**3GPP TSG-RAN WG4 Meeting # 99-e R4-210xxxx**

**Electronic Meeting, 19th – 27th May 2021**

**Agenda item:** 6.1.1, 6.1.2

**Source:** Moderator (Qualcomm Incorporated)

**Title:** Email discussion summary for [99-e][107][ NR\_unlic\_Maintenance]

**Document for:** Information

# Introduction

This document summarizes the email discussion on maintenance for Rel-16 NR-U in Agenda 6.1.1 and 6.1.2. The objective is to agree on a CR for the UE 38.101-1 and a CR for the basestation 38.104 to capture maintenance issues. The list of topics is as follows

1. Requirements applicability for wideband operation (UL and DL) and intra-cell guard bands
2. Other corrections

# Topic #1: Wideband operation

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2109428**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109428.zip) | Apple | Title: NR-U wideband operation and intra-carrier guard bands  Proposal 1: Zero-width intra-carrier guard bands should be assumed for the minimum DL/UL performance requirements.  Proposal 2: Introduce changes to TS 38.101-1 to clarify that if intra-cell guard bands are not signalled, then zero-width guard bands are assumed. |
| [**R4-2110814**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110814.zip) | Nokia | Title: NR-U – System parameters  Proposal 3: Resolve the brackets in section 5.3.3 of TS 38.101-1 by removing the brackets. |

## Open issues summary

Various modifications and clarifications to clauses related to wideband operation are proposed by Apple, Nokia, and Ericsson. The main difference in opinion appears to be whether the uplink requirements apply for intra-cell guard bands configured for zero-width or when set to their non-zero nominal values from Table 5.3.3-2. Other differences in wording between different proposals should also be resolved.

### Sub-topic 1-1

*Sub-topic description:*

*Open issues and candidate options before e-meeting:*

**Issue 1-1: Uplink guard band**

* Proposals
  + Option 1: Zero width
  + Option 2: Non-zero width according to nominal values
* Recommended WF
  + TBA

### Sub-topic 1-2

*Sub-topic description*

*Open issues and candidate options before e-meeting:*

**Issue 1-2: Other changes**

Please comment directly in the CR’s below.

## Companies views’ collection for 1st round

### Open issues

*One of the two formats, i.e. either example 1 or 2 can be used by moderators.*

**Example 1**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Ericsson | Issue 1-1: Option 2 as agreed earlier (zero width is not a possible configuration for verifying different combinations of contiguous UL RB sets).  Sub topic 1-2:  ….  Others: |
| Charter Communications Inc | Issue 1-1: We prefer option 2 |
| Apple | Issue 1-1: Option 1. As a further clarification, our understanding (and this is also what was discussed earlier in RAN4) is that non-zero intra-carrier guard bands make sense for a case when non-contiguous data transmission takes place. If only contiguous data transmission is possible, then non-zero intra-carrier guard bands do not have any meaning because the transmission will anyway take place over all RBs. In other words, the UE behavior is the same irrespective whether zero or non-zero guard bands are used. The proponents of Option 2 should explain further why non-zero guard bands are needed for the contiguous transmission and/or why it would change the UE behavior. |
| MTK | Issue 1-1: Option 1  According to TS38.214, UE should always include the intra-cell guard band between the indicated RB sets in its UL transmission.   |  | | --- | | 6.1.2.2.3        Uplink resource allocation type 2  In uplink resource allocation of type 2, the resource block assignment information defined in [5, TS 38.212] indicates to a UE a set of up to M interlace indices, and for DCI 0\_0 monitored in a UE-specific search space and DCI 0\_1 a set of up to N\_(RB"-" set,UL)^BWP contiguous RB sets, where M and interlace indexing are defined in Clause 4.4.4.6 in [4, TS 38.211]. Within the active UL BWP, the assigned physical resource block n is mapped to virtual resource block n. For DCI 0\_0 monitored in a UE-specific search space and DCI 0\_1, the UE shall determine the resource allocation in frequency domain as an intersection of the resource blocks of the indicated interlaces and **the union of the indicated set of RB sets and intra-cell guard bands defined in Clause 7 between the indicated RB sets**, if any. For DCI 0\_0 monitored in a common search space, … (*text omitted*) | |
| Nokia | Issue 1-1: Option 2. We note that initial access is anyways done in 20MHz CBW and wideband operation modes are configured via RRC signaling. As commented by Ericsson to verify the possible UL configurations of the UE, the non-zero width GBs also needs to be verified. Further, option 1 would create a need for changing also RAN1 and RAN2 specs (e.g. TS 38.214, and TS 38.331) which we do not see justified. @MTK besides pointing the fact that this change will have impact to other WGs we do not understand the point of referring this section. If the concern is configuring zero-GB there should be no issue as existing signaling can configure Zero-GB by signaling “nrofCRBs-r16 = 0” (Note green high-light). |
| Apple | Just to avoid misunderstanding, we do not have concerns with “nominal” intra-carrier guard bands with the understanding that these are the values applied when a corresponding transmission mode requires them. Our concern is that there are transmission modes that do not require any intra-carrier guard bands and for which zero-width intra-carrier guard bands must be assumed.  Referring to the comment from Nokia “*to verify the possible UL configurations of the UE, the non-zero width GBs also needs to be verified*”, can you please clarify what exactly we need to verify? In fact, why do we need intra-carrier guard bands for the UL contiguous transmission and how zero versus non-zero intra-carrier guard bands would change the UE behavior? |

