**3GPP TSG-RAN WG4 Meeting # 111 draftR4-241xxxx**

**Fukuoka, Japan, 20-24 May 2024**

**Agenda item:** 4.8

**Source:** Moderator (Nokia)

**Title:** Ad-hoc minutes for [111][316] Demod\_Maintenance

**Document for:** Approval

# Introduction

*Briefly introduce background, the scope of this email discussion (e.g. list of treated agenda items) and provide some guidelines for email discussion if necessary.*

The scope of this topic summary for demod maintenance is:

4 Up to Rel-17 maintenance for LTE and NR

**4.5 Demodulation and CSI requirements [WI code]**

5 Rel-18 maintenance for LTE and NR

5.2 Rel-18 non-spectrum related WI maintenance

5.2.2 NB-IoT/eMTC core & perf. requirements for NTN [LTE\_NBIOT\_eMTC\_NTN\_req]

**5.2.2.4 Demodulation requirements [LTE\_NBIOT\_eMTC\_NTN\_req-Perf]**

5 Rel-18 maintenance for LTE and NR

5.2 Rel-18 non-spectrum related WI maintenance

5.2.6 Air-to-ground network for NR [NR\_ATG]

5.2.6.4 Demodulation performance requirements [NR\_ATG-Perf]

**5.2.6.4.1 UE demodulation performance and CSI requirements [NR\_ATG-Perf]**

**5.2.6.4.2 BS demodulation performance requirements [NR\_ATG-Perf]**

5 Rel-18 maintenance for LTE and NR

5.2 Rel-18 non-spectrum related WI maintenance

5.2.8 Other Rel-18 non-spectrum related WIs

**5.2.8.4 Demodulation performance and CSI requirements [WI code]**

Additionally, the following Tdocs have been included in this thread by the chair.

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| --- | --- | --- |
| [**R4-2407397**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407397.zip) | Re-inclusion of Channel Model Parameters for FR2 (Demodulation) | Nokia, Ericsson, ZTE |
| [**R4-2407441**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407441.zip) | [TEI] Re-inclusion of Channel Model Parameters for FR2 (Demodulation, Rel-18)) | Nokia, Ericsson, ZTE |

