**3GPP TSG-RAN WG4 Meeting # 100-e R4-211XXXX**

**Electronic Meeting, 16th – 27th August, 2021**

**Agenda item:** 6.1.1.1, 6.1.1.2, 6.1.10.2

**Source:** Moderator (Qualcomm Incorporated)

**Title:** Email discussion summary for [100-e][103] NR\_Maintenance\_R16\_Part\_1

**Document for:** Information

# Introduction

This document summarizes the email discussion for the following agenda items

6.1.1.1 NR-U System parameter

6.1.1.2 NR-U UE RF requirements

6.1.10.2 TEI UE RF requirements

The following contribution has been moved to thread 127.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 6.1.10.2 ->9.3.2.7.2 | UE RF requirements | R4-2113890 | R16 discussion on SCC drop | OPPO |

The following documents have been moved to thread 104.

|  |  |  |  |
| --- | --- | --- | --- |
| [**R4-2113403**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2113403.zip) | Discussion on type 2 UE requirements | Huawei, HiSilicon | other |
| [**R4-2113413**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2113413.zip) | DraftCR for 38.101-3 to specify type 2 UE requirements(Rel-16) | Huawei, HiSilicon | draftCR |
| [**R4-2113414**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2113414.zip) | DraftCR for 38.101-3 to specify type 2 UE requirements(Rel-17) | Huawei, HiSilicon | draftCR |

# Topic #1: NR-U maintenance

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2111839**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2111839.zip) | Charter Communications, Inc | Draft CR: Delete CA configurations with n46EDelete CA configurations with n46EDelete CA configurations CA\_n46E-n48A, CA\_n46E-n48B, CA\_n46E-n48Cn46E CA configurations are in error and can cause implementation issues |
| [**R4-2111842**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2111842.zip) | Charter Communications, Inc | Draft CR: Add n96 to Table 6.5.3.2-1Add n96 to Table 6.5.3.2-1Add n96 to Table 6.5.3.2-1: Requirements for spurious emissions for UE co-existencen96 requirements for co-existence with protected bands will not be specified |
| [**R4-2113434**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2113434.zip) | Huawei, HiSilicon | Draft CR for 38.101-1 to clarify fallback group for bandwidth classFallback group 3 introduced in previous RAN4 meeting is only applicable to bands identified for use with shared spectrum channel access. However, the specifications didn’t clarify this point clearly. It will cause some ambiguties and NBC issue from network perspective for licensed bands. For example, when UE report bandwidth class C in band n41, it’s unclear whether it supports class B. It’s necessary to clarify it in the spec. 1. To clarify that fallback group 3 introduced in previous RAN4 meeting is only applicable to bands identified for use with shared spectrum channel access..It’s unclear whether fallback group 3 is only applicable to bands identified for use with shared spectrum channel access. |

## Open issues summary

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

### Sub-topic 1-1 Draft CR R4-2111839 Delete CA configurations with n46E

CA configurations with Band n46E are not needed, apparently. It may be necessary to first justify and agree at RAN plenary to remove unnecessary band combinations since band combinations are first agreed at RAN plenary due to deployment needs. RAN4 should not remove them without RAN’s approval.

Moderator’s note: There are several cover sheet errors.

* Proposals
	+ Can RAN4 remove band combinations without RAN approval?
* Recommended WF
	+ Submit request to RAN plenary with justification as why n46E combinations are not needed. If agreed, it can be added to basket work item?

### Sub-topic 1-2 Draft CR R4-2111842 Add UE coex for n96

UE coexistence for Band n96 is added for US bands.

Moderator note: There are several cover sheet errors.

* Proposals
	+ Are UE coexistence requirements for Band n96 needed?
	+ If so, are the listed bands in R4-2111842 correct/complete?
* Recommended WF
	+ TBA

### Sub-topic 1-3 Draft CR R4-2113434 Clarify fallback group

Fallback group 3 should be limited to shared spectrum band combinations.

