**3GPP TSG-RAN WG4 Meeting # 94-e-Bis R4-2008933**

**Electronic Meeting, 20 – 30 Apr., 2020**

**Agenda item:** 4.4.1, 4.4.5

**Source: Hisashi Onozawa (Nokia)**

**Title:** Email discussion summary for [95e][102] UE RF requirements maintenance Part 1

**Document for:** Information

# Introduction

**Moderator: In this E-mail thread, the following UE RF maintenance topics are discussed.**

**Topic #1: Maintenance for bands and band combinations in 38.101-1 (agenda 4.4.1.1)**

**Topic #2: Maintenance for bands and band combinations in 38.101-2 (agenda 4.4.1.2)**

**Topic #3:** **Maintenance for bands and band combinations in 38.101-3 (agenda 4.4.1.3)**

**Topic #4:** **Editorial CRs (agenda 4.4.5)**

**Topic #5:** **LS reply on CA/DC fallback (agenda 4.4.1.2/13)**

# Topic #1: Maintenance for bands and band combinations in 38.101-1 (agenda 4.4.1.1)

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2006135 Corrections of UE co-ex tables for Japan-related bands (R15) | SoftBank, NTT docomo, KDDI | Summary of change:  1) Protections among n5, B74 and n77 - n79 are added.  2) Note 13(B3 frequency range) and Note 30(B41 frequency range) are deleted as protected bands are not relevant to specific CBWs.  3) For n8-n78 2UL CA, Note 5(RB restriction condition) is changed as A-MPR(NS\_43) is applied instead in NR.  4) Some errors are corrected: unneccesary note(39) and band(9) are deleted. Missed Note 8 is added. |
| R4-2006136 Corrections of UE co-ex tables for Japan-related bands (R15) | SoftBank, NTT docomo, KDDI | This is Cat F CR due to additional changes.  Summary of change:  For R16, in addition to the above items,  5) Same modifications in 1), 2) and 4) are applied to 2UL CA tables.  6) Protection requirements not approprite for Japan (such as using B38, B40 toward PHS/J-specific bands) are removed from CA table.  7) Some errors are corrected in 2UL CA tables: missed protected bands, notes, including corrections of Note 12/15 to align with the single band table. |
| R4-2007025 CR for [agreed] asynchronous operation for NR CA n78-n79  R4-2007026 (Cat A CR) | NTT DOCOMO | This is already agreed R4-1915529 in RAN4#93, but it was not implemented.  Summary of change:  Introduce additional Delta\_TIB and MSD for aynchronous operation:  Delta\_TIB of 1.5dB for n78 in frequency range of 3700-3800MHz.  Delta\_TIB of 1.5dB for n79 in frequency range of 4400-4500MHz.  MSD of 2dB for n79 and 2.6dB for n78 |

