**3GPP TSG-RAN WG4 Meeting # 109 R4-23XXXXX**

**Chicago, US, November 13 – November 17, 2023**

**Agenda item:** 4.8

**Source:** Moderator (Huawei, HiSilicon)

**Title:** Topic summary for [109][201] Maintenance\_up\_to\_R16

**Document for:** Information

# Introduction

This document provides summary for Tdocs submitted to the following AI

*4.4 RRM requirements [WI code]*

Please kindly take following notes for Tdoc handling in this topic thread.

1. Open issues are based on Discussion papers.
2. Based on Chair’s guidance, all CRs in this email thread will be first handled in NWM flagging procedure which will be triggered separately.
3. Cat-A CRs will not be handled in the summary document or the NWM flagging procedure.
4. The following papers are marked as ‘reserved’ or ‘withdrawn’ in Tdoc list, and they will not be handled in the summary document or the NWM flagging procedure.

|  |  |  |
| --- | --- | --- |
| [R4-2319172](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319172.zip) | [NR\_newRAT-Perf] CR of correction in TC A.6.5.5.4 | Samsung, Anritsu |
| [R4-2320120](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320120.zip) | Correction of measurement gap parameters for additional rel-16 mandatory gap patterns test case | Ericsson |
| [R4-2320524](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320524.zip) | [NR\_RRM\_enh\_Core] CR on the SCell activation | ZTE Corporation |
| R4-2318458 | [NR\_RRM\_Enh-Perf] Maintenance perf part CR on event triggered reporting tests with additional mandatory gap pattern R17 | MediaTek inc. |
| [R4-2320936](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320936.zip) | [NR\_unlic] EN-DC intra-frequency measurement test cases for NR-U – R16 | Qualcomm Incorporated |
| [R4-2320478](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320478.zip) | [NR\_unlic-Perf] HO test cases under CCA update | Qualcomm Incorporated |
| [R4-2320894](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320894.zip) | [NR\_unlic-Perf] HO test cases under CCA update | Qualcomm Incorporated |
| [R4-2320436](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320436.zip) | [NR\_RRM\_enh\_Core] CR on the inter-frequency measurement without gap | ZTE Corporation |

1. Based on Chair’s guidance and offline information, the following papers are included in the summary document and the CRs are included in the NWM flagging procedure.

|  |  |  |
| --- | --- | --- |
| [**R4-2319944**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319944.zip) | [TEI16]Discussion on MRTD/MTTD requirements for inter-band EN-DC with overlapping DL bands | Huawei, HiSilicon |
| [**R4-2319945**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319945.zip) | [TEI16]CR on MRTD/MTTD requirements for inter-band EN-DC with overlapping DL bands R16 | Huawei, HiSilicon |
| [**R4-2319497**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319497.zip) | CR for MRTD/MTTD requirement for EN-DC/NE-DC (R16) | OPPO |
| [**R4-2319498**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319498.zip) | Discussion on left issues for MRTD-MTTD requirements in ENDC and NEDC | OPPO |
| [**R4-2320496**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320496.zip) | further discussion on MTTD/MRTD requirement for FDD-FDD inter-band EN-DC/NE-DC with overlapping DL frequency | Apple |
| [**R4-2319161**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319161.zip) | Draft CR on inter-frequency measurement without gap in CHO | Ericsson |

1. Based on Chair’s guidance, the following paper is moved to topic thread [213].

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| [**R4-2320471**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320471.zip) | [TEI16] RRM requirements impact due to new BS signaling for inter-band EN-DC with overlapping bands | Nokia, Nokia Shanghai Bell |

