**

**Decision: Return to.**

#### 6.3.1 General [NR\_Mob\_enh-Core]

#### 6.3.2 RRM core requirements (38.133) [NR\_Mob\_enh-Core]

##### 6.3.2.1 Handover with simultaneous Rx/Tx with source and target cells [NR\_Mob\_enh-Core]

**R4-2006163 Remaining issues on NR DAPS HO**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2006543 Discussion on remaining issues on DAPS handover**

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

**Discussion:**

**Decision: Noted.**

**R4-2006544 CR to TS 38.133: DAPS handover RRM requirement**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0670 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

**Decision: Merged.**

**R4-2006545 Reply LS on simultaneous reception of DL signals in intra-frequency DAPS HO**

*Type: LS out For: Approval  
 to RAN1, cc RAN2  
 Source: Intel Corporation*

**Discussion:**

**Decision: Noted.**

**R4-2006887 Discussion on dual active protocol stack handover**

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

**Discussion:**

**Decision: Noted.**

**R4-2006978 Sync side conditions for NR DAPS handover**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

DAPS handover discussion

**Discussion:**

**Decision: Noted.**

**R4-2006979 Correction to DAPS HO requirements in 38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0711 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Technically endorsed CR R4-2005307 with further updates to capture threshold between sync and async source and target cell

**Discussion:**

**Decision: Revised to R4-2008586 (from R4-2006979).**

**R4-2008586 Correction to DAPS HO requirements in 38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0711 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Technically endorsed CR R4-2005307 with further updates to capture threshold between sync and async source and target cell

**Discussion:**

**Decision: Return to.**

**R4-2007287 Discussion on remaining open issues on DAPS handover**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

In this TDoc, we provide our views on side condition and the applicability of existing interruption requirements for intra frequency and intra-band inter-frequency DAPS handover

**Discussion:**

**Decision: Noted.**

**R4-2007759 Further discussion on remaining issues on DAPS handover**

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

**Discussion:**

**Decision: Noted.**

**R4-2007760 CR on DAPS handover requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0803 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Merged.**

**R4-2007761 Draft LS on UE capabilities on DAPS HO**

*Type: LS out For: Approval  
 to RAN2  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Noted.**

**R4-2008194 CR on 38133 NR DAPS handover**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0876 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction on NR DAPS handover requirements

**Discussion:**

**Decision: Merged.**

##### 6.3.2.2 Conditional handover [NR\_Mob\_enh-Core]

**R4-2006546 CR to TS 38.133: CHO RRM requirement**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0671 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

**Decision: Revised to R4-2009123 (from R4-2006546).**

**R4-2009123 CR to TS 38.133: CHO RRM requirement**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0671 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

**Decision: Return to.**

##### 6.3.2.3 Conditional PSCell addition/change [NR\_Mob\_enh-Core]

**R4-2007762 CR on conditional PSCell change requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0804 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

##### 6.3.2.4 Others [NR\_Mob\_enh-Core]

**R4-2006980 Testcases for LTE and NR mobility enhancements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Test plan for DAPS and CHO for NR and LTE

**Discussion:**

**Decision: Noted.**

### 6.4 5G V2X with NR sidelink [5G\_V2X\_NRSL]

#### 6.4.1 General [5G\_V2X\_NRSL]

#### 6.4.2 System parameters [5G\_V2X\_NRSL-Core]

#### 6.4.3 UE RF requirements [5G\_V2X\_NRSL-Core]

#### 6.4.5 RRM core requirements (38.133) [5G\_V2X\_NRSL-Core]

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

**Email discussion: [95e][209] 5G\_V2X\_NRSL\_RRM\_1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][209] 5G\_V2X\_NRSL\_RRM\_1 | R16 NR V2X | RRM Core requirements: General, TX timing, Synchronization requirements, Interruption requirements, Others | 6.4.5  6.4.5.1  6.4.5.2  6.4.5.4  6.4.5.5 |

**R4-2008498 Email discussion summary for [95e][209] 5G\_V2X\_NRSL\_RRM\_1** *Type: other For: Information  
 Source: Moderator (LGE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009021 (from R4-2008498).**

**R4-2009021 Email discussion summary for [95e][209] 5G\_V2X\_NRSL\_RRM\_1** *Type: other For: Information  
 Source: Moderator (LGE)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

**General**

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008587 | WF on NR V2X RRM Requirements | LGE, MediaTek |

**Topic #3: Interruption requirements**

Issue 3-1 Interruption for sync source change between gNB and eNB

Agreement: Define this interruption requirement for UE supporting both gNB and eNB as synchronization reference source.

Capture the spec. as follow.

When a UE supports both gNB and eNB as synchronization reference source, UE is allowed to drop NR V2X SL transmission or reception for up to 1 ms when synchronization source is changed:

* From gNB
  + to eNB
* From eNB
  + to gNB

Issue 3-2 Interruption for switching between LTE SL and NR SL

Agreement: Introduce scheduling restriction instead of interruption due to switching between LTE SL and NR SL. The RRM requirements for switching between LTE SL and NR SL shall be aligned with RF conclusion.

Issue 3-3-1 Whether to assume sync./async. between NR Uu and SL in interruption requirement to WAN

Session chair: RAN4 cannot formally agree on the work in Rel-17 since there is no formal WI. Recommend to rephrase, e.g. “Do not define requirements in Rel-16. Topic can be discussed in Rel-17 subject to approval of corresponding WI and objectives.”

Issue 3-3-2 & Issue 3-3-3 Whether a UE supporting NR SL only is not required to sync to gNB or eNB & Whether to differentiate a UE supporting NR SL only and a UE supporting both NR SL and NR WAN in interruption requirement due to synchronization reference source change

Agreement: Introduce applicability rule to interruption requirement due to synchronization source change.

Capture the spec. as follow.

When a UE supports NR V2X sidelink only, the UE is allowed to drop NR V2X SL transmission or reception for up to 1 ms when synchronization source is changed:

…

When a UE further supports both gNB and eNB as synchronization reference source, the UE is also allowed to drop NR V2X SL transmission or reception for up to 1 ms when synchronization source is changed:

Issue 3-3-4 Whether to introduce when the interruption(1ms) occurs due to sync source change happens

Agreement: Keep current spec. unchanged. Related test case will not be defined.

Issue 3-3-6 Whether to define interruption requirement on NR SL due to LTE SL sync source is changed

Agreement: Do not define interruption requirement on NR SL due to LTE SL sync source is changed

Issue 3-3-8 Whether to define interruption requirement on NR WAN due to switching between LTE SL and NR SL

Session chair: RAN4 cannot formally agree on the work in Rel-17 since there is no formal WI. Recommend to rephrase, e.g. “Do not define requirements in Rel-16. Topic can be discussed in Rel-17 subject to approval of corresponding WI and objectives.”

Issue 3-3-9 Whether to define interruption requirement on LTE WAN due to switching between LTE SL and NR SL

Session chair: RAN4 cannot formally agree on the work in Rel-17 since there is no formal WI. Recommend to rephrase, e.g. “Do not define requirements in Rel-16. Topic can be discussed in Rel-17 subject to approval of corresponding WI and objectives.”

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006222 | Revised. |
| R4-2006473 | Merged |
| R4-2006706 | Revised |

**Topic #4: Others**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006709 | Return to. CR includes [] (e.g. [20 sec] and shall be removed before approval). |
| R4-2006696 | Revised. |
| R4-2006702 | Agreed |
| R4-2006700 | Revised |

2nd round email discussion conclusions

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**Email discussion: [95e][210] 5G\_V2X\_NRSL\_RRM\_2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][210] 5G\_V2X\_NRSL\_RRM\_2 | R16 NR V2X | RRM Core requirements: Measurement accuracy | 6.4.5.3 |

**R4-2008499 Email discussion summary for [95e][210] 5G\_V2X\_NRSL\_RRM\_2** *Type: other For: Information  
 Source: Moderator (MediaTek)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009022 (from R4-2008499).**

**R4-2009022 Email discussion summary for [95e][210] 5G\_V2X\_NRSL\_RRM\_2** *Type: other For: Information  
 Source: Moderator (MediaTek)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

**Topic #1: Measurement**

Issue 3-1: Define PSBCH absolute accuracy of ±4.5dB with SNR = -6dB

Issue 3-2: Define PSBCH relative accuracy of ±2.0dB with SNR = -3dB

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006470 | Revised |
| R4-2006685 | Revised |
| R4-2007765 | Revised |

2nd round email discussion conclusions

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**R4-2008587 WF on NR V2X RRM requirements**

*Type: other For: Approval  
 Source: LGE, MediaTek*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2006671 Discussion of remaining issues for NR V2X**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Abstract:**

It discusses remaining a few issues for NR V2X RRM requirements based on the agreed WF in last meeting.

**Discussion:**

**Decision: Noted.**

**R4-2006709 CR of NR V2X editorial correction**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0687 Cat: D (Rel-16)  
  
 Source: LG Electronics Inc.*

**Abstract:**

It is editorial CR for NR V2X RRM requirements.

**Discussion:**

**Decision: Revised to R4-2009109 (from R4-2006709).**

**R4-2009109 CR of NR V2X editorial correction**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0687 Cat: D (Rel-16)  
  
 Source: LG Electronics Inc.*

**Abstract:**

It is editorial CR for NR V2X RRM requirements.

**Discussion:**

**Decision: Return to.**

##### 6.4.5.1 Transmit timing requirements [5G\_V2X\_NRSL-Core]

##### 6.4.5.2 Synchronization requirements [5G\_V2X\_NRSL-Core]

**R4-2006674 Simulation results of PSBCH-RSRP measurement accuracy**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Abstract:**

It provides measurement accuracy based on simulation results for PSBCH-RSRP measurements.

**Discussion:**

**Decision: Noted.**

##### 6.4.5.3 Measurement requirements [5G\_V2X\_NRSL-Core]

**R4-2006469 Discussion on NR V2X measurement requirement**

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

**Discussion:**

**Decision: Noted.**

**R4-2006470 CR on L1 SL-RSRP measurements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0666 Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Revised to R4-2008592 (from R4-2006470).**

**R4-2008592 CR on L1 SL-RSRP measurements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0666 Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Return to.**

**R4-2006471 Link-level simulation for NR V2X PSBCH RSRP**

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

**Discussion:**

**Decision: Noted.**

**R4-2006685 CR of NR V2X measurement accuracy requirements(SL-RSSI and L1 SL-RSRP)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0681 Cat: B (Rel-16)  
  
 Source: LG Electronics Inc.*

**Abstract:**

It is CR to introduce NR V2X measurement accuracy requirements(SL-RSSI, L1 SL-RSRP).

**Discussion:**

**Decision: Revised to R4-2008593 (from R4-2006685).**

**R4-2008593 CR of NR V2X measurement accuracy requirements(SL-RSSI and L1 SL-RSRP)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0681 Cat: B (Rel-16)  
  
 Source: LG Electronics Inc.*

**Abstract:**

It is CR to introduce NR V2X measurement accuracy requirements(SL-RSSI, L1 SL-RSRP).

**Discussion:**

**Decision: Return to.**

**R4-2006711 On NR V2X measurmeent requirement**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Abstract:**

NR V2X measurmeent requirement simulation results

**Discussion:**

**Decision: Noted.**

**R4-2007763 Simulation results of PSBCH-RSRP measurement accuracy**

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

**Discussion:**

**Decision: Noted.**

**R4-2007764 Discussion on measurement related requirements for NR V2X**

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

**Discussion:**

**Decision: Noted.**

**R4-2007765 CR on PSBCH-RSRP accuracy requirements for NR V2X**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0805 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Revised to R4-2008594 (from R4-2007765).**

**R4-2008594 CR on PSBCH-RSRP accuracy requirements for NR V2X**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0805 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

##### 6.4.5.4 Interruption requirements [5G\_V2X\_NRSL-Core]

**R4-2006222 CR on interruption requirements for NR V2X**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0636 Cat: F (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Revised to R4-2008588 (from R4-2006222).**

**R4-2008588 CR on interruption requirements for NR V2X**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0636 Cat: F (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Return to.**

**R4-2006472 Discussion on NR V2X interruption requirement**

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

**Discussion:**

**Decision: Noted.**

**R4-2006473 CR on V2X interruption**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0667 Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Merged.**

**R4-2006706 CR of interruption for switching between NR SL and LTE SL**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0686 Cat: B (Rel-16)  
  
 Source: LG Electronics Inc.*

**Abstract:**

It is CR to introduce interruption requirement for switching between NR SL and LTE SL.

**Discussion:**

**Decision: Revised to R4-2008589 (from R4-2006706).**

**R4-2008589 CR of interruption for switching between NR SL and LTE SL**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0686 Cat: B (Rel-16)  
  
 Source: LG Electronics Inc.*

**Abstract:**

It is CR to introduce interruption requirement for switching between NR SL and LTE SL.

**Discussion:**

**Decision: Return to.**

**R4-2006712 On NR V2X interruption requirement**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Abstract:**

interruption requirement, sync source change and tx switch

**Discussion:**

**Decision: Noted.**

**R4-2007766 Discussion on interruption related issues for NR V2X**

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

**Discussion:**

**Decision: Noted.**

##### 6.4.5.5 Others [5G\_V2X\_NRSL-Core]

**R4-2006696 CR of NR V2X operating band group**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0683 Cat: B (Rel-16)  
  
 Source: LG Electronics Inc.*

**Abstract:**

It is CR to introduce NR V2X operating band group.

**Discussion:**

**Decision: Revised to R4-2008590 (from R4-2006696).**

**R4-2008590 CR of NR V2X operating band group**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0683 Cat: B (Rel-16)  
  
 Source: LG Electronics Inc.*

**Abstract:**

It is CR to introduce NR V2X operating band group.

**Discussion:**

**Decision: Return to.**

**R4-2006700 CR of Annex.B for NR V2X side conditions**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0684 Cat: B (Rel-16)  
  
 Source: LG Electronics Inc.*

**Abstract:**

It is CR to introduce NR V2X measurement conditions in Annex B.

**Discussion:**

**Decision: Revised to R4-2008591 (from R4-2006700).**

**R4-2008591 CR of Annex.B for NR V2X side conditions**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0684 Cat: B (Rel-16)  
  
 Source: LG Electronics Inc.*

**Abstract:**

It is CR to introduce NR V2X measurement conditions in Annex B.

**Discussion:**

**Decision: Return to.**

**R4-2006702 CR of NR V2X abbreviations**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0685 Cat: B (Rel-16)  
  
 Source: LG Electronics Inc.*

**Abstract:**

It is CR to introduce NR V2X abbreviations for RRM requirements.

**Discussion:**

**Decision: Agreed.**

### 6.5 Integrated Access and Backhaul for NR [NR\_IAB]

#### 6.5.1 General [NR\_IAB-Core]

#### 6.5.2 RF requirements [NR\_IAB-Core]

#### 6.5.3 RRM core requirements (38.133) [NR\_IAB-Core]

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

**Email discussion: [95e][211] NR\_IAB\_RRM**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][211] NR\_IAB\_RRM | R16 NR IAB | RRM Core requirements | 6.5.3 |

**R4-2008500 Email discussion summary for [95e][211] NR\_IAB\_RRM** *Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009023 (from R4-2008500).**

**R4-2009023 Email discussion summary for [95e][211] NR\_IAB\_RRM** *Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

**Topic #1: General**

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008595 | WF on NR IAB RRM requirements | Qualcomm |

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007991 | Approved |
| R4-2008238 | Draft CR is not pursued. This is a draft CR and cannot be revised to TP. Another TP allocated instead (R4-2008596) |

**Topic #2: Details of RRC mobility control requirements**

Sub-topic#2-1 Number of supportable SMTC configurations per frequency layer

Agreement: For IAB-MTs that support four SMTC configurations per frequency layer, requirements are derived by assuming each IAB-MT can be configured up to four SMTC windows per frequency layer.

For IAB-MTs that don’t support four SMTC configurations per frequency layer, requirements are derived by assuming each IAB-MT can be configured up to two SMTC windows in intra-frequency and one SMTC window per inter-frequency layer.

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007489 | Noted |
| R4-2007993 | Revised |
| R4-2007994 | Revised |

**Topic #3: Details of MT Timing Related Requirements**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2008239 | Draft CR is not pursued. This is a draft CR and cannot be revised to TP. Another TP allocated instead (R4-2008599) |

**Topic #4: RLM requirements**

Sub-topic #4-1 Framework of RLM evaluation period

Agreement: RLM evaluation periods of IAB-MTs follow the following framework (where K1 and K2 denote the relaxation factors for FR1 and FR2 respectively):

Table 12.3.1.2.2-1: Evaluation period TEvaluate\_out\_SSB and TEvaluate\_in\_SSB for FR1

|  |  |  |
| --- | --- | --- |
| Configuration | TEvaluate\_out\_SSB (ms) | TEvaluate\_in\_SSB (ms) |
| no DRX | Max(200 × K1, Ceil(10 × P × K1) × TSSB) | Max(100 × K1, Ceil(5 × P × K1) × TSSB) |
| NOTE: TSSB is the periodicity of the SSB configured for RLM. | | |

Table 12.3.1.2.2-2: Evaluation period TEvaluate\_out\_SSB and TEvaluate\_in\_SSB for FR2

|  |  |  |
| --- | --- | --- |
| Configuration | TEvaluate\_out\_SSB (ms) | TEvaluate\_in\_SSB (ms) |
| no DRX | Max(200 × K2, Ceil(10 × P × N × K2) × TSSB) | Max(100 × K2, Ceil(5 × P × N × K2) × TSSB) |
| NOTE: TSSB is the periodicity of the SSB configured for RLM. | | |

Table 12.3.1.3.2-1: Evaluation period TEvaluate\_out\_CSI-RS and TEvaluate\_in\_CSI-RS for FR1

|  |  |  |
| --- | --- | --- |
| Configuration | TEvaluate\_out\_CSI-RS (ms) | TEvaluate\_in\_CSI-RS (ms) |
| no DRX | Max(200 × K1, Ceil(Mout×P × K1)×TCSI-RS) | Max(100 × K1, Ceil(Min×P × K1) × TCSI-RS) |
| NOTE: TCSI-RS is the periodicity of the CSI-RS resource configured for RLM. The requirements in this table apply for TCSI-RS equal to 5 ms, 10ms, 20 ms or 40 ms. | | |

Table 12.3.1.3.2-2: Evaluation period TEvaluate\_out\_CSI-RS and TEvaluate\_in\_CSI-RS for FR2

|  |  |  |
| --- | --- | --- |
| Configuration | TEvaluate\_out\_CSI-RS (ms) | TEvaluate\_in\_CSI-RS (ms) |
| no DRX | Max(200 × K2, Ceil(Mout×P × K2)×TCSI-RS) | Max(100 × K2, Ceil(Min×P × K2) × TCSI-RS) |
| NOTE: TCSI-RS is the periodicity of the CSI-RS resource configured for RLM. The requirements in this table apply for TCSI-RS equal to 5 ms, 10 ms, 20 ms or 40 ms. | | |

The agreement will be captured with the following editor’s note in the spec:

[Editor’s note: K1 and K2 will eventually be replaced by their values once RAN4 finalizes these]

Sub-topic#4-2: Beam sweeping factor N for SSB based RLM evaluation period in FR2:

Agreement: N = 8.

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006017 | Revised |

**Topic #5: Link recovery requirements**

Sub-topic#5-1: Beam sweeping factor N for IAB CBD requirements

Session chair: continue discussion given additional comments in the reflector

Sub-topic #5-2: Beam sweeping factor N for IAB BFD requirements

Agreement: For IAB BFD requirement, reuse the beam sweeping factors that were defined for UEs in Rel-15.

Sub-topic #5-3: measurement restriction requirements and minimum requirements for L1 indication during BFD of IAB-MTs.

Agreement: Re-use the measurement restriction requirements and minimum requirements for L1 indication, that were defined for UEs in Rel-15, in IAB networks

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006435 | Revised |
| R4-2007486 | Noted. pCR allocated instead (R4-2008611). |

2nd round email discussion conclusions

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

**R4-2008595 WF on NR IAB RRM requirements**

*Type: other For: Approval  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Return to.**

##### 6.5.3.1 General [NR\_IAB-Core]

**R4-2007269 RRM requirements in IAB TR and TS**

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

**Discussion:**

**Decision: Noted.**

**R4-2007991 TP to TS 38.174 v0.0.1: Adding references related to IAB**

*Type: pCR For: Approval  
 38.174 v0.0.1  
 Source: Ericsson*

**Abstract:**

This TP adds more references which are needed to remove TBDs in various parts of the spec

**Discussion:**

**Decision: Approved.**

**R4-2008196 CR on 38174 RRM IAB TS**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0877 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction on IAB RRM requirements

**Discussion:**

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

**R4-2008238 CR on 38174 RRM IAB TS**

*Type: draftCR For: Endorsement  
 38.174 v0.0.1  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction on IAB RRM requirements

**Discussion:**

**Decision: Not pursued.**

**R4-2008596 TP to 38174 RRM IAB TS**

*Type: pCR For: Approval  
38.174 v0.0.1  
Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

**Discussion:**

**Decision: Return to.**

##### 6.5.3.2 RRC connection mobility control [NR\_IAB-Core]

**R4-2007189 Pending issues on RRC mobility control for IAB-MT**

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

**Discussion:**

**Decision: Noted.**

**R4-2007488 Discussion regarding RRC Connection Mobility Control in IAB Networks**

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

**Discussion:**

**Decision: Noted.**

**R4-2007489 TP for RRC Connection Mobility Control in IAB Networks**

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

**Discussion:**

**Decision: Noted.**

**R4-2007992 Handling 4 SMTC in RRC re-establishment and redirection for IAB MT**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

This paper analyzes impact of IAB-MT handling up to 4 SMTC window in RRC re-establishment and RRC release with redirection requirements for IAB MT. RAN1 feature list was agreed in R1-2003073 and sent to RAN4 in LS in R1-2003072.

**Discussion:**

**Decision: Noted.**

**R4-2007993 TP to TS 38.174 v0.0.1: Updates to RRC re-establishment requirements for IAB MT**

*Type: pCR For: Approval  
 38.174 v0.0.1  
 Source: Ericsson*

**Abstract:**

This TP defines RRC re-establishment requirements for IAB MT

**Discussion:**

**Decision: Revised to R4-2008597 (from R4-2007993).**

**R4-2008597 TP to TS 38.174 v0.0.1: Updates to RRC re-establishment requirements for IAB MT**

*Type: pCR For: Approval  
 38.174 v0.0.1  
 Source: Ericsson*

**Abstract:**

This TP defines RRC re-establishment requirements for IAB MT

**Discussion:**

**Decision: Return to.**

**R4-2007994 TP to TS 38.174 v0.0.1: Updates to RRC re-direction requirements for IAB MT**

*Type: pCR For: Approval  
 38.174 v0.0.1  
 Source: Ericsson*

**Abstract:**

This TP defines RRC re-direction requirements for IAB MT

**Discussion:**

**Decision: Revised to R4-2008598 (from R4-2007994).**

**R4-2008598 TP to TS 38.174 v0.0.1: Updates to RRC re-direction requirements for IAB MT**

*Type: pCR For: Approval  
 38.174 v0.0.1  
 Source: Ericsson*

**Abstract:**

This TP defines RRC re-direction requirements for IAB MT

**Discussion:**

**Decision: Return to.**

##### 6.5.3.3 MT timing related requirements [NR\_IAB-Core]

**R4-2008197 discussion on Tansmit Timing requirement for IAB-MT**

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

**Abstract:**

Discussion on transmit timing requirement for IAB-MT

**Discussion:**

**Decision: Noted.**

**R4-2008198 CR on 38174 Transmit Timing requirements for IAB-MT**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0878 Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction on transmit timing requirement for IAB-MT

**Discussion:**

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

**R4-2008239 CR on 38174 Transmit Timing requirements for IAB-MT**

*Type: draftCR For: Endorsement  
 38.174 v0.0.1  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction on transmit timing requirement for IAB-MT

**Discussion:**

**Decision: Not pursued.**

**R4-2008599 TP to TS 38174 Transmit Timing requirements for IAB-MT**

*Type: pCR For: Approval  
 38.174 v0.0.1  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Return to.**

##### 6.5.3.4 RLM requirements [NR\_IAB-Core]

**R4-2006016 on RLM requirements for IAB MT**

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

**Discussion:**

**Decision: Noted.**

**R4-2006017 TP for IAB RLM**

*Type: pCR For: Approval  
 38.174 v0.0.1  
 Source: ZTE Corporation*

**Discussion:**

**Decision: Revised to R4-2008600 (from R4-2006017).**

**R4-2008600 TP for IAB RLM**

*Type: pCR For: Approval  
 38.174 v0.0.1  
 Source: ZTE Corporation*

**Discussion:**

**Decision: Return to.**

**R4-2006433 Radio Link Monitoring requirement for IAB-MT**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

**Decision: Noted.**

**R4-2007490 Discussion regarding RLM requirements of IAB-MTs**

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

**Discussion:**

**Decision: Noted.**

**R4-2007684 Discussion on RLM requirement for IAB-MT**

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

**Discussion:**

**Decision: Noted.**

##### 6.5.3.5 BFR requirements [NR\_IAB-Core]

**R4-2006015 on BFD and BFR requirements for IAB MT**

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

**Discussion:**

**Decision: Noted.**

**R4-2006434 Link Recovery requirement for IAB-MT**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

**Decision: Noted.**

**R4-2006435 TP to TS 38.174 v0.0.1: Beam Candidate Detection Requirements for IAB MT**

*Type: pCR For: Approval  
 38.174 v0.0.1  
 Source: Samsung*

**Discussion:**

**Decision: Revised to R4-2008601 (from R4-2006435).**

**R4-2008601 TP to TS 38.174 v0.0.1: Beam Candidate Detection Requirements for IAB MT**

*Type: pCR For: Approval  
 38.174 v0.0.1  
 Source: Samsung*

**Discussion:**

**Decision: Return to.**

**R4-2007486 TP regarding BFD requirements of IAB-MTs**

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

**Discussion:**

**Decision: Noted.**

**R4-2008611 TP to TS 38.174 on BFD requirements of IAB-MTs**

*Type: pCR For: Approval  
 38.174 v0.0.1  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2007487 Discussion regarding BFD and CBD requirements of IAB-MTs**

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

**Discussion:**

**Decision: Noted.**

**R4-2007683 Discussion on BFD and CBD requirement for IAB-MT**

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

**Discussion:**

**Decision: Noted.**

#### 6.5.4 EMC core requirements [NR\_IAB-Core]

### 6.6 Multi-RAT Dual-Connectivity and Carrier Aggregation enhancements [LTE\_NR\_DC\_CA\_enh]

#### 6.6.1 General [LTE\_NR\_DC\_CA\_enh-Core]

#### 6.6.2 RF requirements [LTE\_NR\_DC\_CA\_enh-Core]

#### 6.6.3 RRM core requirements (38.133) [LTE\_NR\_DC\_CA\_enh-Core]

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

**Email discussion: [95e][212] LTE\_NR\_DC\_CA\_RRM\_1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][212] LTE\_NR\_DC\_CA\_RRM\_1 | R16 MR-DC | RRM Core requirements: Early Measurement reporting, Others | 6.6.3.1  6.6.3.3 |

**R4-2008501 Email discussion summary for [95e][212] LTE\_NR\_DC\_CA\_RRM\_1** *Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009024 (from R4-2008501).**

**R4-2009024 Email discussion summary for [95e][212] LTE\_NR\_DC\_CA\_RRM\_1** *Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

**General**

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008602 | WF on MR-DC EMR RRM requirements | Nokia, Nokia Shanghai Bell |
| R4-2008603 | Big CR Introduction of UE requirement for MR-DC early measurement reporting in 38.133 | Nokia, Nokia Shanghai Bell |
| R4-2008604 | Big CR Introduction of UE requirement for MR-DC early measurement reporting in 36.133 | Nokia, Nokia Shanghai Bell |

**Topic #1: RRM core requirements for NR Inter-frequency and LTE Inter-RAT EMR in NR (38.133)**

Sub-topic#1-3 UE requirements concerning number of EMR carriers

Agreement: Total number of NR inter-frequency EMR carriers ≤7 carriers

Agreement: Total number of LTE inter-RAT EMR carriers ≤7 carriers

Sub-topic#1-4 UE requirements related to EMR and beam-level measurement capability

Session chair: continue discussion based on comment in reflector

**Topic #2: RRM core requirements for NR Inter-RAT EMR in E-UTRAN (36.133)**

Sub-topic#2-6: Beam level measurements for NR Inter-RAT EMR

Agreement: Define UE measurement capability to support beam-level measurements for EMR on inter-frequency NR carriers

2nd round email discussion conclusions

GTW session (June 3, 2020)

**Issue 1-1:** s-NonIntraSearch thresholds and EMR carriers

* Proposals

Nokia:

* s-NonIntraSearchP and s-NonIntraSearchQ do not affect the idle/inactive mode measurement procedures.
* s-NonIntraSearchP and s-NonIntraSearchQ not affecting the idle/inactive mode measurement procedures applies generically to all configured EMR carriers.
* UE NR EMR requirements capture that s-NonIntraSearchP and s-NonIntraSearchQ do not affect the idle/inactive mode measurement procedures.

Huawei:

* Though the measurement procedure is not affected by the search threshold, the EMR measurement requirements and capability can be defined based on serving cell condition and the search threshold.
* The carrier is configured for mobility measurement with equal or lower priority and Srxlev ≤ SnonIntraSearchP or Squal ≤ SnonIntraSearchQ

MediaTek:

* RAN4 to reuse the “s-NonIntraSearchP and s-NonIntraSearchQ” to define the not in cell center condition in EMR
* Candidate options:

Before the discussion started there were 2 options on the table:

1. Search thresholds do not apply to carriers configured for EMR measurements.
2. Search thresholds do not affect measurement procedures to carriers configured for EMR measurements, but the search thresholds are used to condition when EMR carriers measured.

During the meeting discussion companies have further explained their reasoning and provided their views on this topic and which of option 1 or option 2 is the company preference:

Option 1: ZTE, Nokia, Qualcomm, Ericsson

Option 2: Huawei, MediaTek

* Recommendations for 2nd round:

Most companies prefer that any configured search thresholds do not apply carrier configures for EMR (option 1). Considering the discussion during the meeting, the moderator would like to ask proponents of option 2, if they can compromise to option 1. Possible improvements and optimizations addressed by option 2 can be addressed in a later release?

Discussion

HW: Not applying search thresholds conflicts with the last meeting agreements for non-overlapping carriers. For O1 the UE behavior will be quite complex.

MTK: Share same view with HW. In connected mode, UE is not able to simultaneously measure carriers with 2 different measurement principles.

Nokia: the key discussion is how to interpret RAN2 agreement. Another way is to ask RAN2. Another way is to follow Rel-15 as stated in WID.

Huawei: Option 1 is an optimization. Currently there is a CR proposed in Rel-15 euCA which changes the UE behavior.