## Open issues summary

## Companies views’ collection for 1st round

### Open issues

### CRs/TPs comments collection

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| **CR/TP number** | **Comments collection** |
| R4-2006135 | OPPO: Generally ok with this CR, a clarification question since there is new bands added in the coexistence table, how to handle UEs designed before or on the time when these new requirements are added? |
| SoftBank: [Response to OPPO]: Thanks for the comment. As mentioned in R4-2000959 (please check), the bands listed in the table are harmless to add and satisfy the requirements "almost automatically". So we believe that the same design can pass the test even after the additions of new bands. (If this is not a case, we need to study if A-MPR is needed or not). The similar situation happens in n77 for US handled in [126] where the addition of US bands won't cause an issue in general.  But a CR of this kind implicitly asks UE or chipset vendors to check if there is a problem on their implementations. So please let us know if you have a concern or you need time to check. |
| Huawei:  1. For CA\_n8-n78, we can delete the general requirements to protect 860~890 since NS\_43 can be indicated by NW. And NS\_43 is introduced for band n8 at NR stage.  2. We have noticed that protected frequency for NR band n8 is different from LTE band 8. Maybe 860~890 protection can be deleted for all NR CA band combination including band n8 as single band n8 did. |
| Qualcomm: What does note 5 or NS\_43 applicability have to do with the B11, B21 requirement? Also, n8 odes not have the 860-890M requirement in the coexistence table, so why does CA\_n8-n78 have this? NS\_43 is still signaled to UE in both CA and non-Ca cases and the requirement is defined in another sub-clause without RB restriction. |
| SoftBank(2): [Response to Huawei/Qualcomm] Thank you so much for the comments.  Our understanding is that requirements are requirements (= to be there) regardless of general or additional requirements (NS\_XX). For example in 860-890MHz, it is an additional requirement from n8 but a general requirement from n78. Then in 2UL, an essential issue is that we cannot clearly split general and additional requirements as per single band case. Our proposals are largely based on 36.101 Table 6.6.3.2A-0 (that includes such Notes as Note 7, 8, 15, 16 for NS) and 38.101-1 Table 6.5A.3.2.3-1 (that includes Note 17 for NS).  Note 5 for B11/B21 is simply based on LTE examples, i.e. J-band is tested under J-band constraint (but it is largely useless in this case).  If there are possible discrepancies among companies as above, it might be better to discuss and confirm how 2UL co-ex table should be formulated otherwise we will keep creating a standard without consistency.  Apple:  The lines with note 5 should be deleted instead of changing note 5 to point to NS\_43, since these requirements with NS values need to be in the Additional Spurious Emissions chapter., see also our notes for 6136 below. |
| R4-2006136 | CHTTL: Not sure it is ok to mixed cat A CR with cat F CR. The work item code is Rel.15 WI but some changes are related to Rel.16 WI. |
| SoftBank: {response to CHTTL] Thanks for the comment. I think that this is a convention in Cat F but it is better to check with MCC. |
| Huawei:  1. For CA\_n1-n8, frequency range 860~890 and PHS should be deleted due to the defination of NS\_05 and NS\_43.  2. Other CA combos which including band n1 or n8 should be modified following the same principle. |
| Qualcomm: What does note 5 or NS\_43 applicability have to do with the B11, B21 requirement? Also, n8 odes not have the 860-890M requirement in the coexistence table, so why does CA\_n8-n78 have this? NS\_43 is still signaled to UE in both CA and non-Ca cases and the requirement is defined in another sub-clause without RB restriction. |
| SoftBank(2): [Response to Huawei/Qualcomm] Please see the response to 6135.  Apple:  For CA\_1A\_n8A a conditional requirement in the Spurious emissions for UE-coexistence table shall not be added in case NS\_43 is signaled. This belongs into the additional spurious emissions section, where it already is. Adding reference to note 17 is also wrong, since it refers to NS\_05 in 6.6.3.3.1, but this doesn’t exist. Also this additional spurious emissions requirement needs to be in the additional spurious emission section, where it already is. Generally there should not be any requirement in the Spurious Emissions for UE co-existence table which only applies when NS\_xx is signaled. These should be in the Additional spurious emissions tables in 6.5.3.3. This also applies to CA\_1A\_n78A, CA\_1A\_n79A, CA\_8A\_n41A. |
| R4-2007025 | Skyworks: since this CR says that n79 is asynchronous with n78 in Japan one must conclude that n77 is asynchronous with n79 in Japan and thus that IMDs of non contiguous CA in n77 can de-sense n79. How can this be reconciled? Especially for discussion in thread 118.  Skyworks(2): from offline discussion we understand that N78/79 asynchronous operation is only when enough isolation from n77 network is granted so we withdraw our comment |
| CHTTL: The requirements related to 90MHz n78 DL are missing? |
| Qualcomm: Need to avoid the “filter” comment in specification. This will cause RAN5 confusion. It does not know whether combined filter exists. Can we modify the note so that requirements do not apply for UEs that support both n77 and n78. |

## 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.*

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|  | **Status summary** |
| **Issue #1** | Regarding R4-2006135/ R4-2006136, there are several comments to remove emission requirements if they are associated with additional emission requirements based on NS. Although LTE spec has some, it looks most companies think they are not needed.  Recommend to remove additional emissions from 2UL general coex table in the NR specs. |