# Topic #1: Up to Rel-17 maintenance for LTE and NR (4.5)

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary and flags

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Company** | **Title** | **Flags and agreements (up to #16)** |
| [**R4-2407179**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407179.zip) | Anritsu Corporation | (NR\_HST-Perf) CR to FR1 HST-DPS on TCI state switching scheduling | Apple (Manasa): Agree with the update. Perhaps more clear to say - TCI state switching command scheduled by MAC CE with PDSCH configuration - MCS 4, Layer 1, StartRB 24, NumOfRB 28  Anritsu (Yamashita): To Apple, thank you for the suggestion of the improvement of wording. We are fine with the correction and I'd like to reflect that change in the revision.  Discussion:  Moderator: Revised version in draft folder.  => Revised  Revision likely directly acceptable. |
| R4-2407180 | Anritsu Corporation | (NR\_HST-Perf) CR to FR1 HST-DPS on TCI state switching scheduling | Cat A  => Return to |
| R4-2407181 | Anritsu Corporation | (NR\_HST-Perf) CR to FR1 HST-DPS on TCI state switching scheduling | Cat A  => Return to |
| [**R4-2407237**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407237.zip) | Apple | (NR\_perf\_enh-Perf) Editorial CR change to combine tables for requirements applicability for optional UE features | R&S (Niels): Second table should be voided instead of removed completly.  Samsung (Lili): It seems this CR is doing the same correction with R4-2407238, so it should be a cat-A CR.  Ericsson (Uesaka): we are fine to merge two tables. But the Table 6.1.1.3-2 should be kept as VOID.  MediaTek (Licheng): We are OK to merge the table, but the Table 6.1.1.3-2 should be kept as VOID. Also, we suggest to revise the title of Table 6.1.1.3-1 "Requirements applicability for optional features with UE capability signalling" to align the tile of Table 5.1.1.3-1 "Requirements applicability for optional UE features".  Discussion:  Apple: Revised version sent around with all requested changes. No other comments.  R&S: Comments on the revision. Talk about it offline. But the technical change is fine.  => Revised  Check with R&S if revision acceptable |
| [**R4-2407238**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407238.zip) | Apple | (NR\_perf\_enh-Perf) Editorial CR change to combine tables for requirements applicability for optional UE features | R&S (Niels): Text is added to first table, but second table is not removed from spec. Information would now be doubled in the spec.  Samsung (Lili): The contents of Table 6.1.1.3-2 is merged to Table 6.1.1.3-1, but the Table 6.1.1.3-2 is not removed.  Moderator’s note: This is R17 CR. R17 version does not remove table, while R16 version does. R17 version has formatting issues.  Discussion:  As above.  => Revised  Check with R&S if revision acceptable |
| R4-2407239 | Apple | (NR\_perf\_enh-Perf) Editorial CR change to combine tables for requirements applicability for optional UE features | Cat A  => Return to |
| [**R4-2407240**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407240.zip) | Apple | (NR\_newRAT-Perf) Editorial CR to Rename sub-clauses under PDCCH requirements | Huawei-Like: The changes may be unnecessary since the original wording is fine without any technical issues.  Discussion:  Huawei: No need to change. No technical issue. But if only company to flag, then we can compromise.  Apple: The formatting is very different from similar headings and in the spirit of alignment proposed.  Huawei: Fine with change.  => Agreed |
| R4-2407241 | Apple | (NR\_newRAT-Perf) Editorial CR to Rename sub-clauses under PDCCH requirements | Cat A  => Agreed |
| R4-2407242 | Apple | (NR\_newRAT-Perf) Editorial CR to Rename sub-clauses under PDCCH requirements | Cat A  => Agreed |
| R4-2407243 | Apple | (NR\_newRAT-Perf) Editorial CR to Rename sub-clauses under PDCCH requirements | Cat A  => Agreed |
| [**R4-2407355**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407355.zip) | Apple | (NR\_NTN\_solutions-Perf) CR to 38.101-5 to update section with PDSCH demod requirements | Qualcomm (Jahidur): If we want to clarify that the throughput is only measured on the enabled HARQ processes for the HARQ disabled case, we suggest to add a note in the test parameter section (under Table 8.2.1.2.2.1.1-2) rather than in the requirement table.  Discussion:  Apple: Discussed with QC. Revision uploaded. Moved to note for test 1-4.  QC: Fine the revision.  => Revised  Revision likely directly acceptable. |
| R4-2407356 | Apple | (NR\_NTN\_solutions-Perf) CR to 38.101-5 to update section with PDSCH demod requirements | Cat A  => Return to |
| [**R4-2407398**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407398.zip) | Nokia | [NR\_newRAT-Perf] CR to TS 38.104 (Corrections on Clause 8.3.4.1.1 and 11.3.2.6.2) (rel 17) | => Agreed |
| R4-2407399 | Nokia | [NR\_newRAT-Perf] CR to TS 38.104 (Corrections on Clause 8.3.4.1.1 and 11.3.2.6.2) (rel 18) | Cat A  => Agreed |
| R4-2407402 | Qualcomm Incorporated | [NR\_demod\_enh2-Perf] Corrections related to Rel. Indep. Requirements | Cat A  MCC: withdrawn  => Withdrawn  Withdrawn by MCC before meeting. |
| [**R4-2407403**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407403.zip)  -> R4-2409800 | Qualcomm Incorporated | [NR\_demod\_enh2-Perf] Corrections related to Rel. Indep. Requirements | Cat A  MCC: revised to R4-2409800 and changed to Cat-A.  CTC (Jingzhou): Fine with the added content, but this feature is added in both Rel-15 and Rel-16 38.306, so should be updated as below: 'These requirements are optional for Rel-15 and Rel-16 UEs and can be executed based on UE declaration of support of the feature ‘MMSE-IRC (Minimum Mean Square Error - Interference Rejection Combining) receiver’ indicated in 38.306 (**Rel-15 and** Rel-16).'  Huawei-Like: For the content: "of support of the feature ‘MMSE-IRC (Minimum Mean Square Error - Interference Rejection Combining) receiver’ indicated in 38.306 (Rel-16). " This clarification may be unnecessary since the feature description has been captured in the first column: "UE demodulation and CSI requirements for MMSE-IRC receiver for scenarios with inter cell and intra cell inter user interference" For the content "These requirements are mandatory without capability signalling from Rel-17." We don't think this clarification is needed since this spec is about how to test old release UEs and it's clear that this WI is introduced in R17 and the applicability rules for R17 has been captured in 38.101-4  These requirements are mandatory without capability signalling from Rel-17.  Apple (Manasa): There is no UE capability for MMSE-IRC receiver. This is the baseline receiver assumption in RAN4 and has no UE declaration.  MediaTek (Licheng): We share the same view as Huawei. It is quite clear that R-17 UE need to pass the requirements and it is not necessary to make any change.  => Return to  Rev 0 was R4-2407403. |