### 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.*

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| --- | --- |
| **CR/TP number** | **Comments collection** |
| [**R4-2111012**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111012.zip)  Apple | Ericsson: not agreed. The (default) nominal GB apply for all transmissions with wideband operation. These nominal GB are also assumed when the *intraCellGuardBandsDL-List* and the corresponding for the UL are absent as specified in 38.214 clause 7. The latter refers to the 38.101-1, which is why the table must specify all possible intra-cell GBs. However, the RF requirements in 38.101-1 only apply for specific intra-cell GB configurations: zero-width GB in the DL with all RB sets scheduled, and nominal GB in the UL with GB scheduled in between scheduled RB sets.  The square brackets should be removed as proposed in R4-2110814. |
| Nokia: Not agreeable. With the proposed change “no intra-cell guard band” becomes the default. Meaning two type of intra-cell GBs will be behind the RRC signaling (i.e. nominal, and configurable). This would mean changes to RAN1 and RAN2 specs, at least 38.214 and 38.331. We see no justification for making changes with this cross WG impact at this stage.  We propose simply to remove the brackets as proposed in R4-2110814. |
| Huawei: not agreeable. We agree just remove the []. |
| [**R4-2109972**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109972.zip)  Ericsson | Apple: Sub-clause 6.1F is not Ok. Referring to our comments and our CR, zero-width intra-carrier guard bands should be configured for the UL transmission. Section 7.1F is Ok as a principle, but we prefer slightly different wording (refer to R4-2111012). |
| Company B |
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## 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.*

There is still no agreement in the intra-cell guard band for wideband uplink transmission. One set of companies believes that for contiguous RB-sets in the uplink, which is the only mode of operation considered by RAN4 for Rel-16, only zero-wide guardbands apply. Another set of companies believes that UE performance is not adequately verified if non-zero nominal guardbands are not included. The other changes in the CR’s appear to be less contentious.

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|  | **Status summary** |
| **Sub-topic #1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* Continue discussion on guard bands. |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| [**R4-2111012**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2111012.zip)  Apple | *To be revised* |
| [**R4-2109972**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109972.zip)  Ericsson | *To be revised* |

## Discussion on 2nd round (if applicable)

To help guide the 2nd round discussion on guard bands, the moderator suggests the following discussion points at least

1. For contiguous uplink RB-sets, is it possible for the network to configure non-zero guard bands? Those guard bands would not be available to the UE for transmission. Or is it the case that the guard bands are always zero in this case?
2. If zero guard bands are configured/assumed for contiguous uplink RB-sets, which UE Tx requirements are not adequately verified?
3. If the disagreement is a matter of performance verification, is it possible to include both zero and non-zero guard band applicability in the RAN4 specifications, and leave the verification (zero, non-zero, or both) to RAN5?