ZTE: we agree with Nokia that we have different interpretation of RAN2 agreement.

QC: we need more time to investigate. Not sure if Option 1 is feasible now.

Nokia: if we go with Option 2 then we’ll need to let RAN2 know.

MTK: RAN2 agreement “How the UE performs idle/inactive measurements is up to UE implementation as long as the requirement in TS38.133”

Conclusion: Send LS to RAN2 to clarify RAN2 agreement and ask feedback on 2 Options above.

Agreement

Further discuss between the 2 options

1. Search thresholds do not apply to carriers configured for EMR measurements.
2. Search thresholds do not affect measurement procedures to carriers configured for EMR measurements, but the search thresholds are used to define the EMR measurement requirements.

Send LS to RAN2 to ask whether Option 1 or 2 contradict RAN2 agreements

Chair: Agreements need to be made no later than in RAN4 #96e. In case no conclusions are reached then no requirements may be defined for this scenario.

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**Email discussion: [95e][213] LTE\_NR\_DC\_CA\_RRM\_2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][213] LTE\_NR\_DC\_CA\_RRM\_2 | R16 MR-DC | RRM Core requirements: Efficient and low latency serving cell configuration, activation and setup | 6.6.3.2 |

**R4-2008502 Email discussion summary for [95e][213] LTE\_NR\_DC\_CA\_RRM\_2** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009025 (from R4-2008502).**

**R4-2009025 Email discussion summary for [95e][213] LTE\_NR\_DC\_CA\_RRM\_2** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

**Topic #1: Direct SCell activation**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006063 | Agreed |
| R4-2007782 | Agreed |
| R4-2007785 | Revised |
| R4-2007836 | Agreed |
| R4-2007837 | Revised |

**Topic #2: SCell dormancy**

Issue 2-1-1: Switching delay non-dormancy to dormancy, general case w.r.t. parameter change

Agreement: For general case w.r.t. parameter change, and conditioned on that DCI is received within the first 3 OFDM symbols, switching between non-dormancy and dormancy follows the Rel-15 BWP switching time in Table 8.6.2-1.

Issue 2-4-1: Measurement requirements

Agreement: UE measurement requirements for a dormancy SCell are the same as activated SCell measurement requirements.

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008607 | WF on SCell dormancy | Ericsson |

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007839 | Revised |
| R4-2007840 | Revised |
| R4-2008199 | Revised (R4-2003371 is the incoming LS and cannot be revised. R4-2008199 was revised instead.) |

2nd round email discussion conclusions

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**R4-2008602 WF on MR-DC EMR RRM requirements**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2008607 WF on SCell dormancy**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2009121 LS on search threshold for EMR measurements**

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

**Abstract:**

**Discussion:**

**Decision: Return to.**

##### 6.6.3.1 Early Measurement reporting [LTE\_NR\_DC\_CA\_enh-Core]

**R4-2007281 Early measurement reporting in MR-DC**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2007965 On measurement capability for EMR**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On measurement capability for EMR

**Discussion:**

**Decision: Noted.**

**R4-2007966 Response LS on clarification of UE requirements for early measurement performance and reporting**

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

**Abstract:**

Response LS on clarification of UE requirements for early measurement performance and reporting

**Discussion:**

**Decision: Revised to R4-2009116 (from R4-2007966).**

**R4-2009116 Response LS on clarification of UE requirements for early measurement performance and reporting**

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

**Abstract:**

Response LS on clarification of UE requirements for early measurement performance and reporting

**Discussion:**

**Decision: Return to.**

###### 6.6.3.1.1 NR measurements for EMR [LTE\_NR\_DC\_CA\_enh-Core]

**R4-2007151 NR EMR requirements for 38.133**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Noted.**

**R4-2007152 TP for NR MR-DC RRM requirements for 38.133**

*Type: discussion For: Approval  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Noted.**

**R4-2007153 Big CR Introduction of UE requirement for MR-DC early measurement reporting in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Noted.**

**R4-2008603 Big CR Introduction of UE requirement for MR-DC early measurement reporting in 38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-TBD Cat: B (Rel-16)  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

**Discussion:**

Session chair: final CR shall not include [] or FFS items

**Decision: Return to.**

**R4-2007832 Discussion on early measurement in NR**

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

**Discussion:**

**Decision: Noted.**

**R4-2007833 CR to introduce EMR in 38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0842 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Return to.**

###### 6.6.3.1.2 LTE NR Inter-RAT EMR [LTE\_NR\_DC\_CA\_enh-Core]

**R4-2007154 NR inter-RAT EMR requirements for 36.133**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Noted.**

**R4-2007155 TP for NR inter-RAT EMR requirements for 36.133**

*Type: discussion For: Approval  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Noted.**

**R4-2007156 Big CR Introduction of UE requirement for MR-DC early measurement reporting in 36.133**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Noted.**

**R4-2008604 CR Introduction of UE requirement for MR-DC early measurement reporting in 36.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-TBD Cat: B (Rel-16)  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

**Discussion:**

Session chair: final CR shall not include [] or FFS items

**Decision: Return to.**

**R4-2007834 Discussion on LTE – NR inter-RAT EMR**

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

**Discussion:**

**Decision: Noted.**

**R4-2007835 CR to introduce EMR in 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6883 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Return to.**

##### 6.6.3.2 Efficient and low latency serving cell configuration, activation and setup [LTE\_NR\_DC\_CA\_enh-Core]

**R4-2007655 Further discussion on clarification of UE requirements for early measurement performance and reporting**

*Type: discussion For: Discussion  
 Source: ZTE*

**Discussion:**

**Decision: Noted.**

**R4-2007656 Reply LS on clarification of UE requirements for early measurement performance and reporting**

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

**Discussion:**

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

###### 6.6.3.2.1 Direct SCell activation [LTE\_NR\_DC\_CA\_enh-Core]

**R4-2006063 [CR] Delay requirements for direct SCell activation**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0599 Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

Formal version of draft CR R4-2005328, which was endorsed in the last meeting.

**Discussion:**

**Decision: Agreed.**

**R4-2006885 Discussion on LTE CRS based and NR SSB based measurement in NR IDLE/INACTIVE mode**

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

**Discussion:**

**Decision: Noted.**

**R4-2007343 On NR Measurement for EMR**

*Type: discussion For: Approval  
 Source: OPPO*

**Discussion:**

**Decision: Noted.**

**R4-2007654 Discussion on NR EMR measurements**

*Type: discussion For: Discussion  
 Source: ZTE*

**Discussion:**

**Decision: Noted.**

**R4-2007782 CR 38.133 (8.3.4-5) Corrections to Direct SCell activation**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0814 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Corresponding draft CR was endorsed at RAN4#94-e-Bis (R4-2005327)

**Discussion:**

**Decision: Agreed.**

**R4-2007785 CR 38.133 (8.3.4-5) Addition of interruption windows for Direct SCell Activation**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0817 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Interruption window for Rel-15 SCell activation was agreed at RAN4#94-e-Bis. In this CR we are providing corresponding interruption window definitions for Rel-16 Direct SCell activation.

**Discussion:**

**Decision: Revised to R4-2008605 (from R4-2007785).**

**R4-2008605 CR 38.133 (8.3.4-5) Addition of interruption windows for Direct SCell Activation**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0817 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Interruption window for Rel-15 SCell activation was agreed at RAN4#94-e-Bis. In this CR we are providing corresponding interruption window definitions for Rel-16 Direct SCell activation.

**Discussion:**

**Decision: Return to.**

**R4-2007836 CR on interruption requirements for direct SCell activation for 38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0843 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007837 CR on interruption requirements for direct SCell activation for 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6884 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008606 (from R4-2007837).**

**R4-2008606 CR on interruption requirements for direct SCell activation for 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6884 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

###### 6.6.3.2.2 SCell dormancy [LTE\_NR\_DC\_CA\_enh-Core]

**R4-2006520 On Scell domancy RRM requirements**

*Type: discussion For: Approval  
 Source: vivo*

**Discussion:**

**Decision: Noted.**

**R4-2006886 Discussion on NR SSB based measurement in LTE IDLE/INACTIVE mode**

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

**Discussion:**

**Decision: Noted.**

**R4-2007157 SCell Dormancy requirements discussion**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Noted.**

**R4-2007282 Scell BWP dormancy**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2007288 Discussion on RRM requirements for SCell dormancy**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

Provided our views on UE SCell dormancy switch delay requirements, UE requirements for a SCell dormancy and interruption requirements

**Discussion:**

**Decision: Noted.**

**R4-2007344 On LTE NR inter-RAT EMR**

*Type: discussion For: Approval  
 Source: OPPO*

**Discussion:**

**Decision: Noted.**

**R4-2007786 On SCell dormancy**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we are providing input on requirements for SCell dormancy.

**Discussion:**

**Decision: Noted.**

**R4-2007838 Discussion on SCell dormancy**

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

**Discussion:**

**Decision: Noted.**

**R4-2007839 CR on delay requirements for SCell dormancy**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0844 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Revised to R4-2008608 (from R4-2007839).**

**R4-2008608 CR on delay requirements for SCell dormancy**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0844 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007840 CR on interruption requirements for SCell dormancy**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0845 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Revised to R4-2008609 (from R4-2007840).**

**R4-2008609 CR on interruption requirements for SCell dormancy**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0845 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2008187 Impact analysis on dormant BWP configuration**

*Type: discussion For: Discussion  
 Source: Futurewei Technologies*

**Discussion:**

**Decision: Noted.**

**R4-2008199 Reply LS to RAN2 on dormant BWP**

*Type: LS out For: Approval  
 to RAN2, RAN1  
 Source: Futurewei Technologies*

**Discussion:**

**Decision: Revised to R4-2008610 (from R4-2008199).**

**R4-2008610 Reply LS to RAN2 on dormant BWP**

*Type: LS out For: Approval  
 to RAN2, RAN1  
 Source: Futurewei Technologies*

**Discussion:**

**Decision: Revised to R4-2009245 (from R4-2008610).**

**R4-2009245 Reply LS to RAN2 on dormant BWP**

*Type: LS out For: Approval  
 to RAN2, RAN1  
 Source: Futurewei Technologies*

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

##### 6.6.3.3 Others [LTE\_NR\_DC\_CA\_enh-Core]

### 6.7 UE power saving in NR [NR\_UE\_pow\_sav]

#### 6.7.1 General [NR\_UE\_pow\_sav]

#### 6.7.2 RRM core requirements (38.133) [NR\_UE\_pow\_sav-Core]

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**Email discussion: [95e][214] NR\_UE\_pow\_sav\_RRM**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][214] NR\_UE\_pow\_sav\_RRM | R16 NR UE Power Saving | RRM Core requirements | 6.7.2 |

**R4-2008503 Email discussion summary for [95e][214] NR\_UE\_pow\_sav\_RRM** *Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009026 (from R4-2008503).**

**R4-2009026 Email discussion summary for [95e][214] NR\_UE\_pow\_sav\_RRM** *Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

**Topic #1: RRM measurement relaxation**

Issue 2.2.1-5: Whether the measurement relaxation method for higher priority or equal/lower priority applies to inter-RAT measurement with higher priority or equal/lower priority?

Agreement: The measurement relaxation method for higher priority or equal/lower priority applies to inter-RAT measurement with higher priority or equal/lower priority.

Issue 2.2.1-6: Whether to introduce carrier specific threshold for inter-frequency measurement relaxation.

It is up to RAN2’s decision on whether to introduce carrier specific threshold for inter-frequency measurement relaxation.

Issue 2.2.1-7: When Srxlev > SnonIntraSearchP and Squal > SnonIntraSearchQ or When Srxlev ≤ SnonIntraSearchP or Squal ≤ SnonIntraSearchQ, whether UE can stop measurement on higher priority inter-frequency/inter-RAT layers, when criteria of low mobility and not in cell edge are both fulfilled.

Session chair: no consensus to change previous agreement

Issue 2.2.1-9: Triggering RRM relaxation mode

Agreement: The evaluation rate for measurement relaxation mode triggering shall be the same as current serving cell evaluation rate defined in 38.133.

Issue 2.5.1-10: Threshold mismatch between not at cell edge condition and cell center condition

Agreement: RAN4 not specify intra/inter-frequency requirement when the threshold configured for not-at-cell-edge condition is higher than that for cell center condition of “SnonIntraSearchP” or “SnonIntraSearchQ”.

• This rule also applies in “SIntraSearchP” or “SIntraSearchQ”.

Issue 2.2.2-1: EMR impact in power saving mode

Agreement: Measurements on EMR carriers should not be relaxed if T331 is running.

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008612 | WF on RRM measurement relaxation for Power Saving | CATT |

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006517 | Revised (LS on RRM measurement relaxation) |
| R4-2006221 | Revised |
| R4-2007893 | Revised |

**Topic #2: Maintenance for MIMO layer adaption**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007440 | Agreed |

GTW session (June 4, 2020)

**Issue 2.5.1-1: Scaling factor of measurement interval for scenario#1(Low mobility scenario) and scenario#2 (Not-in-cell-edge scenario)**

* Option 1: The same value (Huawei, vivo, CATT, Qualcomm, Apple, ZTE, CMCC, Nokia, Intel)
  + 2 times (ZTE, Nokia)
  + 4 times (Huawei, vivo, CATT, Qualcomm, Apple, CMCC, Intel)
* Option 2: Different value (Ericsson)
  + 4 for low mobility scenario and 2 for not-at cell edge scenario (Ericsson)

Discussion

E///: We have 2 scenarios. For scenario #2 there may be UEs with different velocity. There may be impact on mobility for high speed UEs. We have not seen any analysis. RAN1 analysis does not cover high mobility use cases.

MTK: one company has shown that there is not impact on mobility performance for either scenario. Support of 2 different scenarios is more challenging for UE.

Vivo: We did some analysis. Some analysis in RAN1 has covered high mobility. We have shown that 4 times scaling factor has min impact on mobility performance. For IncMon we suggested scaling factor 6 and it did not have significant mobility impact.

QC: Scaling factor 4 achieves higher power saving. NW can fully control mobility and cell edge criterion. Different values will result in transition stage requirements which will overcomplicate.

E///: High speed was not considered in RAN1 studies. Some companies presented simulation results but there were no formal studies and common simulation assumptions.

E///: can compromise to same value with 2 times scaling factor

MTK/CATT/Qualcomm: prefer 4 times

Intel/vivo: 3 times is possible compromise

ZTE: prefer 2 times. Can compromise to 3 or 4.

CATT: ok with 3 times to move forward

HW/Apple/QC/MTK/Ericsson: we can compromise to 3 times

Agreement

Use 3 times fixed scaling factor of measurement interval for scenario #1(Low mobility scenario) and scenario #2 (Not-in-cell-edge scenario)

**Issue 2.5.1-5: When Srxlev > SnonIntraSearchP and Squal > SnonIntraSearchQ and only criteria of low mobility is configured, if the low mobility criteria is fulfilled, what’s UE measurement behaviour?**

* Option 1: UE can stop equal/low priority measurements and the UE measures higher priority inter-frequency/inter-RAT layers at least every Thigher\_priority\_search. (vivo, CATT, ZTE, CMCC, Nokia, NEC, OPPO)
* Option 2: UE enters the scenario 3 RRM measurement relaxation (1 hour) for higher priority inter-freq measurement; while UE is not required to do any lower and equal priority inter-freq measurement. (Apple, Qualcomm, Huawei, LGE, MTK, Intel)

Discussion

LGE/MTK: support Option 2.

HW: RAN2 has sent LS with high priority flag indication.

Intel: support Option 2

Agreement

When Srxlev > SnonIntraSearchP and Squal > SnonIntraSearchQ and only criteria of low mobility is configured, if the low mobility criteria is fulfilled

UE is not required to do any lower and equal priority inter-frequency/inter-RAT measurement

When NW indicates that higher priority carrier measurements can be relaxed (highPriorityMeasRelax), UE measures higher priority inter-frequency/inter-RAT layers at least every 1 hour

When NW does not indicate that higher priority carrier measurements can be relaxed, UE measures higher priority inter-frequency/inter-RAT layers at least every Thigher\_priority\_search (60 sec)

Minimum transition period

Agreement

* When switching from scenario #1 or #2 to scenario #3, the UE shall fulfil the requirements corresponding to scenario #1 or #2 for 1 measurement period and thereafter switch to requirements corresponding to scenario #3
* When switching from scenario #3 to scenario #1 or #2, the UE shall fulfil the requirements corresponding to scenario #1 or #2 upon fulfilling the switching criteria.
* When switching from normal mode to scenario #1/#2/#3, the UE shall fulfil the requirements corresponding to normal mode for 1 measurement period and thereafter switch to requirements corresponding to scenario #1/#2/#3
* When switching from scenario #1/#2/#3 to normal mode, the UE shall fulfil the requirements corresponding to normal mode upon fulfilling the switching criteria.
* No requirements will be defined for the case of multiple transitions of scenarios within 1 measurement period

2nd round email discussion conclusions

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**R4-2008612 WF on RRM measurement relaxation for Power Saving**

*Type: other For: Approval  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009131 (from R4-2008612).**

**R4-2009131 WF on RRM measurement relaxation for Power Saving**

*Type: other For: Approval  
 Source: CATT*

**Abstract:**

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

**R4-2006518 CR for maximum MIMO layer adaptation**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0669 Cat: F (Rel-16)  
  
 Source: vivo,CATT*

**Discussion:**

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

**R4-2007440 CR for maximum MIMO layer adaptation**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0736 Cat: F (Rel-16)  
  
 Source: vivo,CATT*

**Discussion:**

**Decision: Agreed.**

##### 6.7.2.1 RRM measurement relaxation [NR\_UE\_pow\_sav-Core]

**R4-2006198 On remaining issues for RRM power saving**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Apple*

**Discussion:**

**Decision: Noted.**

**R4-2006219 Further discussion on the remaining issues for RRM measurement relaxation**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

**Decision: Noted.**

**R4-2006220 CR on measurement relaxation in idle mode for UE power saving**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0634 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

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

**R4-2006221 CR on minimum requirement at transition period for UE power saving**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0635 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Revised to R4-2008614 (from R4-2006221).**

**R4-2008614 CR on minimum requirement at transition period for UE power saving**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0635 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Revised to R4-2009244 (from R4-2008614).**

**R4-2009244 CR on minimum requirement at transition period for UE power saving**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0635 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

**R4-2006516 On remaining issues on NR UE power savings**

*Type: discussion For: Approval  
 Source: vivo*

**Discussion:**

**Decision: Noted.**

**R4-2006517 LS on RRM relaxation in UE power saving**

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

**Discussion:**

**Decision: Revised to R4-2008613 (from R4-2006517).**

**R4-2008613 LS on RRM relaxation in UE power saving**

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

**Discussion:**

**Decision: Revised to R4-2009132 (from R4-2008613).**

**R4-2009132 LS on RRM relaxation in UE power saving**

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

**Discussion:**

**Decision: Return to.**

**R4-2006519 Draft CR on IDLE state measurement relaxation for UE power saving**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: vivo*

**Discussion:**

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

**R4-2006695 Performance Impact on measurement relaxation for power saving**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Discussion:**

**Decision: Noted.**

**R4-2006698 LS on measurement relaxation for inter-frequency on power saving**

*Type: LS out For: Approval  
 to RAN WG2  
 Source: LG Electronics Inc.*

**Discussion:**

**Decision: Noted.**

**R4-2006810 RRM measurement relaxation for UE power saving**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

**Decision: Noted.**

**R4-2006884 Discussion on RRM measurement relaxation for RRC\_IDLE/INACTIVE**

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

**Discussion:**

**Decision: Noted.**

**R4-2006993 Draft CR on IDLE state measurement relaxation for UE power saving**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: vivo*

**Discussion:**

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

**R4-2007158 RRM requirements for UE Power Saving**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Noted.**

**R4-2007345 On RRM measurement relaxation for power saving**

*Type: discussion For: Approval  
 Source: OPPO*

**Discussion:**

**Decision: Noted.**

**R4-2007495 RRM measurement relaxation for power saving**

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

**Discussion:**

**Decision: Noted.**

**R4-2007728 Discussion on measurement relaxation in power saving**

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

**Discussion:**

**Decision: Noted.**

**R4-2007729 Discussion on the remaining issues in power saving**

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

**Discussion:**

**Decision: Noted.**

**R4-2007730 CR on measurement relaxation for power saving**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0791 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

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

**R4-2007892 Discussions on RRM impact of NR UE power saving**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution, we continue the discussions on RRM measurement relaxations based on latest agreements.

**Discussion:**

**Decision: Noted.**

**R4-2007893 Measurement requirements for UEs under power saving mode**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0854 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR to capture the relaxed RRM measurement requirements.

**Discussion:**

**Decision: Revised to R4-2008615 (from R4-2007893).**

**R4-2008615 Measurement requirements for UEs under power saving mode**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0854 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR to capture the relaxed RRM measurement requirements.

**Discussion:**

**Decision: Revised to R4-2009133 (from R4-2008615).**

**R4-2009133 Measurement requirements for UEs under power saving mode**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0854 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

CR to capture the relaxed RRM measurement requirements.

**Discussion:**

**Decision: Return to.**

#### 6.7.3 Demodulation and CSI requirements (38.101-4) [NR\_UE\_pow\_sav-Perf]

### 6.8 NR Positioning Support [NR\_pos]

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**Email discussion: [95e][215] NR\_pos\_RRM\_1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][215] NR\_pos\_RRM\_1 | R16 NR Positioning | RRM Core requirements: General, UE requirements (PRS-RSTD, UE Rx-Tx time difference) | 6.8.1  6.8.2.1.1  6.8.2.1.3  6.8.2.1.5 |

**R4-2008504 Email discussion summary for [95e][215] NR\_pos\_RRM\_1** *Type: other For: Information  
 Source: Moderator (Huawei, HiSilicon)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009027 (from R4-2008504).**

**R4-2009027 Email discussion summary for [95e][215] NR\_pos\_RRM\_1** *Type: other For: Information  
 Source: Moderator (Huawei, HiSilicon)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

**Topic #1: General Aspect**

Sub-topic 1-1 Possible down-scoping of the WI

Session chair: Not to be discussed further. Continue the discussion on these issues and make decision whether each individual issue will be still pursued in Rel-16 or deferred to Rel-17 under the respective topics.

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008664 | WF on requirements for RSTD and UE Rx-Tx time difference measurement | Huawei, HiSilicon |

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007996 | Return to |
| R4-2007842 | Return to |
|  |  |
| R4-2006237 | Return to |
| R4-2007954 | Return to |
| R4-2006171 | Return to |
| R4-2006559 | Return to |
|  |  |
| R4-2006560 | Return to |
| R4-2007955 | Return to |
| R4-2006561 | Return to |
| R4-2007958 | Return to |
| R4-2007959 | Return to |
| R4-2007946 | Return to |
| R4-2007950 | Return to |
| R4-2007998 | Return to |
| R4-2007951 | Return to |

2nd round email discussion conclusions

GTW session (June 2)

**Topics#2: Intra/inter-frequency definition**

Sub-topic 2-1 Intra/inter-frequency definition for RSTD measurement

* Option 1. Intra-frequency RSTD measurement is defined as when the neighbor DL PRS resource and the reference DL PRS resource belong to the same positioning frequency layer. Otherwise, the RSTD measurement is inter-frequency. (QC, Intel, HW)
  + Conditional on sub-topic 2-2 (QC)
* Option 2. Intra-frequency RSTD measurement is defined when neighbour DL PRS resource and reference DL PRS resource belong to the same positioning frequency layer, and the BW of the positioning frequency layer is within the BW of UE’s active DL BWP, and SCS and CP of the positioning frequency layer are the same as those of UE’s active DL BWP. Otherwise, the RSTD measurement is inter-frequency. (MTK)
* Option 2a. Intra-frequency RSTD measurement is defined when the DL PRS resources to be measured, including reference cell and neighbor cell, have the same center frequency, SCS and CP type as active BWP and the BW of these PRS are all within the active BWP. Otherwise, the RSTD measurement is inter-frequency measurement. (CATT)
* Option 3. Intra-frequency RSTD measurement: the center frequency of PRS BW is the center frequency of a serving cell SSB and has the same SCS as that of the serving cell SSB, otherwise it is inter-frequency. MG may be needed for intra- or inter-frequency, depending on whether or not the PRS BW is within the active BWP (NOTE: for RSTD, the above conditions are met for both reference and the other DL links) (ZTE, Ericsson)
* Option 5. The intra-frequency RSTD definition is based on the relation between SCS, CP, and center frequency of the serving cell and the PRS of each of the reference cell and measured cell: for intra-frequency RSTD they are the same for the reference cell and they are the same for the measured (“neighbor”) cell. (Ericsson)
  + FFS: SCS of the serving cell
* Recommendations for 2nd round:
  + Companies are encouraged to provide views on the following principles:
    - should the definition be based on PRS BW being within active BWP?
    - should the definition be based on PRS center frequency being same as serving cell BWP?
    - should the definition be based on PRS center frequency being same as serving cell SSB?
    - should the definition be based on PRS SCS/CP being same as serving cell BWP?
    - should the definition allow existence of both intra and inter-frequency when more than one PRS frequency layer are configured?

Discussion

HW: RAN1 recently agreed that UE needs to make measurements with MGs only. This means that Option 1 can be the simplest approach. CATT also mentioned that we may not need intra/inter frequency definition at all in this case.

QC: We are also aware of RAN1 agreement. We can agree on option 1. We still need intra-/inter-frequency measurements since RAN1 feature list already has some features for intra-/inter-frequency.

Intel: Prefer Option 1. We are ok not to introduce intra/inter-freq definitions

MTK: Can compromise to Option 1. Still ok to define intra-/inter-freq meas. It can be helpful to distinguish scenarios with multiple layers.

HW: We are fine with either to define Option 1 or do not define intra-/inter-freq.

CATT: For Option 1 both cells need to be measured and not clear if the definition is clear

Nokia: May not need to define intra/inter-frequency

QC: there are some more references in RAN1 specs to intra/inter-frequency

CATT: Option 1 may not apply for other measurements. There are no reference cells for other measurements.

Intel: need to have consistent definition. For other measurements reference cells config can be missing and we may need to compare serv / neighbour cell configurations.

E///: We need both intra/inter frequency definitions. For Option 1 – UE can reselect reference cells and the definition becomes unclear.

MTK: The reference cell for Option 1 – this is the cell configured to the UE for measurement.

QC: in our understanding the reference cell is always present as a part of assistance data.

QC: No strong reason to keep intra/inter-freq definition in case the references in RAN1 specs can be removed

MTK: In RAN1 UE feature list there is a feature definition for the support of intra/inter-frequency measurements.

E///: still think we need to define both. The reason is that typically accuracy requirements are different.

HW: Accuracy may be different depending whether the measurements are done on the same frequency layer or not.

Candidate agreement:

* + Option 1. Intra-frequency RSTD measurement is defined as when the neighbor DL PRS resource and the reference DL PRS resource belong to the same positioning frequency layer. Otherwise, the RSTD measurement is inter-frequency. (QC, Intel, HW, MTK)
  + Option 2: Do not define intra/inter-frequency definition for RSTD (Intel, HW, [CATT], Nokia)

Note: Accuracy may be different depending whether the measurements are done on the same frequency layer or not.

Agreement

Do not define intra/inter-frequency definition for PRS-RSTD

Note: Accuracy may be different depending whether the measurements are done on the same positioning frequency layer or not.

Do not define intra/inter-frequency definition for PRS-RSRP

Note: Classification of accuracy requirements is FFS (e.g. whether to define different accuracy for measurements on different frequencies)

Do not define intra/inter-frequency definition for UE Rx-Tx timing difference

Note: Classification of accuracy requirements is FFS (e.g. whether to define different accuracy for measurements on different frequencies)

Sub-topic 2-2 Applicable scenarios for RSTD measurement requirements

* Option 1. Define intra-frequency RSTD requirements for the scenarios (QC, MTK)
  + SCS and CP of the positioning frequency layer is the same as the active BWP of UE
  + BW of positioning frequency layer is within the active BWP of the UE.
* Option 2. Define requirements with and without measurement gaps, for intra- and inter-frequency measurement requirements. (Ericsson, HW)
* Option 3. Define requirements for following scenarios (Intel)
  + Intra-frequency measurement without gap
  + Intra-frequency measurement with gap
  + Inter-frequency measurement with gap
* Option 4. FFS (CATT)

Sub-topic 2-3 Intra/inter-frequency definition for Rx-Tx time difference measurement

* Option 1. UE Rx-Tx timing difference measurement is defined as intra-frequency if PRS resources of all the Rx-Tx time difference measurements on the same TRP belong to the same positioning frequency layer. Otherwise, the UE Rx-Tx timing difference measurement is inter-frequency. (QC)
* Option 2. Same definition as for RSTD measurement. (CATT, HW, ZTE, Intel, MTK)
* Option 3: The intra-frequency UE Rx-Tx definition is based on the relation between SCS, CP, and center frequency of the serving cell and the PRS of the measured cell: for intra-frequency UE Rx-Tx they are the same. (Ericsson)
  + FFS: SCS of the serving cell

Sub-topic 2-4 Applicable scenarios for Rx-Tx time difference measurement requirements

* Option 1. Define intra-frequency Rx-Tx time difference measurement requirements for the scenarios (QC, MTK)
  + SCS and CP of the positioning frequency layer is the same as the active BWP of UE
  + BW of positioning frequency layer is within the active BWP of the UE
  + Positioning SRS resource is on the same band as positioning frequency layer
* Option 2. Define requirements with and without measurement gaps, for intra- and inter-frequency measurement requirements. (Ericsson, HW)
* Option 3. Define requirements for following scenarios (Intel)
  + Intra-frequency measurement without gap
  + Intra-frequency measurement with gap
  + Inter-frequency measurement with gap
* Option 4. Requirements are only defined for the case where PRS and SRS are in the same band (HW)
* Option 5. FFS (CATT)

Topics#3: Measurement period for RSTD

Sub-topic 3-1 Basic number of PRS occasions

* Option 1. A certain number (X) of PRS occasions, X=TBD (QC, Intel, CATT, HW, MTK)
  + X=4 (Qualcomm, CATT, Huawei, MTK)
  + X < 4 (Intel)
* Option 2. ceil(NPRS,req / KPRS) (Ericsson)
  + NPRS,req is the comb pattern realizations that are required for RSTD measurement, derived from simulation results
  + KPRS= LPRS/CombSizeN × ResourceRepetitionFactor is the number of comb pattern realizations within a single TPRS,
  + LPRS is the number of PRS symbols per slot

Discussion

E///: we still need to discuss and have better understanding. No definition of PRS occasion. Companies have different interpretation. Need to check impact of Comb configuration.

QC: We have definition of PRS occasion in our paper. Intel and MTK may have same understanding. Option 2 is not aligned with RAN1 specs definitions. Option 2 enforces cross-occasion combining of measurements.

HW: Issue of option 2 can be addressed by proper side condition in accuracy requirements. O2 implies cross-occasion processing and we don’t agree

MTK: Support O1.