* Proposals
	+ Are the clarifications in R4-2113434 needed and acceptable?
* Recommended WF
	+ TBA

## Companies views’ collection for 1st round

### Open issues

Sub topic 1-1 Draft CR R4-2111839 Delete CA configurations with n46E

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Skyworks | n46E is for aggregated BW > 300MHz and the widest available spectrum is UNII-2C with 260MHz. so BW class E is not usable in n46 and this is also why 802.11be has no 320MHz channel in 5GHz band. If this can only be removed in RAN, our suggestion is that RAN4 provided technical justification in a WF or LS. Note that there are also inter-band combinations using n46E that should be removed |
| ZTE | This issue was discussed in offline email discussion, where the reasons are provided by SKW. So these reasons can be included in the CR cover.Since n46E combs were introduced in Rel-16, therefore it maynot submit request to RAN plenary with justification due to the Rel-16 basket WID was over. We don’t think we can treat it in Rel-17 basket WID.So we cannot add the request in Rel-17 basket WID for RANP meeting decision. |
| Charter Communications Inc. | A combination with n46E was approved in error.  In n46, the max BW is 255 MHz (5470 MHz-5725 MHz; U-N-II2-c)  and the correct bandwidth type for n46 is “N’ not “E”.  “N” type BW class was added in a recent CR,  this draft CR is to finalize the correction and delete the incorrect bandwidth type.  Our understanding is that this is a RAN4 decision and not Plenary.Table 5.3A.5-1: NR CA bandwidth classes

|  |  |  |  |
| --- | --- | --- | --- |
| NR CA bandwidth class | Aggregated channel bandwidth | Number of contiguous CC | Fallback group |
| A | BWChannel ≤ BWChannel,max | 1 | 1, 2, 3 |
| B | 20 MHz ≤ BWChannel\_CA ≤ 100 MHz | 2 | 2, 3 |
| C | 100 MHz < BWChannel\_CA ≤ 2 x BWChannel,max | 2 | 1, 3 |
| D | 200 MHz < BWChannel\_CA ≤ 3 x BWChannel,max | 3 |  |
| E | 300 MHz < BWChannel\_CA ≤ 4 x BWChannel,max | 4 |  |
| G | 100 MHz < BWChannel\_CA ≤ 150 MHz | 3 | 2 |
| H | 150 MHz < BWChannel\_CA ≤ 200 MHz | 4 |  |
| I | 200 MHz < BWChannel\_CA ≤ 250 MHz | 5 |  |
| J | 250 MHz < BWChannel\_CA ≤ 300 MHz | 6 |  |
| K | 300 MHz < BWChannel\_CA ≤ 350 MHz | 7 |  |
| L | 350 MHz < BWChannel\_CA ≤ 400 MHz | 8 |  |
| M3 | 50 MHz ≤ BWChannel\_CA ≤ 200 MHz | 3 | 3 |
| N3 | 80 MHz ≤ BWChannel\_CA ≤ 300 MHz | 4 |  |
| O3 | 100 MHz ≤ BWChannel\_CA ≤ 400 MHz | 5 |  |
| NOTE 1:    BWChannel, max is maximum channel bandwidth supported among all bands in a releaseNOTE 2:    It is mandatory for a UE to be able to fallback to lower order NR CA bandwidth class configuration within a fallback group. It is not mandatory for a UE to be able to fallback to lower order NR CA bandwidth class configuration that belong to a different fallback group.NOTE 3:    This bandwidth class is only applicable to bands identified for use with shared spectrum channel access in Table 5.2-1. |