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| **Company** | **Comments** |
| Nokia | After further discussions we are okay with the revised Ericsson CRs (Shared 24th May). In our understanding these addresses the concerns expressed in 1st round. |
| Apple | Since NR-U UL transmission is always contiguous, i.e. the UL allocation spans also RBs between the RB-sets, then zero or non-zero guard bands can be considered only outside the UL allocation. Based on that RAN4 specifications should specify unambiguously (e.g. in 5.3.3) that in case of UL guard bands are not applicable between the scheduled RB-sets. |
| Qualcomm | We are also ok with the revised Ericsson CR’s. In our view, the usage of the term “guard band” is interpreted differently by different people which has been the source of this ambiguity, but Ericsson’s revised CR clarifies this while maintaining the same framework agreed in RAN1. |
| MediaTek (from email) | I think we are in the discussion between the following 2 wording options for those RBs in between adjacent RB-sets to be transmitted:   1. Guardband with UL scheduling 2. No guardband   Option 1 aligns with current RAN1 spec, but Option 2 is more straightforward.  We are slightly prefer Option 1 for consistency among specs. |
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# Topic #2: Other corrections

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2110128**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110128.zip) | Nokia, Charter Communications, CableLabs | Title: Discussion on correction of NR-U band n46 channels for 60 MHz and 80 MHz  Proposal 1: It is proposed to remove channel 787000 from 60 MHz CBW, and channel 786332 from 80 MHz CBW from band n46. |
| [**R4-2110814**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110814.zip) | Nokia | Title: NR-U – System parameters  Proposal 1: The restriction of n96, for US operation only, should be discussed by RAN4.  Proposal 2: Modify the note for n96 according to option 2 making it generic. |

## 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 2-1

BCS for CA\_n46 are proposed to be modified to remove bandwidths not supported by the band and to add BCS to enable wideband operation with CA. Generally, addition of new BCS must be approved at RAN plenary rather than directly adding by CR.

*Open issues and candidate options before e-meeting:*

**Issue 2-1: BCS for intra-band CA in Band n46**

* Proposals
  + Option 1: BCS modified for CA\_n46B, CA\_n46D, CA\_n46E, CA\_n46M and CA\_n46N, BCS not feasible removed and additional BCS specified for n\*20 MHz aggregation.
  + Option 2: Modify the BCS to remove bandwidths not feasible, but do not add new BCS
  + Option 3: Do not modify BCS at all
* Recommended WF
  + TBA

### Sub-topic 2-2

Some 60 MHz and 80 MHz channels defined for Band n46 overlap two WiFi 80 MHz channels. It is proposed to disallow these channels.

*Open issues and candidate options before e-meeting:*

**Issue 2-2: 60 MHz and 80 MHz channels**

* Proposals
  + Option 1: Remove channel 787000 from 60 MHz CBW, and channel 786332 from 80 MHz CBW from band n46.
  + Option 2: Keep channels 787000 and 786332
* Recommended WF
  + TBA

### Sub-topic 2-3

For intra-band CA, there is a note that indicates that requirements apply only for the case of non-simultaneous Tx/Rx across all carriers within the CA configuration. Presently, for intra-band contiguous CA, this note is only applied to CA\_n46 rather than generally to all combinations.

*Open issues and candidate options before e-meeting:*

**Issue 2-3: Applicability of intra-band contiguous CA requirements**

* Proposals
  + Option 1: Remove Note 1. Non-simultaneous Tx/Rx condition applies to all intra-band CA.
  + Option 2: Keep Note 1. Non-simultaneous Tx/Rx condition applies only to CA\_n46
* Recommended WF
  + TBA

### Sub-topic 2-4

Band n96 is presesntly only applicable to the US as indicated by Note 14. If Band n96 will be used in Europe or other countries around the world (e.g., Korea and Brazil), how should the note be modified?