### CRs/TPs

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

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
| R4-2006135 | There are several comments to remove emission requirements from 2UL coexistence table if they are associated with additional emission requirements based on NS.  Recommend revise the CR and continue to discuss the revised draft in the second round. |
| R4-2006136 | There are several comments to remove emission requirements from 2UL coexistence table if they are associated with additional emission requirements based on NS.  Recommend revise the CR and continue to discuss the revised draft in the second round.  Moderator will check with MCC if splitting CR to Cat A and Cat F is needed or not. Please continue discuss the technical contents of the CR in the second round. |
| R4-2007025  R4-2007026 | Recommend revise the CR and continue to discuss an updated CR draft in the second round.  Cat A CR is already uploaded. The revision is necessary. |

## Discussion on 2nd round (if applicable)

Please add if further comment or discussion is needed.

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| --- | --- |
| R4-2008970  (Rev of R4-2006135) |  |
| R4-2008971  (Rev of R4-2006136) |  |
| R4-2008395 (Rev of R4-2007025)  Cat A CR R4-2008396 (Rev of R4-2007026) |  |

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

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| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #2: Maintenance for bands and band combinations in 38.101-2 (agenda 4.4.1.2)

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2006815  CR for TS 38.101-2: Intra-band non-contiguous CA configuration clarifications  R4-2006816 Cat A CR | MediaTek | [Already endorsed R4-2005201 in RAN4#94bis-e]  Summary of change:  1. Add NOTE 5 in Table 5.5A.2-1 and NOTE 4 in Table 5.5A.2-2 to clarify the definition of  (BWChannel,block) which should be “the maximum total bandwidth from the summation of the sub-block bandwidths and shall be less than the bandwidth of the operating band”.  2. Remove NOTE 1 index for values under  (BWChannel,block) column for certain CA configurations which should have been removed in previous CR R4-1907999.  3. Re-calculate the maximum total bandwidth for some CA configurations to align with the  (BWChannel,block) definition. |
| R4-2006907  CR to TS 38.101-2 on corrections to intra-band CA band for FR2 (Rel-15)  R4-2006908 Cat A CR | ZTE | Summary of change:  (1) Correct the NR CA band in table 5.2A.1-1.  (2) Typo corrections on intra-band CA configuration table.  (3) Remove the empty tables in section 5.5A.1 and 5.5A.2. |

## Open issues summary

## Companies views’ collection for 1st round

### Open issues

### CRs/TPs comments collection

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| **CR/TP number** | **Comments collection** |
| R4-2006815 | No comment received. |
| R4-2006907 | Huawei: unnecessary change. |
| [ZTE2]: Response to HW’s comment. This CR is to correct the representation of NR CA band for FR2 intra-band contiguous CA. As pointed in the CR, according to the agreements in the previous RAN4 meetings, for intra-band contiguous CA, the NR CA Band is represented as “CA\_nX” by removing the CA BW class letter as the suffix. The notation in current spec is not correct and need to be corrected. In addition, some other editorial corrections have been made for section 5.5A in this CR. |

## Summary for 1st round

### Open issues

### CRs/TPs

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

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
| R4-2006815 | Recommend Approve |
| R4-2006907 | A question is raised whether this maintenance change is necessary not.  Recommend continue the 2nd round. |

## Discussion on 2nd round (if applicable)

Please add if further comment or discussion is needed.

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| R4-2006907 |  |

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

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| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #3: Maintenance for bands and band combinations in 38.101-3 (agenda 4.4.1.3)