| [**R4-2407405**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407405.zip)  -> R4-2409799 | QUALCOMM Incorporated | Corrections on the FRC for Table A.3.2.2.2-29 | NR\_demod\_enh2-Perf  Cat A  MCC: revised to R4-2409799 and changed to Cat-A.  Apple (Manasa): Would like to understand the test config and how we get 42. Also suggest to correct “I” to “i” in -- For i, if mod(I,10)={0,1,2,3,4,5,6} and i  => Agreed  Rev 0 was R4-2407405. |
| R4-2407406 | Qualcomm Incorporated | [NR\_demod\_enh2-Perf] Corrections related to Rel. Indep. Requirements | Cat A  MCC: R4-2407402 withdrawn. This CR can stay as is.  => Return to |
| R4-2407407 | Qualcomm Incorporated | [NR\_demod\_enh2-Perf] Corrections related to Rel. Indep. Requirements | MCC: Changed to Cat-F.  Discussion:  QC: Our understanding is that the Rel-18 text was agreed and should be propagated into the maintenance.  Apple: MMSE-IRC is baseline receiver, there is no declaration.  QC: Declaration in RAN5.  Apple: We need declaration as for R-ML to have applicability rule  CTC: For IRC in R16/17 we need to declare .  Apple: Only for MU MIMO requirement, which are based on UE declaration, but not all the other requirements.  HW: Issue in not capability definition. First column is already clarifying applicability by name.  MTEK: MMSE is baseline. This optional is for testing not for UE capability. Optional w/o UE capability. That is for RAN5. It is clear in current version.  CTC: Ran5 has completed test cases without issues.  => Return to  Needs online discussion. |
| R4-2407408 | Qualcomm Incorporated | Corrections on the FRC for Table A.3.2.2.2-29 | NR\_demod\_enh2-Perf  MCC: Changed to Cat-F.  Discussion:  Apple/QC: We will discuss offline. CR can be agreed.  => Agreed |
| [**R4-2408330**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408330.zip) | Ericsson | CR for 38.108 on FR1 PUCCH demodualtion requirements | => Agreed |
| R4-2408331 | Ericsson | (NR\_NTN\_solutions-Perf) CR for 38.108 SAN PUCCH demodulation requirements | Cat A  => Agreed |
| [**R4-2408332**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408332.zip) | Ericsson | (NR\_NTN\_solutions-Perf) CR for 38.181 SAN PUCCH demodulation requirements | => Agreed |
| R4-2408333 | Ericsson | (NR\_NTN\_solutions-Perf) CR for 38.181 SAN PUCCH demodulation requirements | Cat A  => Agreed |
| [**R4-2408334**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408334.zip) | Ericsson | CR for 38.104 on FR2-2 PUSCH demodualtion requirements | NR\_ext\_to\_71GHz-Perf  => Agreed |
| R4-2408335 | Ericsson | (NR\_ext\_to\_71GHz-Perf) CR for 38.104 FR2-2 PUSCH demodulation requirements | Cat A  => Agreed |
| [**R4-2408336**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408336.zip) | Ericsson | CR for 38.104 on FR2-2 PUSCH demodualtion requirements | NR\_ext\_to\_71GHz-Perf  Discussion:  Title mismatch. The CR is for 141-2  Moderator: Check with MCC.  => Revised  Change title to include 38.141-2 |
| R4-2408337 | Ericsson | (NR\_ext\_to\_71GHz-Perf) CR for 38.141-2 FR2-2 PUSCH demodulation requirements | Cat A  => Return to |
| [**R4-2408735**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408735.zip) | Ericsson | (NR\_demod\_enh2-Perf ) CR to 38.101-4 Correction on FRC for CRS-IM requirement | Apple (Manasa): This change is not required. The FRC is correct. R.PDSCH.1-17.2 FDD  Discussion:  Apple: Checked and ok with change.  => Agreed |
| R4-2408736 | Ericsson | (NR\_demod\_enh2-Perf ) CR to 38.101-4 Correction on FRC for CRS-IM requirement | Cat A  => Agreed |
| [**R4-2408984**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408984.zip) | Huawei,HiSilicon | [NR\_IAB-Perf] CR on IAB-MT radiated CSI reporting requirement | Nokia (Axel): It is our understanding that the IAB spec intends to use the 4Rx sections performance values directly.  Discussion:  HW: Check 174/176-2. Mismatch. For OTA only 2Rx. Cannot understand comment to re-use 4Rx.  Nokia: In this case it’s a matter of reading. The spec says that we apply/re-use the 4Rx requirements. The intention is not to introduce new 2Rx requirements values. Just re-use the 4Rx values in the 2Rx setup.  Huawei: So no 2Rx test case at all.  Nokia: No. We just use the numbers. We have test.  Huawei: Did we have such an agreement.  Ericsson: 2Rx reqs have 3dB performance degradation to 4Rx, no? If re-use what about test setup.  Samsung: We didn’t introduce 2Rx requirements, but in case of OTA we can’t do different than 2Rx.  HW: Take offline. Check inconsistency.  Nokia: No mismatch. Both have 2Rx requirements.  Samsung: Maybe clarify text in reuse text.  => Return to  Needs online discussion. |
| R4-2408985 | Huawei,HiSilicon | [NR\_IAB-Perf] CR on IAB-MT radiated CSI reporting requirement | Cat A  => Return to |
| R4-2408986 | Huawei,HiSilicon | [NR\_IAB-Perf] CR on IAB-MT radiated CSI reporting requirement | Cat A  => Return to |
| [**R4-2408987**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408987.zip) | Huawei,HiSilicon | [NR\_newRAT-Perf] Discussion on PTRS configuration for UE demodulation requirements | Discussion.  => Noted |