Intel: Agree with Huawei’s comments.

QC: PRS occasion is the time duration spanned by one DL PRS resource after repetition by DL-PRS-ResourceRepetitionFactor.

HW: need to add RSTD uncertainty

Candidate definition: PRS occasion is the time duration spanned by one DL PRS resource after repetition by DL-PRS-ResourceRepetitionFactor ± its corresponding DL-PRS-expectedRSTD-uncertainty

E///: it may imply big NW overhead. Transmission of more PRS shall result in better accuracy.

Agreements

PRS occasion definition:

Option 1: PRS occasion is the time duration spanned by one DL PRS resource after repetition by DL-PRS-ResourceRepetitionFactor ± its corresponding DL-PRS-expectedRSTD-uncertainty. (QC, Intel, HW, CATT, MTK)

Option 2: PRS occasion is one single DL PRS repetition (i.e. repetition factor of 1) (Ericsson)

Option 3: PRS occasion is one comb pattern without being repeated within a slot and without applying a resource repetition factor (Ericsson)

Basic number of PRS occasions

* Option 1. A certain number (X) of PRS occasions, X=4 (QC, Intel, CATT, HW, MTK)
* Option 2. ceil(NPRS,req / KPRS) (Ericsson)
  + NPRS,req is the comb pattern realizations that are required for RSTD measurement, derived from simulation results
  + KPRS= LPRS/CombSizeN × ResourceRepetitionFactor is the number of comb pattern realizations within a single TPRS,
  + LPRS is the number of PRS symbols per slot

Periodicity of PRS occasions

* + Option 1. (QC, HW, MTK, Intel)
  + Option 2. (Ericsson)

Sub-topic 3-2 Periodicity of PRS occasions

* Option 1. (QC, ~~CATT~~, HW, MTK, Intel)
* Option 2. (Ericsson)
  + ~~In the realistic deployment Tprs configured by LMF can guarantee UE’s capability (Intel)~~

Discussion

E///: need to wait for outcome of RAN1 agreements on capability

Intel: Can compromise to Option 1.

CATT: In case T > TPRS we can’t measure PRS. E.,g. T = 25ms and TPRS = 20ms then we can’t measure 2nd PRS and we measure every 40ms.

HW: T definition is clear from RAN1. T shall be accounted in PRS occasion periodicity. For CATT – it can be further discussed.

QC: Same as HW. RAN1 does not have further discussion.

Intel: there is ongoing discussion on capability (e.g. case whether UE can report multiple capabilities reported)

E///: TPRS is cell-specific configuration regardless of UE-specific capabilities. We can discuss how T impacts measurement periodicity rather than PRS occasion periodicity.

HW: TPRS is configured by NW. This is the reason for Option 1. “Periodicity of PRS occasions” is related to how often UE makes the measurements.

Sub-topic 3-3 Scaling of PRS occasions due to UE processing capability

* Option 1. (QC)
* Option 1a. (HW)
  + requirements do not apply for resources spanning over two sampling periods of N
* Option 2. Depends on T and Tprs (MTK)
  + , if Tprs <= T
  + , of Tprs > T
* Option 3. (CATT, HW)
  + requirements apply provided that the configured PRS duration K is no larger than N
* Option 4. FFS (Ericsson)
  + Also need to consider the case where PRS is measured with MG

Sub-topic 3-4 Sampling and processing time for baseline requirements

* Option 1: T (QC, Intel, CATT, HW, MTK)
* Option 2. (Intel)
* Option 3: FFS (Ericsson)
  + discuss the sampling/processing time after the measurement period is settled

Sub-topic 3-5 Rx beam sweeping in FR2

* Option 1. UE sweeps its Rx beams within a PRS instance (occasion) if the number of repetitions, DL-PRS-ResourceRepetitionFactor, is larger than what is required to meet the accuracy requirements. If not, UE sweeps its Rx beams across PRS instances (occasions) (QC)
  + Define UE capability to differ UE that supports Rx beam sweeping within a PRS occasion and UE that uses one Rx beam per PRS occasion
* Option 2. The similar way in SSB-based RRM for Rx beam sweeping factor is preferred, i.e. no intra-PRS-occasion Rx beam sweeping (CATT, MTK, Intel, ZTE, HW, Nokia)
* Option 3. For FR1, no impact of UE rx beam sweeping on RSTD measurement period shall be considered. For FR2, at least for the case when the QCL information is available to the UE, there is no impact of UE rx beam sweeping on RSTD measurement period. (Ericsson)

Discussion

QC: Option 1 is feasible for some implementations and reduces the latency

HW: we are ok with split capabilities. But requirements for Option 1 can be quite complicated. Do we want to have it in Rel-16?

E///: for FR2 if UE has QCL information then scaling is not needed.

HW: even if UE is configured with QCL the RX beam sweeping may not be avoided since in the same symbol there may be PRS from different sources.

MTK: same view with HW. Prefer Option 1 in the next release.

Nokia: Prefer Option 2. Capabilities can be further discussed but this means that there will different UE behaviors which may complicate.

E///: we can agree on Option 2 if scenario with QCL is addressed.

Agreement:

For FR1, no impact of UE RX beam sweeping on RSTD measurement period shall be considered

For FR2

Use Rx beam sweeping factor similar way as in SSB-based RRM (i.e. no intra-PRS-occasion Rx beam sweeping) for the case when the QCL information is not available to the UE

FFS how to handle the case when the QCL information is available to the UE

Option 1: Do not perform RX beam sweeping

Option 2: Perform RX beam sweeping

Solutions with more advanced RX beam sweeping can be considered in the future releases

Sub-topic 3-7 Measurement period with multiple PRS frequency layers

* Option 1. Use the maximum PRS resource periodicity among all PRS resources (QC, MTK, HW)
* Option 2. LMF needs not to provide multiple PRS periodicity to UE with a single layer at least (Intel)
* Option 3. FFS (Ericsson)
  + discuss this after we agree on a measurement period for the same PRS periodicity

Topic #9: Measurement report mapping

Sub-topic 9-3 Whether signaling of NTA offset along with Rx-Tx time difference to LMF is needed

* Option 1. No (QC, CATT, HW, Intel, MTK)
* Option 2. Yes (Ericsson)

Discussion

Ericsson: in some scenarios information is needed in LMF. We concern that at early stage we will not have all capabilities. For Multi-RTT UE reports from multiple cells, in this case it is not clear if the correct NTA offset will be applied.

QC: what is the frequency of reporting?

E///: report once per each positioning session

Nokia: support proposal

E///: this is NTA offset of the serving cell

HW: for Multi-RTT the gNB needs to configure the SRS transmissions. Will it know that multi-RTT is used.

E///: some cases when it does not know

MTK: we still don’t know why LMF needs it. UE measurements already exclude NTA offset.

E///: in LTE it is not included since NTA offset is fixed for FDD/TDD. For NR the NTA offset is configured.

CATT: will LMF modify the measurement reported by UE

E///: we assume so, but this is up to LMF implementation

Tentative agreement

Introduce signaling of NTA offset along with Rx-Tx time difference from UE to LMF. Report can be done once per each positioning session.

Topic #11: Scheduling restriction and need for measurement gaps

Sub-topic 11-1 Need for measurement gaps

Sub-topic 11-2 Scheduling restriction in FR1

Topic #4: Measurement period for UE Rx-Tx time difference

Sub-topic 4-1 Whether SRS periodicity should be accounted in Rx-Tx time difference measurement period

Sub-topic 4-5 Proximity between SRS and PRS

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**Email discussion: [95e][216] NR\_pos\_RRM\_2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][216] NR\_pos\_RRM\_2 | R16 NR Positioning | RRM Core requirements: UE requirements (PRS-RSRP measurements, SSB and CSI-RS RSRP/RSRQ measurements) | 6.8.2.1.2  6.8.2.1.4 |

**R4-2008505 Email discussion summary for [95e][216] NR\_pos\_RRM\_2** *Type: other For: Information  
 Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009028 (from R4-2008505).**

**R4-2009028 Email discussion summary for [95e][216] NR\_pos\_RRM\_2** *Type: other For: Information  
 Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2008666 | WF on requirements for NR Positioning PRS-RSRP, SSB and CSI-RS RSRP/RSRQ measurements | Intel |

**Topic #1: PRS-RSRP report mapping**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006238 | Revised |

**Topic #3: Measurement period**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007844 | Return to |

**Topic #4: Measurement capability and reporting criteria for PRS RSRP**

Tdoc decisions

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| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007960 | Return to |

**Topic #7: NR E-CID positioning method**

Tdoc decisions

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| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007939 | Return to |
| R4-2007940 | Return to  Session chair: CR marked as return to since it includes TBD. Recommend to remove TBDs or we can technically endorse it. |

2nd round email discussion conclusions

GTW session (June 2)

**Topic #1: PRS-RSRP report mapping**

Sub-topic #1-1 Differential PRS-RSRP reporting range for FDM-ed resources

* Option 1. The reporting range for differential reporting for PRS RSRP measurements on FDM-ed PRS resources is [-27 dB; 27 dB] or smaller (Ericsson)
* Option 2. The reporting range of ±30 dB for PRS-RSRP differential report can be applicable in both TDM and FDM case. (Huawei, CATT, Qualcomm, Intel, MTK)

**Topic #2: Intra-frequency & Inter-frequency PRS RSRP measurement definitions**

Sub-topic #2-1 Intra-frequency & inter-frequency definition for PRS-RSRP

* Option 1: (Qualcomm, Huawei, CATT, MTK, Intel)

Given PRS-RSRP needed for different positioning methods in Re1-16, the principle to define intra/inter frequency PRS-RSRP measurements can be

* + In DL-TDOA the definition of intra/inter-frequency PRS-RSRP measurement follows those of RSTD
  + In multi-RTT the definition of intra/inter-frequency PRS-RSRP measurement follows those of UE Rx-Tx time difference
  + In DL-AoD the definition of intra/inter-frequency PRS-RSRP measurement follow those of PRS-RSTD
* Option 2: (Ericsson)
  + The intra-frequency PRS-RSRP definition is based on the relation between SCS, CP, and center frequency of the serving cell and of the PRS of the measured cell: for intra-frequency they are the same
    - FFS: SCS of the serving cell

Sub-topic#2-3 Applicable scenarios of PRS-RSRP measurement requirements

* Option 1: Define intra-frequency PRS-RSRP measurement requirements for the scenarios (Qualcomm)
  + SCS and CP of the positioning frequency layer is the same as the active BWP of UE
  + BW of positioning frequency layer is within the active BWP of the UE
* Option 2 (Ericsson, Intel, Huawei, MTK):
  + RAN4 will define requirements for intra- and inter-frequency PRS-RSRP, with and without measurement gaps

**Topic #3: Measurement period**

Sub-topic#3-1 Principles for defining measurement period for PRS RSRP

* Given the PRS-RSRP needed in different NR positioning methods, the principle for defining PRS- RSRP measurement period can be
  + when configured with UE Rx-Tx, PRS-RSRP measurement period can be same as that of UE Rx-Tx measurement
  + when configured with RSTD, PRS-RSRP measurement period can be same as that of RSTD measurement
  + FFS: when not configured with either UE Rx-Tx or RSTD.

Sub-topic#3-2 Measurement period under cell change

* Given PRS-RSRP needed in different positioning methods in Re1l6, the principle for defining measurement period for PRS RSRP under cell change can be:
  + when configured with RSTD, PRS-RSRP measurement period due to HO can be same as that of RSTD
  + when configured with UE Rx-Tx, PRS-RSRP measurement period due to HO can be same as that of UE Rx-Tx time difference
  + FFS: when not configured with either UE Rx-Tx or RSTD

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**Email discussion: [95e][217] NR\_pos\_RRM\_3**

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| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][217] NR\_pos\_RRM\_3 | R16 NR Positioning | RRM Core requirements: Impact on existing requirements (incl. MG), gNB requirements, Others | 6.8.2.2  6.8.2.3  6.8.2.4 |

**R4-2008506 Email discussion summary for [95e][217] NR\_pos\_RRM\_3** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009029 (from R4-2008506).**

**R4-2009029 Email discussion summary for [95e][217] NR\_pos\_RRM\_3** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

**New tdocs**

|  |  |  |
| --- | --- | --- |
| R4-2008667 | WF on impact of NR positioning measurements on RRM | Ericsson |
| R4-2008668 | WF on gNB requirements for NR positioning | Ericsson |
| R4-2008669 | LS on UE capability for concurrent processing of PRS and RRM measurements | Qualcomm |

**Topic #1: Impact of positioning on existing RRM requirements**

Issue 1-1-1: Applicability of Rel-15 MG patterns for positioning measurements

All Rel-15 MG patterns are applicable for positioning measurements.

Issue 1-1-4: UE capability for supporting new MG patterns if introduced in Rel-16

New MG patterns, if introduced, shall be UE capability.

Issue 1-1-5: Gap sharing between positioning and RRM measurements

Re-use the handling of LTE PRS in Rel-15 CSSF for gap sharing between NR PRS and RRM.

Issue 1-2-4: PRS measurement period when incomplete PRS measurement in active BWP is abandoned and restarted in gaps

Following was agreement in RAN4#94-ebis (R4-2005379):

“Following is the UE behavior and applicable positioning measurement requirements when the UE is performing positioning measurement in active BWP and the active BWP change triggers the UE to request gaps:

UE abandons old/incomplete positioning measurement performed within the active BWP, restarts the positioning measurement and performs the positioning measurements in gaps”.

Do not define any additional requirements related to the above agreement but capture the above UE behavior in the relevant requirements for positioning measurement being performed within the active BWP.

**Issue 1-3-3: UE capability for concurrent RRM/PRS processing/measurement**

Define the following two set of requirements:

1. For UE which does not need any PRS and/or RRM measurement relaxation due to concurrent processing of PRS and RRM measurements.
2. For UE which needs PRS and/or RRM measurement relaxation due to concurrent processing of PRS and RRM measurements.

Define UE capability signalling which indicates the concurrent processing of PRS and RRM measurements does not need any PRS and/or RRM measurement relaxation.

**Topic #2: gNB measurement accuracy requirements**

Issue 2-3-5: Applicability of gNB Rx-Tx accuracy under TA change

In both serving and neighbour cells of the UE, gNB Rx-Tx accuracy shall not apply if UE transmit timing changes due to gNB sending TA during the measurement period.

**Topic #3: gNB measurement report mapping**

Issue 4-1-1: Conditions for accurate path loss measurement

UE’s path loss measurement is considered accurate/reliable provided that the side conditions for the measurement used by the UE for the path loss estimation are met. FFS whether to include criteria for deriving measurement accuracy in the LS response.

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006239 | Noted |
| R4-2006240 | Noted |
| R4-2006241 | Revised |
| R4-2007336 | Noted |
| R4-2007849 | Revised |
| R4-2007850 | Noted |
| R4-2007851 | Revised |

**Topic #4: Pathloss measurement and SRS during DRX**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007957 | Revised |
| R4-2007855 | Revised |

2nd round email discussion conclusions

GTW session (June 2)

**Issue 1-1-2: Need for new MG pattern in Rel-16**

* Should new MG pattern for positioning measurements be introduced in Rel-16?
  + Option 1: Yes (HW, QC, E///, MTK, Nokia)
  + Option 2: No (Intel, CATT)

Discussion

QC: we have RAN1 agreement that Positioning measurements are done with MGs only. So, now this becomes more important.

Apple: Support Option 2 due to timelines. Need to consider coordination between existing and new MG patterns.

Intel: RAN1 agreement does not mean that we need to define new pattern. Potential impacts from new MG shall be evaluated. Many existing requirements assume the max MGRP of 160ms. This is not possible to fix it fast. We can optimize it in the future release.

CATT: Support Option 2 due to timeline. RAN1 is discussing the capability for X and new gaps may have impact.

QC: we proposed this long time ago and companies keep commenting on no time. To CATT we have a different understanding.

MTK: can we introduce MGL of 10ms in this release as a compromise. This will have min impact to the existing measurement.

Nokia: Support Option 1 and statements made by QC.

E///: we need gaps.

Intel: can compromise to introduce MGL of 10ms as suggested by MTK.

* New measurement gaps
  + Option 1: Introduce new MGs in Rel-16

|  |  |  |
| --- | --- | --- |
| **Pattern #** | **MGL (ms)** | **MGRP (ms)** |
| 0 | 10 | 80 |
| 1 | 10 | 160 |
| 2 | 20 | 80 |
| 3 | 20 | 160 |
| 4 | 40 | 320 |
| 5 | 40 | 640 |
| 6 | 50 | 320 |
| 7 | 50 | 640 |

* + Option 2: Introduce a limited set of new MGs in Rel-16

|  |  |  |
| --- | --- | --- |
| **Pattern #** | **MGL (ms)** | **MGRP (ms)** |
| 0 | 10 | 80 |
| ~~1~~ | ~~[10 or larger value]~~ | ~~160~~ |

Other MGs can be considered in the future.

* + Option 3: Do not introduce new MGs in Rel-16.

~~Agreement:~~

* + ~~Introduce a limited set of new MGs in Rel-16~~

|  |  |  |
| --- | --- | --- |
| **~~Pattern #~~** | **~~MGL (ms)~~** | **~~MGRP (ms)~~** |
| ~~0~~ | ~~10~~ | ~~80~~ |
| ~~1~~ | ~~[10 or larger value]~~ | ~~160~~ |

~~Other MGs can be considered in the future.~~

Conclusion: no consensus to introduce new MG patterns. Continue discussion.

**Issue 1-1-3: New MG patterns if introduced in Rel-16**

* Tentative agreements:
  + Uphold agreements on MGL and MGRP from RAN4#94-ebis (MGL =10, 20, 40 and 50 ms and MGRP=80, 160, 320, 640 ms)
  + Combinations of MGL and MGRP:

|  |  |  |
| --- | --- | --- |
| **Pattern #** | **MGL (ms)** | **MGRP (ms)** |
| 0 | 10 | 80 |
| 1 | 10 | 160 |
| 2 | 20 | 80 |
| 3 | 20 | 160 |
| 4 | 40 | 320 |
| 5 | 40 | 640 |
| 6 | 50 | 320 |
| 7 | 50 | 640 |

* Candidate options: Which of these additional MG patterns are agreeable?

|  |  |  |
| --- | --- | --- |
| **Pattern #** | **MGL (ms)** | **MGRP (ms)** |
| 8 | 10 | 160 |
| 9 | 10 | 320 |
| 10 | 20 | 160 |
| 11 | 20 | 320 |
| 12 | 40 | 160 |
| 13 | 50 | 160 |

**Issue 2-1-1: Selection of option for gNB measurement accuracy requirements**

* Option 1: Define accuracy for SRS-RSRP and gNB Rx-Tx time difference (E///, Nokia, Intel)
* Option 2: Define accuracy for SRS-RSRP, gNB Rx-Tx time difference and UL RTOA (CATT, HW, CMCC, Intel)

**Issue 4-2-1: SRS transmission during DRX inactive**

*Candidate options:*

* Is it feasible for UE to transmit SRS for positioning during the DRX inactive period?
  + Option 1: HW, QC, MTK, Intel,
    - Yes
  + Option 2: E///, Nokia
    - No

Discussion

E///: it can be misinterpreted by RAN2

HW: concern from E/// can be addressed in the LS with additional clarification

E///: we can work on wording

Nokia: we have concerns as well. We don’t have requirements in DRX inactive period. From UE side it will increase complexity. Prefer to look into this in Rel-17.

HW: RAN2 is asking on feasibility. Power consumption and complexity shall be considered in RAN2.

Nokia: This was not considered in RAN4. Need to address TX timing impact.

HW: will sync to gNB first before SRS transmission.

Chair: continue discussion in reflector.

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**R4-2008664 WF on requirements for RSTD and UE Rx-Tx time difference measurement**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2008666 WF on requirements for NR Positioning PRS-RSRP, SSB and CSI-RS RSRP/RSRQ measurements**

*Type: other For: Approval  
 Source: Intel*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009139 (from R4-2008666).**

**R4-2009139 WF on requirements for NR Positioning PRS-RSRP, SSB and CSI-RS RSRP/RSRQ measurements**

*Type: other For: Approval  
 Source: Intel*

**Abstract:**

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

**R4-2008667 WF on impact of NR positioning measurements on RRM**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2008668 WF on gNB requirements for NR positioning**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2008669 LS on UE capability for concurrent processing of PRS and RRM measurements**

*Type: LS out For: Approval  
 to RAN2 cc RAN1  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2009111 LS on intra/inter-frequency measurement for NR positioning**

*Type: LS out For: Approval  
 to RAN1, RAN2   
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Return to.**

#### 6.8.1 General [NR\_pos-Core/Perf]

**R4-2006560 CR to TS 38.133: Structure for NR positioning RRM requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0674 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

**Decision: Return to.**

**R4-2006561 CR to TS 38.133: PRS RSTD requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0675 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

**Decision: Return to.**

**R4-2006562 Views on down scoping for NR positioning remaining issues**

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

**Discussion:**

**Decision: Noted.**

**R4-2007271 Discussion on the SRS for positioning during the DRX inactive period**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

**Decision: Noted.**

#### 6.8.2 RRM core requirements (38.133) [NR\_pos-Core]

##### 6.8.2.1 UE requirements [NR\_pos-Core]

**R4-2007952 On new measurement gaps for NR positioning**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On new measurement gaps for NR positioning

**Discussion:**

**Decision: Noted.**

**R4-2007953 LS on measurement gaps for NR positioning**

*Type: LS out For: Approval  
 to RAN1,RAN2  
 Source: Ericsson*

**Abstract:**

LS on measurement gaps for NR positioning

**Discussion:**

**Decision: Revised to R4-2009120 (from R4-2007953).**

**R4-2009120 LS on measurement gaps for NR positioning**

*Type: LS out For: Approval  
 to RAN1,RAN2  
 Source: Ericsson*

**Abstract:**

LS on measurement gaps for NR positioning

**Discussion:**

**Decision: Revised to R4-2009246 (from R4-2009120).**

**R4-2009246 LS on measurement gaps for NR positioning**

*Type: LS out For: Approval  
 to RAN1,RAN2  
 Source: Ericsson*

**Abstract:**

LS on measurement gaps for NR positioning

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

**R4-2007955 Positioning measurement accuracy requirements structure in section 10**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0862 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Positioning measurement accuracy requirements structure in section 10

**Discussion:**

**Decision: Revised to R4-2009126 (from R4-2007955).**

**R4-2009126 Positioning measurement accuracy requirements structure in section 10**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0862 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Positioning measurement accuracy requirements structure in section 10

**Discussion:**

**Decision: Return to.**

###### 6.8.2.1.1 PRS-RSTD measurements [NR\_pos-Core]

**R4-2006018 PRS-RSTD measurements for NR positioning**

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

**Abstract:**

This paper discusses the definition of intra and inter frequency RSTD measurements.

**Discussion:**

**Decision: Noted.**

**R4-2006168 On PRS-RSTD measurements for NR positioning**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2006232 Discussion on RSTD measurement requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

**Decision: Noted.**

**R4-2006304 Discussion of remaining issues for PRS-RSTD measurement**

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

**Discussion:**

**Decision: Noted.**

**R4-2006556 Further discussion on NR PRS RSTD requirements**

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

**Discussion:**

**Decision: Noted.**

**R4-2007145 Scaling of measurement period due to UE Rx beam sweeping**

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

**Abstract:**

Propose to re-use R15 beam sweeping factor.

**Discussion:**

**Decision: Noted.**

**R4-2007841 Discussion on RSTD measurement**

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

**Discussion:**

**Decision: Noted.**

**R4-2007842 [draft] reply LS on agreements related to NR Positioning**

*Type: LS out For: Approval  
 to RAN1  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007944 On PRS RSTD measurements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On PRS RSTD measurements

**Discussion:**

**Decision: Noted.**

**R4-2007945 On PRS RSTD measurement report mapping**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On PRS RSTD measurement report mapping

**Discussion:**

**Decision: Noted.**

**R4-2007946 Measurement report mapping for PRS RSTD**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0859 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Measurement report mapping for PRS RSTD

**Discussion:**

**Decision: Revised to R4-2009112 (from R4-2007946).**

**R4-2009112 Measurement report mapping for PRS RSTD**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0859 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Measurement report mapping for PRS RSTD

**Discussion:**

**Decision: Revised to R4-2009253 (from R4-2009112).**

**R4-2009253 Measurement report mapping for PRS RSTD**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0859 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Measurement report mapping for PRS RSTD

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

**R4-2007949 On additional path reporting with positioning measurements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On additional path reporting with positioning measurements

**Discussion:**

**Decision: Noted.**

**R4-2007950 Additional path report mapping for RSTD**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0860 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Additional path report mapping for RSTD

**Discussion:**

**Decision: Return to.**

**R4-2007958 Reporting criteria for NR RSTD**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0863 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Reporting criteria for NR RSTD

**Discussion:**

**Decision: Revised to R4-2009114 (from R4-2007958).**

**R4-2009114 Reporting criteria for NR RSTD**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0863 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Reporting criteria for NR RSTD

**Discussion:**

**Decision: Revised to R4-2009257 (from R4-2009114).**

**R4-2009257 Reporting criteria for NR RSTD**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0863 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Reporting criteria for NR RSTD

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

###### 6.8.2.1.2 PRS-RSRP measurements [NR\_pos-Core]

**R4-2006169 On PRS-RSRP measurements for NR positioning**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2006233 Discussion on PRS-RSRP measurement requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

**Decision: Noted.**

**R4-2006238 CR on PRS-RSRP measurement report mapping**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0642 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Revised to R4-2008665 (from R4-2006238).**

**R4-2008665 CR on PRS-RSRP measurement report mapping**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0642 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Revised to R4-2009129 (from R4-2008665).**

**R4-2009129 CR on PRS-RSRP measurement report mapping**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0642 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Return to.**

**R4-2006305 Discussion of remaining issues for PRS-RSRP measurement**

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

**Discussion:**

**Decision: Noted.**

**R4-2007843 Discussion on PRS-RSRP measurement**

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

**Discussion:**

**Decision: Noted.**

**R4-2007844 CR for measurement requriements for PRS-RSRP**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0846 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007947 On PRS-RSRP measurements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On PRS-RSRP measurements

**Discussion:**

**Decision: Noted.**

**R4-2007948 On PRS-RSRP measurement report mapping**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On PRS-RSRP measurement report mapping

**Discussion:**

**Decision: Noted.**

**R4-2007951 Additional path report mapping for UE Rx-Tx**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0861 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Additional path report mapping for UE Rx-Tx

**Discussion:**

**Decision: Return to.**

**R4-2007960 Reporting criteria for PRS-RSRP**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0865 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Reporting criteria for PRS-RSRP

**Discussion:**

**Decision: Return to.**

###### 6.8.2.1.3 Rx-Tx time difference measurements [NR\_pos-Core]

**R4-2006170 On UE Rx-Tx time difference measurement for NR positioning**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2006234 Discussion on UE Rx-Tx time difference measurement requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

**Decision: Noted.**

**R4-2006237 Link level simulation assumption for UE RX-Tx time difference**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

**Decision: Noted.**

**R4-2007845 Discussion on Rx-Tx time difference measurement**

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

**Discussion:**

**Decision: Noted.**

**R4-2007943 On UE Rx-Tx measurements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On UE Rx-Tx measurements

**Discussion:**

**Decision: Noted.**

**R4-2007954 Link-level simulation assumptions for UE Rx-Tx**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Link-level simulation assumptions for UE Rx-Tx

**Discussion:**

**Decision: Noted.**

**R4-2007956 On criterion of pathloss measurement failure for power control of SRS for positioning**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On criterion of pathloss measurement failure for power control of SRS for positioning

**Discussion:**

**Decision: Noted.**

**R4-2007957 Response LS on criterion of pathloss measurement failure for power control of SRS for positioning**

*Type: LS out For: Approval  
 to RAN1  
 Source: Ericsson*

**Abstract:**

Response LS on criterion of pathloss measurement failure for power control of SRS for positioning

**Discussion:**

**Decision: Revised to R4-2008673 (from R4-2007957).**

**R4-2008673 Response LS on criterion of pathloss measurement failure for power control of SRS for positioning**

*Type: LS out For: Approval  
 to RAN1  
 Source: Ericsson*

**Abstract:**

Response LS on criterion of pathloss measurement failure for power control of SRS for positioning

**Discussion:**

**Decision: Revised to R4-2009247 (from R4-2008673).**

**R4-2009247 Response LS on criterion of pathloss measurement failure for power control of SRS for positioning**

*Type: LS out For: Approval  
 to RAN1  
 Source: Ericsson*

**Abstract:**

Response LS on criterion of pathloss measurement failure for power control of SRS for positioning

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

**R4-2007959 Reporting criteria for NR UE Rx-Tx**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0864 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Reporting criteria for NR UE Rx-Tx

**Discussion:**

**Decision: Return to.**

**R4-2007995 Impact of NTA offset on UE Rx-Tx time difference measurement**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

This paper analyzes the impact of NTA offset on UE Rx-Tx time difference measurements.

**Discussion:**

**Decision: Noted.**

**R4-2007996 LS on impact of NTA offset on UE Rx-Tx time difference measurement**

*Type: LS out For: Approval  
 to RAN2, cc RAN1  
 Source: Ericsson*

**Abstract:**

This LS requests RAN2 to define signaling to inform LMF the NTA offset used in a cell when UE Rx-Tx time difference measurements are performed.

**Discussion:**

**Decision: Revised to R4-2009119 (from R4-2007996).**

**R4-2009119 LS on impact of NTA offset on UE Rx-Tx time difference measurement**

*Type: LS out For: Approval  
 to RAN2, cc RAN1  
 Source: Ericsson*

**Abstract:**

This LS requests RAN2 to define signaling to inform LMF the NTA offset used in a cell when UE Rx-Tx time difference measurements are performed.