To ZTE, we can make a revision to include Skyworks reasons |
| Nokia | We are okay to remove this combinations since it was added by mistake. |
| CHTTL | ok too. Support to have the reasons provided by Skyworks in the CR cover. |
| Qualcomm | Given the explanation, we are ok to remove these combos and also agree with the suggestion to provide explanation on the cover sheet. We also noticed a similar CR in R4-2113569 so maybe they can be merged. |
| Charter Communications Inc | I will kindly ask the moderator to provide a revised t doc to change the cover sheet explanation and upload as a draft for checking in round 2 and eventually upload as a formal draft CR. I wil also like to have a revision tdoc for Rev2 R4-2112222 that has been confirmed in email discussion [114] but needed to be in [103]. |

Sub topic 1-2 Draft CR R4-2111842 Add UE coex for n96

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Skyworks | Coexistence table is not existing for n46. And n46 and soon n96 are available in many countries/regions. Given that these bands are unlicensed, above any of the NR bands and anyhow there is no protection available from Wi-Fi operating in the same bands we are not sure this is required or fair. |
| Charter Communications Inc | With regards to adding UE co-existence to N96 draft CR, this was brought out by a US operator when we submitted a TP for TR including CA/DC bandwidth combinations with n96.  The information was also corroborated with the operator and other companies.  The listed bands in R4-2111842 are correct and complete |
| Nokia | We have not previously added unlicensed band in the protected band list. This is not done in LTE (B46 - 36.101) nor the 5 GHz (n46 – 38.101-1) band in NR. We do not think we should change precedent.  |
| Charter Communications Inc.  | If the consensus opinion is that this is not needed then we can note the draft CR. Again I was guided by another network operator that this was needed to get combos with n96 added to the spec. |
| CHTTL | Since there is no standalone solution on the unlicensed band in LTE band 46, so it make sense that there is no UE co-existence requirement for B46. But since n46 and n96 supports standalone solution, we are wondering why there is an issue to add protection to other bands as proposed in this draft CR? |
| Qualcomm | There was a previous agreement (proposed in R4-2011345, no objection so agreed as captured in moderator summary R4-2011847 and then reflected in the CR) that standalone NR-U bands would neither receive nor provide UE coexistence protection to other bands. |

Sub topic 1-3 Draft CR R4-2113434 Clarify fallback group

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Skyworks | This clarification is helpful for reader not familiar with NRU. |
| Nokia | We are okay with the added clarification. |
| Huawei | Support this CR. |
| CHTTL | We also think the clarification is helpful. One clarification question that is it correct that the class M. N, O and the class C, D, E are in the same fallback group @@? It seems some of the higher oder combos might not fallback to the lower order… |
| Qualcomm | Ok |
| Huawei | To CHTTL, Yes. I suppose that was previous agreement in Rel-16 NR-U. |

### CRs/TPs comments collection

*For close-to-finalize WIs and maintenance work, comments collections can be arranged for TPs and CRs. For ongoing WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| XXX | Company A |
| Company B |
|  |
| YYY | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary**  |
| Sub topic 1-1 Draft CR R4-2111839 Delete CA configurations with n46E | *Tentative agreements: Revised to include justification in the cover sheet and correct cover sheet errors.**Candidate options:**Recommendations for 2nd round: Check the revision for agreement.* |
| Sub topic 1-2 Draft CR R4-2111842 Add UE coex for n96 | *Tentative agreements: UE coexistence is not needed for standalone Band n96.**Candidate options:**Recommendations for 2nd round: Topic is closed.* |
| Sub topic 1-3 Draft CR R4-2113434 Clarify fallback group | *Tentative agreements: The draft CR is agreeable.**Candidate options:**Recommendations for 2nd round: Topic is closed.* |

A draft CR in R4-2112222 was incorrectly submitted to thread 114 where it was flagged. The revision was requested to be treated in this thread. It can be discussed in the second round.

Moderator note: After clarification with MCC, it was determined that this CR to a Rel-16 specification is incorrect as the band combinations were only included in a Rel-17 WID. The moderator proposes to mark the revision as “not pursued”. Please comment below if you feel differently or have a different suggestion.