**Note that R4-2006242 is moved Rel-16 maintenance (E-mail thread #126).**

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2006137  Corrections of UE co-ex tables for Japan-related bands (R15)  R4-2006138 Cat A CR | SoftBank, NTT docomo, KDDI | Summary of change:  1) Protections among n5, B74, n77 - n79 are added.  2) Note 13(B3 frequency range) and Note 19(B41 frequency range) are deleted as protected bands are not relevant to specific CBWs.  3) Japan-related requirements are removed from B38, B40 and B5(which is limited to NB/MTC in Note 4.)  4) Missed PHS protection is added to DC\_1\_n77-n79.  5) Some errors are corrected: The contents of Note 10/11 are corrected to align with those of 36.101. |
| R4-2006138  Corrections of UE co-ex tables for Japan-related bands (R16) | SoftBank, NTT docomo, KDDI | [This is Cat F CR due to additional changes.]  For R16, in addition to above:  6) The same modification is made for Intra-non cont. table (DC\_3\_n3).  7) n41 protection to 2505-2535MHz(NS\_47) with 30MHz CBW is added to 2UL EN-DC tables.  8) Errors in notes/protected bands are corrected for R16 combos including Japan bands, including correcting the content of Note 10/11 in EN-DC. |
| R4-2006342  CR Coexistence cleanup for 38101-3 Rel15  R4-2006343 (Cat A CR)  Moderator: Please register Cat A CR in the same agenda item as the original CR. | Apple Inc. | Summary of change:  Band protections are defined in the current release which are technical not possible to realize |
| R4-2006452  CR for TS 38.101-3: Missing MSD due to cross band isolation  R4-2006453 (Cat A CR) | MediaTek | [Already endorsed R4-2005203 in RAN4#94bis-e]  Summary of change:  Add missing MSD due to cross band isolation for DC\_1A\_n40A, DC\_3A\_n50A, DC\_3A\_n51A , DC\_30A\_n66A and DC\_46A/C/D/E\_n78A |
| R4-2006454  CR for TS 38.101-3: MSD due to UL harmonic  R4-2006455 (Cat A CR) | MediaTek | [Already endorsed R4-2005204 in RAN4#94bis-e]  Summary of change:  1. Add missing MSD numbers due to UL harmonic for DC\_B5-n78  2. Add missing MSD numbers due to UL harmonic for DC\_B12-n66 and DC\_B28-n51  3. Add missing MSD numbers due to UL harmonic for DC\_B26-n41 for 100MHz CBW |
| R4-2006457 CR for TR37.863-01-01: TP for missing MSD due to UL harmonic and cross band isolation for band combinations | MediaTek | [Already endorsed R4-2005202 in RAN4#94bis-e]  Summary of change:  CR for TR37.863-01-01: TP for missing MSD due to UL harmonic and cross band isolation for band combinations |
| R4-2006490  MOP for interband EN-DC including both FR1 and FR2 REL15  R4-2006491 (Cat A CR) | Nokia, Nokia Shanghai Bell | Summary of change:  Add missing MSD numbers due to UL harmonic for DC\_B28-n51, DC\_1A\_n40A, DC\_3A\_n50A, DC\_3A\_n51A , DC\_30A\_n66A and DC\_46A/C/D/E\_n78A |
| R4-2008229 CR for 38.101-3 Correction on EN-DC synchronous carriers (R15)  R4-2008230 (Cat A CR) | Huawei, HiSilicon | Summary of change:  Add a new NOTE for DC\_20\_n28 to avoid the unnecessry limitation on network deployment. |