**Discussion:**

**Decision: Return to.**

**R4-2007997 Analysis of UE Rx-Tx Measurement Report Mapping in NR**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This paper analyzes UE Rx-Tx measurement report mappings in NR based on agreements in RAN4#94-ebis

**Discussion:**

**Decision: Noted.**

**R4-2007998 UE Rx-Tx Measurement Report Mapping in NR in 38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0870 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR defines UE Rx-Tx measurement report mappings in NR

**Discussion:**

**Decision: Revised to R4-2009113 (from R4-2007998).**

**R4-2009113 UE Rx-Tx Measurement Report Mapping in NR in 38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0870 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR defines UE Rx-Tx measurement report mappings in NR

**Discussion:**

**Decision: Revised to R4-2009254 (from R4-2009113).**

**R4-2009254 UE Rx-Tx Measurement Report Mapping in NR in 38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0870 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR defines UE Rx-Tx measurement report mappings in NR

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

**R4-2006557 Further discussion on UE Rx-Tx time difference requirements**

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

**Session chair: moved from AI 6.8.2.1.2**

**Discussion:**

**Decision: Noted.**

###### 6.8.2.1.4 SSB and CSI-RS RSRP/RSRQ measurements [NR\_pos-Core]

**R4-2007939 NR E-CID reporting criteria requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0857 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

NR E-CID reporting criteria requirements

**Discussion:**

**Decision: Revised to R4-2009103 (from R4-2007939).**

**R4-2009103 NR E-CID reporting criteria requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0857 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

NR E-CID reporting criteria requirements

**Discussion:**

**Decision: Return to.**

**R4-2007940 NR E-CID measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0858 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

NR E-CID measurement requirements

**Discussion:**

**Decision: Revised to R4-2009104 (from R4-2007940).**

**R4-2009104 NR E-CID measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0858 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

NR E-CID measurement requirements

**Discussion:**

**Decision: Return to.**

###### 6.8.2.1.5 Link-level evaluations for PRS-RSTD and PRS-RSRP [NR\_pos-Core]

**R4-2006171 Link-level simulation assumptions for UE Rx-Tx time difference measurements**

*Type: discussion For: Approval  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Revised to R4-2009127 (from R4-2006171).**

**R4-2009127 Link-level simulation assumptions for UE Rx-Tx time difference measurements**

*Type: discussion For: Approval  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Return to.**

**R4-2006559 Link-level simulation assumptions for UE Rx-Tx time difference measurement**

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

**Discussion:**

**Decision: Return to.**

**R4-2007941 Updated link simulation results for NR RSTD**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Updated link simulation results for NR RSTD

**Discussion:**

**Decision: Noted.**

**R4-2007942 Updated link simulation results for PRS RSRP**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Updated link simulation results for PRS RSRP

**Discussion:**

**Decision: Noted.**

##### 6.8.2.2 Impact on existing RRM requirements [NR\_pos-Core]

**R4-2006173 On Impact of NR positioning on existing RRM requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2006236 Impact on existing RRM measurement**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

**Decision: Noted.**

**R4-2006306 Discussion on impact on existing RRM requirements**

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

**Discussion:**

**Decision: Noted.**

**R4-2006555 Further discussion on UE RRM impacts due to NR Pos measurement**

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

**Discussion:**

**Decision: Noted.**

**R4-2007144 BWP switch during gaps used for PRS measurements**

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

**Discussion:**

**Decision: Noted.**

**R4-2007846 Impact of positioning on existing RRM requirements**

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

**Discussion:**

**Decision: Noted.**

**R4-2007999 Impact of active BWP change on positioning measurements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

This paper provides UE Rx-Tx measurement report mappings in NR

**Discussion:**

**Decision: Noted.**

##### 6.8.2.3 gNB requirements [NR\_pos-Core]

**R4-2006024 gNB requirements for NR positioning**

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

**Abstract:**

This paper discusses some pending issues left from last meeting

**Discussion:**

**Decision: Noted.**

**R4-2006172 on gNB requirements for NR positioning**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2006235 Discussion on gNB measurement requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

**Decision: Noted.**

**R4-2006239 CR on UL RTOA measurement report mapping**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0643 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Postponed.**

**R4-2006240 CR on gNB Rx-Tx time difference measurement report mapping**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0644 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Postponed.**

**R4-2006241 CR on SRS RSRP measurement report mapping**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0645 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Revised to R4-2008670 (from R4-2006241).**

**R4-2008670 CR on SRS RSRP measurement report mapping**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0645 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Return to.**

**R4-2006558 Further discussion on gNB measurement requirements in NR Positioning**

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

**Discussion:**

**Decision: Noted.**

**R4-2007116 On gNB measurement accuracy requirements for NR positioning**

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

**Abstract:**

Discussion on gNB measurement accuracy requirements for NR positioning.

**Discussion:**

**Decision: Noted.**

**R4-2007275 Optionality for positioning measurements in gNB**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Defer the decision until accuracy work has progressed.

**Discussion:**

**Decision: Noted.**

**R4-2007277 Side conditions for gNB measurement accuracy**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Use the same SINR values for UE and gNB as side condition for the accuracy requirement.

**Discussion:**

**Decision: Noted.**

**R4-2007278 Beam configuration for gNB measurement accuracy**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Fixed antenna beams are assumed in gNB for deriving accuracy.

**Discussion:**

**Decision: Noted.**

**R4-2007286 PRS/SRS configurations for gNB measurement accuracy**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

PRS/SRS configurations for gNB has to declare by manufacture.

**Discussion:**

**Decision: Noted.**

**R4-2007304 Applicability of gNB Rx-Tx accuracy under TA change**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

The requirements for UE Rx-Tx time difference measurement apply, provided the TA offset has not changed during the measurement period.

**Discussion:**

**Decision: Noted.**

**R4-2007305 Accuracy for different BS types**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

The requirements for positioning should be independent of the test type "connected", "hybrid" or "over the air".

**Discussion:**

**Decision: Noted.**

**R4-2007336 gNB Positioning Measurement Report Mapping**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0722 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Structure expand for gNB measurements.

**Decision: Postponed.**

**R4-2007847 Discussion on the scope gNB requirements for NR positioning**

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

**Discussion:**

**Decision: Noted.**

**R4-2007848 Discussion on gNB positioning measurement requirements**

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

**Discussion:**

**Decision: Noted.**

**R4-2007849 CR for gNB Rx-Tx time difference and UL-RTOA report mapping**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0847 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Revised to R4-2008671 (from R4-2007849).**

**R4-2008671 CR for gNB Rx-Tx time difference and UL-RTOA report mapping**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0847 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007850 CR for SRS-RSRP report mapping**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0848 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Postponed.**

**R4-2007851 CR for AoA/ZoA report mapping**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0849 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Revised to R4-2008672 (from R4-2007851).**

**R4-2008672 CR for AoA/ZoA report mapping**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0849 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

##### 6.8.2.4 Others [NR\_pos-Core]

**R4-2007117 On UE aspects for NR positioning**

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

**Abstract:**

Disussion on UE aspects for NR positioning

**Discussion:**

**Decision: Noted.**

**R4-2007852 Discussion on criterion for inaccurate pathloss measurement**

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

**Discussion:**

**Decision: Noted.**

**R4-2007853 [draft] reply LS on criterion of pathloss measurement failure for power control of SRS for positioning**

*Type: LS out For: Approval  
 to RAN1  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Noted.**

**R4-2007854 Discussion on positioning SRS during DRX inactive time**

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

**Discussion:**

**Decision: Noted.**

**R4-2007855 [draft] reply LS on positioning SRS during DRX inactive time**

*Type: LS out For: Approval  
 to RAN2  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Revised to R4-2008674 (from R4-2007855).**

**R4-2008674 Reply LS on positioning SRS during DRX inactive time**

*Type: LS out For: Approval  
 to RAN2  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Revised to R4-2009248 (from R4-2008674).**

**R4-2009248 Reply LS on positioning SRS during DRX inactive time**

*Type: LS out For: Approval  
 to RAN2  
 Source: Huawei, HiSilicon*

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

### 6.9 Physical layer enhancements for NR URLLC [NR\_L1enh\_URLLC-Core]

### 6.10 Single radio voice call continuity from 5G to 3G (SRVCC) [SRVCC\_NR\_to\_UMTS-Core]

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**Email discussion: [95e][218] SRVCC\_NR\_to\_UMTS\_RRM**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][218] SRVCC\_NR\_to\_UMTS\_RRM | R16 SRVCC | RRM Core maintenance | 6.10.1  6.10.2 |

**R4-2008507 Email discussion summary for [95e][218] SRVCC\_NR\_to\_UMTS\_RRM** *Type: other For: Information  
 Source: Moderator (Huawei, HiSilicon)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009030 (from R4-2008507).**

**R4-2009030 Email discussion summary for [95e][218] SRVCC\_NR\_to\_UMTS\_RRM** *Type: other For: Information  
 Source: Moderator (Huawei, HiSilicon)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006986 | Revised |
| R4-2006987 | Agreed |
| R4-2007755 | Revised |

2nd round email discussion conclusions

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#### 6.10.1 RRM core requirements maintenance (38.133) [SRVCC\_NR\_to\_UMTS-Core]

**R4-2006987 Gap applicability errors corrected for SRVCC**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0713 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Endorsed CR R4-2003097 without further changes

**Discussion:**

**Decision: Agreed.**

#### 6.10.2 RRM perf requirements (38.133) [SRVCC\_NR\_to\_UMTS-Perf]

**R4-2006986 SRVCC test case for event triggered reporting**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0712 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Endorsed CR R4-2005333 without further changes

**Discussion:**

**Decision: Revised to R4-2008616 (from R4-2006986).**

**R4-2008616 SRVCC test case for event triggered reporting**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0712 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Endorsed CR R4-2005333 without further changes

**Discussion:**

**Decision: Revised to R4-2009136 (from R4-2008616).**

**R4-2009136 SRVCC test case for event triggered reporting**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0712 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Endorsed CR R4-2005333 without further changes

**Discussion:**

**Decision: Return to.**

**R4-2007755 Test case for NR to UTRA FDD Inter-RAT handover**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0802 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008617 (from R4-2007755).**

**R4-2008617 Test case for NR to UTRA FDD Inter-RAT handover**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0802 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

### 6.11 Enhancements on MIMO for NR [NR\_eMIMO]

#### 6.11.1 UE RF core requirements (38.101) [NR\_eMIMO-Core]

#### 6.11.2 RRM core requirements (38.133) [NR\_eMIMO-Core]

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**Email discussion: [95e][219] NR\_eMIMO\_RRM**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][219] NR\_eMIMO\_RRM | R16 NR eMIMO | RRM Core requirements | 6.11.2 |

**R4-2008508 Email discussion summary for [95e][219] NR\_eMIMO\_RRM** *Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009031 (from R4-2008508).**

**R4-2009031 Email discussion summary for [95e][219] NR\_eMIMO\_RRM** *Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

**General**

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008618 | WF on NR eMIMO RRM requirements | Samsung |

**Topic #1: L1-SINR Measurement**

Issue 1-1-1: For SSB/CSI-RS-based CMR+IMR, the sharing factor P

Agreement: For SSB/CSI-RS-based CMR+IMR L1-SINR measurement:

* + - No requirement when CMR or IMR is fully overlapped with MG.
    - The variable P used for defining L1-SINR measurement period could can be defined as the maximum value between PCMR and PIMR, where
      * PCMR is the scaling factor for CMR according to the principles of defining variable P for L1-RSRP measurement.
      * PIMR is the scaling factor for IMR according to the principles of defining variable P for L1-RSRP measurement.

Issue 1-1-2: Extend single carrier requirement to CA

Agreement: For extending single carrier requirement to CA for L1-SINR measurement:

* Follow the conclusion from extending single carrier requirement to CA for L1-RSRP measurement in Rel-15 TEI.

Issue 1-2-2: For SSB-based CMR+IMR, “repetition = ON” field of IMR

Agreement: For SSB-based CMR+IMR with NZP IMR configured with “repetition = ON”:

* No measurement period requirement shall be applied.

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006371 | Revised |
| R4-2007769 | Postponed |

**Topic #2: SCell Beam Failure Recovery**

Issue 2-1-1: BFD/CBD Sharing factor for FR1 inter-band CA

Agreement

* BFD/CBD Sharing factor for FR1 inter-band CA:
  + The sharing factor is proportional to the number of bands on which UE is performing BFD/CBD only for SCell.

Issue 2-1-3: Sharing factor for BFD/CBD measurement on PCell/PSCell

Agreement

* Sharing factor for BFD/CBD measurement on PCell/PSCell:
  + No scaling factor is introduced for BFD/CBD measurements on PCell/PSCell.

Issue 2-2-1: How the requirement for beam failure recovery request should be defined

Agreement

* The requirement for beam failure recovery request is defined as:
  + After detecting beam failure in an SCell, UE is required to transmit scheduling request on PUCCH configured for SR for BFR within a period T, where
    - T = T1 x Ceil((T2 + D) / T1),
      * T1 is equal to the periodicity of PUCCH configured with *schedulingRequestForBFR*.
      * T2 is the time to perform the candidate beam detection T2 = TEvaluate\_CBD.
        + TEvaluate\_CBD is the evaluation period for candidate beam detection specified in TS38.133 8.5.5 and 8.5.6.
      * D is the UE Processing time.

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007771 | Revised |
| R4-2006373 | Merged |
| R4-2006374 | Revised |
| R4-2007379 | Merged |

**Topic #3: DL/UL Beam Indication with Reduced Latency and Overhead**

Issue 3-1-1: The necessity of new RRM requirement for MAC-CE based spatial relation update for aperiodic-SRS

Agreement

* The necessity of new RRM requirement for MAC-CE based spatial relation update for aperiodic-SRS:
  + No new RRM requirement is introduced for the feature of MAC-CE based spatial relation update for aperiodic SRS.

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006868 | Return to |

**Topic #4: Multi-TRxP Transmission**

Issue 4-2-1: For FR1 Intra-band CA, whether or not the same conclusion as intra-band EN-DC can be applied

Agreement

* For FR1 Intra-band CA, RRM MRTD requirement impact due to enabling multi-TRxP transmission in Rel-16:
  + RAN4 apply the same conclusion as intra-band EN-DC.

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006377 | Revised |

2nd round email discussion conclusions

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**R4-2008618 WF on NR eMIMO RRM requirements**

*Type: other For: Approval  
 Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Return to.**

##### 6.11.2.1 L1-SINR [NR\_eMIMO-Core]

**R4-2006205 Discussion on requirements for L1-SINR measurements**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

**Decision: Noted.**

**R4-2006370 Discussion on L1-SINR Measurement Requirement**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

**Decision: Noted.**

**R4-2006371 CR to TS38.133 on introduction of L1-SINR Measurement Requirement (Section 3.3 and 9)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0646 Cat: B (Rel-16)  
  
 Source: Samsung*

**Discussion:**

**Decision: Revised to R4-2008619 (from R4-2006371).**

**R4-2008619 CR to TS38.133 on introduction of L1-SINR Measurement Requirement (Section 3.3 and 9)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0646 Cat: B (Rel-16)  
  
 Source: Samsung*

**Discussion:**

**Decision: Return to.**

**R4-2006864 Discussion on RRM requirements for L1-SINR**

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

**Discussion:**

**Decision: Noted.**

**R4-2007483 RRM requirements for L1-SINR estimation**

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

**Discussion:**

**Decision: Noted.**

**R4-2007767 Discussion on L1-SINR measurement requirements for NR eMIMO**

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

**Discussion:**

**Decision: Noted.**

**R4-2007768 Discussion on L1-SINR measurement accuracy for NR eMIMO**

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

**Discussion:**

**Decision: Noted.**

**R4-2007769 DraftCR on L1-SINR measurement accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Postponed.**

**R4-2008091 Discussions on Rel-16 NR eMIMO L1-SINR measurements**

*Type: other For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

There are still a number of open issues related to L1-SINR measurement requirements.

This contribution provides our views of the above open issue.

**Discussion:**

**Decision: Noted.**

##### 6.11.2.2 SCell Beam failure recovery [NR\_eMIMO-Core]

**R4-2006372 Discussion on SCell Beam Failure Recovery RRM Requirement**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

**Decision: Noted.**

**R4-2006373 CR to TS38.133 on introduction of SCell BFD and CBD (Section 8.5)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0647 Cat: B (Rel-16)  
  
 Source: Samsung*

**Discussion:**

**Decision: Merged.**

**R4-2006374 CR to TS38.133 on introduction of SCell BFRQ Procedure (Section 8.5)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0648 Cat: B (Rel-16)  
  
 Source: Samsung*

**Discussion:**

**Decision: Revised to R4-2008621 (from R4-2006374).**

**R4-2008621 CR to TS38.133 on introduction of SCell BFRQ Procedure (Section 8.5)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0648 Cat: B (Rel-16)  
  
 Source: Samsung*

**Discussion:**

**Decision: Return to.**

**R4-2006865 Discussion on RRM requirements for BFR on SCell**

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

**Discussion:**

**Decision: Noted.**

**R4-2007378 BFRQ on SR-like PUCCH resource**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the RRM requirements for BFRQ on SR-like PUCCH resource.

**Discussion:**

**Decision: Noted.**

**R4-2007379 Draft CR: Correction of SCell BFRQ Procedure (Section 8.5)**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: Ericsson*

**Abstract:**

This draft CR corrects the SCell BFRQ procedure requirements.

**Discussion:**

**Decision: Merged.**

**R4-2007484 SCell Beam Failure Detection and Recovery**

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

**Discussion:**

**Decision: Noted.**

**R4-2007770 Discussion on SCell BFD and CBD requiremetns for NR eMIMO**

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

**Discussion:**

**Decision: Noted.**

**R4-2007771 CR on SCell BFD and CBD requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0806 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Revised to R4-2008620 (from R4-2007771).**

**R4-2008620 CR on SCell BFD and CBD requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0806 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

##### 6.11.2.3 DL/UL beam indication with reduced latency and overhead [NR\_eMIMO-Core]

**R4-2006375 Discussion on MAC-CE based spatial relation update for aperiodic SRS**

*Type: discussion For: Approval  
 Source: Samsung*

**Discussion:**

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**Decision: Noted.**

##### 6.11.2.4 Others [NR\_eMIMO-Core]

**R4-2006065 Discussion on applicable timing for the unknown PL RS activated by MAC-CE**

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

**Discussion:**

**Decision: Noted.**

**R4-2006206 Discussion on RRM requirements for Multi-TRP**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

**Decision: Noted.**

**R4-2006376 Discussion on MRTD/MTTD requirement to Enable Multi-TRP Transmission**

*Type: discussion For: Discussion  
 Source: Samsung*

**Discussion:**

**Decision: Noted.**

**R4-2006377 CR to TS38.133 on introduction of multi-TRP transmission (Section 7.5 and 7.6)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0649 Cat: B (Rel-16)  
  
 Source: Samsung*

**Discussion:**

**Decision: Revised to R4-2008622 (from R4-2006377).**

**R4-2008622 CR to TS38.133 on introduction of multi-TRP transmission (Section 7.5 and 7.6)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0649 Cat: B (Rel-16)  
  
 Source: Samsung*

**Discussion:**

**Decision: Return to.**

**R4-2006866 Discussion on MRTD for multiple TRPs scenario**

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

**Discussion:**

**Decision: Noted.**

**R4-2006867 Discussion on PL RS activation requirement via MAC CE**

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

**Discussion:**

**Decision: Noted.**

**R4-2006868 CR for introduction of pathloss reference signal switching delay**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0702 Cat: B (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Return to.**

**R4-2007380 MRTD/MTTD requirements for Multi-TRP deployment for MIMO+CA and MIMO+DC**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the MRTD/MTTD requirements for multi-TRP deployment.

**Discussion:**

**Decision: Noted.**

**R4-2007485 MRTD/MTTD in CA/DC with multiple TRPs**

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

**Discussion:**

**Decision: Noted.**

**R4-2007772 Discussion on MRTD and MTTD requirements for multi-TRP transmissions**

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

**Discussion:**

**Decision: Noted.**

**R4-2008092 Discussions on Rel-16 NR eMIMO multi-TRP transmissions**

*Type: other For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

The document discusses if FR1 intra-band EN-DC MRTD/MTTD and CA MRTD requirements are affected by multi-TRP transmission.

**Discussion:**

**Decision: Noted.**

#### 6.11.3 Demodulation and CSI requirements (38.101-4) [NR\_eMIMO-Perf]

### 6.12 Add support of NR DL 256QAM for FR2 [NR\_DL256QAM\_FR2]

#### 6.12.1 General [NR\_DL256QAM\_FR2]

#### 6.12.2 BS RF core requirements (38.104) [NR\_DL256QAM\_FR2]

#### 6.12.3 UE RF core requirements (38.101-2) [NR\_DL256QAM\_FR2]

#### 6.12.4 Demodulation and CSI requirements (38.101-4) [NR\_DL256QAM\_FR2-Perf]

### 6.13 RF requirements for NR frequency range 1 (FR1) [NR\_RF\_FR1]

#### 6.13.1 RF core requirements [NR\_RF\_FR1]

#### 6.13.2 RRM core requirements (38.133) [NR\_RF\_FR1]

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**Email discussion: [95e][220] NR\_RF\_FR1\_RRM**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][220] NR\_RF\_FR1\_RRM | R16 NR FR1 RF | RRM Core requirements | 6.13.2 |

**R4-2008509 Email discussion summary for [95e][220] NR\_RF\_FR1\_RRM** *Type: other For: Information  
 Source: Moderator (Huawei, HiSilicon)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009032 (from R4-2008509).**

**R4-2009032 Email discussion summary for [95e][220] NR\_RF\_FR1\_RRM** *Type: other For: Information  
 Source: Moderator (Huawei, HiSilicon)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008623 | WF on DL interruption on LTE carriers at Tx switching between two uplink carriers | Huawei, HiSilicon |

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007732 | Revised |
| R4-2007733 | Revised |

2nd round email discussion conclusions

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##### 6.13.2.1 RRM requirements for Tx switching between two uplink carriers [NR\_RF\_FR1]

**R4-2008623 WF on DL interruption on LTE carriers at Tx switching between two uplink carriers**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2006035 RRM interruption requirement for switching between two uplink carriers**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Discussion:**

**Decision: Noted.**

**R4-2006211 On DL interruption for UL Tx switching**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Apple*

**Discussion:**

**Decision: Noted.**

**R4-2006572 Interruption for Tx switching between two uplink carriers**

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

**Discussion:**

**Decision: Noted.**

**R4-2006805 RRM requirements for switching between case1 and case 2**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

**Decision: Noted.**

**R4-2007346 On interruption for FR1 Tx switching between two uplink carriers**

*Type: discussion For: Approval  
 Source: OPPO*

**Discussion:**

**Decision: Noted.**

**R4-2007731 DL interruption due to Tx switching between two uplink carriers**

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

**Discussion:**

**Decision: Noted.**

**R4-2007732 CR on DL interruption on LTE carriers at Tx switching between two uplink carriers**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6875 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008624 (from R4-2007732).**

**R4-2008624 CR on DL interruption on LTE carriers at Tx switching between two uplink carriers**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6875 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007733 CR on DL interruption Tx switching between two uplink carriers**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0792 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008625 (from R4-2007733).**

**R4-2008625 CR on DL interruption Tx switching between two uplink carriers**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0792 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

### 6.14 NR RF requirement enhancements for frequency range 2 (FR2) [NR\_RF\_FR2\_req\_enh]

#### 6.14.1 RF core requirements [NR\_RF\_FR2\_req\_enh]

#### 6.14.2 RRM core requirements (38.133) [NR\_RF\_FR2\_req\_enh]

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**Email discussion: [95e][221] NR\_RF\_FR2\_req\_enh\_RRM**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][221] NR\_RF\_FR2\_req\_enh\_RRM | R16 NR FR2 RF | RRM Core requirements | 6.14.2 |

**R4-2008510 Email discussion summary for [95e][221] NR\_RF\_FR2\_req\_enh\_RRM** *Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009033 (from R4-2008510).**

**R4-2009033 Email discussion summary for [95e][221] NR\_RF\_FR2\_req\_enh\_RRM** *Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008626 | WF on MRTD for FR2 inter-band CA | Apple |

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006214 | Return to.  Session chair: This is a Rel-15 CR for Rel-16 WI. A Rel-16 CR shall be used. |
| R4-2007096 | Return to |
| R4-2007774 | Return to |

2nd round email discussion conclusions

GTW session (June 1st)

**Issue 1-1: Requirements for MRTD requirement with common beam management**

* Option 1: 260ns (Apple, Mediatek, Qualcomm, OPPO / 4)
* Option 2: 3us (Ericsson, NTT DCM, T-Mobile USA, Verizon, NEC / 5)
* Option 3: 3us for co-located deployment, 8us for non-co-located deployment (Huawei)
* Option 4: 7us (Nokia)

Discussion

Apple: ongoing discussion in RF session on CBM/IBM. UE capability was proposed. CBM assumption are yet unclear.

Apple: from chipset vendor perspective CBM with 3us is not possible to support since MRTD > CP. UE needs to switch the beam in the middle of OFDM symbol.

QC: Agree with Apple. 3us will result in multiple scheduling restriction requirements.

E///: Propose 3us. UE can assume co-located deployment. UE does not need to change the beam.

HW: suggest both co-located and non-co-located

Nokia: this is inter-band CA and we shall keep existing MRTD. 3us at least needed for co-located. Ok with Option 2 and 3.

MTK: we already agreed to have CBM for 2 CC from spatial perspective. MRTD is from time perspective and this causes issues.

MTK: what is the benefit to have large MRTD for the NW. It will result in degradation.

ZTE: we had similar discussion for intra-band CA. Need to involve RF session to check inter-band CA TAE is aligned with 260ns.

Nokia: 260ns will limit NW deployment

E///: existing inter-band CA requirements are 3us

Apple: this was discussed in Rel-15 and not related to CBM

Candidate agreements:

Requirements for MRTD requirement with common beam management (CBM)

Option 1:

At least 260ns MRTD is feasible for CBM from UE perspective

Further study feasibility to support up to 3us MRTD under assumption of co-located deployment in terms of impact on performance (e.g. possible scheduling restrictions)

Option 2:

Do not define CBM RRM requirements in Rel-16

**Issue 1-2: If 260ns MRTD is not feasible for some scenarios in common beam management then some performance degradation for MRTD larger than a threshold (e.g. 260ns) should be discussed**

* Option 1: yes (Qualcomm, MediaTek, Apple, OPPO, )
* Option 2: no (Ericsson)

**Issue 1-3: The following revision is proposed for TS38.133**

Table 7.6.4-2: Maximum receive timing difference requirement for inter-band NR carrier aggregation

|  |  |
| --- | --- |
| Frequency Range of the pair of carriers | Maximum receive timing difference (µs) |
| FR1 | 33 |
| FR2 | 8note1 |
| Between FR1 and FR2 | 25 |
| Note1: this MRTD requirement applies to independent beam management only. | |

* Option 1: yes (Apple, Qualcomm, Mediatek, OPPO)
* Option 2: no (Huawei, Nokia, Ericsson)
* Option 3: proposal in R4-2007096 (Ericsson, NEC)

**Sub-topic 1-4: MRTD with independent beam management**

* Option 1: 4~5us (Apple, Mediatek, OPPO)
* Option 2: 8us (Ericsson, Huawei, NTT DCM, T-Mobile USA, Verizon, Qualcomm, NEC, Nokia)
* Option 3: 7us (Nokia)

**Issue 1-5: MTTD for common beam management**

* Option 1: Corresponding MTTD for inter-band FR2 NR CA with common beam management as 3.5 µs (Ericsson)
  + Ericsson needs to confirm their proposal since their comment is different from the one in their paper. [Ericsson]: Option 1 as stated here is fine. Comment updated for consistency.
* Option 2: MTTD can be derived based on the corresponding MRTD agreement (Huawei, Nokia, NTT DCM, NEC)
* Option 3: MTTD should not be defined for inter-band CA with common beam (Qualcomm, Mediatek, Apple)

**Sub-topic 1-6: MTTD for independent beam management**

* Option 1: Keep MTTD for FR2 inter-band CA unchanged (i.e. 8.5 µs) for independent beam management. (Qualcomm, Huawei, Ericsson)
  + Ericsson needs to confirm their proposal since their comment is different from the one in their paper. [Ericsson]: Option 1 as stated here is fine. Comment updated for consistency.
* Option 2: MTTD can be derived based on the corresponding MRTD agreement (MTK, OPPO, Apple, Nokia, NTT DCM, NEC)

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##### 6.14.2.1 Inter-band DL CA MRTD [NR\_RF\_FR2\_req\_enh]

**R4-2008626 WF on MRTD for FR2 inter-band CA**

*Type: other For: Approval  
 Source: TBA*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2006212 On common beam management and MRTD for FR2 iner-band CA**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

**Decision: Noted.**

**R4-2006214 CR on MRTD for FR2 inter-band CA**

*Type: CR For: Agreement  
 38.133 v15.9.0 CR-0630 Cat: F (Rel-15)  
  
 Source: Apple*

**Discussion:**

Session chair: This is a Rel-15 CR for Rel-16 WI. A Rel-16 CR shall be used.

**Decision: Return to.**

**R4-2006215 CR on MRTD for FR2 inter-band CA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0631 Cat: A (Rel-16)  
  
 Source: Apple*

**Discussion:**

**Decision: Return to.**

**R4-2006571 MRTD requirements for FR2 inter-band DL CA**

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

**Discussion:**

**Decision: Noted.**

**R4-2007095 MRTD and MTTD requirements for FR2 inter-band DL CA**

*Type: other For: Approval  
 Source: Ericsson, , NTT DOCOMO, INC.*

**Abstract:**

In this contribution, we present our proposals on the MRTD definition for FR2 inter-band CA.

**Discussion:**

**Decision: Noted.**

**R4-2007096 Updates on MRTD and MTTD requirements for FR2 inter-band DL CA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0716 Cat: B (Rel-16)  
  
 Source: Ericsson, NTT DOCOMO, INC.*

**Abstract:**

There is a proposal to update the MRTD and MTTD for inter-band FR2 NR CA wrt UE implemntation. We propsoe this CR to facilitate the commomn beam management based UE implementation.

**Discussion:**

**Decision: Return to.**

**R4-2007133 MRTD for FR2 Inter-band CA**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2007289 Discussion on MRTD requirement for FR2 inter-band DL CA**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

MRTD requirements for FR2 inter-band DL CA is discussed

**Discussion:**

**Decision: Noted.**

**R4-2007773 Discussion on MRTD requirements for FR2 inter-band DL CA**

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

**Discussion:**

**Decision: Noted.**

**R4-2007774 CR on MRTD requirements for FR2 inter-band CA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0807 Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2008195 MRTD for inter-band DL CA**

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

**Abstract:**

discussion on MRTD requirement for inter-band DL CA

**Discussion:**

**Decision: Noted.**

### 6.15 NR RRM requirement enhancement [NR\_RRM\_Enh\_Core]

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**Email discussion: [95e][222] NR\_RRM\_Enh\_RRM\_1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][222] NR\_RRM\_Enh\_RRM\_1 | R16 NR RRM Enh | RRM Core requirements: General, BWP switching, Spatial relation switch for UL, non-simultaneous UL CA | 6.15.1.4  6.15.1.8  6.15.1.9 |

**R4-2008511 Email discussion summary for [95e][222] NR\_RRM\_Enh\_RRM\_1** *Type: other For: Information  
 Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009034 (from R4-2008511).**

**R4-2009034 Email discussion summary for [95e][222] NR\_RRM\_Enh\_RRM\_1** *Type: other For: Information  
 Source: Moderator (Intel Corporation)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

**Topic #1: BWP Switching on multiple CCs**

Issue 1-1-3: TBWPswitchDelay when SCS changes

the simultaneous BWP switch on multiple CCs case, if the BWP switch on multiple CCs results in the change of the SCS on any CC among involved CCs, TBWPswitchDelay should be based on the smallest SCS among all SCS values of all involved CCs.