# Topic #1: Open issues

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2320496**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320496.zip) | Apple | **Proposal 1:** **RAN4 to confirm whether the 4th scenario in *asyncIntraBandENDC also* include FDD-FDD inter-band EN-DC with overlapping DL frequency or not.**   * **If yes, confirm the agreement in previous meeting and agree the endorsed CR in [3] from the last meeting.** * **If no, update the endorsed CR in [3] to reflect that async MRTD/MTTD requirements are mandatory for FDD-FDD inter-band EN-DC with overlapping DL frequency. And send updated LS on *asyncIntraBandENDC* accordingly.** |
| [**R4-2319498**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319498.zip) | OPPO | **Observation 1: The capability of *asyncIntraBandENDC* can be extended to FDD- FDD inter-band NE-DC with overlapping DL bands.**  **Observation 2: The capability ‘asyncIntraBandENDC’ can only apply for FDD-FDD intra-band co-located EN-DC and FDD-FDD inter-band EN-DC/NE-DC with overlapping DL bands operation.**  **Observation 3: For intra-band co-located EN-DC or inter-band EN-DC/NE-DC with overlapping DL bands, only sync operation is assumed for TDD-TDD case.**  **Observatino 4: The capability ‘interBandMRDC-WithOverlapDL-Bands-r16’ can apply for FDD-FDD or TDD-TDD inter-band (NG)EN-DC/NE-DC operation with overlapping or partially overlapping DL bands.**  **Proposal 1: RAN4 to discuss whether to define MTTD/MRTD requirements for intra-band NE-DC.**  **Proposal 2: RAN4 to discuss whether to extend the capability of *asyncIntraBandENDC* to NEDC for inter-band case only, or intra-band case as well.**  **Proposal 3: Complete the requirements of MTTD/MRTD for TDD-TDD inter-band sync NE-DC with overlapping DL bands .** |
| [**R4-2319944**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319944.zip) | Huawei, HiSilicon | ***Observation 1: In R15, for inter-band EN-DC with overlapping or partially overlapping DL bands (i.e. DC\_42\_n77/DC\_42\_n78/ DC\_20\_n28/DC\_28\_n20), the MRTD requirements for synchronous intra-band EN-DC are applied with the limitation on co-located deployment.***  ***Observation 2: In R15, the limitation on supporting only synchronous operation can be applied only under co-located deployment for intra-band EN-DC or inter-band EN-DC with overlapping or partially overlapping DL bands.***  ***Observation 3: UE capability IE asyncIntraBandENDC only apply to FDD-FDD intra-band EN-DC combinations and TDD-TDD inter-band EN-DC combinations*** ***DC\_42\_n77 and DC\_42\_n78. For these EN-DC combinations, UE supports only synchronous operation by default when IE asyncIntraBandENDC is not indicated.***  ***Proposal 1:*** ***For TDD-TDD inter-band EN-DC with overlapping or partially overlapping DL bands (i.e. DC\_42\_n77 and DC\_42\_n78), UE indicating interBandMRDC-WithOverlapDL-Bands-r16 applies***   * ***MRTD=33us (i.e. MRTD value for synchronous inter-band EN-DC) when asyncIntraBandENDC is not indicated*** * ***MRTD=0.5slot (i.e. MRTD value for asynchronous inter-band EN-DC) when asyncIntraBandENDC is indicated***   ***Observation 4: If UE capability IE asyncIntraBandENDC was reused to be applied for FDD-FDD inter-band EN-DC with overlapping or partially overlapping DL bands (i.e. DC\_20\_n28/DC\_28\_n20), the UE not indicating asyncIntraBandENDC would have backward compatibility issue.***  ***Proposal 2:*** ***For FDD-FDD inter-band EN-DC with overlapping or partially overlapping DL bands (i.e. DC\_20\_n28/DC\_28\_n20), there is no need to introduce UE capability asyncIntraBandENDC, and UE indicating interBandMRDC-WithOverlapDL-Bands-r16 applies MRTD=0.5slot (i.e. MRTD value for asynchronous inter-band EN-DC).*** |