## Discussion on 2nd round (if applicable)

### CRs/TPs comments collection

*For close-to-finalize WIs and maintenance work, comments collections can be arranged for TPs and CRs. For ongoing WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| Revision of R4-2111839 | Charter Communications Inc Rev2-R4-2111839 includes cover sheet errors and change in CR justification as highlighted in first round.A Rel-17 version, draft R4-2111840 has also been uploaded to mirror the changes made in Rev2 R4-2111839 |
| Qualcomm: In reviewing rev2 of this draft CR, a number of cover sheet errors are still observed. The WI code “NR-based access to unlicensed spectrum” is not valid, the clauses affected is not correct, the test specification 38.521-3 is marked affected but does not appear to be correct.Charter Communications Inc : Thank you Qualcomm for the late comment. I have uploaded revision R3-R4-211839 and have corrected the WI code, the test specification and the clauses affected. I have also made similar changes to R2-R4-2111840. Kindly provide timely feedback  |
|  |
| Revision of R4-2112222 | Moderator proposal: Not pursued |
| Charter Communications Inc. We will withdraw this draft Cr and follow up with a CR to 38.307 as indicated by MCC |
|  |

# Topic #2: Other UE RF maintenance

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2112727**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2112727.zip) | ZTE Corporation | Draft CR: Draft CR to TS 38.101-1 on corrections to symbols and abbreviations (Rel-16)Some symbols in clause 3.2 and abbreviations in clause 3.3 are inaccurate and should be corrected.(1) To correct symbols in clause 3.2.(2) To correct abbreviations in clause 3.3.The symbols and abbreviations will be inaccurate.  |

## Open issues summary

Collect company views on the following two sub-topics.

### Sub-topic 2-1 Draft CR R4-2112727 Correction to symbols and abbreviations

* Proposals
	+ Are the corrections proposed in R4-2112727 needed and acceptable?
* Recommended WF
	+ TBA

## Companies views’ collection for 1st round

### Open issues

Sub topic 2-1 Draft CR R4-2112727 Correction to symbols and abbreviations

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Huawei | 1) We can't agree with the correction for FREF. We don't need to copy the core requirements into the symbol clause. It's redundant.2) Most of the Corrections should be corrected from Rel-15. |
| ZTE | Thanks for Huawei’s comments. Reply as below:1. Can we remove the formula in yellow as below?

FREF, shift RF reference frequency for Supplementary Uplink (SUL) bands except n95, for the uplink of all FDD bands, and for TDD bands n48, n90 and n38 ~~F~~~~REF, shift~~ ~~= F~~~~REF~~ ~~+ Δ~~~~shift~~~~, Δ~~~~shift~~ ~~= 0 kHz or 7.5 kHz~~1. Ok. The corrections could be corrected from Rel-15.
 |
| Huawei | To ZTE, You can correct as bleowFREF, shift RF reference frequency for Supplementary Uplink (SUL) bands ~~except n95, for~~ the uplink of all FDD bands, and ~~for~~ TDD bands ~~n48, n90 and n38~~ ~~F~~~~REF, shift~~ ~~= F~~~~REF~~ ~~+ Δ~~~~shift~~~~, Δ~~~~shift~~ ~~= 0 kHz or 7.5 kHz~~For the core requirements, people should follow the clause 5.4. It can avoid the misalignment. |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| [**R4-2112727**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2112727.zip)Draft CR to TS 38.101-1 on corrections to symbols and abbreviations (Rel-16) | Company A |
| Company B |
| Huawei: 1) We can't agree with the correction for FREF. We don't need to copy the core requirements into the symbol clause. It's redundant.2) Most of the Corrections should be corrected from Rel-15. |
| ZTE: Thanks Huawei for the comments. The reply is as above. |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary**  |
| Sub topic 2-1 Draft CR R4-2112727 Correction to symbols and abbreviations | *Tentative agreements: The definition of the symbol should not include core requirement text. The correction should be applied starting from Rel-15.**Candidate options:**Recommendations for 2nd round: Revise the CR to reword the definition. Change the CR to Rel-15 and create a new Rel-16 Cat A CR.* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