| [**R4-2408988**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408988.zip) | Huawei, HiSilicon | [NR\_newRAT-Perf] CR on PTRS configuration for UE demodulation requirements | Nokia (Axel): Prefer for RAN5 to adapt. RAN4 agreements are clearly intended to have K/L configured.  Apple (Manasa): Agree with the change. Don’t we also need to update in common parameters table that PT-RS not configured for certain tests?  R&S (Niels): No technical concern on the change, but the background why it is changed is not clear in the spec and my cause confusion in the future.  Ericsson (Uesaka) flags: **R4-2408987**: We are fine not to transmit PTRS for FRC with MCS < 10 to align with RAN5. However TS38.101-4 Table 7.2-1 configures both K\_PT-RS and L\_PT-RS. If RAN4 agree not to transmit PTRS for MCS<10, we also need a note in this table, e.g., K\_PT-RS/L\_PT-RS is not configured for MCS < 10 in Table 7.2-1.  Qualcomm (Stefan): this change requires more discussion. We wonder why not to change the RAN5 spec to follow what RAN4 specified. Clearly, we cannot redo conformance testing for an existing device  Discussion:  Huawei: Some agree. Some companies don’t agree.  We found possible misalignment between RAN4/5. From RAN1 spec it is clear that if PTRS not configured and MCS small, no PTRS is transmitted. In Rel-15 we decided to always use default value. Based on this, RAN5 is correct. But we need to remove configuration from tables. We cannot say that RAN5 spec is incorrect.  Apple: Agree with change in the FRCs, but in the common parameters we config. We need to specifically say in common table to declare PTRS as non-configured. But unclear if we can update this in this meeting.  Huawei: For MCS>10 it should be configured.  Apple: For ATP there should be a PTRS configuration. We can not only specify this in the FRCs. Remove PTRS config from common table and move it to specific config tables, but only for MCS>10.  HW: Revise CR to capture Apple comments and changes.  QC: Configuring PTRS for MCS<10 is not forbidden RAN4 defined PTRS in these test cases. RAN5 did not take this into account.  HW: Based on Rel-15, RAN4 agreed to use default values; which means no config for MCS<10.  QC: Need to check that conformance tests were done following RAN5. But we need to check this before we can agree. Will check this until online session.  HW: Will check the same with TE vendors.  R&S: Agree not configured 508, but may need to check dedicated configuration 5.4.X section.  Will do until online.  => Revised  Needs online discussion. QC, HW, R&S to report back online on whether conformance tests were run using RAN5 version. |
| R4-2408989 | Huawei,HiSilicon | [NR\_newRAT-Perf] CR on PTRS configuration for UE demodulation requirements | Cat A  => Return to |
| R4-2408990 | Huawei,HiSilicon | [NR\_newRAT-Perf] CR on PTRS configuration for UE demodulation requirements | Cat A  => Return to |
| R4-2408991 | Huawei,HiSilicon | [NR\_newRAT-Perf] CR on PTRS configuration for UE demodulation requirements | Cat A  => Return to |
| [**R4-2408992**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408992.zip) | Huawei,HiSilicon | [NR\_L1enh\_URLLC-Perf] CR on PTRS configuration for UE demodulation requirements | Nokia (Axel): Prefer for RAN5 to adapt. RAN4 agreements are clearly intended to have K/L configured.  Apple (Manasa): Agree with the change. Don’t we also need to update in common parameters table that PT-RS not configured for certain tests?  R&S (Niels): No technical concern on the change, but the background why it is changed is not clear in the spec and my cause confusion in the future.  Qualcomm (Stefan): this change requires more discussion. We wonder why not to change the RAN5 spec to follow what RAN4 specified. Clearly, we cannot redo conformance testing for an existing device  Discussion:  As above (PTRS).  => Revised |
| R4-2408993 | Huawei,HiSilicon | [NR\_L1enh\_URLLC-Perf] CR on PTRS configuration for UE demodulation requirements | Cat A  => Return to |
| R4-2408994 | Huawei,HiSilicon | [NR\_L1enh\_URLLC-Perf] CR on PTRS configuration for UE demodulation requirements | Cat A  => Return to |
| [**R4-2408995**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408995.zip) | Huawei, HiSilicon | [NR\_DL1024QAM\_FR1-Perf] Updates to CQI reporting definition test metric under AWGN for 1024QAM test | Apple (Manasa): understand with the motivation, but need to check if test purpose is still met. If reported CQI is the highest and BLER is < 0.1 there would be no way to verify if UE CQI mapping is for 10% BLER  Ericsson (Uesaka): We are fine to consider the case the median CQI is the highest CQI index. If the reported median is the highest CQI, we don’t think we need to check the case BLER<0.1. Maybe we can say that: "If the PDSCH BLER using the transport format indicated by median CQI is less than or equal to 0.1, **and if the reported median CQI is not the highest CQI index**, then the BLER using the transport format indicated by the (median CQI+1) shall be greater than 0.1".  Qualcomm (Stefan): We suggest replacing 'is the highest CQI value' by 'shall be the highest CQI value'  Discussion:  Huawei: Didn’t understand Apples comment. For Eri and QC: Fine, but prefer wording of Eri.  Apple: If reported CQI is max CQI, in AWGN we want UE to report for 10% BLER. So +/- CQI should be words. If we always report max CQI we are not testing if the UE is able to have the mapping about 10% BLER. But fine, since we don’t have a choice.  QC: Fine with Ericsson’s wording.  => Revised  Revision to introduce Eri’s wording. |
| R4-2408996 | Huawei,HiSilicon | [NR\_DL1024QAM\_FR1-Perf] CR on updates to CQI reporting under AWGN for 1024QAM | Cat A  => Return to |
| [**R4-2409019**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409019.zip) | Huawei,HiSilicon | [NR\_demod\_enh2-Perf] CR for 38.101-4 Introduction of applicability rules | Moderator (Axel): Collision with R4-2409007 and R4-2409021 in [324]. Please resolve and/or check with MCC.  CTC: To Nokia: R4-2409007, R4-2409021 and R4-2409019 are adding different clauses in the same row, may not be conflict with each other.  CTC: However, the idea of the proposed changes seems to be applicable for all test requirements in TS38.101-4 that configure >2 NZP CSI-RS ports and/or >1 MIMO layers across different releases and different WIs. For example, Clause 5.2.2.2.4 and Clause 5.2.3.2.4 also configure 4Tx. Table 5.2.2.1.9 and Table 5.2.2.1.13 also configure rank 2. So I would like to flag this CR and request attention for the whole session.  Apple (Manasa): Don’t know if this change is needed esp for MIMO layers. The UE is only scheduled with 2 MIMO layers, not 4 for MU-MIMO tests. For CSI-RS ports, do we need applicability since we don’t have CSI feedback?  Anritsu (Yamashita): We suppose there is a typo in mentioned TC for “Supported maximum number of PDSCH MIMO layers” (FR1 TDD PDSCH). TC should be Clause 5.2.3.