| [**R4-2320275**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320275.zip) | Nokia, Nokia Shanghai Bell | Adopt the following changes to test case for MAC-CE based active TCI state switch in clause A.7.5.8.1 |
| [**R4-2320716**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320716.zip) | Nokia, Nokia Shanghai Bell, AT&T, BT plc, Vodafone | [**Proposal 1: Clarify UE interruptions requirements on serving cells for the following scenarios:**](#_Toc149568124)  [**a.** **Scenario 1: the UE supporting interRAT-NeedForGapsNR-r16 is connected to LTE cell with NR measurement objects**](#_Toc149568125)  [**b.** **Scenario 2: the UE supporting nr-NeedForGap-Reporting-r16 or interFrequencyMeas-Nogap-r16 is connected to NR cell with NR measurement objects**](#_Toc149568126)  [**Proposal 2: For Scenario 1: Specify that a UE shall not indicate support of “no-gap” in the LTE UE capability interRAT-NeedForGapsNR-r16 if such measurements cause interruptions.**](#_Toc149568127)  [**Proposal 3: For Scenario 1: If the SMTC of the NR interRAT carrier is partially overlapping with measurement gaps, the UE shall perform NR interRAT measurements using the gaps.**](#_Toc149568128)  [**Proposal 4: For Scenario 2: The indication of “no-gap” as part of NeedForGapsInfoNR-r16 means no-gap and no interruption.**](#_Toc149568129)  [**Proposal 5: For Scenario 2: Specify that a UE shall not indicate support of “no-gap” in the NR UE capability interFrequencyMeas-Nogap-r16 if such measurements cause interruptions.**](#_Toc149568130)  [**Proposal 6: For Scenario 2: If the SMTC is partially overlapping with measurement gaps, the UE shall perform the measurements using the gaps.**](#_Toc149568131)  [**Observation 1:** LTE interFreqNeedForGaps or interRATNeedForGaps do not allow interruptions in 36.133.](#_Toc149568132)  [**Observation 2:** The need for interruptions was never discussed during Rel-16 RRM enhancements for inter-frequency gapless measurements.](#_Toc149568133)  [**Observation 3:** During Rel 16 discussion, the need for interruption for gapless measurements was never considered or brought up.](#_Toc149568134)  [**Observation 4:** Gapless measurements were never intended to allow UE interruptions](#_Toc149568135)  [**Observation 5:** Inter RAT interruptions could account for 10% interruption ratio when using 20 ms SMTC periodicity.](#_Toc149568136)  [**Observation 6:** If interruptions are allowed for UEs supporting no-gap in interRAT-NeedForGapsNR-r16, the interruptions will impact network KPIs of Rel-15, Rel-16 and Rel-17 LTE base stations in the field.](#_Toc149568137)  [**Observation 7:** In a real deployment a high interruption ratio from unspecified sources may trigger corrective actions.](#_Toc149568138)  [**Observation 8:** A NR inter-frequency measurement is defined as “without gaps” for a UE supporting interFrequencyMeas-Nogap-r16 even when the network configures a measurement gap.](#_Toc149568139)  [**Observation 9:** The behavior when the network configures measurement gaps is not defined for a UE supporting no-gap and a network configuring a gap.](#_Toc149568140)  [**Observation 10:** The network cannot control the UE behavior after it reports interRAT-NeedForGapsNR-r16.](#_Toc149568141)  [**Observation 12:** There are no measurement delay requirements associated with gapless measurements performed by UEs supporting interRAT-NeedForGapsNR-r16](#_Toc149568142)  [**Observation 13:** If a UE signals no-gap as part of needForGaps or needForGapNCSG no interruption is expected by Rel-15 to Rel-17 gNBs.](#_Toc149568143) |
| [**R4-2320723**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320723.zip) | Nokia, Nokia Shanghai Bell | LS based on R4-2320716 |