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008675 | WF on NR RRM enhancements - BWP switching on multiple CCs | Intel |

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007680 | Revised |
| R4-2008191 | Revised |
| R4-2008192 | Revised |

**Topic #2: UL Spatial Relation Info Switching**

Issue 2-1-2: Whether define the spatial relation delay requirement for UE which supports BC Bit-0 and Bit 1

Define requirement for BC bit-0 UE. Requirement for BC bit-0 UE is FFS.

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008679 | WF on NR RRM enhancements – UL spatial relation info switch | MediaTek |

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006479 | Revised |

GTW session (June 1st)

**Topic #1: BWP Switching on multiple CCs**

Issue 1-1-1: Delay requirements for DCI/timer based BWP switch

* 1st round summary

|  |
| --- |
| ; N: Number of CCs with simultaneous BWP switch; K is number of CCs that can be processed simultaneously; D is incremental delay for BWP switch processing on additional CCs; FFS on D and K  *Candidate options:*   * Options for D: * Option 1(MTK, NEC, Huawei, Ericsson, ZTE): D=100us for Type 1; 200 us for Type 2 * Option 2(Apple): D = 450us for Type 1; 1.5ms for Type 2; * Option 3(Intel, Qualcomm, Vivo, OPPO): some value between option 1 and option 2. * Option 3a (Intel, Qualcomm, Vivo, OPPO): D = 200us for Type 1 and 800us for Type 2 * Option 3b (OPPO): D = 200us for Type 1 and 450us for Type 2 * Option 4 (Nokia): D = 100us for both Type 1 and Type 2 * Definition of N (Huawei, MTK): For DCI and timer-based BWP switch on multiple CCs, for UE which is capable of per-FR gap, N is the number of simultaneous BWP switching on CCs within the same frequency range; For UE which is not capable of per-FR gap, N is the number of simultaneous BWP switching on both FR.   *The options are still quite diverse. Apple raise the solution to add some limitation about the number of CCs with simultaneous switch in order to be within k0/k2 on FR2. However, some other companies still have concern about the impact to the Scell activation. Since the delay time is highly related to the UE implementation, another alternative way is to define a new UE capability and the delay time is depended on the reported UE capability.*  *Recommendations for 2nd round: Further discussion is needed. Suggest companies to agree about a compromise value. if no compromised value can be agreed, can a new UE capability be defined to solve the problem?* |

Discussion:

Intel: compromise values is Option 3a

Nokia: Can compromise to Option 1. Option 2 and 3 are too long

Apple: Compromise 300us for Type 1 and 1ms for Type 2

Huawei: 100us for Type 1 and 400us for Type 2

MediaTek: RAN1 has limitation. Decouple FR1 and FR2. FR1: Option 3b. FR2: Option 1.

Qualcomm: RAN1 can easily solve it and increase scheduling offset. Compromise to Option 3a.

Chair: can we go with different capabilities?

Intel/Apple: Yes

Nokia: 1 value will be simple. Capabilities will increase complexity of NW

ZTE: Many values is too complex. At most 2 set of capabilities.

MTK: Agree with Nokia. Decouple with FR1/FR2.

HW: Single set of requirements. Do not need to differentiate for Type 1/2.

Vivo: we are ok with different capabilities. Can we set upper bound for total delay?

QC: we agree with HW on a single set of requirements for FR1/FR2. We are ok with multiple capabilities

Agreement:

Candidate values

Type 1: 100, 200, 300

Type 2: 200, 400, 800, 1000.

Candidate agreements:

~~Version 1~~

~~Option 3a: (Intel, Qualcomm, Vivo, OPPO): D = 200us for Type 1 and 800us for Type 2~~

~~Option 3c: D = N us for Type 1 and M us for Type 2~~

~~Option 5: Define new UE capabilities.~~

* ~~D = X~~
* ~~D = Y~~
* ~~D = Z~~

Version 2

Option A: D = [100 or 200] us for Type 1 and 800us for Type 2 (HW, vivo, Intel with 200, Nokia with 100 but not for Type 2, OPPO with 200, NEC but not for Type 2, MTK but 400 for Type 2, E// is same as Nokia, QC in case of 800us, ZTE Type 2 is too long)

Option B: Define new UE capabilities for BWP switching on multiple CCs (HW, Apple, Intel, OPPO)

D = 100us, 200us, 400us, 800us, 1000us

Capabilities are separate from single CC Type ½ capabilities

Same capabilities apply for FR1 and FR2

Discussion

HW: Option A with 100, Option B

Vivo: A

NEC: Option A

Chair: For Option A we repeat same Options as originally. Do not see way to converge on a single set of values due to different UE implementations. Are there any objections on Option B.

ZTE/Nokia: have concerns on Option B. It will complicate NW implementation.

Apple: the consequence is that many UEs will not be able to support this feature.

Intel: Option B is a compromise proposal. We discussed this for 3 meetings and companies do not converge. Do not agree with ZTE/Nokia that it will overcomplicate NW.

Vivo: ok with Option B. For NW we agreed that interruptions are decoupled with BWP switching.

MTK: Agree with Apple view. It will not complicate NW implementation.

Candidate agreement:

Option 1: Define new UE capabilities for BWP switching on multiple CCs

D = 100us, 200us, 400us, 800us, 1000us

Capabilities are separate from single CC Type ½ capabilities

Same capabilities apply for FR1 and FR2

Supported: vivo, Apple, QC, Intel, OPPO, E///, HW

Objected: MTK, ZTE,

Agreement

Define new UE capabilities for BWP switching on multiple CCs

Type 1: D = 100us, 200us

Type 2: D = 400us, 800us, 1000us

Same capabilities apply for FR1 and FR2

Issue 1-1-2: Delay requirements for RRC based BWP switch

* 1st round summary

|  |
| --- |
| ; Where DRRC is FFS  extended delay for RRC based BWP switching on multiple CCs is needed.  *Tentative agreement: No agreement in the 1st round.*  *Candidate options:*   * Option 1(Apple, Ericsson): DRRC = 1.5ms * Option 1a (OPPO, Ericsson):DRRC = 1.5ms for N (N ≤ 8) cells * Option 2(MTK, NEC, Huawei, Nokia, Ericsson, ZTE): DRRC = 0ms * Option 3(Vivo, Ericsson, NEC): DRRC = D (agreed value for DCI/timer based BWP switch). * Option 4(Intel, Ericsson, OPPO): if N<=3, re-use the existing requirement. if N>3, DRRC =1.5ms. where N is the total number of CCs. * Option 5 (Qualcomm, Ericsson, OPPO): DRRC = 800 us in the Delay requirements for RRC based BWP switch.   Note: Spec clarifies that RRC configures UE to switch to BWPs in activated SCells only.   * Option 6 (Ericsson): DRRC ≤ 1.5ms * Option 7(Ericsson, NEC, Intel) if N<=3, re-use the existing requirement. if N>3, DRRC =D. where N is the total number of CCs.   *The options are still quite diverse. some companies prefer no time extension since the original RRC processing delay is already quite relax. Some other companies have concern if the number of CCs is large, the time may not be enough. Ericsson further propose a compromise way. if N<=3, re-use the existing requirement. if N>3, DRRC =D. since the D is derived from issue 1-1-1, if no compromise value is agreed, it seems that RRC based delay can still be dependent on the new UE capability.*  *Recommendations for 2nd round: further discussion.* |

Issue 1-2-2: Delay requirements for Timer based BWP switch

* 1st round summary

|  |
| --- |
| *Tentative agreement: No agreement in the 1st round.*  *Candidate options:*   * Option 1 (Vivo): the switch delay of one timer based BWP switch on one FR will not be impacted by a partial overlap timer based BWP switch on the other FR. * Option 2 with update (Apple, Qualcomm, Intel): * TBWPSwitchDelayPartialOverlapTimer = TDelay + TBWPSwitchDelayTimer, where TDelay is upper bounded by timer based BWP switch delay on single CC or multiple CCs. TBWPSwitchDelayTimer is the timer based BWP switch delay on single CC or multiple CCs. * Option 3 (MTK): UE should be allowed to conduct the BWP switch for different request sequentially in a first-come-first-serve manner for non-simultaneous Timer-based BWP switch in NR-DC. * Option 4(Intel): For timer and RRC based partial overlap triggered BWP switching, the delay time is upper bounded by the multiple BWP switch delay in the first CG. * Option 5(OPPO): Clarify the assumption for UE capacity of support independent timer-based BWP switch in different FR. * Option 6(Qualcomm): RAN4 does not define any requirement to address the impact from partially overlapped and timer-based BWP switching in the other FR. * If a requirement must be defined, the same principle of existing requirement can be extended across FRs, i.e. timer-based BWP switch in one FR should be delayed by ongoing timer-based BWP switch in another FR. * Option 7: Depending on whether UE is capable of per-FR gap. * For UE capable of per-FR gap: * Option 1 (Huawei, NEC): TDelay+TBWPSwitchDelay where TDelay is the time delayed by ongoing timer-based BWP switching with in the same frequency range. * Option 2 (Ericson): UE capable of per FR gap, shall be able to perform BWP switching on any two CCs across the two CGs over partially or fully overlapping time period by including an extra margin (Tother,CG) in the total delay BWP switching delay for. * Tother,CG is defined as follows:   + Where:     - N = 2 is the number of CCs across CGs on which partial overlap BWP switching occurs during at least partially overlapping time.     - K is number of CCs that can be processed simultaneously     - D is delay.     - The values of K and D agreed for simultaneous BWP switching on multiple CCs shall be reused. * For UE not capable of per-FR gap: * Option 1 (Huawei, NEC): *TDelay+TMultipleBWPSwitchDelay,* where *TDelay*is the time delayed by ongoing timer-based BWP switching with in the same frequency range; *TMultipleBWPSwitchDelay* is *TBWPSwitchDelay+* D(N-1), N is the number of timer-based BWP switch on CCs in the other FR of which the time periods of BWP switching delay are overlapped with TNonSimultaneousTimer, and D is the incremental delay, which is same as that of simultaneous BWP switch on multiple CCs. * Option 2 (Ericsson): UE not capable of per FR gap, shall perform partial overlap BWP switching on all CCs across both CGs sequentially on first-come-first served basis.   *The main issue is that for timer based BWP switch on multiple CCs, if UE is capable of per-FR gap and the timer based BWP switch happens in two frequency range, can it be handled in parallel or sequentially? Some companies support that the processing can be in parallel, while some others prefer not to differentiate the case and define it in a simple way.*  *Recommendations for 2nd round: further discussion. Whether to define a unified requirement or separate requirement dependent on the UE capability of per -FR gap.* |

**Topic #2: UL Spatial Relation Info Switching**

Issue 2-1-1: When the UL signal has spatial relation to an unknown DL RS

* 1st round summary

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| --- |
| *Tentative agreement: No agreement in the 1st round.*  *Candidate options:*   * Option 1 (MTK, Ericsson, NTT DOCOMO, ZTE, Nokia): UE transmits using previous TX beam * Option 2 (NTT DOCOMO, Nokia, Ericsson, MTK): Drop UL transmission until spatial relation info is known * Option 3 (Apple, Intel, Qualcomm, Huawei, NTT DOCOMO): Up to UE implementation and no requirement is needed to be specified   *The views are still quite diverse. In general, the case is a corner case, can we compromise to a proposal?*  *Recommendations for 2nd round: further discussion is needed.* |

Issue 2-1-3: Whether to consider DL timing tracking when associated DL-RS

* 1st round summary

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| --- |
| *Tentative agreement: No agreement in the 1st round.*  *Candidate options:*   * + Sub1. Whether to consider timing tracking when associated DL-RS QCLed with a different qcl-Type1 RS?     - Option 1(Apple, Intel, NTT DOCOMO, Ericsson, Qualcomm): No     - Option 2 (MTK, ~~Qualcomm~~, ZTE): Yes     - Option 3: Up to UE     - Option 4 (Nokia): The WF is not clear about whether this relates to known or unknown case. Additionally, the question is not clear to us and we would prefer more discussion on this subtopic to understand the actual scenario.     - Option 5 (Huawei, Nokia):     - When the timing of new DL RS is different with the old DL RS’s timing, UE may adjust the uplink according to the target DL RS timing. * -if the target DL RS is in the active TCI list, it means that timing information is maintained in UE side, so no time for timing tracking is considered; * if the target DL RS is in the active TCI list, we suggest that there is no requirements. But we also can agree that additional time for timing tracking is considered.   + Sub2. Whether to consider timing tracking when associated DL-RS is an unknown DL RS?     - Option 1(Apple, Intel, NTT DOCOMO, Ericsson, Qualcomm): No     - Option 2(MTK, Nokia, Qualcomm, ZTE): Yes     - Option 3: Up to UE     - Option 4 (Huawei): no requirement   + Sub3. Whether to consider timing tracking when PUSCH/PUCCH and SRS associated with different DL-RSs in one slot?     - Option 1 (Apple, Intel, NTT DOCOMO, Ericsson, Qualcomm, ZTE, Nokia): No     - Option 2 (Nokia): Yes     - Option 3 (MTK, Huawei): It should be an error configuration when PUSCH/PUCCH and SRS associated with different QCL-Type A(or C) DL-RSs in one slot. In this situation, it’s up to UE to decide whether to adjust the timing or not.     - Option 4 (Qualcomm, Nokia): It is up to UE whether to consider timing tracking when PUSCH/PUCCH and SRS associated with different DL-RSs are in one slot.   *for sub3, the majority companies agree not to define the requirement.*  *for sub1, the views are quite diverse. A compromise option is provided by huawei which further distinguish cases whether QCL-ed DL-RS is in active TCI-state or not.*  *for sub2,* *the views are quite diverse either.*  *Recommendations for 2nd round: agree not to define the requirement for sub3. Further discussion for sub 1 and sub 2. for sub-1, the case can be further distinguished: whether associated DL-RS is in active TCI-state or not.* |

Candidate agreements:

* + Sub1. Whether to consider timing tracking when associated DL-RS QCLed with a different qcl-Type1 RS?
    - Option 1(Apple, Intel, NTT DOCOMO, Ericsson, Qualcomm, Samsung): No
    - Option 2 (MTK, ~~Qualcomm~~, ZTE): Yes
    - Option 3: Up to UE
    - Option 4 (Nokia): The WF is not clear about whether this relates to known or unknown case. Additionally, the question is not clear to us and we would prefer more discussion on this subtopic to understand the actual scenario.
    - Option 5 (Huawei):
    - When the timing of new DL RS is different with the old DL RS’s timing, UE may adjust the uplink according to the target DL RS timing.
* -if the target DL RS is in the active TCI list, it means that timing information is maintained in UE side, so no time for timing tracking is considered;
* if the target DL RS is **not** in the active TCI list, we suggest that there is no requirements. But we also can agree that additional time for timing tracking is considered.

Discussion

HW: if RS is in active TCI list then Option 1 is ok. If it is not then additional time is needed.

MTK: can compromise to Option 5.

ZTE: Option 5 is reasonable. UE should meet initial TX timing requirements.

QC: for Option 5, will UE UL TX timing be checked?

ZTE: yes, in our view. UE needs to adjust timing.

Nokia: Option 1

Apple: UE cannot adjust timing multiple times within a slot

MTK: this is a different question. The main issue is whether we allow UE to adjust timing.

~~Agreement~~

~~When associated DL-RS QCLed with a different qcl-Type1 RS DL timing tracking is not needed. Define requirements for the case when the target DL RS is in the active TCI list. Do not define requirements for other cases.~~

Session chair: Continue discussion in the 2nd round.

2nd round email discussion conclusions

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**Email discussion: [95e][223] NR\_RRM\_Enh\_RRM\_2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][223] NR\_RRM\_Enh\_RRM\_2 | R16 NR RRM Enh | RRM Core requirements: SRS carrier switching, CGI reading, Mandatory MG patterns | 6.15.1.1  6.15.1.3  6.15.1.6 |

**R4-2008512 Email discussion summary for [95e][223] NR\_RRM\_Enh\_RRM\_2** *Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009035 (from R4-2008512).**

**R4-2009035 Email discussion summary for [95e][223] NR\_RRM\_Enh\_RRM\_2** *Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

GTW session (May 29th)

**Topic #3: Mandatory gap pattern**

Issue 3-1-1: Mandatory gap patterns for GP#12-GP#23

* + Option 1 (CMCC, Huawei, Mediatek)
    - GP#16, GP#17, GP#18, and GP#19
  + Option 2 (NTT DOCOMO, Ericsson)
    - GP#15, GP#17, GP#18, and GP#19
  + Option 3 (Ericsson, ZTE, NTT DOCOMO, Nokia, MTK)
    - GP#17, GP #18 and GP#19
  + Option 4 (Qualcomm, OPPO, Apple, Nokia)
    - GP#17 and GP#18

Discussion:

ZTE: At least 17 and 18 can be agreed. Potentially 19 can be agreed.

QC: patterns shall be market driven. Can compromise to GP 17 and 18.

DCM: to QC what is the exact meaning of market driven? We show benefit for GP19.

QC: we want to have more flexibility for different regions and operators. Prefer to agree on number of new patterns.

HW: we prefer to have GP19

MTK: Option 3 will be a compromise

QC: we can go with O3

Agreement: GP#17, GP #18 and GP#19 are defined as mandatory

Issue 3-2-1: Mandatory gap patterns for GP#2-GP#11

* + Option 1 (Ericsson)
    - GP#2, GP#3, GP#7, GP#8 and GP#9
  + Option 2 (ZTE, Ericsson)
    - GP#2, GP#3, GP#7, GP#8
  + Option 3 (CMCC, Huawei, Mediatek)
    - GP#2, GP#3, GP#10, and GP#11
  + Option 4 (Qualcomm, OPPO, Nokia, Apple)
    - GP#2 and GP#3

Discussion:

ZTE: GP 2 and 3 are common set.

QC: Don’t agree to introduce 7 and 8.

HW: 2/3/7/8 are related MGL 40/80. 160 also needs to be considered.

CMCC: Share same view with HW

OPPO: Support Option 4

MTK: prefer up to 4 patterns

Agreement:

GP#2, GP#3 are defined as mandatory.

Up to two additional GPs for GP#2-GP#11 will be defined as mandatory. GP is FFS between GP 7, 8, 10, 11.

**Topic #2: CGI reading**

Issue 2-1-1: Rx beam sweeping for MIB decoding in FR2

* + Option 1 (Ericsson, MediaTek, Nokia)
    - Rx beam sweeping is not assumed
  + Option 2 (Qualcomm, Huawei, ZTE, Intel, Apple)
    - Allow UE to perform Rx beam sweeping

Discussion:

Intel: Prefer to use Option 2. We can add side conditions. In real conditions beam sweeping shall be assumed

E///: The question is how we define the requirements. We do not want to add delay requirements.

MTK: to Intel – this requirement is for known case only and UE does not need beam sweeping

QC: the requirement is for max allowed time. We don’t want to force UE to do beam sweeping but still want to allow UE to improve performance.

HW: Known condition under assumption of no RX beam sweeping will be too stringent. Option 1 will limit UE behavior and in real field UE can miss CGI.

Nokia: The requirements will be defined for know cell and in this case no need to assume beam sweeping

ZTE: In practical conditions beam sweeping will be helpful.

Apple: Agree with Option 2

Nokia: can compromise to Option 2 and consider 2 cases with good and bad conditions

Candidate options for discussion in the 2nd round:

Rx beam sweeping for MIB decoding in FR2

* + Option 1
    - Rx beam sweeping is not assumed
  + Option 2
    - Allow UE to perform Rx beam sweeping
  + Option 3
    - Rx beam sweeping is up to UE implementation. Requirements allow UEs with and without Rx beam sweeping.
  + Option 4
    - Rx beam sweeping is up to UE capability. Define requirements for both UE with and without Rx beam sweeping.
  + Option 5
    - Do not define the MIB decoding requirements in FR2 in Rel-16

Session chair: will come back in this meeting to check the status

Issue 2-2-1: SIB1 decoding delay requirements

* + Option 1a (Ericsson, Nokia)
    - [4] samples with -6dB SNR
      * Soft combing of 4 samples is assumed
  + Option 1b (ZTE, Ericsson, Nokia)
    - [6] samples with -6dB SNR
      * SIB1 decoding is up to UE implementation
  + Option 2 (MediaTek, Qualcomm, Huawei)
    - [7] samples with -3dB SNR
      * One shot decoding is assumed

Agreement:

Reference receiver

No IC receiver assumed for requirements definition

Soft combining

Option 1: No soft combining (MTK, QC, HW, Apple)

Option 2: Soft combining (ZTE, E///, Nokia)

[-X dB] SNR and [6] samples

Issue 2-4-1: Margin for interruptions during each autonomous gap for SIB1 decoding

* + Option 1 (Ericsson, ZTE)
    - 2\*RF tuning time + 1 slot (victim cell SCS)
  + Option 2 (Qualcomm)
    - 2\* BWP switching time + 1 slot (victim cell SCS)
  + Option 3 (Huawei, Mediatek)
    - 2\* 2ms + 1 slot (victim cell SCS)

Issue 2-3-1: Whether to define known cell condition for CGI reading in FR1

* + Option 1: Yes (Mediatek, Huawei, Nokia, ZTE)
  + Option 2: No (Qualcomm, Ericsson)

Issue 2-3-3: value of X

* + Option 1: (Nokia, Ericsson, ZTE)
    - X = 5 for FR2
  + Option 2 (Mediatek, Huawei, Ericsson)
    - X=3 for FR2

1st round email discussion conclusions

**Topic #1: SRS carrier switching requirements**

Sub-topic #1-1 SRS carrier switching interruption requirements

Interruption requirements for CA other than case 1, case 2 and case 3 are the same as for async case

* Case 1: CA is co-location deployed
* Case 2: Single TAG CA, or carriers in the same TAG for multiple TAG CA
* Case 3: uplink time difference does not exceed a threshold X
  + X = [5] us

Sub-topic #1-2 Impact to RRM measurement requirements due to SRS carrier switching

In EN-DC and NE-DC operation,

* For UE capable of per-FR gap,
  + Interruptions on NR measurement are allowed in FR1 but NOT allowed in FR2 due to LTE SRS carrier based switching.
  + Additional delay can be expected on NR measurement in FR1 when UE is configured to perform LTE SRS carrier based switching.
* For UE not capable of per-FR gap,
  + Interruptions on NR measurement are allowed in both FR1 and FR2 due to LTE SRS carrier based switching.
  + Additional delay can be expected on NR measurement in both FR1 and FR2 when UE is configured to perform LTE SRS carrier based switching.
* Note: LTE SRS carrier based switching is allowed to be dropped when colliding with NR measurement

In EN-DC and NE-DC operation,

* For UE capable of per-FR gap,
  + Interruptions on E-UTRA measurement are allowed due to NR SRS carrier based switching in FR1, but NOT allowed due to NR SRS carrier based switching in FR2.
  + Additional delay can be expected on E-UTRA measurement when UE is configured to perform NR SRS carrier based switching in FR1.
* For UE not capable of per-FR gap,
  + Interruptions on E-UTRA measurement are allowed due to NR SRS carrier based switching in both FR1 and FR2.
  + Additional delay can be expected on E-UTRA measurement when UE is configured to perform NR SRS carrier based switching in FR1 and/or in FR2.
* Note: NR SRS carrier based switching is allowed to be dropped when colliding with E-UTRA measurement

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| [R4-2007645](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_eBis/Docs/R4-2003966.zip) | Revised |
| [R4-2007646](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_eBis/Docs/R4-2003966.zip) | Revised |
| [R4-2007743](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_eBis/Docs/R4-2004299.zip) | Merged |
| [R4-2007744](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_eBis/Docs/R4-2004300.zip) | Revised |
| [R4-2007756](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_eBis/Docs/R4-2003966.zip) | Revised |

**Topic #2: CGI reading requirements with autonomous gap**

Sub-topic #1-3 Known cell condition

Known cell condition for FR2

* During the last X seconds before the reception of the report CGI command
  + the UE has sent a valid L3-RSRP measurement report with SSB index for the target cell
* During MIB decoding at least reported SSBs remains detectable according to the cell identification conditions specified in clauses 9.2 or 9.3 of TS 38.133, and
* During SIB1 decoding the SSB used for MIB decoding remains detectable according to the cell identification conditions specified in clauses 9.2 or 9.3 of TS 38.133.

If it is agreed to specify known cell condition for FR1, known cell condition for FR2 with X=5 will be reused.

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008685 | WF on NR RRM enhancements – CGI reading | ZTE |

Tdoc decisions

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| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007643 | Revised |
| R4-2006971 | Revised |
| R4-2006972 | Revised |
| R4-2007641 | Revised |
| R4-2007642 | Revised |
| R4-2007862 | Revised |
| R4-2007863 | Agreed |

**Topic #3: Mandatory MG patterns**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007647 | Revised |
| R4-2006718 | Revised  Session chair: please note that the tdoc type is DraftCR and not a CR. Let know if CR is needed. |

2nd round email discussion conclusions

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**Email discussion: [95e][224] NR\_RRM\_Enh\_RRM\_3**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][224] NR\_RRM\_Enh\_RRM\_3 | R16 NR RRM Enh | RRM Core requirements: Multiple Scell activation/deactivation, Inter-frequency measurements, UE-specific BW change, inter-band CA | 6.15.1.2  6.15.1.5  6.15.1.7  6.15.1.10 |

**R4-2008513 Email discussion summary for [95e][224] NR\_RRM\_Enh\_RRM\_3** *Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009036 (from R4-2008513).**

**R4-2009036 Email discussion summary for [95e][224] NR\_RRM\_Enh\_RRM\_3** *Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

GTW session (May 29th)

**Topic #1: Multiple Scell activation**

Issue 1-1: Whether or not to further down select multiple Scell activation cases for requirements from R4-2005347?

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| --- |
| *Tentative agreements:*  Based on the 1st round discussion, 6 companies supported option 1 while 1 company supported option 2. The tentative agreement based on majority view is Option 1.  *Candidate options:*   * Option 1(Apple, MediaTek, Huawei, Ericsson, NEC, Nokia): No * Option 2 (Qualcomm): Yes, and following scope is applied   + RAN4 to not define any requirements for a case where all to-be-activated SCells are unknown without active serving cell on the same band   + RAN4 to not define any requirements for a case where to-be-activated SCells belong to different scenario groups, e.g. combinatorial cases of issue 1-10-x and issue 1-10-y in R4-2005405   *Recommendations for 2nd round:*  The tentative agreement shall be finally confirmed in the 2nd round and the agreement will be captured in the WF. |

Discussion:

HW/Apple prefer “RAN4 to not define any requirements for a case where all to-be-activated SCells are unknown without active serving cell on the same band”

Agreement

RAN4 to not define any requirements for a case where any to-be-activated SCells are unknown without active serving cell or known to-be-activated SCells on the same band

Issue 1-2: Scaling for unknown intra-band contiguous being-activated SCell

|  |
| --- |
| *Tentative agreements:*  No agreement has been made in the 1st round due to the diverse proposals. Apple added a new option 2b for companies to compromise.  *Candidate options:*   * Option 1 (Apple, Huawei, MTK): FR1 unknown SCells that are contiguous to FR1 known cell or FR1 active serving cell still needs to be accounted for in N and can be scaled by N. * Option 2 (Nokia, QC): The FR1 unknown SCells which are contiguous to the FR1 known cell or FR1 active serving cell on the same band should not be counted when deriving the scaling factor N. * Option 2a (Ericsson, NEC): An unknown SCell in FR1 that is contiguous to an active serving cell, or to a known SCell being activated by the same MAC PDU, is not accounted for in, or scaled by, N when either of the following is fulfilled:   + A single SSB is used in the unknown SCell   + Multiple SSBs are used in the unknown SCell, and TCI state indication for PDCCH is provided by the same MAC PDU used for SCell activation   + Otherwise the SCell is accounted for in, and scaled by, N. * Option 2b (Apple): An unknown SCell in FR1 that is contiguous to an active serving cell, or to a known SCell being activated by the same MAC PDU, is not accounted for in, or scaled by, N when the following conditions are fulfilled:   + A single SSB is used in the unknown SCell; or multiple SSBs are used in the unknown SCell and TCI state indication for PDCCH is provided by the same MAC PDU used for SCell activation; and   + its ssb-PositionInBurst is same as the one of FR1 known cell or FR1 active serving cell, and   + its SSB DL Tx beam is same as the corresponding SSB DL Tx beam at the same SSB position of FR1 known cell or FR1 active serving cell, and   + its SMTC offset is same as the one of FR1 known cell or FR1 active serving cell   Otherwise the SCell is accounted for in, and scaled by, N.  *Recommendations for 2nd round:*  Encourage companies to discuss how to compromise to the final solution, and the agreements will be captured in the WF.  Moderator suggestion: could we use option 2b as a starting point to discuss the compromised solution? |

Discussion

Apple/NEC/Ericsson/Nokia/MTK: Can agree with Option 2b

Huawei: need to check on Option 2b

Tentative agreement

* Option 2b: An unknown SCell in FR1 that is contiguous to an active serving cell, or to a known SCell being activated by the same MAC PDU, is not accounted for in, or scaled by, N when the following conditions are fulfilled:
  + A single SSB is used in the unknown SCell; or multiple SSBs are used in the unknown SCell and TCI state indication for PDCCH is provided by the same MAC PDU used for SCell activation; and
  + its ssb-PositionInBurst is same as the one of FR1 known cell or FR1 active serving cell, and
  + its SSB DL Tx beam is same as the corresponding SSB DL Tx beam at the same SSB position of FR1 known cell or FR1 active serving cell, and
  + its SMTC offset is same as the one of FR1 known cell or FR1 active serving cell

Otherwise the SCell is accounted for in, and scaled by, N.

Issue 1-3: “cell detection time” in delay extension due to searcher limitation

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| --- |
| *Tentative agreements:*  Based on the 1st round discussion, 6 companies supported option 1 while 2 company supported option 2. The tentative agreement based on majority view is Option 1. However, Huawei proposed new option 3 for compromising.  *Candidate options:*   * Option 1 (Apple, MediaTek, Ericsson, NEC, QC, Nokia): “cell detection time” in delay extension due to searcher limitation means “1\*TRS” for FR1 unknown SCells and “8\*TRS” for the FR2 unknown SCell * Option 2 (NEC, Huawei): “cell detection time” in delay extension due to searcher limitation means “TFirstSSB\_MAX + TSMTC\_MAX + Trs” for FR1 unknown SCell and “TFirstSSB + 23\*Trs” for the FR2 unknown Scell * Option 3 (Huawei): “cell detection time” in delay extension due to searcher limitation means “1\*TRS” for FR1 unknown SCells and “8\*TRS” for the FR2 unknown SCell. And meanwhile AGC time is scaled by the number of bands with unknown SCell but without known or active serving cell.   *Recommendations for 2nd round:*  The tentative agreement and the new option 3 for compromising shall be finally confirmed in the 2nd round and the agreement will be captured in the WF. |

Agreement: “Cell detection time” in delay extension due to searcher limitation means “1\*TRS” for FR1 unknown SCells and “8\*TRS” for the FR2 unknown SCell

Issue 1-4: Interruption for multiple SCell activation

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| --- |
| *Tentative agreements:*  Based on the 1st round discussion, 6 companies supported option 1 while 1 company supported option 2. The tentative agreement based on majority view is Option 1.  *Candidate options:*   * Option 1 (Apple, MTK, Huawei, Ericsson, NEC, Nokia): single interruption due to RF tuning/retuning shall be assumed when one single MAC CE command is received for multiple SCell activation. * Option 2 (Qualcomm): For interruptions on other serving cells when multiple SCells are being activated   + In case of N Scells, that are inter-band or intra-band non-contiguous, being activated, there will be N independent interruptions on other cells.   + In case of multiple intra-band contiguous cells being activated, there will be one interruption on other active cells.   *Recommendations for 2nd round:*  The tentative agreement shall be finally confirmed in the 2nd round and the agreement will be captured in the WF. |

Discussion

QC: suggest to have relaxation for FR2 inter-band CA

Apple: FR2 inter-band CA is out of scope

Agreement:

Single interruption due to RF tuning/retuning shall be assumed when one single MAC CE command is received for multiple SCell activation.