*Open issues and candidate options before e-meeting:*

**Issue 2-4: Applicability of Band n96**

* Proposals
  + Option 1: Modify Note 14 according to R4-2106273:

“This band is applicable in the USA subject to FCC Report and Order FCC 20-51 and in Europe subject to CEPT ECC Decision (20)01 for the 5945 to 6425 MHz frequency range.”

* + Option 2: Modify the note to generic text:

“This band is only applicable subject to regional and/or country specific restrictions”

* Recommended WF
  + TBA

### Sub-topic 2-5

Specifications for receiver maximum input level and receiver spurious emissions are missing.

*Open issues and candidate options before e-meeting:*

**Issue 2-5: Missing requirements**

* Proposals
  + Option 1: Add the requirements for maximum input level and spurious emissions. CR is welcomed.
  + Option 2: Those requirements do not apply for NR-U. Please justify.
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

**Example 1**

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| --- | --- |
| **Company** | **Comments** |
| Qualcomm | Sub topic 2-1: Option 2. Addition of new BCS should be first approved at RAN plenary rather than added directly by CR.  Sub topic 2-2: How were these two channels added in the first place if they overlap WiFi channels?  Sub-topic 2-3: Option 1. Including the note only for CA\_n46 is an obvious error.  Sub-topic 2-4: Option 2. The specifications need to accommodate other countries adopting this spectrum and we can’t continually list them one-by-one.  ….  Others: |
| Ericsson | Sub-topic 2-1: Option 2, BCS can only be added by RAN as the moderator correctly points out.  Sub-topic 2-2: possibly Option 1. Option 1 is in accordance with the WF. More importantly, for the range 5150-5725 MHz the alignment with the subcarrier grids of IEEE 802.11 is due to requirements on LBT in the published European standard EN 301 893 covering operation up to 5725 MHz. Extension of this range up to 5850 MHz is discussed and supported by a few European Administrations. Now, since LBT will also be an essential requirement for the 6 GHz range in Europe, raster alignment with IEEE 802.11 in 5725-5850 MHz is very likely and hence channels straddling the Wi-Fi channels should avoided. There are no raster restrictions in the FCC Part 15 rules. One alternative option is to put the NR-ARFCN for these channels within square brackets until regulation is clearer should a nominal channel raster be specified for the extended range 5725-5850 MHz.  Sub-topic 2-3: Option 1.  Sub-topic 2-4: Option 2. A general note is fine given that the band is now becoming available in other countries. However, we would like to consider further the wording of this note.  Sub-topic 2-5: Option 1. Spurious emissions requirements must be complete. |
| Charter Communications Inc. | Subtopic 2-1: We prefer option 2  Subtopic 2-2: We proposed option 1. Regardless of how they got approved, it needs to be align to WI Fi bonding configurations.  Subtopic 2.3: We prefer option 1  Subtopic 2.4: We prefer option 2  Subtopic 2.5: We prefer option 1 |
| Apple | Issue 2-1: Option 2.  Issue 2-3: Option 1. As a further clarification, we do not remove NOTE1 but rather remove a reference from band n46 to NOTE1 so that the NOTE1 applies to all the bands.  Issue 2-4: Option 2, we prefer having a more generic note because more and more countries adopt the 6GHz band. |
| CHTTL | Issue 2-4: We are not ok with either option 1 or option 2. First of all, how to support 6GHz unlicensed spectrum in Europe is still under discussion, and in another thread. Second, we do not understand the option 2, since every band in 3GPP is subject to regional and/or country specific restrictions, is there any band that no need to follow the regulator’s requirement? Third, NOTE 14 is a compromised solution from the agreed WF in Rel.16, we should respect the previous agreement and stick to it. |
| Skyworks | Issue 2-2: our understanding is that those channels were in LAA also because at the time the UNII4 use was retricted. We need to crosscheck if those channels are still valid in other regions and which one collide with the removal of restrictions by FCC up to 5895MHz  Issue 2-4: the band should be applicable to all regions, support option 2 |
| CableLabs | Issue 2-1: support option 2.  Issue 2-2: option 1. It is clear that NR-U 60 MHz channel raster 787000 (5775-5835 MHz) and 80 MHz channel raster 786332 (5755-5835 MHz) conflict with two Wi-Fi 80 MHz channels 155 from 5735-5815 MHz and 171 from 5815-5895 MHz.  Issue 2-4: support option 2.  Issue 2-5: support option 1. Agreed with Ericsson, spurious emission requirements is essential. |
| Nokia | Subtopic 2-1: Option 2  Subtopic 2-2: Option 1- We have previous agreement to align to WiFi raster, hence these points must be a mistake. If new frequency range becomes available, we can add corresponding raster points at that stage.  Subtopic 2.3: Option 1  Subtopic 2.4: Option 2 – We think this is the best approach as we otherwise would end up with an extensive list of supported countries/regions.  Subtopic 2.5: Option 1 |
| Huawei | Issue 2-4: we tend to agree with CHTTL that how to support 6GHz unlicensed spectrum in Europe should be discussed in another thread but not in the Rel-16 maintenance. |