## Open issues summary

### Sub-topic 1-1: Interruption requirements for Rel-16 measurements without gaps

R4-2320716 proposes to clarify UE interruptions requirements for two scenarios:

* Scenario 1: UE supporting interRAT-NeedForGapsNR-r16 is connected to LTE cell with NR measurement objects
* Scenario 2: UE supporting nr-NeedForGap-Reporting-r16 or interFrequencyMeas-Nogap-r16 is connected to NR cell with NR measurement objects

#### Issue 1-1-1: Scenario 1, LTE – NR inter-RAT measurement

* Proposals
  + Option 1 (Nokia, AT&T, BT plc, Vodafone):
    - Specify that a UE shall not indicate support of “no-gap” in the LTE UE capability interRAT-NeedForGapsNR-r16 if such measurements cause interruptions.
    - If the SMTC of the NR interRAT carrier is partially overlapping with measurement gaps, the UE shall perform NR interRAT measurements using the gaps.
* Recommended WF
  + Discuss the option.
  + Based on the outcome, discuss whether to send LS to RAN2

#### Issue 1-1-2: Scenario 2, NR measurements without gaps

* Proposals
  + Option 1 (Nokia, AT&T, BT plc, Vodafone):
    - The indication of “no-gap” as part of NeedForGapsInfoNR-r16 means no-gap and no interruption.
    - Specify that a UE shall not indicate support of “no-gap” in the NR UE capability interFrequencyMeas-Nogap-r16 if such measurements cause interruptions.
    - If the SMTC is partially overlapping with measurement gaps, the UE shall perform the measurements using the gaps.
* Recommended WF
  + Discuss the option.
  + Based on the outcome, discuss whether to send LS to RAN2.

### Sub-topic 1-2: MRTD/MTTD for EN-DC/NE-DC with overlapping DL bands

#### Issue 1-2-1: Application of UE capability asyncIntraBandENDC for EN-DC

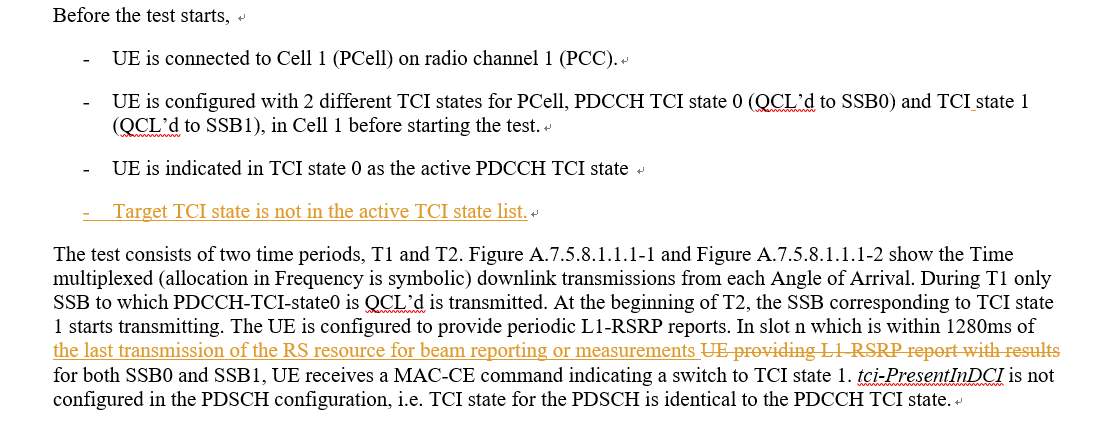
* Proposals
  + Option 1 (HW):
    - Capability asyncIntraBandENDC applies for TDD-TDD inter-band EN-DC but not for FDD-FDD inter-band EN-DC.
    - For TDD-TDD inter-band EN-DC with overlapping or partially overlapping DL bands (i.e. DC\_42\_n77 and DC\_42\_n78), UE indicating interBandMRDC-WithOverlapDL-Bands-r16 applies
      * MRTD=33us (i.e. MRTD value for synchronous inter-band EN-DC) when asyncIntraBandENDC is not indicated
      * MRTD=0.5slot (i.e. MRTD value for asynchronous inter-band EN-DC) when asyncIntraBandENDC is indicated
    - For FDD-FDD inter-band EN-DC with overlapping or partially overlapping DL bands (i.e. DC\_20\_n28/DC\_28\_n20), UE indicating interBandMRDC-WithOverlapDL-Bands-r16 applies MRTD=0.5slot (i.e. MRTD value for asynchronous inter-band EN-DC).
  + Option 2 (Apple):
    - RAN4 to confirm if asyncIntraBandENDC applies for FDD-FDD inter-band EN-DC.
      * If yes, confirm the agreement in previous meeting and agree the endorsed CR in R4-2317400 from the last meeting.
      * If no, update the endorsed CR in to reflect that async MRTD/MTTD requirements are mandatory for FDD-FDD inter-band EN-DC with overlapping DL frequency. And send updated LS on asyncIntraBandENDC accordingly.
* Recommended WF
  + Discuss the options
  + Based on the outcome, discuss whether to send LS to RAN2.