### CRs/TPs comments collection

*For close-to-finalize WIs and maintenance work, comments collections can be arranged for TPs and CRs. For ongoing WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| Revision of R4-2112727 | Company A |
| Company B |
|  |

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on … | YYY |  |
| LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
|  |  |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation**  | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| [**R4-2111839**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2111839.zip) | Delete CA configurations with n46E | Charter Communications, Inc | Revised |  |
| [**R4-2111840**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2111840.zip) | Delete CA configurations with n46E | Charter Communications, Inc | Cat A CR |  |
| [**R4-2111841**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2111841.zip) | Add n96 to Table 6.5.3.2-1 | Charter Communications, Inc | Not Pursued |  |
| [**R4-2111842**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2111842.zip) | Add n96 to Table 6.5.3.2-1 | Charter Communications, Inc | Withdrawn |  |
| [**R4-2112727**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2112727.zip) | Draft CR to TS 38.101-1 on corrections to symbols and abbreviations (Rel-16) | ZTE Corporation | Revised | *CR should be revised as Rel-15 CR. Will also need a new Cat A Rel-16 CR now. The existing Rel-17 Cat A CR which hasn’t been submitted yet should also reflect the necessary changes.* |
| [**R4-2112728**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2112728.zip) | Draft CR to TS 38.101-1 on corrections to symbols and abbreviations (Rel-17) | ZTE Corporation | Cat A CR |  |
| [**R4-2113434**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2113434.zip) | Draft CR for 38.101-1 to clarify fallback group for bandwidth class(Rel-16) | Huawei, HiSilicon | Agreeable |  |
| [**R4-2113435**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2113435.zip) | Draft CR for 38.101-1 to clarify fallback group for bandwidth class(Rel-17) | Huawei, HiSilicon | Cat A CR |  |
| R4-2112222 | add combinations with n46 and n48 | Charter Communications | Revised | *This was moved from thread 114.* |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
	1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
	2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents

## 2nd round

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation**  | **Comments** |
| R4-210xxxx | Draft CR to TS 38.101-1 on corrections to symbols and abbreviations (Rel-15) | ZTE Corporation | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-210xxxx | Draft CR to TS 38.101-1 on corrections to symbols and abbreviations (Rel-16) | ZTE Corporation | Agreeable, Revised, Merged, Postponed, Not Pursued | Cat A |
| R4-210xxxx | Draft CR to TS 38.101-1 on corrections to symbols and abbreviations (Rel-17) | ZTE Corporation | Agreeable, Revised, Merged, Postponed, Not Pursued | Cat A |
| R4-210xxxx | Delete CA configurations with n46E | Charter Communications | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-2111840 | Delete CA configurations with n46E | Charter Communications | Agreeable, Revised, Merged, Postponed, Not Pursued | Cat A CR |
| R4-210xxxx | add combinations with n46 and n48 | Charter Communications | Not Pursued? | Rel-17 combinations cannnot be added to Rel-16 specification (except for 38.307) |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics.
2. For the Recommendation column please include one of the following:
	1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
	2. Other documents: Agreeable, Revised, Noted
3. Do not include hyper-links in the documents

# Annex

Contact information

|  |  |  |
| --- | --- | --- |
| **Company** | **Name** | **Email address** |
| Skyworks Solutions Inc. | Dominique Brunel | dominique.brunel@skyworkinc.com |
| CHTTL | Tank (Bo-Han Hsieh) | taaaaank@gmail.com |

Note:

1. Please add your contact information in above table once you make comments on this email thread.
2. If multiple delegates from the same company make comments on single email thread, please add you name as suffix after company name when make comments i.e. Company A (XX, XX)