**2**.17 (TDD) instead of Clause 5.2.3.**1**.17 (FDD)  Discussion:  Huawei: The change is needed. Discuss the change separate from demod\_enh3.  CTC: Change is the same in enh2 and enh3. Since this is bigger, we think a bigger CR is needed next meeting to change all releases and all WIs. Prefer to discuss enh3 and only change there this meeting.  Apple: No update is needed for MIMO layers. All requirements are for single carrier case. The capability is on for CA. But fine with CTC proposal to not touch this change in this meeting.  Huawei: Don’t agree to treat CRs in next meeting. to CTC: We don’t think there is a big change, we have limited test cases for 4 Rx. to Apple: Supporting for 4Rx is mandatory feature with capability signalling. There is a table in the spec that captures all clauses and we should update.  Apple: Mandatory only for CA. It is mandatory to signal to support 4 layers for 4Rx UEs. CSI-port change we agree.  Huawei: Can we agree change for CSI-RS part first in this meeting, and other in next meeting?  CTC: For CSI-RS part, there are other requirements from other WIs. So that why we propose to add those all in one go.  => Revise  Revise to only cover CSI-RS part. Discuss offline/online how to handle other WIs (either this meeting or next) offline. |
| R4-2409020 | Huawei,HiSilicon | [NR\_demod\_enh2-Perf] CR for 38.101-4 Introduction of applicability rules | Cat A  => Return to |
| [**R4-2409022**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409022.zip) | Huawei,HiSilicon, Ericsson | [NR\_newRAT-Perf] CR for 38.101-4: Corrections on Rel-15 PMI test setup | Nokia (Axel): There is no ULA antenna configured. ULA low, means no antenna correlation. Only directivity here comes from beam direction in B.2.3.2.3. Need to keep it or PMI is completely random. Beam steering formulation not limited to X-pol (even though located in X-pol ant section).  Apple (Manasa): The note can be entirely removed instead of saying Note:void.  Qualcomm (Jahidur) flags: Agree with Nokia's view. Beam-steering may not be limited to X-polarized antenna config only.  Discussion:  Huawei: to Apple: not sure if we can void note. to QC: That would be a big change. No need for this big work.  Eri: Voiding of notes. RAN5 refers to notes sometimes, hence should be voided. Avoid complaints from RAN5. to QC: beamsteering formula is based on 2D configuration which is based on X-pol config. For ULA we only have 1D, so beamsteering cannot be applied.  Apple: X-pol only exists for 4Tx and we are talking 2Tx here.  => Return to  Discuss online. |
| R4-2409023 | Huawei,HiSilicon,Ericsson | [NR\_newRAT-Perf] CR for 38.101-4 Corrections on PMI test setup | Cat A  => Return to |
| R4-2409024 | Huawei,HiSilicon,Ericsson | [NR\_newRAT-Perf] CR for 38.101-4 Corrections on PMI test setup | Cat A  => Return to |
| R4-2409025 | Huawei,HiSilicon,Ericsson | [NR\_newRAT-Perf] CR for 38.101-4 Corrections on PMI test setup | Cat A  => Return to |
| [**R4-2409026**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409026.zip) | Huawei,HiSilicon, Ericsson | [NR\_redcap-Perf] CR for 38.101-4: Corrections on Rel-17 RedCap PMI test setup | Nokia (Axel): There is no ULA antenna configured. ULA low, means no antenna correlation. Only directivity here comes from beam direction in B.2.3.2.3. Need to keep it or PMI is completely random. Beam steering formulation not limited to X-pol (even though located in X-pol ant section).  Qualcomm (Jahidur): Agree with Nokia's view. Beam-steering may not be limited to X-polarized antenna config only.  Discussion:  => Return to  Same as NR\_newRAT. Discuss online. |
| R4-2409027 | Huawei,HiSilicon,Ericsson | [NR\_redcap-Perf] CR for 38.101-4 Corrections on PMI test setup | Cat A  => Return to |
| [**R4-2409113**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409113.zip) | Rohde & Schwarz | (NR\_newRAT-Perf) Correction of TRS configuration for FR1 PDSCH tests | Huawei-Like: If we changes the number of TRS resources, the performance may be different, one alternative way is to configure two CSI-RS resource set with each set having two CSI-RS resources  Apple (Manasa): Agree with the change. Need to remove other references to resources 3, 4 in the table  Discussion:  R&S: Discussed with Apple, they are fine. To HW: We did the change and with it the UEs are fine.  HW: If we change the TRS symbol the performance is also changes. We saw change in simulation.  => Return to  Discuss offline. |
| R4-2409114 | Rohde & Schwarz | (NR\_newRAT-Perf) Correction of TRS configuration for FR1 PDSCH tests | Cat A  => Return to |
| R4-2409115 | Rohde & Schwarz | (NR\_newRAT-Perf) Correction of TRS configuration for FR1 PDSCH tests | Cat A  => Return to |
| R4-2409116 | Rohde & Schwarz | (NR\_newRAT-Perf) Correction of TRS configuration for FR1 PDSCH tests | Cat A  => Return to |
| **[R4-2409438](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409438.zip)** | Keysight Technologies UK Ltd | (NR\_IIoT\_URLLC\_enh-Perf) CR to 38.141-1: PUCCH format 0 demod AWGN level correction | => Agreed |
| R4-2409439 | Keysight Technologies UK Ltd | (NR\_IIoT\_URLLC\_enh-Perf) CR to 38.141-1: PUCCH format 0 demod AWGN level correction | Cat A  => Agreed |
| [**R4-2409440**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409440.zip) | Keysight Technologies UK Ltd | (NR\_NTN\_solutions-Perf) CR to 38.108: Correction on FRCs in demod requirement | => Agreed |
| R4-2409441 | Keysight Technologies UK Ltd | (NR\_NTN\_solutions-Perf) CR to 38.108: Correction on FRCs in demod requirement | Cat A  => Agreed |
| **[R4-2409442](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409442.zip)** | Keysight Technologies UK Ltd | (NR\_NTN\_solutions-Perf) CR to 38.181: Correction on FRCs in conducted demod requirement | Keysight (Takao Miyake): there is different way to fix error, like to ask revision if still allowed.  Ericsson (Nicholas): The changing in requirement part is not needed, just to change FRC table index in Annex which could align with 38.108.  Discussion:  Moderator: Revised version in draft folder.  => Revised.  Revision likely directly acceptable. |
| R4-2409443 | Keysight Technologies UK Ltd | (NR\_NTN\_solutions-Perf) CR to 38.181: Correction on FRCs in conducted demod requirement | Cat A  => Return to |