Issue 1-5-1: activation delay for FR1 known SCell with Scell\_meas\_cycle≤160ms

|  |
| --- |
| *Tentative agreements:*  Based on the 1st round discussion, 4 companies supported option 2 while 1 company supported option 3. The tentative agreement based on majority view is Option 2.  *Candidate options:*   * Option 2 (MediaTek, Huawei, Apple, Qualcomm):   + TFirstSSB\_MAX + Trs + 5ms, if on the same band UE also has at least one parallel to-be-activated SCell which is FR1 known Scell with the SCell measurement cycle larger than 160ms but does not have any parallel to-be-activated SCell which is FR1 unknown SCell.   + TFirstSSB\_MAX + TSMTC\_MAX + Trs + 5ms, if on the same band UE also has at least one parallel to-be-activated SCell which is FR1 unknown Scell   + TFirstSSB\_MAX+ 5ms, for all other cases * Option 3 (Nokia):   + TFirstSSB\_MAX + Trs + 5ms, if multiple SCells to be activated are all FR1 known SCells and at least one of them is with Scell measurement cycle larger than 160ms   + TFirstSSB\_MAX + TSMTC\_MAX + 2\*Trs + 5ms, if the multiple SCells to be activated are all FR1 and at least one of the SCells is unknown SCell.   + TFirstSSB+ 5ms, otherwise.   *Recommendations for 2nd round:*  The tentative agreement shall be finally confirmed in the 2nd round and the agreement will be captured in the WF. |

Agreement:

* Option 2:
  + TFirstSSB\_MAX + Trs + 5ms, if on the same band UE also has at least one parallel to-be-activated SCell which is FR1 known Scell with the SCell measurement cycle larger than 160ms but does not have any parallel to-be-activated SCell which is FR1 unknown SCell.
  + TFirstSSB\_MAX + TSMTC\_MAX + Trs + 5ms, if on the same band UE also has at least one parallel to-be-activated SCell which is FR1 unknown Scell
  + TFirstSSB\_MAX+ 5ms, for all other cases

**Topic #2: Inter-frequency measurement without MG**

Issue 2-2: Scheduling restriction when the target SSB has a different SCS grid

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| --- |
| *Tentative agreements:*  None. Based on the 1st round discussion, 5 companies supported option 1 while 5 company supported option 2.  *Candidate options:*   * + Option 1 (vivo, Qualcomm, MediaTek, OPPO, Intel): * When the target SSB has a different SCS grid as that of UE’s serving cell, UE is allowed to have scheduling restriction in the entire SMTC duration.   + Option 2 (CMCC, Huawei, Apple, Ericsson, ZTE): * No additional scheduling restriction is specified for the case the target SSB has a different SCS grid as that of UE’s serving cell.   *Recommendations for 2nd round:*  Need to further discuss between option 1 and option 2. The agreement will be captured in the WF. |

Discussion

Apple: different SCS grid means same SCS but different channel raster

Huawei: such scenario with different grids can happen

CMCC: such scenario is not typical but it cannot be precluded. But this is not a new issues and it can already happen in intra-band case.

Intel: in Rel-15 the center frequency of serving and neighbor cell are the same

MTK: In Rel-16 we are ok to handle the scenario with different SCS grids but need scheduling restriction

QC: Complexity is different depending on whether this is same SCS grid or different

ZTE: same view as HW

Agreement

Do not define requirements for scenarios when the target SSB has a different SCS grid

1st round email discussion conclusions

**Topic #1: Multiple Scell activation/deactivation (6.15.1.2)**

Issue 1-6: Multiple SCell activation requirement in inter-band CA in FR2

RAN4 to defer the discussion for multiple SCell activation in FR2 inter-band CA

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008994 | WF on NR RRM enhancements – multiple SCell activation | Apple |

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006194 | Return to |
| R4-2006195 | Return to |
| R4-2006196 | Return to |
| [R4-2007857](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007857.zip) | Return to |
| [R4-2007858](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007857.zip) | Return to |
| [R4-2007859](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007857.zip) | Return to |

**Topic #2: Inter-frequency measurement requirement without MG (6.15.1.5)**

Issue 2-1: Capability of supporting inter-frequency measurement without MG

Option 1: Optional with UE capability signaling

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008995 | WF on NR RRM enhancements – Inter-frequency measurement without MG | CMCC |

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006807 | Revised |
| R4-2007745 | Approved |
| R4-2006882 | Revised |

**Topic #3: UE-specific CBW change (6.15.1.7)**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006197 | Return to |
| R4-2006547 | Return to  Session chair: CR marked as return to since it includes []. Recommend to remove [] or we can technically endorse it. |
| R4-2006548 | Agreed |

**Topic #4: Inter-band CA requirement for FR2 UE measurement capability of independent Rx beam and/or common beam (6.15.1.10)**

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008998 | WF on NR RRM enhancements – FR2 inter-band CA RRM | Huawei |

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007776 | Revised |
| R4-2007777 | Return to |
| R4-2007778 | Revised |
| R4-2007779 | Revised |
| R4-2007802 | Return to |

2nd round email discussion conclusions

GTW session (June 1st)

**Topic #4: Inter-band CA requirement for FR2 UE measurement capability of IBM/CMB**

Issue 4-2: Interruption requirement for inter-band FR2 CA with using common beam management

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| --- |
| *Tentative agreements:*  None. Based on 1st round discussion, 4 companies supported option 3, 1 company supported option 4, and 3 companies supported option 5 (newly added option based on comments).  *Candidate options:*  Based on the 1st round comments, we add one more option (option 5) for further discussion:   * + Option 3 (Qualcomm, MTK, Apple, Intel (if MRTD is 260ns)):   For a FR2 inter-band CA combination with using common beam management, the existing interruption requirements of intra-band CA can be applied.   * + Option 4 (Huawei):   For FR2 inter-band CA with common beam management, the interruption requirements can be defined as the current interruption with adding a SMTC duration which is the longest SMTC duration among all the serving cells in this FR2 band pair.   * + Option 5 (Ericsson, NTT DOCOMO, Nokia)   We need feedback on the RF architectures of common beam UEs for example in different band combinations. Then it is straightforward to decide on the suitable interrupt requirements.  *Recommendations for 2nd round:*  Continue discussion in the 2nd round. Agreements will be captured in the WF. |

Issue 4-4-1: whether scheduling restriction is needed with independent beam

|  |
| --- |
| *Tentative agreements:*  None.  *Candidate options:*   * + Option 1 (MTK): * For both IBM and CBM UEs which do not support simultaneousRxTxInterBandCA, scheduling restriction due to RLM/BFD/CBD/L1-RSRP measurements on PUCCH/PUSCH/SRS shall be applied. (this bullet is also supported by Qualcomm) * RAN4 to specify the scheduling restriction applies on one FR2 band due to SS-RSRP/SS-RSRQ/SS-SINR measurements being performed on another FR2 band.   + Option 2 (NTT DOCOMO, Ericsson, Huawei, Qualcomm, Intel (except the point Apple raised, i.e. mixed numerology also needs to be considered)): * There are no scheduling restrictions on one FR2 band due to RLM/BFD/CBD/L1-RSRP measurements being performed on another FR2 band. The scheduling availability requirements for FR2 inter-band CA scenario shall be introduced to clarify there is no scheduling restriction if UE uses independent beam.   + Option 3 (Nokia):   The requirements applicable for UE capable of both CBM and IBM when operating in IBM mode, apply to an IBM capable UE configured to operate in CBM mode.  Use the discussion from simultaneousRxTxInterbandCA for addressing collision between UL/DL Tx.  Support of different numerologies is a UE capability issue.   * + Option 4 (Apple): * For both IBM and CBM UEs which do not support simultaneousRxTxInterBandCA, scheduling restriction due to RLM/BFD/CBD/L1-RSRP measurements on PUCCH/PUSCH/SRS shall be applied. * For IBM UEs which do not support *simultaneousRxDataSSB-DiffNumerology*, RAN4 to specify the scheduling restriction applies on one FR2 band due to SS-RSRP/SS-RSRQ/SS-SINR measurements and SSB based RLM/BFD/CBD/L1-RSRP measurement being performed on another FR2 band, when the aforementioned SSB has different SCS from PDCCH/PDSCH on another FR2 band. * For IBM UEs which do not support *supportedSubCarrierSpacingDL*, RAN4 to specify the scheduling restriction applies on one FR2 band due to CSI-RSRP/CSI-RSRQ/CSI-SINR measurements and CSI-RS based RLM/BFD/CBD/L1-RSRP measurement being performed on another FR2 band, when the aforementioned CSI-RS has different SCS from PDCCH/PDSCH on another FR2 band.   *Recommendations for 2nd round:*  Continue discussion in the 2nd round. Agreements will be captured in the WF.  Moderator suggestion: as commented by some companies, it can be regarded as error cases that network configures simultaneous UL/DL or mixed numerology if the UE does not have such capability of *simultaneousRxTxInterBandCA* or *simultaneousRxDataSSB-DiffNumerology* or *supportedSubCarrierSpacingDL.* Could we preclude those error cases in condition for requirement applicability in spec? Then without those error cases, option 2 might be more agreeable. |

Issue 4-5-1: measurement restriction requirement with CBM

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| --- |
| *Tentative agreements:*  Based on 1st round discussion, 8 companies supported option 1, and 1 company supported option 4.  The tentative agreement based on majority view is: option 1.  *Candidate options:*   * + Option 1 (MTK, Qualcomm, Huawei, Apple, Ericsson, QC, Intel, NTT DOCOMO): * For CBM UEs in FR2 inter-band CA, the existing measurement restriction requirements for FR2 is applied for the RLM/BFD/CBD/L1-RSRP measurements being performed on different FR2 bands.   + Option 4 (Nokia): * When defining UE measurement restriction requirements, the UE capable of IBM but operating in CBM mode should be accounted. * A UE capable of both IBM and CBM is operated in CBM mode would not cause inter-band measurement restrictions.   *Recommendations for 2nd round:*  The tentative agreement shall be finally confirmed in the 2nd round. Agreement will be captured in WF |

Issue 4-5-2: measurement restriction requirement with IBM

|  |
| --- |
| *Tentative agreements:*  None. Based on 1st round discussion, 6 companies supported option 1, and 2 company supported option 2, and 1 company suggested to wait conclusions in issue 4-4-1.  *Candidate options:*   * + Option 1 (Ericsson, MTK, Huawei, Qualcomm, NTT DOCOMO, Nokia):   No measurement restrictions are specified between bands for IBM UE   * + Option 2 (Apple, Intel):  1. For IBM UEs which do not support *simultaneousRxDataSSB-DiffNumerology*, RAN4 to specify the measurement restriction when the SSB for RLM, BFD, CBD or L1- RSRP measurement on one FR2 band has different SCS from the CSI-RS for RLM, BFD, CBD or L1- RSRP measurement on another FR2 band, and the aforementioned SSB is in the same OFDM symbol as the aforementioned CSI-RS. 2. For IBM UEs which do not support *supportedSubCarrierSpacingDL*, RAN4 to specify the measurement restriction when the CSI-RS for RLM, BFD, CBD or L1- RSRP measurement on one FR2 band has different SCS from the CSI-RS for RLM, BFD, CBD or L1- RSRP measurement on another FR2 band, and the aforementioned CSI-RSs are in the same OFDM symbol.   *Recommendations for 2nd round:*  Continue discussion in 2nd round. Agreement will be captured in WF.  Moderator suggestion: since this is similar issue as in issue 4-4-1, could we wait for conclusion from issue 4-4-1 to determine which option shall be used? |

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**R4-2008675 WF on NR RRM enhancements - BWP switching on multiple CCs**

*Type: other For: Approval  
 Source: Intel*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2008679 WF on NR RRM enhancements – UL spatial relation info switch**

*Type: other For: Approval  
 Source: MediaTek*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2008685 WF on NR RRM enhancements – CGI reading**

*Type: other For: Approval  
 Source: ZTE*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2008994 WF on NR RRM enhancements – multiple SCell activation**

*Type: other For: Approval  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2008995 WF on NR RRM enhancements – Inter-frequency measurement without MG**

*Type: other For: Approval  
 Source: CMCC*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2008998 WF on NR RRM enhancements – FR2 inter-band CA RRM**

*Type: other For: Approval  
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2009100 WF on NR RRM enhancements – SRS carrier based switching**

*Type: other For: Approval  
 Source: ZTE*

**Abstract:**

**Discussion:**

**Decision: Return to.**

#### 6.15.1 RRM core requirements (38.133) [NR\_RRM\_Enh\_Core]

##### 6.15.1.1 SRS carrier switching requirements [NR\_RRM\_Enh\_Core]

**R4-2006474 Discussion on Interruption at SRS carrier switch**

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

**Discussion:**

**Decision: Noted.**

**R4-2006713 On SRS carrier switching requirement**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Abstract:**

SRS carrier switching requirement

**Discussion:**

**Decision: Noted.**

**R4-2007104 Interruption requirements due to SRS carrier switching**

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

**Discussion:**

**Decision: Noted.**

**R4-2007347 On remaining issues for SRS carrier switching**

*Type: discussion For: Approval  
 Source: OPPO*

**Discussion:**

**Decision: Noted.**

**R4-2007644 Remaining open issues on NR SRS carrier switching RRM requirements**

*Type: discussion For: Discussion  
 Source: ZTE*

**Discussion:**

**Decision: Noted.**

**R4-2007645 CR to 38.133 on SRS carrier switching interruption requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0741 Cat: B (Rel-16)  
  
 Source: ZTE*

**Discussion:**

**Decision: Revised to R4-2008681 (from R4-2007645).**

**R4-2008681 CR to 38.133 on SRS carrier switching interruption requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0741 Cat: B (Rel-16)  
  
 Source: ZTE*

**Discussion:**

**Decision: Return to.**

**R4-2007646 CR to 38.133 on impact to measurement requirements due to LTE SRS carrier switching**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0742 Cat: F (Rel-16)  
  
 Source: ZTE*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008682 (from R4-2007646).**

**R4-2008682 CR to 38.133 on impact to measurement requirements due to LTE SRS carrier switching**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0742 Cat: F (Rel-16)  
  
 Source: ZTE*

**Discussion:**

**Decision: Return to.**

**R4-2007742 Discussion on SRS carrier switching interruption**

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

**Discussion:**

**Decision: Noted.**

**R4-2007743 CR on impact on NR RRM measurement due to LTE SRS carrier switching**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0797 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Merged.**

**R4-2007744 CR on impact on LTE RRM measurement due to NR SRS carrier switching**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6876 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008683 (from R4-2007744).**

**R4-2008683 CR on impact on LTE RRM measurement due to NR SRS carrier switching**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6876 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007756 CR on NR SRS carrier switching interruption in TS 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6878 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008684 (from R4-2007756).**

**R4-2008684 CR on NR SRS carrier switching interruption in TS 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6878 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2009128 (from R4-2008684).**

**R4-2009128 CR on NR SRS carrier switching interruption in TS 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6878 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

##### 6.15.1.2 Multiple Scell activation/deactivation [NR\_RRM\_Enh\_Core]

**R4-2006192 On remaining issues for multiple SCell activations**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Apple*

**Discussion:**

**Decision: Noted.**

**R4-2006193 On activation delay requirements for multiple SCell activation**

*Type: discussion For: Approval  
 38.133 v..  
 Source: Apple*

**Discussion:**

**Decision: Noted.**

**R4-2006194 CR on multiple SCell activation deactivation requirement for R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0625 Cat: B (Rel-16)  
  
 Source: Apple*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2009097 (from R4-2006194).**

**R4-2009097 CR on multiple SCell activation deactivation requirement for R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0625 Cat: B (Rel-16)  
  
 Source: Apple*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Return to.**

**R4-2006195 CR on multiple SCell activation interruption requirement for R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0626 Cat: B (Rel-16)  
  
 Source: Apple*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2009098 (from R4-2006195).**

**R4-2009098 CR on multiple SCell activation interruption requirement for R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0626 Cat: B (Rel-16)  
  
 Source: Apple*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Return to.**

**R4-2006196 CR on multiple NR SCell activation interruption requirement for R16 TS36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6839 Cat: B (Rel-16)  
  
 Source: Apple*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Return to.**

**R4-2006475 Discussion on Multiple SCell activation**

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

**Discussion:**

**Decision: Noted.**

**R4-2007105 Multiple SCells Activation Delay Requirements**

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

**Discussion:**

**Decision: Noted.**

**R4-2007284 Multiple SCell activation in NR**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Qualcomm Incorporated*

**Discussion:**

**Decision: Noted.**

**R4-2007290 Discussion on remaining open issues in delay extension of multiple SCell activation**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

We provided our views on some of the remaining open issues on delay extension of SCell activation during multiple SCell activation.

**Discussion:**

**Decision: Noted.**

**R4-2007790 On activation of multiple SCells**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we are providing input on simultaneous activation of multiple SCells.

**Discussion:**

**Decision: Noted.**

**R4-2007856 Discussion on multiple SCell activation**

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

**Discussion:**

**Decision: Noted.**

**R4-2007857 CR on Multiple SCell activation/deactivation delay requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0850 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Return to.**

**R4-2007858 CR on Multiple SCell activation/deactivation interruption requirements 38133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0851 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Return to.**

**R4-2007859 CR on Multiple SCell activation/deactivation interruption requirements 36133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6885 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2009108 (from R4-2007859).**

**R4-2009108 CR on Multiple SCell activation/deactivation interruption requirements 36133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6885 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Return to.**

##### 6.15.1.3 CGI reading requirements with autonomous gap [NR\_RRM\_Enh\_Core]

**R4-2006476 Discussion on CGI reading requirement for NR**

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

**Discussion:**

**Decision: Noted.**

**R4-2006714 On CGI reading requirement**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Abstract:**

CGI reading requirement on MIB and SIB

**Discussion:**

**Decision: Noted.**

**R4-2006715 CR: CGI reading**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: Qualcomm, Inc.*

**Discussion:**

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

**R4-2006970 Further considerations for CGI decoding in NR**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on CGI reading based onm WF

**Discussion:**

**Decision: Noted.**

**R4-2006971 LTE CGI measurements with autonomous gaps for 38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0709 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

InterRAT reading of LTE CGI with NR sevring cell

**Discussion:**

**Decision: Revised to R4-2008687 (from R4-2006971).**

**R4-2008687 LTE CGI measurements with autonomous gaps for 38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0709 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

InterRAT reading of LTE CGI with NR sevring cell

**Discussion:**

**Decision: Return to.**

**R4-2006972 NR CGI measurements with autonomous gaps for 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6845 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

InterRAT reading of NR CGI with LTE sevring cell

**Discussion:**

**Decision: Revised to R4-2008688 (from R4-2006972).**

**R4-2008688 NR CGI measurements with autonomous gaps for 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6845 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

InterRAT reading of NR CGI with LTE sevring cell

**Discussion:**

**Decision: Return to.**

**R4-2007640 Remaining open issues on NR CGI reading with autonomous gaps**

*Type: discussion For: Discussion  
 Source: ZTE*

**Discussion:**

**Decision: Noted.**

**R4-2007641 CR to 38.133 on CGI reading of NR cell**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0739 Cat: B (Rel-16)  
  
 Source: ZTE*

**Discussion:**

**Decision: Revised to R4-2008689 (from R4-2007641).**

**R4-2008689 CR to 38.133 on CGI reading of NR cell**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0739 Cat: B (Rel-16)  
  
 Source: ZTE*

**Discussion:**

**Decision: Return to.**

**R4-2007642 CR to 38.133 on interruption requirements for CGI reading**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0740 Cat: B (Rel-16)  
  
 Source: ZTE*

**Discussion:**

**Decision: Revised to R4-2008990 (from R4-2007642).**

**R4-2008990 CR to 38.133 on interruption requirements for CGI reading**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0740 Cat: B (Rel-16)  
  
 Source: ZTE*

**Discussion:**

**Decision: Return to.**

**R4-2007643 Reply LS on CGI reading with autonomous gaps**

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

**Discussion:**

**Decision: Revised to R4-2008686 (from R4-2007643).**

**R4-2008686 Reply LS on CGI reading with autonomous gaps**

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

**Discussion:**

**Decision: Return to.**

**R4-2007860 Discussion on NR CGI reading requirements**

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

**Discussion:**

**Decision: Noted.**

**R4-2007861 Discussion on scope and requirements for LTE CGI reading**

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

**Discussion:**

**Decision: Noted.**

**R4-2007862 CR to 36.133 on interruption requirements for CGI reading**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6886 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Revised to R4-2008991 (from R4-2007862).**

**R4-2008991 CR to 36.133 on interruption requirements for CGI reading**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6886 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007863 CR to 36.133 on CGI reading of LTE cell**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6887 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2008188 discussion on CGI reading with autonomous gap**

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

**Abstract:**

discussion on CGI reading with autonomous gap

**Discussion:**

**Decision: Noted.**

**R4-2008189 Draft Response LS on CGI reading with autonomous gaps**

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

**Abstract:**

Draft Response LS on T321 timer value for CGI reading with autonomous gaps

**Discussion:**

**Decision: Return to.**

##### 6.15.1.4 BWP switching on multiple CCs [NR\_RRM\_Enh\_Core]

**R4-2006203 Discussion on requirements for BWP switching on multiple CCs**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

**Decision: Noted.**

**R4-2006477 Discussion on BWP switch on multiple CC**

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

**Discussion:**

**Decision: Noted.**

**R4-2006522 Remaining issues on BWP switching on mulitple CCs**

*Type: discussion For: Approval  
 Source: vivo*

**Discussion:**

**Decision: Noted.**

**R4-2006551 Discussion on RRM requirements for BWP switching on multiple CCs**

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

**Discussion:**

**Decision: Noted.**

**R4-2007291 Discussion on requirements for BWP switch delay on multiple CC**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

We provided our views on delay requirements for BWP switching on multiple CC.

**Discussion:**

**Decision: Noted.**

**R4-2007348 On RRM requirements for BWP switching on multiple CCs**

*Type: discussion For: Approval  
 Source: OPPO*

**Discussion:**

**Decision: Noted.**

**R4-2007498 Delay requirement for simultaneous switching of multiple BWPs**

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

**Discussion:**

**Decision: Noted.**

**R4-2007680 CR on introduction of RRM requirements for BWP switching delay on multiple CCs**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0764 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008676 (from R4-2007680).**

**R4-2008676 CR on introduction of RRM requirements for BWP switching delay on multiple CCs**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0764 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007681 Discussion on partial overlap BWP switching on multiple CCs**

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

**Discussion:**

**Decision: Noted.**

**R4-2007682 Discussion on simultaneous BWP switching on multiple CCs**

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

**Discussion:**

**Decision: Noted.**

**R4-2007788 On simultaneous BWP switching on multiple CCs**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we are providing input on simultaneously triggered BWP switching on multiple component carriers.

**Discussion:**

**Decision: Noted.**

**R4-2007990 Analysis of open issues for partially overlapped BWP triggering on multiple CCs**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

This paper provides further analysis of non-smultaneous BWP switching delay on multiple CCs

**Discussion:**

**Decision: Noted.**

**R4-2008190 discussion on BWP switch on multiple CCs**

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

**Abstract:**

Discussion on delay requirements for BWP switch considering multiple CCs.

**Discussion:**

**Decision: Noted.**

**R4-2008191 CR on 36133 interruption requirements for BWP switching on multiple CCs**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6909 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

CR on 36133 interruption requirements for BWP switching on multiple CCs

**Discussion:**

**Decision: Revised to R4-2008677 (from R4-2008191).**

**R4-2008677 CR on 36133 interruption requirements for BWP switching on multiple CCs**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6909 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

CR on 36133 interruption requirements for BWP switching on multiple CCs

**Discussion:**

**Decision: Return to.**

**R4-2008192 CR on 38133 interruption requirements for BWP switching on multiple CCs**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0875 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

CR on 38133 interruption requirements for BWP switching on multiple CCs

**Discussion:**

**Decision: Revised to R4-2008678 (from R4-2008192).**

**R4-2008678 CR on 38133 interruption requirements for BWP switching on multiple CCs**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0875 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

CR on 38133 interruption requirements for BWP switching on multiple CCs

**Discussion:**

**Decision: Return to.**

##### 6.15.1.5 Inter-frequency measurement requirement without MG [NR\_RRM\_Enh\_Core]

**R4-2006521 Remaining issues for inter-frequency measurement without gap**

*Type: discussion For: Approval  
 Source: vivo*

**Discussion:**

**Decision: Noted.**

**R4-2006716 On Inter-frequency without gap requirement**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Abstract:**

Inter-frequency without gap requirement

**Discussion:**

**Decision: Noted.**

**R4-2006806 RRM requirements on inter-frequency measurement without gap**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

**Decision: Noted.**

**R4-2006807 CR on introducing inter-frequency measurements without measurement gap (9.1.5, 9.1.6, 9.3.1, 9.3.4, 9.3.5)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0690 Cat: B (Rel-16)  
  
 Source: CMCC*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008996 (from R4-2006807).**

**R4-2008996 CR on introducing inter-frequency measurements without measurement gap (9.1.5, 9.1.6, 9.3.1, 9.3.4, 9.3.5)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0690 Cat: B (Rel-16)  
  
 Source: CMCC*

**Discussion:**

**Decision: Return to.**

**R4-2006888 Discussion on inter-frequency measurement requirement without gap**

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

**Discussion:**

**Decision: Noted.**

**R4-2007349 On remaining issues for inter-frequency measurement without MG**

*Type: discussion For: Approval  
 Source: OPPO*

**Discussion:**

**Decision: Noted.**

**R4-2007745 LS on inter-frequency measurement requirement without MG**

*Type: LS out For: Approval  
 to RAN2, RAN1  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Approved.**

**R4-2007746 Discussion on inter-frequency measurement without gap**

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

**Discussion:**

**Decision: Noted.**

##### 6.15.1.6 Mandatory MG patterns [NR\_RRM\_Enh\_Core]

**R4-2006717 On Mandatory gap patterns requirement**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Abstract:**

Mandatory gap patterns requirement

**Discussion:**

**Decision: Noted.**

**R4-2006718 CR: mandatory gap pattern**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: Qualcomm, Inc.*

**Discussion:**

**Decision: Not pursued.**

**R4-2008993 CR: mandatory gap pattern**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-TBA Cat: B (Rel-16)***Discussion:**

**Decision: Return to.**

**R4-2006767 Further discussion on mandating gap patterns for Rel-16 NR**

*Type: discussion For: Approval  
 Source: CMCC*

**Discussion:**

**Decision: Noted.**

**R4-2006874 Discussion on mandatory MG patterns**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: NTT DOCOMO, INC.*

**Discussion:**

**Decision: Noted.**

**R4-2006974 Further discussion on additional mandatory gap patterns for release 16**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion around WF in R4-2005345

**Discussion:**

**Decision: Noted.**

**R4-2006975 Further LS on mandatory of measurement gap patterns**

*Type: LS out For: Approval  
 to RAN WG2  
 Source: Ericsson*

**Abstract:**

LS to inform RAN2 which gap patterns to specify as mandatory in R16

**Discussion:**

**Decision: Noted.**

**R4-2007159 Discussion on Mandatory Gap Patterns**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Noted.**

**R4-2007350 On remaining issues for mandatory MG patterns**

*Type: discussion For: Approval  
 Source: OPPO*

**Discussion:**

**Decision: Noted.**

**R4-2007647 LS on mandatory of measurement gap patterns**

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

**Discussion:**

**Decision: Revised to R4-2008992 (from R4-2007647).**

**R4-2008992 LS on mandatory of measurement gap patterns**

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

**Discussion:**

**Decision: Return to.**

**R4-2007648 Remaining open issues on mandatary gap patterns**

*Type: discussion For: Discussion  
 Source: ZTE*

**Discussion:**

**Decision: Noted.**

**R4-2007747 Discussion on mandatory gap pattern in R-16**

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

**Discussion:**

**Decision: Noted.**

**R4-2007748 [Draft] LS on mandantory gap patterns**

*Type: LS out For: Approval  
 to RAN2  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Noted.**

##### 6.15.1.7 UE-specific CBW change [NR\_RRM\_Enh\_Core]

**R4-2006197 CR on UE behavior for UE specific CBW change**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0627 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Return to.**

**R4-2006547 CR to TS 38.133: RRM requirement for UE-specific CBW change delay**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0672 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

**Decision: Revised to R4-2009124 (from R4-2006547).**

**R4-2009124 CR to TS 38.133: RRM requirement for UE-specific CBW change delay**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0672 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

**Decision: Return to.**

**R4-2006548 CR to TS 38.133: RRM requirement for interruption due to UE-specific CBW change**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0673 Cat: B (Rel-16)  
  
 Source: Intel Corporation*

**Discussion:**

**Decision: Agreed.**

##### 6.15.1.8 Spatial relation switch for uplink [NR\_RRM\_Enh\_Core]

**R4-2006204 Discussion on requirements for UL spatial relation info switch**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

**Decision: Noted.**

**R4-2006478 Discussion on active spatial relation switch**

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

**Discussion:**

**Decision: Noted.**

**R4-2006479 CR on active spatial relation switch**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0668 Cat: B (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Revised to R4-2008680 (from R4-2006479).**

**R4-2008680 CR on active spatial relation switch**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0668 Cat: B (Rel-16)  
  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Return to.**

**R4-2006554 Discussion on requirements for spatial relation info switch for UL**

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

**Discussion:**

**Decision: Noted.**

**R4-2006875 Discussion on spatial relation switch for uplink**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: NTT DOCOMO, INC.*

**Discussion:**

**Decision: Noted.**

**R4-2007160 Discussion on UL spatial relation switch**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Noted.**

**R4-2007496 Spatial relation switch for uplink**

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

**Discussion:**

**Decision: Noted.**

**R4-2007749 Discussion on spatial relation switch for uplink channels and SRS**

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

**Discussion:**

**Decision: Noted.**

**R4-2007789 On spatial relation switching delay requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we are providing input on spatial relation switching requirements.