#### Issue 1-2-2: MTTD/MRTD requirements for NE-DC

* Proposals
  + Option 1 (OPPO):
    - For intra-band NE-DC
      * RAN4 to discuss whether to define MTTD/MRTD requirements for intra-band NE-DC.
      * RAN4 to discuss whether to extend the capability of asyncIntraBandENDC to NEDC for inter-band case only, or intra-band case as well.
    - For inter-band NE-DC
      * Complete the requirements of MTTD/MRTD for TDD-TDD inter-band sync NE-DC with overlapping DL bands
* Recommended WF
  + Discuss the option

### Sub-topic 1-3: Update of test case for MAC-CE based TCI state switch delay

* Proposals
  + Option 1 (Nokia):
    - Adopt the following changes to test case for MAC-CE based active TCI state switch in clause A.7.5.8.1



* Recommended WF
  + Discuss the changes.

# Topic #2: CRs

*Based on Chair’s guidance, all CRs in this email thread will be first handled in NWM flagging procedure which will be triggered separately. The list in this section is for information only.*

## CRs for Rel-15 WIs

|  |  |  |
| --- | --- | --- |
| **NR\_newRAT-Core/Perf** | | |
| [**R4-2318642**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2318642.zip) | [NR\_newRAT] CR on NR-E-UTRAN HO requirement maintenance R15 | Apple |
| [**R4-2318699**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2318699.zip) | CR on active TCI state list update delay - R15 | Apple |
| [**R4-2318700**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2318700.zip) | CR on active TCI state list update delay - R16 | Apple |
| [**R4-2318701**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2318701.zip) | CR on active TCI state list update delay - R17 | Apple |
| [**R4-2318702**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2318702.zip) | CR on active TCI state list update delay - R18 | Apple |
| [**R4-2320568**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320568.zip) | [NR\_unlic-Core]: Modify the condition for gradual timing adjustment. | ZTE |
| [**R4-2319338**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319338.zip) | [NR\_newRAT-Perf] Correction to CORESET RMC and SS-RSRQ accuracy test cases\_R15 | Huawei, HiSilicon, Starpoint |
| [**R4-2319339**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319339.zip) | [NR\_newRAT-Perf] Correction to CORESET RMC and SS-RSRQ accuracy test cases\_R16 | Huawei, HiSilicon |
| [**R4-2319554**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319554.zip) | [NR\_newRAT-Perf] CR of correction in TC A.6.5.5.4 | Samsung, Anritsu |
| [**R4-2320276**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320276.zip) | NR\_newRAT-Perf CR clarification on MAC-CE based TCI state switch delay | Nokia, Nokia Shanghai Bell |
| [**R4-2320467**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320467.zip) | [NR\_newRAT-Perf] CR on updating the band combination configurations in performance part | Nokia, Nokia Shanghai Bell |
| [**R4-2320708**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320708.zip) | [NR\_newRAT-Perf ] Correction on Control Channel RMCs (Rel-16) | Keysight Technologies UK Ltd |
| [**R4-2320955**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320955.zip) | Removal of fading conditions in FR2 2 AoA RLM test cases (Cat-F Rel-15) | Qualcomm Incorporated |
| [**R4-2319113**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319113.zip) | [NR\_newRAT-Perf, NR\_feMIMO-Perf] CR to FR1 Beam failure detection requirement | Anritsu Corporation |
| **NB\_IOTenh2-Perf** | | |
| [**R4-2320751**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320751.zip) | [NB\_IOTenh2-Perf] CR to 36.133 for correcting errors on the PHR table for NB1 UEs | Nokia, Nokia Shanghai Bell |