### 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** |
| [**R4-2109970**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109970.zip)  Corrections to BCS for n46 (Ericsson) | Ericsson: we need to modify this CR to remove the new BCS, which cannot be added without RAN approval. |
| Company B |
|  |
| [**R4-2110131**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110131.zip)  CR to 38.101-1 with correction of NR-U 60 MHz and 80 MHz channels (Nokia, Charter Communications, CableLabs) | Ericsson: one alternative is to put these NR-ARFCN in between square brackets until regulations become clearer (nominal channel raster). |
| Nokia: We think it is better to remove this raster’s now. If new frequency range becomes available, we can add corresponding raster points at that stage. |
|  |
| [**R4-2110129**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110129.zip)  CR to 38.104 with correction of NR-U 60 MHz and 80 MHz channels (Nokia, Charter Communications, CableLabs) | Ericsson: see above. |
| Nokia: See above |
|  |
| [**R4-2110986**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110986.zip)  Applicability of requirements for intra-band contiguous CA (Qualcomm Incorporated) | 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 2-1: BCS for intra-band CA in Band n46** | *Tentative agreements:* Option 2: Modify the BCS to remove bandwidths not feasible, but do not add new BCS  *Candidate options:*  *Recommendations for 2nd round:* No further discussion, modify R4-2109970 according to the agreement. |
| **Sub-topic 2-2: 60 MHz and 80 MHz channels** | *Tentative agreements:* Option 1: Remove channel 787000 from 60 MHz CBW, and channel 786332 from 80 MHz CBW from band n46.  *Candidate options:*  *Recommendations for 2nd round:* Two companies wanted to check, but suggest that the channels are removed unless these two companies find contrary evidence. |
| **Sub-topic 2-3: Applicability of intra-band contiguous CA requirements** | *Tentative agreements:* Option 1: Remove Note 1. Non-simultaneous Tx/Rx condition applies to all intra-band CA.  *Candidate options:*  *Recommendations for 2nd round:* No further discussion. |
| **Sub-topic 2-4: Applicability of Band n96** | *Tentative agreements:* The note should be generalized since the band is becoming available in other countries.  *Candidate options:*  *Recommendations for 2nd round:* The wording of a generalized note needs further discussion. In particular, there may be concerns about whether n96 should be applicable to Europe. |
| **Sub-topic 2-5: Missing requirements** | *Tentative agreements:* Option 1: Add the requirements for maximum input level and spurious emissions.  *Candidate options:*  *Recommendations for 2nd round:* Companies are encouraged to provide text or even CR for the missing requirements |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| [**R4-2109970**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109970.zip)  Corrections to BCS for n46 (Ericsson) | *To be revised* |
| [**R4-2110131**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110131.zip)  CR to 38.101-1 with correction of NR-U 60 MHz and 80 MHz channels (Nokia, Charter Communications, CableLabs) | *Agreeable* |
| [**R4-2110129**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110129.zip)  CR to 38.104 with correction of NR-U 60 MHz and 80 MHz channels (Nokia, Charter Communications, CableLabs) | *Agreeable* |
| [**R4-2110986**](http://ftp.3gpp.org/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110986.zip)  Applicability of requirements for intra-band contiguous CA (Qualcomm Incorporated) | *Agreeable* |