**Discussion:**

**Decision: Noted.**

##### 6.15.1.9 Non-simultaneous UL carrier operation in FR2 [NR\_RRM\_Enh\_Core]

##### 6.15.1.10 Inter-band CA requirement for FR2 UE measurement capability of independent Rx beam and/or common beam [NR\_RRM\_Enh\_Core]

**R4-2006869 Discussion on Inter-band CA requirement for FR2**

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

**Discussion:**

**Decision: Noted.**

**R4-2006876 Discussion on inter-band CA requirement for FR2**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: NTT DOCOMO, INC.*

**Discussion:**

**Decision: Noted.**

**R4-2006973 RRM requirements for interband FR2 operation**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion around WF in R4-2005353

**Discussion:**

**Decision: Noted.**

**R4-2007161 FR2 inter-band CA requirement**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Noted.**

**R4-2007497 RRM requirements with common and independent beams in FR2 inter band CA**

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

**Discussion:**

**Decision: Noted.**

**R4-2007775 Discussion on RRM requirements of FR2 inter-band CA scenario**

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

**Discussion:**

**Decision: Noted.**

**R4-2007776 CR on interruption requirements for FR2 inter-band CA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0808 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Revised to R4-2008999 (from R4-2007776).**

**R4-2008999 CR on interruption requirements for FR2 inter-band CA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0808 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007777 CR on scaling factor CSSFoutside\_gap for FR2 inter-band CA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0809 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007778 CR on scheduling availability requirements for FR2 inter-band CA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0810 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Revised to R4-2009000 (from R4-2007778).**

**R4-2009000 CR on scheduling availability requirements for FR2 inter-band CA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0810 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007779 CR on measurement restriction requirements for FR2 inter-band CA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0811 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Revised to R4-2009001 (from R4-2007779).**

**R4-2009001 CR on measurement restriction requirements for FR2 inter-band CA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0811 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007802 CR on SCell activation requirements for FR2 inter-band CA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0819 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Revised to R4-2009118 (from R4-2007802).**

**R4-2009118 CR on SCell activation requirements for FR2 inter-band CA**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0819 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Return to.**

### 6.16 NR RRM requirements for CSI-RS based L3 measurement [NR\_CSIRS\_L3meas]

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**Email discussion: [95e][225] NR\_CSIRS\_L3meas\_RRM\_1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][225] NR\_CSIRS\_L3meas\_RRM\_1 | R16 NR CSI-RS L3 Measurements | RRM Core requirements: CSI-RS measurement bandwidth; CSI-RS intra/inter-frequency measurement definition; Others | 6.16.1 6.16.1.1 6.16.1.2  6.16.1.5 |

**R4-2008514 Email discussion summary for [95e][225] NR\_CSIRS\_L3meas\_RRM\_1** *Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009037 (from R4-2008514).**

**R4-2009037 Email discussion summary for [95e][225] NR\_CSIRS\_L3meas\_RRM\_1** *Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

**Topic #2: Intra-frequency and inter-frequency measurement definition (AI 6.16.1.2)**

Issue 3.2.1-4: Whether to define the requirements when the BW of intra-MO is different from that of the CSI-RS resources configured for the serving cell in Rel-16.

No requirement is defined when the BW of intra-MO is different from that of the CSI-RS resources configured for the serving cell in Rel-16.

Issue 3.2.1-5: Scenarios for CSI-RS based intra-frequency measurement requirements in Rel-16.

Scenarios for CSI-RS based intra-frequency measurement requirements in Rel-16.

* + All CSI-RS resources in the same MO have the same BW
  + The BW of the CSI-RS on the neighbour cell is within the active BWP of the UE
  + No requirement is defined when the BW of intra-MO is different from that of the CSI-RS resources configured for the serving cell in Rel-16

Issue 3.2.1-6: Scenarios for CSI-RS based inter-frequency measurement requirements in Rel-16.

Scenarios for CSI-RS based inter-frequency measurement requirements in Rel-16.

* + All CSI-RS resources in the same MO have the same BW
  + Inter-frequency CSI-RS resource to be measured with gap that is not confined in the active BWP

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2009002 | WF on CSI-RS configuration and intra/inter-frequency measurements definition for CSI-RS based L3 measurement | CATT |
| R4-2009010 | CR on Carrier-specific scaling factor for CSI-RS measurement | MediaTek |
| R4-2009011 | CR on L3 CSI-RS measurements introduction, requirement applicability and number of cells/beams to be measured for inter-frequency measurement | vivo |
| R4-2009012 | CR on scheduling restriction for CSI-RS based intra-frequency measurement | Qualcomm |

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006224 | Revised |
| R4-2007737 | Revised |
| R4-2006766 | Revised |
| R4-2006229 | Revised |
| R4-2007739 | Revised |
| R4-2007358 | Revised  Session chair: note that this is a Draft CR. Let me know if CR is needed instead |
|  |  |

2nd round email discussion conclusions

GTW session (June 3, 2020)

#### Issue 2.2.1-1: Whether to define additional CSI-RS configuration {D=1 with PRBs ≥ 96} for the CSI-RS based measurement requirement?

* Option 1: Yes (NTT DOCOMO, ZTE, Nokia, NEC);
* Option 2: No (CATT, Qualcomm, Huawei, vivo, MTK, OPPO, Intel, CMCC, Apple)

#### Issue 3.2.1-2: Whether to include servingCellMO in the intra-frequency definition?

* Option 1: Yes (MTK, OPPO, Huawei, vivo)
* Option 2: No (CATT, Intel, CMCC, NTT DOCOMO, Nokia, NEC, ZTE, Qualcomm)

*To move forward, the recommended WF proposes to follow the same description (indicated for measurement) as SSB in the definition.*

* the centre frequency of CSI-RS resources on the target cell configured for measurement is the same as centre frequency of CSI-RS resource on the serving cell indicated for measurement.

*Huawei, CATT, MTK, CMCC, Apple, Intel, NTT DOCOMO support the recommended WF in 1st round discussion.*

Issue 3.2.1-3: When CSI-RS resource of serving cell is not available, the MOs configured for CSI-RS based RRM measurement

* Option 1: (NTT DOCOMO, ZTE, NEC, Nokia, Apple)
  + Defined as CSI-RS based inter-frequency measurement.
* Option 2: (MediaTek, OPPO, Huawei, Qualcomm, CATT, vivo, CMCC)
  + No requirement.

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**Email discussion: [95e][226] NR\_CSIRS\_L3meas\_RRM\_2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][226] NR\_CSIRS\_L3meas\_RRM\_2 | R16 NR CSI-RS L3 Measurements | RRM Core requirements: Measurement capability; Intra/Inter-frequency measurement requirements | 6.16.1.3  6.16.1.4 |

**R4-2008515 Email discussion summary for [95e][226] NR\_CSIRS\_L3meas\_RRM\_2** *Type: other For: Information  
 Source: Moderator (OPPO)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009038 (from R4-2008515).**

**R4-2009038 Email discussion summary for [95e][226] NR\_CSIRS\_L3meas\_RRM\_2** *Type: other For: Information  
 Source: Moderator (OPPO)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2009009 | WF on CSI-RS based L3 measurement capability and requirements | OPPO |

Issue 2-1-1: Whether to define requirements related to associated SSB

No requirements shall be defined in Rel-16 for CSI-RS L3 measurement, when

1. associated SSB is not configured
2. associated SSB is not detected even if associated SSB is configured

Issue 2-1-3: Conditions for gap-needed or gapless

Define requirements only for intra-f without gap and inter-f with gap in Rel-16.

* Option 1:
  + All inter-frequency measurements are gap-assisted.

All intra-frequency measurements are gapless

2nd round email discussion conclusions

GTW session (June 3, 2020)

#### Issue 1-1-1: Alignment on Measurement capabilities per MO or per layer

*Candidate options:*

* *Option 1: 6 companies*
* *Option 2: 4 companies*

*Recommendations for 2nd round:*

Continue discussion and conclude in this meeting.

* Option 1: CSI-RS measurement capability requirements are defined on per layer.
  + One or multiple MOs can be corresponding to one frequency layer.
* Option 2: CSI-RS measurement capability requirements are defined on per MO basis.
  + One CSI-RS frequency layer is identical to one MO with CSI-RS. Different MOs are different frequency layers.

*Discussion in 2nd round:*

* *Option 1: Huawei, CATT, CMCC, MTK, OPPO, Intel, vivo, Qualcomm, Docomo, Apple*
* *Option 2: ZTE, Nokia*

#### Issue 1-2-1: number of frequency layers to be monitored

*Tentative agreements:*

UE shall be able to measure at least [X1] CSI-RS inter-frequency layers if there is no SSB based measurement is configured. At least [X2] NR inter-frequency layers in total including CSI-RS and SSB frequency layers.

* FFS on X1 and X2

In summary, number of frequency layers to be monitored

* SSB intra-frequency layer: 1 per serving cell
* CSI-RS intra-frequency layer: [1] per serving cell
* SSB inter-frequency layers: 7
* CSI-RS inter-frequency layers: [7]
* Total inter-frequency layers including SSB and CSI-RS: [7]
* Total inter-frequency and inter-RAT layers: 13

NOTE: Double confirmation is expected on the values in [] before we remove the square brackets in this meeting

*Candidate options:*

* + Option 1: X1=X2= 7, 1 company
  + Option 1a: X1= 0, X2=7, 5 companies
  + Option 1b: X1=6, X2=7, 1 company
  + Option 2: X1= 8, X2=8, 2 companies

*Discussion in 2nd round:*

* X1 = 0 for the case when no associated SSB is configured
* Compromise Option 3: X1 =0, X2=8, 4 companies

#### Issue 1-2-2: SSB frequency layers to be monitored

*Tentative agreements:*

Option 1 and 2 in principle are similar expect per MO or per layer, which is still pending on the conclusion of Issue 1-1.

*Candidate options:*

* *Option 1:2 companies*
* *Option 2: 2 companies*

*Recommendations for 2nd round:*

Continue discussion based on the updated option 1 and 2.

*Option 1:* The number of SSB frequency layers is the total number of MOs with

* When associatedSSB is configured, the UE is supposed to monitor not only the frequency layer of the CSI-RS resource, but also the frequency layer of the associatedSSB which is indicated via ssbFrequency.
* If the CSI-RS resources with different center frequencies (i.e. layers) are associated with the same ssbFrequency, the layer corresponding to the ssbFrequency shall be counted only once to the total number of effective carrier frequency layers.

*Option 2:* The number of SSB frequency layers is the total number of “carrier frequencies” including

* Ssbfrequency when ssb-ConfigMobility is configured
* Ssbfrequency when CSI-RS -ResourceConfigmobility is configured with associatedSSB

the ssbfrequency is counted only once if the ssbfrequency in above bullets are the same, or ssbfrequency in multiple MOs are the same.

*Discussion in 2nd round:*

* Q1: TBD. Related to issue 1-1-1.
* Q2: option 1 as marjority views.
* Q3: option 1 as marjority views

Issue 2-4-1: Whether to introduce UE capability to indicate the simultaneous reception of CSI-RS of neighbour cell and SSB of serving cell

*Tentative agreements:*

FFS: Introduce **new UE capability** to indicate the simultaneous reception of CSI-RS of neighbour cell and SSB of serving cell

#### [Moderator]: Suggest to be discussed in the GTW meeting due to ASN.1 freezing

*Candidate options:*

* + Option 1 (New UE capability): 9 companies
  + Option 4 (No): 4 companies

*Recommendations for 2nd round:*

Continue discussion. If agreed to introduce UE capability, **an LS** should be sent out to RAN2 in this meeting.

*Discussion in 2nd round:*

* Option 1 (New UE capability): 9 companies (Huawei, CATT, CMCC, MTK, OPPO, Nokia, vivo, Qualcomm, Docomo)
* FFS : 2 companies (ZTE, apple)

Issue 1-6-1: Whether to introduce restriction on CSI-RS MO configuration

*Proposals*

* + Option 1 (Apple):
    - Further restriction on CSI-RS MO configuration for mobility in Rel-16 include
      * A fixed channel bandwidth per MO should be configured
      * Up to 2 CSI-RS resources periodicities can be configured per intra-frequency MO
      * Up to 1 CSI-RS resource periodicity can be configured per inter-frequency MO
  + Option 2 (Huawei):
    - RAN4 does not define restrictions on number of CSI-RS resources periodicities per MO.
  + Option 3 (Intel):
    - Considering the flexibility of CSI-RS, more configuration options of CSI-RS than that of SSB can be designed.
  + Option 4: Up to RAN2.

*Candidate options:*

* *Option 1: Yes， 6 companies (Vivo, MTK, Intel, Qualcomm, Apple, OPPO)*
* *Option 2: No， 6 companies(CATT, ZTE, Huawei, Nokia, CMCC, Docomo)*

*Discussion in 2nd round:*

* + - * Option 1: 5 companies
      * Option 2: 3 companies
      * Option 3: 5 companies

Recommended WF:

* + In R16, Confine CSI-RS resources within SMTC of the *associatedSSB* and the corresponding periodicity of the SMTC should not be more than 40ms.
    - FFS introduce CMTC in R17
  + Time domain restriction on CSI-RS resources configuration is introduced:
    - * CSI-RS resources are configured in 5ms window
      * CSI-RS periodicities for L3 measurement : [10,20,40] ms
      * Up to [2] CSI-RS periodicities can be configured per CSI-RS intra-frequency layer
      * Up to [1] CSI-RS periodicity can be configured per CSI-RS inter-frequency layer

#### Issue 2-1-1: Whether to define requirements related to associated SSB

*1st round agreements:*

No requirements shall be defined in Rel-16 for CSI-RS L3 measurement, when

1. associated SSB is not configured
2. associated SSB is not detected even if associated SSB is configured

2nd round

Q1: No requirements shall be defined in Rel-16 for CSI-RS L3 measurement, when associated SSB is not QCLed with CSI-RS

* + - Option 1: No requirements
    - Option 2: Others

*Discussion in 2nd round:*

* + - Option 1: Huawei, MTK, OPPO, Intel(at least for FR2), vivo, Qualcomm, Apple, Nokia, ZTE,
    - Option 2: CATT, Docomo, [LGE]

Tenative agreement: UE is not required to perform CSI-RS based L3 measurement when associated SSB is not QCLed with CSI-RS [for FR2]

Q2: No requirements shall be defined in Rel-16 for CSI-RS L3 measurement, when associated SSB is not included in ssb-ToMeasure in SSB-ConfigMobility in the same MO.

* + - Option 1: No requirements
    - Option 2: other

*Discussion in 2nd round:*

* + - Option 1: Huawei, MTK, OPPO, vivo, Qualcomm, Apple, Docomo
    - Option 2: Nokia, ZTE,Docomo

Tenative agreement: No requirements shall be defined in Rel-16 for CSI-RS L3 measurement, when associated SSB is not included in ssb-ToMeasure in SSB-ConfigMobility in the same MO.

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**R4-2009002 WF on CSI-RS configuration and intra/inter-frequency measurements definition for CSI-RS based L3 measurement**

*Type: other For: Approval  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009256 (from R4-2009002).**

**R4-2009256 WF on CSI-RS configuration and intra/inter-frequency measurements definition for CSI-RS based L3 measurement**

*Type: other For: Approval  
 Source: CATT*

**Abstract:**

**Discussion:**

**Session chair: return in Fri GTW**

**Decision: Return to.**

**R4-2009009 WF on CSI-RS based L3 measurement capability and requirements**

*Type: other For: Approval  
 Source: OPPO*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2009010 CR on Carrier-specific scaling factor for CSI-RS measurements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-TBA Cat: B (Rel-16)  
 Source: MediaTek*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2009011 CR on L3 CSI-RS measurements introduction, requirement applicability and number of cells/beams to be measured for inter-frequency measurement**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-TBA Cat: B (Rel-16)  
 Source: vivo*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2009012 CR on scheduling restriction for CSI-RS based intra-frequency measurement**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-TBA Cat: B (Rel-16)  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Return to.**

#### 6.16.1 RRM core requirements (38.133) [NR\_CSIRS\_L3meas-Core]

**R4-2006216 On remaining issues for CSI-RS based L3 measurements**

*Type: discussion For: Discussion  
 Source: Apple*

**Discussion:**

**Decision: Noted.**

##### 6.16.1.1 CSI-RS measurement bandwidth [NR\_CSIRS\_L3meas-Core]

**R4-2006223 Discussion on the remaining issues on CSI-RS measurement configuration and definition for RRM measurement requirement**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

**Decision: Noted.**

**R4-2006949 Discussion on CSI-RS parameters for RRM core requirements**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: NTT DOCOMO, INC.*

**Discussion:**

**Decision: Noted.**

**R4-2007098 Discussion on CSI-RS measurement bandwidth**

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

**Discussion:**

**Decision: Noted.**

**R4-2007649 Further discussion on configuration of CSI-RS based L3 measurement**

*Type: discussion For: Discussion  
 Source: ZTE*

**Discussion:**

**Decision: Noted.**

**R4-2007803 Discussion on CSI-RS L3 measurement period requirements**

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

**Discussion:**

**Decision: Noted.**

##### 6.16.1.2 CSI-RS based intra-frequency and inter-frequency measurements definition [NR\_CSIRS\_L3meas-Core]

**R4-2006224 LS on CSI-RS based intra-frequency and inter-frequency Measurement definition**

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

**Discussion:**

**Decision: Revised to R4-2009003 (from R4-2006224).**

**R4-2009003 LS on CSI-RS based intra-frequency and inter-frequency Measurement definition**

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

**Discussion:**

**Decision: Revised to R4-2009134 (from R4-2009003).**

**R4-2009134 LS on CSI-RS based intra-frequency and inter-frequency Measurement definition**

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

**Discussion:**

**Decision: Return to.**

**R4-2006553 Discussion about CSI-RS L3 measurement bandwidth and definition**

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

**Discussion:**

**Decision: Noted.**

**R4-2006573 Definition of Intra and inter frequency for CSI-RS RRM**

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

**Discussion:**

**Decision: Noted.**

**R4-2006763 Further discussion on the definition of CSI-RS based intra-frequency measurements**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

**Decision: Noted.**

**R4-2006950 Discussion on the definition of CSI-RS based intra-frequency and inter-frequency measurement**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: NTT DOCOMO, INC.*

**Discussion:**

**Decision: Noted.**

**R4-2007099 CSI-RS based intra-frequency measurements definition**

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

**Discussion:**

**Decision: Noted.**

**R4-2007292 Definition of Intra and Inter-frequency CSI-RS based L3 measurements**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

We provided our views on the definition of Intra and Inter-frequency CSI-RS based L3 measurements

**Discussion:**

**Decision: Noted.**

**R4-2007351 On remaining issues for definition of intra-f CSI-RS L3 measurement**

*Type: discussion For: Approval  
 Source: OPPO*

**Discussion:**

**Decision: Noted.**

**R4-2007651 Further discussion on definition of CSI-RS based RRM measurements**

*Type: discussion For: Discussion  
 Source: ZTE*

**Discussion:**

**Decision: Noted.**

**R4-2007734 Definition for the CSI-RS based intra-frequency and inter-frequency measurement**

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

**Discussion:**

**Decision: Noted.**

**R4-2007735 [DRAFT] Reply LS on clarification about CSI-RS measurement**

*Type: LS out For: Approval  
 to RAN2, cc RAN1  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007737 CR on CSI-RS based L3 measurement framework and introduction**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0793 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Discussion:**

MTK: some sections may be implemented differently

Nokia: need to wait for progress before we can agree on overall CR

Intel: conflict with endorsed NR Positioning clause numbering

HW: the motivation is that we need to split CRs among the companies

MTK: agree with HW that we need to agree on the structure CR

CMCC: we also think it is necessary.

QC: prefer to merge CSI-RS with existing sections

Vivo: same view with MTK and QC

**Decision: Revised to R4-2009004 (from R4-2007737).**

**R4-2009004 CR on CSI-RS based L3 measurement framework and introduction**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0793 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

**R4-2007738 CR on CSI-RS based intra-f and inter-f measurement definition**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0794 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

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

**R4-2008143 More comments on CSI-RS based intra-frequency and inter-frequency measurements definition**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Qualcomm CDMA Technologies*

**Discussion:**

**Decision: Noted.**

##### 6.16.1.3 Measurement capability [NR\_CSIRS\_L3meas-Core]

**R4-2006225 Further discussion on CSI-RS based UE measurement capabilities**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

**Decision: Noted.**

**R4-2006227 CR on CSI-RS based UE measurement capabilities**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0637 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

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

**R4-2006552 Discussion about CSI-RS L3 measurement capability and requirements**

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

**Discussion:**

**Decision: Noted.**

**R4-2006574 Discussion on measurement capability for CSI-RS RRM**

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

**Discussion:**

**Decision: Noted.**

**R4-2006764 Further discussion on CSI-RS measurement capability**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

**Decision: Noted.**

**R4-2006766 38.133 CR on UE measurement capability for CSI-RS measurement**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0688 Cat: B (Rel-16)  
  
 Source: CMCC*

**Discussion:**

**Decision: Revised to R4-2009005 (from R4-2006766).**

**R4-2009005 38.133 CR on UE measurement capability for CSI-RS measurement**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0688 Cat: B (Rel-16)  
  
 Source: CMCC*

**Discussion:**

**Decision: Return to.**

**R4-2007100 Discussion on the CSI-RS based measurement capability**

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

**Discussion:**

**Decision: Noted.**

**R4-2007352 On Measurement capability for CSI-RS L3 measurement**

*Type: discussion For: Approval  
 Source: OPPO*

**Discussion:**

**Decision: Noted.**

**R4-2007353 Draft CR on CSI-RS based L3 measurement capability(9.1.3)**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: OPPO*

**Discussion:**

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

**R4-2007354 Draft CR on CSI-RS based L3 measurement capability(9.2.3)**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: OPPO*

**Discussion:**

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

**R4-2007355 Draft CR on CSI-RS based L3 measurement capability(9.3.3)**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: OPPO*

**Discussion:**

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

**R4-2007650 Further discussion on UE measurement capability of CSI-RS based RRM measurements**

*Type: discussion For: Discussion  
 Source: ZTE*

**Discussion:**

**Decision: Noted.**

**R4-2007864 On CSI-RS measurement capability**

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

**Discussion:**

**Decision: Noted.**

**R4-2007865 CR on CSI-RS measurement capability - number of cells and beams**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0852 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

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

**R4-2007866 CR on CSI-RS measurement capability - number of layers**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0853 Cat: B (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

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

**R4-2007867 On time window for CSI-RS measurement**

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

**Discussion:**

**Decision: Noted.**

**R4-2008237 More comments on CSI-RS measurement capabilities and requirements**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

CSI-RS L3, capabilities and requirements

**Discussion:**

**Decision: Noted.**

##### 6.16.1.4 Intra-frequency and inter-frequency measurement requirements [NR\_CSIRS\_L3meas-Core]

**R4-2006226 Discussion on CSI-RS based measurement requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Discussion:**

**Decision: Noted.**

**R4-2006228 CR on Carrier-specific scaling factor for CSI-RS measurement**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0638 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

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

**R4-2006229 CR on CSI-RS based intra-frequency measurement requirement**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0639 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Revised to R4-2009006 (from R4-2006229).**

**R4-2009006 CR on CSI-RS based intra-frequency measurement requirement**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0639 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Return to.**

**R4-2006230 CR on CSI-RS based inter-frequency measurement requirement**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0640 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

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

**R4-2006575 Cell identification requirements for CSI-RS RRM**

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

**Discussion:**

**Decision: Noted.**

**R4-2006765 Discussion on CSI-RS measurement requirements**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

**Decision: Noted.**

**R4-2006841 Discussion on CSI-RS L3 measurement requirement**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Discussion:**

**Decision: Noted.**

**R4-2006951 Discussion on measurement requirements of CSI-RS based L3 measurement**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: NTT DOCOMO, INC.*

**Discussion:**

**Decision: Noted.**

**R4-2007101 CSI-RS based intra-frequency measurement requirements**

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

**Discussion:**

**Decision: Noted.**

**R4-2007356 On measurement requirement for CSI-RS based L3 measurements**

*Type: discussion For: Approval  
 Source: OPPO*

**Discussion:**

**Decision: Noted.**

**R4-2007357 Draft CR on intra-frequency CSI-RS L3 measurement(9.2.1, 9.2.4)**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: OPPO*

**Discussion:**

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

**R4-2007358 Draft CR on intra-frequency CSI-RS L3 measurement requirement(9.2.5)**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: OPPO*

**Discussion:**

**Decision: Revised to R4-2009008 (from R4-2007358).**

**R4-2009008 Draft CR on intra-frequency CSI-RS L3 measurement requirement(9.2.5)**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: OPPO*

**Discussion:**

**Decision: Return to.**

**R4-2009099 CR on inter-frequency CSI-RS L3 measurement requirement (9.2.5)**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-TBA Cat: B (Rel-16)  
  
 Source: OPPO*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2007359 Draft CR on inter-frequency CSI-RS L3 measurements(section 9.3.1, 9.3.6)**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: OPPO*

**Discussion:**

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

**R4-2007360 Draft CR on inter-frequency CSI-RS L3 measurements requirement(section 9.3.4, 9.3.5)**

*Type: draftCR For: Endorsement  
 38.133 v16.3.0  
 Source: OPPO*

**Discussion:**

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

**R4-2007736 Discussion on CSI-RS based L3 measurement requirements**

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

**Discussion:**

**Decision: Noted.**

**R4-2007739 CR on CSI-RS based measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0795 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2009007 (from R4-2007739).**

**R4-2009007 CR on CSI-RS based measurement requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0795 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

##### 6.16.1.5 Others [NR\_CSIRS\_L3meas-Core]

**R4-2006576 Synchronization assumption for L3 CSI-RS measurement**

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

**Discussion:**

**Decision: Noted.**

**R4-2007102 Pre-emption on CSI-RS based measurements**

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

**Discussion:**

**Decision: Noted.**

**R4-2007103 Simulation results for CSI-RS based measurements**

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

**Discussion:**

**Decision: Noted.**

**R4-2007868 On synchronization assumption for CSI-RS measurement requirements**

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

**Discussion:**

**Decision: Noted.**

### 6.17 NR support for high speed train scenario [NR\_HST]

#### 6.17.1 RRM core requirements (38.133) [NR\_HST-Core]

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

**Email discussion: [95e][227] NR\_HST\_RRM**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][227] NR\_HST\_RRM | R16 NR HST | RRM Core requirements | 6.17.1 |

**R4-2008516 Email discussion summary for [95e][227] NR\_HST\_RRM** *Type: other For: Information  
 Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009039 (from R4-2008516).**

**R4-2009039 Email discussion summary for [95e][227] NR\_HST\_RRM** *Type: other For: Information  
 Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008627 | WF on NR HST RRM requirements | CMCC |

**Topic #1: Cell re-selection requirements**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006774 | Revised |

**Topic #2: Cell identification delay requirements**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006231 | Revised |

**Topic #3: RLM**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2008058 | Revised |

**Topic #4: Beam management**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2008065 | Revised |

**Topic #5: Inter-RAT measurement**

Issue 5-3: Cell identification with DRX in connected mode

Agreement: Cell identification with DRX on NR- EUTRA inter-RAT measurement in connected mode

|  |  |  |
| --- | --- | --- |
| DRX cycle length (s) | TIdentify, E-UTRAN TDD (s) (DRX cycles) | |
|  | Gap period = 40 ms, 20 ms | Gap period = 80 ms |
| ≤0.16 | Non-DRX requirements in clause 9.4.2.2 apply | Non-DRX requirements in clause 9.4.2.2 apply |
| 0.16<DRx cycle<=0.32 | Note1 (15\*CSSFinterRAT) |
| 0.32<DRx cycle <= 0.64 | Note1 (10\* CSSFinterRAT) |
| DRx cycle = 1.024 | Note1 (10\* CSSFinterRAT) | Note1 (10\* CSSFinterRAT) |
| DRx cycle = 1.28 | Note1 (8\* CSSFinterRAT | Note1 (8\* CSSFinterRAT) |
| 1.28< DRX-cycle ≤10.24 | Note1 (20\* CSSFinterRAT) | Note1 (20\* CSSFinterRAT) |
| NOTE 1: The time depends on the DRX cycle length.  NOTE 2: CSSFinterRAT is as defined in clause 9.4.3.2. | | |

Issue 5-6: Cell identification requirements in connected mode

Agreement: Cell identification with DRX on EUTRA-NR inter-RAT measurement in connected mode

|  |  |  |  |
| --- | --- | --- | --- |
| DRX cycle | TPSS/SSS\_sync\_NR | TSSB\_measurement\_period\_NR | TSSB\_time\_index\_NR |
| No DRX | Max(600ms, 8 x max(MGRP, SMTC period))×Nfreq | Max(200ms, 8 x max(MGRP, SMTC period))×Nfreq | Max(120ms, 3 x max(MGRP, SMTC period)) ×Nfreq |
| DRX cycle < 320ms | Max(600ms, ceil( 8 × M) × max(MGRP, SMTC period, DRX cycle)) ×Nfreq | Max(200ms, ceil(8 × M) x max(MGRP, SMTC period, DRX cycle))×Nfreq | Max(120ms, ceil(3 × M) x max(MGRP, SMTC period, DRX cycle)) ×Nfreq |
| DRX cycle≥320ms | 8× M × DRX cycle ×Nfreq | 4× M × DRX cycle ×Nfreq | [3] × DRX cycle ×Nfreq |
| Note 1: M = 1 when SMTC < =40, and M = 1.5 when SMTC >40 | | | | |

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006773 | Revised |
| R4-2006985 | Revised |
| R4-2007273 | Revised |
| R4-2007741 | Revised |

**Topic #6: others**

Q2: Do we need to send LS to RAN2 to check whether “early implementation” approach is applicable for NR HST RRM enhancement?

Agreement: Rel.16 NR HST RRM requirements can be release independent from Rel-15.

* Send LS to RAN2 to check with RAN2 whether “early implementation” approach is applicable for NR HST RRM enhancement
* If Rel.16 NR HST RRM requirements are release independent from Rel-15. The requirements are optional for Rel-15 UEs.

GTW session

Issue 1: Notation issue for CR on NR- EUTRA Inter-RAT measurement in idle mode

For non-high-speed carriers

Option 1: NEUTRA\_carrier\_nonHST is used in the spec

Option 2: NEUTRA\_carrier is used in the spec

For high-speed carriers

NEUTRA\_carrier\_HST is used in the spec

Discussion

Vivo: prefer Option 2.

QC: For inter-RAT this is special. We can have simultaneously have HST and non-HST carrier. Preference for Option 1 but can compromise to Option 2.

HW: does it impact any equations for inter-RAT requirements?

QC/vivo: No. this is just notation.

E///: Prefer Option 2.