## Open issues summary

*Before Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 1-1 NR\_newRAT

*Sub-topic description:*

None.

*Open issues and candidate options before meeting:*

**Issue 1-1-1: FR2 requirements and RMCs with PTRS default configuration**

* Background
  + In [R4-2408987] the authors cite TS 38.213 as the UE shall assume PT-RS is not present if MCS < 10 (QPSK) when both *frequencyDensity* and *timeDensity* in *phaseTrackingRS* are not configured.
    - The authors note that TS 38.508-1 (RAN5) does not configure *frequencyDensity* and *timeDensity* in *phaseTrackingRS*, which would trigger the “not present” case.
  + The authors note that the RAN4 RMCs were derived with K=2, L=1 assumptions.
  + The authors observe that in TS 38.101-4, “the PTRS is configured with default value K = 1 and L = 2 with both *frequencyDensity* and *timeDensity* absent for all FR2 PDSCH demodulation requirements”.
    - The moderator observes that K and L are denoted “Frequency density (KPT-RS)” and “Time density (LPT-RS)” respectively.
  + In the moderators understanding, there is a mismatch between RAN4 and RAN5 specifications, where the RAN5 specifications trigger the “PTRS not present” case, while RAN4 may have intended for PTRS being present with K=2, L=1.
    - [R4-1809392]
    - Previous agreements
      * PTRS is configured when introducing performance requirements in FR2.
    - Proposals for requirements definition
      * FR2: PTRS configuration (port 1, per 2PRB in frequency domain, per symbol in time domain)
  + This mismatch should be resolved, albeit that the performance difference may be negligible according to [R4-2408987].
* Proposals
  + Option 1 (HW): Only modify the RMC with PTRS not present for all FR2 QPSK PDSCH demodulation requirements and keep the corresponding performance requirements unchanged.
  + Other options not precluded.
* Recommended WF
  + Discuss offline and online.  
    Handle R4-2408988 - R4-2408991 and R4-2408992 - R4-2408994 accordingly.