## CRs for Rel-16 WIs

|  |  |  |
| --- | --- | --- |
| **NR\_pos-Perf** | | |
| [**R4-2318345**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2318345.zip) | CR on R16 positioning test cases | CATT |
| **NR\_RRM\_enh-Core/Perf** | | |
| [**R4-2320873**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320873.zip) | Correction of measurement gap parameters for additional rel-16 mandatory gap patterns test case | Ericsson |
| [**R4-2320441**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320441.zip) | [NR\_RRM\_enh-Core] CR on the SCell activation | ZTE |
| [**R4-2320587**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320587.zip) | [NR\_RRM\_enh-Core] CR on the inter-frequency measurement without gap | ZTE, Ericsson |
| [**R4-2320717**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320717.zip) | [NR\_RRM\_enh-Core] CR Clarification of interruption behavior for interRAT measurements without gaps | Nokia, Nokia Shanghai Bell |
| [**R4-2320720**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320720.zip) | [NR\_RRM\_enh-Core] CR Clarification of interruption behavior for measurements without gaps | Nokia, Nokia Shanghai Bell |
| [**R4-2318457**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2318457.zip) | [NR\_RRM\_Enh-Perf] Maintenance perf part CR on event triggered reporting tests with additional mandatory gap pattern R16 | MediaTek inc. |
| [**R4-2318567**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2318567.zip) | [NR\_RRM\_enh-Perf] CR for Spatial relation info switch test requirements - Rel17 | Apple |
| [**R4-2319342**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319342.zip) | [NR\_RRM\_Enh-Perf] Correction to CGI measurement test cases\_R16 | Huawei, HiSilicon |
| [**R4-2320168**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320168.zip) | [NR\_RRM\_Enh-Perf] CR on TCs for UE specific CBW change R16 | Apple |
| [**R4-2320861**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320861.zip) | Corrections to NR Measurements with Autonomous Gaps | Nokia, Nokia Shanghai Bell |
| **NR\_UE\_pow\_sav-Core** | | |
| [**R4-2319209**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319209.zip) | Correction on measurements for UE configured with relaxed measurement criterion | Samsung |
| [**R4-2319210**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319210.zip) | Correction on measurements for UE configured with relaxed measurement criterion | Samsung |
| **NR\_unlic-Core/Perf** | | |
| [**R4-2319158**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319158.zip) | Draft CR on CSSF in NR-U | Ericsson |
| [**R4-2320978**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320978.zip) | [NR\_unlic] EN-DC intra-frequency measurement test cases for NR-U – R16 | Qualcomm |
| [**R4-2321001**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2321001.zip) | [NR\_unlic-Perf] HO test cases under CCA update | Qualcomm Incorporated |
| **NR\_Mob\_enh-Core** | | |
| [**R4-2319161**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319161.zip) | Draft CR on inter-frequency measurement without gap in CHO | Ericsson |
| **MTTD/MRTD** | | |
| [**R4-2318627**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2318627.zip) | On MRTD/MTTD requirement for inter-band non-collocated EN-DC/NE-DC (R16) | Apple, OPPO |
| [**R4-2319945**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319945.zip) | [TEI16]CR on MRTD/MTTD requirements for inter-band EN-DC with overlapping DL bands R16 | Huawei, HiSilicon |
| [**R4-2319497**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319497.zip) | CR for MRTD/MTTD requirement for EN-DC/NE-DC (R16) | OPPO |