Agreement: Use NEUTRA\_carrier notation for non HST carriers in the spec

Issue 2: Whether the introduction of per carrier flag will have impact on the higher priority measurement can be further checked in next meeting

Discussion

CMCC: suggest not to mention per carrier flag from CRs (i.e. cover current agreements) and come back in the next meeting

QC: support CMCC’s view.

vivo: it is easy to converge. Would like to check with companies whether any enhancement is needed.

CMCC: it is necessary to enhance. Several options may exist

E///: there are 2 requirements for higher priority. Whether to introduce enhancement depends on the case. Not sure if enhancements are needed.

Agreement: Whether the introduction of per carrier flag will have impact on the higher priority measurement can be further checked in next meeting

2nd round email discussion conclusions

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**R4-2008627 WF on NR HST RRM requirements**

*Type: other For: Approval  
 Source: CMCC*

**Abstract:**

**Discussion:**

**Session chair: come back in Fri GTW**

**Decision: Return to.**

**R4-2006719 On HST RRM requirement**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Abstract:**

HST RRM requirement inter-RAT

**Discussion:**

**Decision: Noted.**

**R4-2006770 Further discussion on RRM for NR high speed scenario**

*Type: discussion For: Approval  
 Source: CMCC*

**Discussion:**

**Decision: Noted.**

**R4-2006772 Discussion on SS-SINR measurement for NR HST**

*Type: discussion For: Discussion  
 Source: CMCC*

**Discussion:**

**Decision: Noted.**

**R4-2006965 LS on supporting Rel-16 NR HST RRM enhanced requirements from Rel-15 UEs**

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

**Discussion:**

**Decision: Return to.**

**R4-2007272 Discussion on remaining RRM issues in NR HST**

*Type: discussion For: Discussion  
 Source: vivo*

**Discussion:**

**Decision: Noted.**

##### 6.17.1.1 Cell re-selection [NR\_HST-Core]

**R4-2006774 38.133 CR on cell re-selection requirements for Rel-16 NR HST**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0689 Cat: B (Rel-16)  
  
 Source: CMCC*

**Discussion:**

**Decision: Revised to R4-2008628 (from R4-2006774).**

**R4-2008628 38.133 CR on cell re-selection requirements for Rel-16 NR HST**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0689 Cat: B (Rel-16)  
  
 Source: CMCC*

**Discussion:**

**Decision: Return to.**

**R4-2007162 NR HST Serving cell and idle mode**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Noted.**

**R4-2008040 CR for Measurement and evaluation of serving cell in HST**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0872 Cat: F (Rel-16)  
  
 Source: Nokia Corporation*

**Discussion:**

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

##### 6.17.1.2 Cell identification delay [NR\_HST-Core]

**R4-2006231 CR on cell identification requirements for NR HST**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0641 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Revised to R4-2008629 (from R4-2006231).**

**R4-2008629 CR on cell identification requirements for NR HST**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0641 Cat: B (Rel-16)  
  
 Source: CATT*

**Discussion:**

**Decision: Return to.**

**R4-2006983 Requirement applicability in NR high speed**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Further considattions on note related to requirement applicability in NR high speed

**Discussion:**

**Decision: Noted.**

**R4-2007163 Connected mode HST operation with long DRX**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Noted.**

**R4-2008090 Discussions on SS-SINR measurements for Rel-16 high speed train**

*Type: other For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

At the RAN4#94-e-bis meeting, link simulation results for SS-SINR were provided and discussed in [2]. Further discussions and link simulation results for SS-SINR are provided in this document. Based on our discussions and simulation results, we attempt to

**Discussion:**

**Decision: Noted.**

##### 6.17.1.3 RLM [NR\_HST-Core]

**R4-2008058 CR to TS 38.133: NR HST RLM requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0873 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This CR updates the RLM requirements for NR HST according to the WF on RRM for NR HST (R4-2005358) which was agreed at the last meeting.

**Discussion:**

**Decision: Revised to R4-2008630 (from R4-2008058).**

**R4-2008630 CR to TS 38.133: NR HST RLM requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0873 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This CR updates the RLM requirements for NR HST according to the WF on RRM for NR HST (R4-2005358) which was agreed at the last meeting.

**Discussion:**

**Decision: Return to.**

##### 6.17.1.4 Beam management [NR\_HST-Core]

**R4-2008065 CR to TS 38.133: NR HST beam management requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0874 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This CR updates the beam management requirements for NR HST according to the WF on RRM for NR HST (R4-2005358) which was agreed at the last meeting.

**Discussion:**

**Decision: Revised to R4-2008631 (from R4-2008065).**

**R4-2008631 CR to TS 38.133: NR HST beam management requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0874 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This CR updates the beam management requirements for NR HST according to the WF on RRM for NR HST (R4-2005358) which was agreed at the last meeting.

**Discussion:**

**Decision: Return to.**

##### 6.17.1.5 Inter-RAT measurement [NR\_HST-Core]

**R4-2006771 Further discussion on inter-RAT measurement requirements for NR HST**

*Type: discussion For: Approval  
 Source: CMCC*

**Discussion:**

**Decision: Noted.**

**R4-2006773 36.133 CR on cell identification in connected mode for EUTRAN-NR measurement for Rel-16 NR HST**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6840 Cat: B (Rel-16)  
  
 Source: CMCC*

**Discussion:**

**Decision: Revised to R4-2008632 (from R4-2006773).**

**R4-2008632 36.133 CR on cell identification in connected mode for EUTRAN-NR measurement for Rel-16 NR HST**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6840 Cat: B (Rel-16)  
  
 Source: CMCC*

**Discussion:**

**Decision: Return to.**

**R4-2006984 InterRAT requirements for high speed train**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on necessary InterRAT requirements for high speed train

**Discussion:**

**Decision: Noted.**

**R4-2006985 Cell re-selection for EUTRAN-NR high speed in TS36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6848 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Requirements for reselection from LTE to NR for HST

**Discussion:**

**Decision: Revised to R4-2008633 (from R4-2006985).**

**R4-2008633 Cell re-selection for EUTRAN-NR high speed in TS36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6848 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Requirements for reselection from LTE to NR for HST

**Discussion:**

**Decision: Revised to R4-2009240 (from R4-2008633).**

**R4-2009240 Cell re-selection for EUTRAN-NR high speed in TS36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6848 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Requirements for reselection from LTE to NR for HST

**Discussion:**

**Session chair: come back in Fri GTW**

**Decision: Return to.**

**R4-2007164 Idle mode inter-RAT measurements requirements**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Noted.**

**R4-2007165 Connected mode inter-RAT measurements**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Noted.**

**R4-2007273 CR on cell re-selection requirement for NR-EUTRAN measurement in TS38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0723 Cat: B (Rel-16)  
  
 Source: vivo*

**Discussion:**

**Decision: Revised to R4-2008634 (from R4-2007273).**

**R4-2008634 CR on cell re-selection requirement for NR-EUTRAN measurement in TS38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0723 Cat: B (Rel-16)  
  
 Source: vivo*

**Discussion:**

**Decision: Return to.**

**R4-2007740 Discussion on the RRM requirements in NR HST**

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

**Discussion:**

**Decision: Noted.**

**R4-2007741 Cell identification in connected mode for NR-EUTRAN measurement in HST**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0796 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Revised to R4-2008635 (from R4-2007741).**

**R4-2008635 Cell identification in connected mode for NR-EUTRAN measurement in HST**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0796 Cat: B (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Return to.**

#### 6.17.2 Demodulation and CSI requirements (38.101-4 / 38.104) [NR\_HST-Perf]

### 6.18 NR performance requirement enhancement [NR\_perf\_enh-Perf]

### 6.19 Over the air (OTA) base station (BS) testing TR [OTA\_BS\_testing-Perf]

### 6.20 2-step RACH for NR [NR\_2step\_RACH-Perf]

#### 6.20.1 RRM core requirements (38.133) [NR\_2step\_RACH-Core]

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

**Email discussion: [95e][228] NR\_2step\_RACH\_RRM**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][228] NR\_2step\_RACH\_RRM | R16 2-step RACH for NR | RRM Core requirements | 6.20.1 |

**R4-2008517 Email discussion summary for [95e][228] NR\_2step\_RACH\_RRM** *Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009090 (from R4-2008517).**

**R4-2009090 Email discussion summary for [95e][228] NR\_2step\_RACH\_RRM** *Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008636 | WF on RRM requirements for 2-step RACH | ZTE |

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| [R4-2006](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_eBis/Docs/R4-2003394.zip)601 | Revised |
| R4-2007653 | Revised |
| R4-2008001 | Revised |
| R4-2008002 | Revised |

2nd round email discussion conclusions

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**R4-2008636 WF on RRM requirements for 2-step RACH**

*Type: other For: Approval  
 Source: ZTE*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2006601 CR to TS 38.133: introducing 2-step RACH core requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0678 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell, ZTE*

**Abstract:**

The CR introduces the 2-step RACH core requirements section on TS 38.133.

**Discussion:**

**Decision: Revised to R4-2008637 (from R4-2006601).**

**R4-2008637 CR to TS 38.133: introducing 2-step RACH core requirements**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0678 Cat: B (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell, ZTE*

**Abstract:**

The CR introduces the 2-step RACH core requirements section on TS 38.133.

**Discussion:**

**Decision: Return to.**

**R4-2006605 On RRM core requirements for 2-step RA type**

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

**Abstract:**

Discussion paper on the RRM core requirements for 2-step RA type

**Discussion:**

**Decision: Noted.**

**R4-2007293 Discussion on RRM Requirements for 2-step RACH**

*Type: discussion For: Approval  
 Source: NEC*

**Abstract:**

RRM requirements for 2-Step RACH are discussed

**Discussion:**

**Decision: Noted.**

**R4-2007491 RRM core requirements for 2-step RACH**

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

**Discussion:**

**Decision: Noted.**

**R4-2007652 Remaining open issues on RRM requirements for 2-step RACH**

*Type: discussion For: Discussion  
 Source: ZTE*

**Discussion:**

**Decision: Noted.**

**R4-2007653 CR to 38.133 on UE transmit timing requirements for 2-step RACH**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0743 Cat: B (Rel-16)  
  
 Source: ZTE*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2008638 (from R4-2007653).**

**R4-2008638 CR to 38.133 on UE transmit timing requirements for 2-step RACH**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0743 Cat: B (Rel-16)  
  
 Source: ZTE*

**Discussion:**

**Decision: Return to.**

**R4-2007869 discussion on 2-step RA requirements**

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

**Discussion:**

**Decision: Noted.**

**R4-2008000 On defining 2-step RA and 4-step RA in exisitng RRM requirements**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

This paper analyzes the impact of 2-step RACH on existing RRM requirements (Handover, RRC re-establishment, RRC release with redirection, PSCell addition)

**Discussion:**

**Decision: Noted.**

**R4-2008001 Applicability of 2-step RA and 4-step RA in RRM requirements in 38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0871 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR defines the impact of 2-step RACH on existing RRM requirements (Handover, RRC re-establishment, RRC release with redirection, PSCell addition)

**Discussion:**

**Decision: Revised to R4-2008639 (from R4-2008001).**

**R4-2008639 Applicability of 2-step RA and 4-step RA in RRM requirements in 38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0871 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR defines the impact of 2-step RACH on existing RRM requirements (Handover, RRC re-establishment, RRC release with redirection, PSCell addition)

**Discussion:**

**Decision: Return to.**

**R4-2008002 Applicability of 2-step RA and 4-step RA in RRM requirements in 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6908 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR defines the impact of 2-step RACH on existing RRM requirements (Handover, RRC release with redirection, PSCell addition)

**Discussion:**

**Decision: Revised to R4-2008640 (from R4-2008002).**

**R4-2008640 Applicability of 2-step RA and 4-step RA in RRM requirements in 36.133**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6908 Cat: B (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR defines the impact of 2-step RACH on existing RRM requirements (Handover, RRC release with redirection, PSCell addition)

**Discussion:**

**Decision: Return to.**

#### 6.20.2 BS Demodulation requirements (38.104/38.141-1/38.141-2) [NR\_2step\_RACH-Perf]

#### 6.20.3 Others [NR\_2step\_RACH-Perf]

### 6.21 R16 NR maintenance [WI code or TEI16]

#### 6.21.1 BS RF [WI code or TEI16]

#### 6.21.2 UE RF [WI code or TEI16]

#### 6.21.3 RRM [WI code or TEI16]

Session chair: AI treated under email thread [95e][233] NR\_RRM\_maintenance

**R4-2006184 CR on measurement gap applicability in TS38.133 for R16**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0618 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

**Decision: Not pursued.**

**R4-2006217 Rapportuer CR for TS38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0632 Cat: D (Rel-16)  
  
 Source: Apple*

**Discussion:**

**Decision: Revised to R4-2008662 (from R4-2006217).**

**R4-2008662 Rapportuer CR for TS38.133**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0632 Cat: F (Rel-16)  
  
 Source: Apple*

**Discussion:**

**Decision: Return to.**

**R4-2006616 On potential enhancement for TCI switching**

*Type: discussion For: Discussion  
 38.133 v..  
 Source: Apple*

**Discussion:**

**Decision: Noted.**

**R4-2007657 CR to 38.133 on intra frequency measurements without gaps**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0744 Cat: F (Rel-16)  
  
 Source: ZTE*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Revised to R4-2009130 (from R4-2007657).**

**R4-2009130 CR to 38.133 on intra frequency measurements without gaps**

*Type: CR For: Agreement  
 38.133 v16.3.0 CR-0744 Cat: F (Rel-16)  
  
 Source: ZTE*

**Discussion:**

Session chair: cover sheet issue (see details in RAN4 reflector)

**Decision: Return to.**

***NeedForGap***

**R4-2006882 Reply LS on NeedForGap capability**

*Type: LS out For: Approval  
 to RAN2  
 Source: MediaTek inc.*

**Session chair: moved from AI 13**

**Discussion:**

**Decision: Revised to R4-2008997 (from R4-2006882).**

**R4-2008997 Reply LS on NeedForGap capability**

*Type: LS out For: Approval  
 to RAN2  
 Source: MediaTek inc.*

**Discussion:**

**Decision: Return to.**

**R4-2006883 Discussion on NeedForGap capability**

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

**Session chair: moved from AI 13**

**Discussion:**

**Decision: Noted.**

#### 6.21.4 Demodulation and CSI [WI code or TEI16]

## 7 UE feature list

## 8 Rel-16 spectrum related Work Items for NR

### 8.1 NR intra band Carrier Aggregation for xCC DL/yCC UL including contiguous and non-contiguous spectrum (x>=y) [NR\_CA\_R16\_intra]

### 8.2 NR inter-band Carrier Aggregation/Dual Connectivity for 2 bands DL with x bands UL (x=1, 2) [NR\_CADC\_R16\_2BDL\_xBUL]

### 8.3 EN-DC of 1 LTE band and 1 NR band [DC\_R16\_1BLTE\_1BNR\_2DL2UL]

### 8.4 EN-DC of 2 LTE band and 1 NR band [DC\_R16\_2BLTE\_1BNR\_3DL2UL]

### 8.5 EN-DC of 3 LTE band and 1 NR band [DC\_R16\_3BLTE\_1BNR\_4DL2UL]

### 8.6 EN-DC of 4 LTE band and 1 NR band [DC\_R16\_4BLTE\_1BNR\_5DL2UL]

### 8.7 EN-DC of x bands (x=1,2, 3, 4) LTE inter-band CA and 2 bands NR inter-band CA [DC\_R16\_xBLTE\_2BNR\_yDL2UL]

### 8.8 Band combinations for SA NR supplementary uplink (SUL), NSA NR SUL, NSA NR SUL with UL sharing from the UE perspective (ULSUP) [NR\_SUL\_combos\_R16]

### 8.9 NR Inter-band Carrier Aggregation for 3 bands DL with 1 band UL [NR\_CA\_R16\_3BDL\_1BUL]

### 8.10 NR Inter-band Carrier Aggregation for 4 bands DL with 1 band UL [NR\_CA\_R16\_4BDL\_1BUL]

### 8.11 NR Inter-band Carrier Aggregation/Dual connectivity for 3 bands DL with 2 bands UL [NR\_CADC\_R16\_3BDL\_2BUL]

### 8.12 Dual Connectivity (EN-DC) with 3 bands DL and 3 bands UL [DC\_R16\_LTE\_NR\_3DL3UL]

### 8.13 Dual Connectivity (EN-DC) of LTE inter-band CA xDL/1UL bands (x=2,3,4) and NR FR1 1DL/1UL band and NR FR2 1DL/1UL band [DC\_R16\_xBLTE\_2BNR\_yDL3UL]

### 8.14 29dBm UE Power Class for B41 and n41 [LTE\_NR\_B41\_Bn41\_PC29dBm]

### 8.15 Power Class 2 UE for EN-DC (1 LTE FDD band +1 NR TDD band) [ENDC\_UE\_PC2\_FDD\_TDD-Core]

### 8.16 Introduction of NR band n259 [NR\_n259]

### 8.17 Adding 25MHz and 50MHz channel bandwidth in NR band n1 [NR\_n1\_BW2]

### 8.18 LTE/NR spectrum sharing in band 48/n48 frequency range [NR\_n48\_LTE\_48\_coex-Core]

### 8.19 Adding 40 MHz channel bandwidth (15, 30 and 60kHz SCS) in NR band n3 [NR\_n3\_BW]

### 8.20 Adding 50 MHz channel bandwidth (15, 30 and 60kHz SCS) in NR band n65 [NR\_n65\_BW]

## 9 Study Items for NR

### 9.1 Study on radiated metrics and test methodology for the verification of multi-antenna reception perf. of NR UEs [FS\_NR\_MIMO\_OTA\_test]

### 9.2 Study on 7-24GHz frequency range [FS\_7to24GHz\_NR]

## 10 Rel-17 spectrum related Work Items for NR

### 10.1 Introduction of FR2 FWA UE with maximum TRP of 23dBm for band n257 and n258 [NR\_FR2\_FWA\_Bn257\_Bn258]

#### 10.1.1 UE RF (38.101-2) [NR\_FR2\_FWA\_Bn257\_Bn258]

#### 10.1.2 BS RF (38.104) [NR\_FR2\_FWA\_Bn257\_Bn258]

#### 10.1.3 RRM (38.133) [NR\_FR2\_FWA\_Bn257\_Bn258]

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

**Email discussion: [95e][234] NR\_FR2\_FWA\_Bn257\_Bn258\_RRM**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][234] NR\_FR2\_FWA\_Bn257\_Bn258\_RRM | R17 FR2 FWA UE with max 23dBm TRP | RRM Core requirements | 10.1.3 |

**R4-2008523 Email discussion summary for [95e][234] NR\_FR2\_FWA\_Bn257\_Bn258\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009096 (from R4-2008523).**

**R4-2009096 Email discussion summary for [95e][234] NR\_FR2\_FWA\_Bn257\_Bn258\_RRM**

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

**Abstract:**

**Discussion:**

**Decision: Return to.**

1st round email discussion conclusions

Issue 1-1: Whether the existing PC1 RRM requirements should be re-used for the new FWA UE with 23dBm TRP.

The existing PC1 RRM requirements should be re-used for the new FWA UE with 23dBm TRP.

Issue 1-3: which RRM core requirements will be impacted if FR2 FWA UE is defined as a new power class.

The following RRM core requirements will be impacted if FR2 FWA UE is not defined as power class 1

* FR2 measurement requirements in idle mode
* Known condition for FR2 SCell activation requirements
* FR2 intra- and inter-frequency measurement requirements

New tdocs

|  |  |  |
| --- | --- | --- |
| R4-2008663 | WF on FR2 new FWA UE RRM requirements | Huawei, HiSilicon |

2nd round email discussion conclusions

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

**R4-2008663 WF on FR2 new FWA UE RRM requirements**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2007804 Discussion on RRM impact due to introduction of new FR2 FWA UE**

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

**Discussion:**

**Decision: Noted.**

**R4-2007134 RRM Requirements for the new FWA device with 23dBm TRP**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Discussion:**

**Session chair: moved from AI 6.13.2.**

**Decision: Noted.**

#### 10.1.4 Others [NR\_FR2\_FWA\_Bn257\_Bn258]

### 10.2 Introduction of NR band n13 [NR\_n13]

#### 10.2.1 UE RF (38.101-1) [NR\_n13-Core]

#### 10.2.2 BS RF (38.104) [NR\_n13-Core]

#### 10.2.3 RRM (38.133) [NR\_n13-Core]

#### 10.2.4 Others [NR\_n13-Core/Perf]

### 11.0 Reply to ITU-R LS (RP-200042)

### 11.1 Study on IMT parameters for frequency ranges 6.425-7.125GHz and 10.0-10.5GHz [FS\_6425\_10500MHz \_NR]

### 11.2 Reply of IMT parameters for other frequency ranges requested in RP-200042

## 12 LTE maintenance (up to Rel15) [WI code or TEI]

### 12.1 BS RF [WI code or TEI]

### 12.2 UE RF [WI code or TEI]

### 12.3 RRM [WI code or TEI]

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

**Email discussion: [95e][232] LTE\_RRM\_maintenance**

|  |  |  |  |
| --- | --- | --- | --- |
| **Email title** | **WI** | **Topic areas** | **AI** |
| [95e][232] LTE\_RRM\_maintenance | Misc | TS 36.133 specification clean up before ITU submission (R4-2006966,  R4-2006967) R15/R16 LTE RRM maintenance | 5.14.2 12.3 |

**R4-2008521 Email discussion summary for [95e][232] LTE\_RRM\_maintenance** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2009094 (from R4-2008521).**

**R4-2009094 Email discussion summary for [95e][232] LTE\_RRM\_maintenance** *Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Return to.**

GTW session (May 29th)

Session chair: check possible issues with spec clean up for 36.133

E///: there is one issue with euCA which we will continue discussion. Besides that no [] or FFS expected.

1st round email discussion conclusions

**Topic #1: euCA requirements finalization**

Tdoc decisions

|  |  |
| --- | --- |
| Tdoc | Tdoc decision |
| R4-2007147 | Agreed |
| R4-2007149 | Return to |

**Topic #2: Rel-13 maintenance**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007424 | Revised |
| R4-2007724 | Agreed |
| R4-2006082 | Merged |
| R4-2006086 | Agreed |

**Topic #3: Rel-14 maintenance**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2007876 | Agreed |

**Topic #4: Rel-15 maintenance**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006966 | Revised |
| R4-2006968 | Agreed |

**Topic #5: Rel-16 maintenance**

Tdoc decisions

|  |  |
| --- | --- |
| **Tdoc** | **Tdoc decision** |
| R4-2006967 | Revised |
| R4-2007118 | Agreed |

2nd round email discussion conclusions

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

**R4-2006966 Finalisation of requirements in 36.133 R15**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6841 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Remove square brackets and TBDs ready for ITU submission

**Discussion:**

**Decision: Revised to R4-2008657 (from R4-2006966).**

**R4-2008657 Finalisation of requirements in 36.133 R15**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6841 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Remove square brackets and TBDs ready for ITU submission

**Discussion:**

**Decision: Return to.**

**R4-2009107 Finalisation of requirements in 36.133 R16**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-TBA Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Return to.**

**R4-2006967 Finalisation of requirements in 36.133 R16**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6842 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Remove square brackets and TBDs ready for ITU submission

**Discussion:**

**Decision: Revised to R4-2008658 (from R4-2006967).**

**R4-2008658 Finalisation of requirements in 36.133 R16**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6842 Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Remove square brackets and TBDs ready for ITU submission

**Discussion:**

**Decision: Return to.**

**R4-2006968 Editorial correction of E-UTRAN FDD – UTRAN TDD Measurements**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6843 Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

Correction of title and spelling errors in testcase A.8.7.A in 36.133

**Discussion:**

**Decision: Agreed.**

**R4-2006969 Editorial correction of E-UTRAN FDD – UTRAN TDD Measurements**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6844 Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Correction of title and spelling errors in testcase A.8.7.A in 36.133

**Discussion:**

**Decision: Agreed.**

**R4-2007118 Correction of subclause references in clause 5**

*Type: CR For: Agreement  
 36.133 v13.18.0 CR-6849 Cat: F (Rel-13)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Subclause referencing for handover clause corrected.

**Discussion:**

**Decision: Agreed.**

**R4-2007146 Number of carriers to measure in euCA**

*Type: discussion For: Discussion  
 36.133 v..  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Noted.**

**R4-2007147 CR on Number of carriers to monitor for IDLE mode measurements**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6850 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Agreed.**

**R4-2007148 CR on Number of carriers to monitor for IDLE mode measurements**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6851 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Agreed.**

**R4-2007149 CR clarifying S-measure thresholds for EMR carriers**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6852 Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Return to.**

**R4-2007150 CR clarifying S-measure thresholds for EMR carriers**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6853 Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Discussion:**

**Decision: Return to.**

**R4-2007424 CR to TS 36.133: Change of SR-ConfigIndex in eMTC RLM DRX test cases (Rel-13)**

*Type: CR For: Agreement  
 36.133 v13.18.0 CR-6858 Cat: F (Rel-13)  
  
 Source: Rohde & Schwarz*

**Discussion:**

**Decision: Revised to R4-2008656 (from R4-2007424).**

**R4-2008656 CR to TS 36.133: Change of SR-ConfigIndex in eMTC RLM DRX test cases (Rel-13)**

*Type: CR For: Agreement  
 36.133 v13.18.0 CR-6858 Cat: F (Rel-13)  
  
 Source: Rohde & Schwarz*

**Discussion:**

**Decision: Return to.**

**R4-2007425 CR to TS 36.133: Change of SR-ConfigIndex in eMTC RLM DRX test cases (Rel-14)**

*Type: CR For: Agreement  
 36.133 v14.14.0 CR-6859 Cat: A (Rel-14)  
  
 Source: Rohde & Schwarz*

**Discussion:**

**Decision: Return to.**

**R4-2007426 CR to TS 36.133: Change of SR-ConfigIndex in eMTC RLM DRX test cases (Rel-15)**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6860 Cat: A (Rel-15)  
  
 Source: Rohde & Schwarz*

**Discussion:**

**Decision: Return to.**

**R4-2007427 CR to TS 36.133: Change of SR-ConfigIndex in eMTC RLM DRX test cases (Rel-16)**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6861 Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Discussion:**

**Decision: Return to.**

**R4-2007724 CR on NB-IoT cell reselection margin in enhanced coverage in Rel-13**

*Type: CR For: Agreement  
 36.133 v13.18.0 CR-6871 Cat: F (Rel-13)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007725 CR on NB-IoT cell reselection margin in enhanced coverage in Rel-14 (Cat A)**

*Type: CR For: Agreement  
 36.133 v14.14.0 CR-6872 Cat: A (Rel-14)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007726 CR on NB-IoT cell reselection margin in enhanced coverage in Rel-15 (Cat A)**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6873 Cat: A (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007727 CR on NB-IoT cell reselection margin in enhanced coverage in Rel-16 (Cat A)**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6874 Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007876 Correction to eMTC inter-frequency reselection margin R14**

*Type: CR For: Agreement  
 36.133 v14.14.0 CR-6891 Cat: F (Rel-14)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007877 Correction to eMTC inter-frequency reselection margin R15**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6892 Cat: A (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2007878 Correction to eMTC inter-frequency reselection margin R16**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6893 Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

**Decision: Agreed.**

**R4-2006082 CR to parameter for Cat-M RRM A.7.3.55**

*Type: CR For: Agreement  
 36.133 v13.18.0 CR-6829 Cat: F (Rel-13)  
  
 Source: ANRITSU LTD*

Session chair: moved from AI 4.10

**Discussion:**

**Decision: Merged.**

**R4-2006083 CR to parameter for Cat-M RRM A.7.3.55**

*Type: CR For: Agreement  
 36.133 v14.14.0 CR-6830 Cat: A (Rel-14)  
  
 Source: ANRITSU LTD*

Session chair: moved from AI 4.10

**Discussion:**

**Decision: Withdrawn.**

**R4-2006084 CR to parameter for Cat-M RRM A.7.3.55**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6831 Cat: A (Rel-15)  
  
 Source: ANRITSU LTD*

Session chair: moved from AI 4.10

**Discussion:**

**Decision: Withdrawn.**

**R4-2006085 CR to parameter for Cat-M RRM A.7.3.55**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6832 Cat: A (Rel-16)  
  
 Source: ANRITSU LTD*

Session chair: moved from AI 4.10

**Discussion:**

**Decision: Withdrawn.**

**R4-2006086 CR to RRM MPDSCH Repetitions in CE ModeA test case**

*Type: CR For: Agreement  
 36.133 v13.18.0 CR-6833 Cat: F (Rel-13)  
  
 Source: ANRITSU LTD*

Session chair: moved from AI 4.10

**Abstract:**

For A.8.1.26, change RMC R.11 HD-FDD -> R.25 HD-FDD

**Discussion:**

**Decision: Agreed.**

**R4-2006087 CR to RRM MPDSCH Repetitions in CE ModeA test case**

*Type: CR For: Agreement  
 36.133 v14.14.0 CR-6834 Cat: A (Rel-14)  
  
 Source: ANRITSU LTD*

Session chair: moved from AI 4.10

**Abstract:**

For A.8.1.26, change RMC R.11 HD-FDD -> R.25 HD-FDD

**Discussion:**

**Decision: Agreed.**

**R4-2006088 CR to RRM MPDSCH Repetitions in CE ModeA test case**

*Type: CR For: Agreement  
 36.133 v15.9.0 CR-6835 Cat: A (Rel-15)  
  
 Source: ANRITSU LTD*

Session chair: moved from AI 4.10

**Abstract:**

For A.8.1.26, change RMC R.11 HD-FDD -> R.25 HD-FDD

**Discussion:**

**Decision: Agreed.**

**R4-2006089 CR to RRM MPDSCH Repetitions in CE ModeA test case**

*Type: CR For: Agreement  
 36.133 v16.5.0 CR-6836 Cat: A (Rel-16)  
  
 Source: ANRITSU LTD*

Session chair: moved from AI 4.10

**Abstract:**

For A.8.1.26, change RMC R.11 HD-FDD -> R.25 HD-FDD

**Discussion:**

**Decision: Agreed.**

### 12.4 Demodulation and CSI [WI code or TEI]

## 13 Liaison and output to other groups

## 14 Revision of the Work Plan

### 14.1 Simplification of band combinations in RAN4 specifications

### 14.2 R17 new proposals

#### 14.2.1 Basket WI approach for adding existing channel bandwidth on existing NR bands

#### 14.2.2 Proposals on adding brand new channel bandwidth

#### 14.2.3 Basket WIs for LTE CA, EN-DC, NR CA and NR DC

#### 14.2.4 Others

### 14.3 Others

## 15 Any other business

### 15.1 Views on workload management and meeting efficiency improvement

### 15.2 Others

## 16 Close of the E-meeting

## BACKUP

**R4-20AAAAA Way forward on XXXX**

*Type: other For: Approval  
 Source: TBA*

**Abstract:**

**Discussion:**

**Decision: Return to.**