**=> Discussion under “R4-2408988”.**

# Topic #2: NB-IoT/eMTC for NTN demodulation requirements (5.2.2.4)

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary and flags

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Company** | **Title** | **Flags and agreements (up to #1)** |
| [**R4-2407150**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407150.zip) | Nokia | [LTE\_NBIOT\_eMTC\_NTN\_req-Perf] CR on TS 36.181 for SAN Demodulation | => Agreed. |

## Open issues summary

*Before Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

None.

# Topic #3: Air-to-ground network for NR demodulation performance requirements (5.2.6.4)

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary and flags

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Company** | **Title** | **Flags and agreements (up to #2)** |
| [**R4-2407119**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407119.zip) | Qualcomm Incorporated | [NR\_ATG-Perf] Corrections related to ATG Applicability [R18][Cat.F] | Moderator (Axel): Table move usually results in table voiding (i.e., delete+void and new table). Please check with MCC, if moving could be possible without void.  Discussion:  Moderator: Checked with MCC and non-voiding move of table is fine.  => Agreed |
| [**R4-2408737**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408737.zip) | Ericsson | CR to 38.101-4: Correction on the reference measurement channel for ATG requirements | NR\_ATG-Perf  => Agreed |
| [**R4-2408953**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408953.zip) | Huawei,HiSilicon | [NR\_ATG-Perf] Discussion on K1 value for new TDD pattern for ATG PDSCH demodulation performance requirements | Discussion.  => Noted  **Issue 3-1-1** needs discussion online and potentially an **LS** needs to be created (draft shared in email thread “[111][316] Demod\_Maintenance -k1 value for ATG”) |
| [**R4-2408954**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408954.zip) | Huawei,HiSilicon | [NR\_ATG-Perf] CR on ATG PDSCH demodulation performance requirements (TS38.101-4, Rel-18) | Moderator (Axel): Deletion of section usually results in void. Please check with MCC, if moving could be possible without void.  Discussion:  Huawei: Did not check with MCC.  => Return to  Requires check with MCC on heading removal.. |
| [**R4-2408955**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408955.zip) | Huawei,HiSilicon | [NR\_ATG-Perf] CR on ATG PUSCH demodulation performance requirements and FRC definition (TS38.104, Rel-18) | => Agreed |
| [**R4-2409083**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409083.zip) | ZTE Corporation, Sanechips | CR on 38.141-2 for ATG demodulation requirements | NR\_ATG-Perf  => Agreed |
| [**R4-2409486**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409486.zip) | Samsung | Correction CR on applicability of ATG performance requirements | NR\_ATG-Perf  => Agreed |

## Open issues summary

*Before Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 3-1 K1 value for (30D4S6U) TDD pattern

*Sub-topic description:*

None.

*Open issues and candidate options before meeting:*

**Issue 3-1-1: K1 configuration for (30D4S6U) TDD pattern**

* Background:
  + According to the authors of [R4-2408953], “the K1 value for new TDD pattern for ATG PDSCH demodulation performance requirements exceeds the maximum number of different K1 value and the range of K1 value.”
* Proposals
  + Option 1 (HW): RAN4 find solution to solve such problem.
  + Other options not precluded.
* Recommended WF
  + Discuss offline and online.

**Adhoc discussion:**

Moderator: CMCC proposed a solution in the email discussion, which is summarized by the moderator and corrected by CMCC as follows:

Option 2 (CMCC)

1) Remap K1 values from “xx-i” to the 5 given fixed values (to obtain <9 different K1 values)

2) Use koffset from Rel-18 ATG feature (to limit K1 values to <32).

3) Ask RAN2, via LS, to implement their agreement of changing K1 range from (0..15) to (0..31) (for unpaired spectrum).

Is option 2 agreeable?

# Topic #4: Rel-18 demodulation performance and CSI requirements (5.2.8.4)

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary and flags

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Company** | **Title** | **Flags and agreements (up to #2)** |
| [**R4-2408773**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2408773.zip) | Ericsson, Nokia | (NonCol\_intraB\_ENDC\_NR\_CA-Perf) Correction of PDSCH demodulation requirements for Non-colocated CA | Moderator (Axel): Please check with MCC on C1 and C3 if those can be implemented by MCC.  => Revised  To include MCC marking guidance. |
| [**R4-2407441**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407441.zip) | Nokia, Ericsson, ZTE | [TEI] Re-inclusion of Channel Model Parameters for FR2 (Demodulation, Rel-18)) | Moderator (Axel): Please check with MCC if the WIC can be used.  Nokia: Checked with MCC. Different WIC, but no need to revise.  => Agreed.  (MCC changed WI code to NR\_RF\_FR2\_req\_enh3.) |

## Open issues summary

*Before Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

None.