## 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”.*

The two main topics for second round discussion are topic 2-4 on applicability note for Band n96 and topic 2-5 on text for missing requirements on maximum input level and spurious emissions.

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| **Company** | **Comments** |
| Nokia | We are fine with the recommendations on these topics in the provided WF (May 24th). |
| Apple | On issue 2-4, we do support generalizing the NOTE so that other countries/regions can be supported. |
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# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on NR-U maintenance-related topics | Qualcomm Incorporated | To capture agreements formally |
|  |  |  |
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**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-2109428 | NR-U wideband operation and intra-carrier guard bands | Apple | Noted |  |
| R4-2109970 | Corrections to BCS for n46 | Ericsson | Revised |  |
| R4-2109971 | Corrections to BCS for n46 | Ericsson | Cat A |  |
| R4-2109972 | Applicability of minimum requirements for shared spectrum access | Ericsson | Revised |  |
| R4-2109973 | Applicability of minimum requirements for shared spectrum access | Ericsson | Cat A |  |
| R4-2110128 | Discussion on correction of NR-U band n46 channels for 60 MHz and 80 MHz | Nokia, Charter Communications, CableLabs | Noted |  |
| R4-2110129 | CR to 38.104 with correction of NR-U 60 MHz and 80 MHz channels | Nokia, Charter Communications, CableLabs | Agreeable |  |
| R4-2110130 | CR to 38.104 with correction of NR-U 60 MHz and 80 MHz channels | Nokia, Charter Communications, CableLabs | Cat A |  |
| R4-2110131 | CR to 38.101-1 with correction of NR-U 60 MHz and 80 MHz channels | Nokia, Charter Communications, CableLabs | Agreeable |  |
| R4-2110132 | CR to 38.101-1 with correction of NR-U 60 MHz and 80 MHz channels | Nokia, Charter Communications, CableLabs | Cat A |  |
| R4-2110810 | NR-U - System parameters | Nokia | Noted |  |
| R4-2110814 | NR-U - System parameters | Nokia | Noted |  |
| R4-2110986 | Applicability of requirements for intra-band contiguous CA | Qualcomm Incorporated | Agreeable |  |
| R4-2110987 | Applicability of requirements for intra-band contiguous CA | Qualcomm Incorporated | Cat A |  |
| R4-2111012 | Corrections of NR-U wideband operation intra-carrier guard bands | Apple | Revised |  |
| R4-2111013 | Corrections of NR-U wideband operation intra-carrier guard bands | Apple | Cat A |  |

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** |
| R4-2107777 | Corrections to BCS for n46 | Ericsson | Agreeable |  |
| R4-2109971 | Corrections to BCS for n46 | Ericsson | Cat A |  |
| R4-2107778 | Applicability of minimum requirements for shared spectrum access | Ericsson | Agreeable | All companies except one could agree. One company preferred that the clarification is moved to a different clause. |
| R4-2109973 | Applicability of minimum requirements for shared spectrum access | Ericsson | Cat A |  |
| R4-2107779 | Corrections of NR-U wideband operation intra-carrier guard bands | Apple | Withdrawn | Not submitted |
| R4-2111013 | Corrections of NR-U wideband operation intra-carrier guard bands | Apple | Cat A, withdrawn |  |
| R4-2107980 | WF on NR-U maintenance-related topics | Qualcomm Incorporated | Agreeable |  |

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