# Tdoc and CR suggested status

Modified procedure

* Similar to the procedure during e-meetings, the moderator will provide a table at the end of the moderator summary listing all documents and their suggested status
* The format of this table should be 3 columns
  + First column is the tdoc number
  + Second column is the suggested status -> see options in the table on the right
  + Third column is any comments (optional)
* Please use this format because chair will try to directly import into chair’s spreadsheet

**Moderator’s note:**  
Note that these suggested statuses will only be created after the NWM flagging process. All non-flagged CRs will be recommended as “agreed”. All discussion tdocs will be proposed as “noted”.

|  |  |  |
| --- | --- | --- |
| **Up to Rel-16 maintenance for LTE and NR (4.5)** | | |
| **T-doc Number** | **Status** | **Comments (optional)** |
| R4-2407179 | Revised | Revision likely directly acceptable. |
| R4-2407180 | Return to | Cat A |
| R4-2407181 | Return to | Cat A |
| R4-2407237 | Revised | Check with R&S if revision acceptable |
| R4-2407238 | Revised | Check with R&S if revision acceptable |
| R4-2407239 | Return to | Cat A |
| R4-2407240 | Agreed |  |
| R4-2407241 | Agreed | Cat A |
| R4-2407242 | Agreed | Cat A |
| R4-2407243 | Agreed | Cat A |
| R4-2407355 | Revised | Revision likely directly acceptable. |
| R4-2407356 | Return to | Cat A |
| R4-2407398 | Agreed |  |
| R4-2407399 | Agreed | Cat A |
| R4-2409800 | Return to | Cat A. Rev 0 was R4-2407403. |
| R4-2409799 | Agreed | Rev 0 was R4-2407405. |
| R4-2407406 | Return to | Cat A |
| R4-2407407 | Return to | **Needs online discussion**. |
| R4-2407408 | Agreed |  |
| R4-2408330 | Agreed |  |
| R4-2408331 | Agreed | Cat A |
| R4-2408332 | Agreed |  |
| R4-2408333 | Agreed | Cat A |
| R4-2408334 | Agreed |  |
| R4-2408335 | Agreed | Cat A |
| R4-2408336 | Revised | Change title to include 38.141-2 |
| R4-2408337 | Return to | Cat A |
| R4-2408735 | Agreed |  |
| R4-2408736 | Agreed | Cat A |
| R4-2408984 | Return to | **Needs online discussion**. |
| R4-2408985 | Return to | Cat A |
| R4-2408986 | Return to | Cat A |
| R4-2408987 | Noted | Discussion tdoc. |
| R4-2408988 | Revised | **Needs online discussion**. QC, HW, R&S to report back online on whether conformance tests were run using RAN5 version. |
| R4-2408989 | Return to | Cat A |
| R4-2408990 | Return to | Cat A |
| R4-2408991 | Return to | Cat A |
| R4-2408992 | Revised | Discussion as above [R4-2408988] |
| R4-2408993 | Return to | Cat A |
| R4-2408994 | Return to | Cat A |
| R4-2408995 | Revised | Revision to introduce Eri’s wording. |
| R4-2408996 | Return to | Cat A |
| R4-2409019 | Revise | Revise to only cover CSI-RS part. **Discuss offline/online** how to handle other WIs (either this meeting or next) offline. |
| R4-2409020 | Return to | Cat A |
| R4-2409022 | Return to | **Discuss online**. |
| R4-2409023 | Return to | Cat A |
| R4-2409024 | Return to | Cat A |
| R4-2409025 | Return to | Cat A |
| R4-2409026 | Return to | Same as NR\_newRAT [R4-2409022]. Discuss online |
| R4-2409027 | Return to | Cat A |
| R4-2409113 | Return to | Discuss offline. |
| R4-2409114 | Return to | Cat A |
| R4-2409115 | Return to | Cat A |
| R4-2409116 | Return to | Cat A |
| R4-2409438 | Agreed |  |
| R4-2409439 | Agreed | Cat A |
| R4-2409440 | Agreed |  |
| R4-2409441 | Agreed | Cat A |
| R4-2409442 | Revised | Revision likely directly acceptable. |
| R4-2409443 | Return to | Cat A |

|  |  |  |
| --- | --- | --- |
| **Rel-17 maintenance for LTE and NR (5.2.4)** | | |
| **T-doc Number** | **Status** | **Comments (optional)** |
| R4-2407150 | Agreed. |  |

|  |  |  |
| --- | --- | --- |
| **Air-to-ground network for NR demodulation performance requirements (5.2.6.4)** | | |
| **T-doc Number** | **Status** | **Comments (optional)** |
| R4-2407119 | Agreed |  |
| R4-2408737 | Agreed |  |
| R4-2408953 | Noted | **Issue 3-1-1** needs discussion online and potentially an **LS** needs to be created (draft shared in email thread “[111][316] Demod\_Maintenance -k1 value for ATG”) |
| R4-2408954 | Return to | Requires check with MCC on heading removal. |
| R4-2408955 | Agreed |  |
| R4-2409083 | Agreed |  |
| R4-2409486 | Agreed |  |

|  |  |  |
| --- | --- | --- |
| **Rel-18 demodulation performance and CSI requirements (5.2.8.4)** | | |
| **T-doc Number** | **Status** | **Comments (optional)** |
| R4-2408773 | Revised | To include MCC marking guidance. |
| R4-2407441 | Agreed. | MCC changed WI code to NR\_RF\_FR2\_req\_enh3. |