## Open issues summary

## Companies views’ collection for 1st round

### Open issues

### CRs/TPs comments collection

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| **CR/TP number** | **Comments collection** |
| R4-2006137 | Huawei:  1、UE can use NS\_05 to protect PHS system for DC\_1\_n77, DC\_1\_n78 and DC\_1\_n79. There is no need to specify PHS bands protection for general requirements. AMPR can be used.  2、Some correction is not aligned with current TS 36.101 spec. Maybe A CR for 36.101 is also needed.  3、Note 9 for PHS protection is not correct. It can be deleted. |
| SoftBank(2): [Response to Huawei] Thank you so much for the comments.  Please see the responses for 6135 firstly to align our understanding. For (2), If we need to touch 36.101, we will do in the next meeting so please specify.  For (3), Note 9, this comes from B28. The reason is same as in 6135: J-band test is done under J-abnd constraint.  Apple:  For some combinations (DC\_1A\_n77A, DC\_1A\_n78A, …) Note 9 is added where it is not needed. Note 9 asks for carriers being placed in n28, which is not part of these combinations. Please remove note 9 from these combinations.  For some combinations lines with note 15 are added. This has a condition that the requirement is only valid for NS\_05. However, all conditional emissions requirements with an NS value as condition should not be in the Spectrum emissions for co-existence table in chapter 6.5B.3, but in the additional spectrum emissions in chapter 6.5B.4 |
| R4-2006138 | CHTTL: Not sure it is ok to mixed cat A CR with cat F CR. The work item code is Rel.15 WI but some changes are related to Rel.16 WI. |
| SoftBank: {response to CHTTL] Thanks for the comment. I think that this is a convention in Cat F but it is better to check with MCC. |
| Huawei:  1、UE can use NS\_05 to protect PHS system for DC\_1\_n77, DC\_1\_n78 and DC\_1\_n79. There is no need to specify PHS bands protection for general requirements. AMPR can be used.  2. NS\_47 for n41 is ASE requirements. There is no need to specify it in the general requirements sub-clause. |
| SoftBank(2): [Response to Huawei] Thank you so much for the comments. Please see the responses for 6135.  Apple:  For some combinations (DC\_1A\_n77A, DC\_1A\_n78A, …) Note 9 is added where it is not needed. Note 9 asks for carriers being placed in n28, which is not part of these combinations. Please remove note 9 from these combinations.  For some combinations lines with note 15 are added. This has a condition that the requirement is only valid for NS\_05. However, all conditional emissions requirements with an NS value as condition should not be in the Spectrum emissions for co-existence table in chapter 6.5B.3, but in the additional spectrum emissions in chapter 6.5B.4  For some combinations lines with note AA and AB together with the notes are added. However, all conditional emissions requirements with an NS value as condition should not be in the Spectrum emissions for co-existence table in chapter 6.5B.3, but in the additional spectrum emissions in chapter 6.5B.4 |
| R4-2006342 | Huawei:  Band 42 shouldn’t be deleted for DC\_26\_n41.  NTT DOCOMO, INC: Protection from DC\_26\_n41 to B42 shall be kept since TS 36.101 specify protection from B26 to B42 and TS 38.101-1 specify protection from n41 to B42. |
| R4-2006452 | CHTTL: Sorry for the late comment, we missed the draft CR in the previous meeting. But the requirement for DC\_3A\_n50A is not needed here, DC\_3A\_n50A is Rel.16 combination. And only 5MHz MSD is specified for DC\_3A\_n51A?  MediaTek: Reply to CHTTL, The CR need to be revised to remove DC\_3A\_n50A. n51A only supports 5MHz CBW. And cat-A CR (R4-2006453) also need to be revised to remove DC\_3A\_n50A. Another CR for cat-F in Rel-16 for DC\_3A\_n50A would be needed in next meeting. |
| R4-2006454 | CHTTL: Sorry for the late comment, we missed the draft CR in the previous meeting. Only 5MHz MSD is specified for DC\_28A\_n51A?  MediaTek: Reply to CHTTL, yes. |
| R4-2006457 | CHTTL: Sorry for the late comment, we missed the draft CR in the previous meeting. But it seems DC\_3A\_n50A was not completed in Rel.15 and transferred to Rel.16, so rather than adding the requirement back to the Rel.15 TR, probably the whole session for DC\_3A\_n50A can be removed, and the changes can be proposed to Rel.16 TR and TS.  And only 5MHz MSD is specified for DC\_3A\_n51A and DC\_28A\_n51A, could you help to further check?  MediaTek: Reply to CHTTL. OK to remove DC\_3A\_n50A in Rel-15 TR. This CR needs revision |
| R4-2006490 | No comment received. |
| R4-2008229 | Nokia: RAN4 does not specify NW behavior in UE spec  Qualcomm: I don’t understand the value of the note. Note 10 and 11 are already included to limit the PSD difference and MRTD. Note 12 seems to be saying the same thing; that is, if Note 10 and Note 11 are not applicable or cannot be guaranteed, then EN-DC should not be configured. So I don’t see the need for Note 12. On the other hand, the “reason for change” is stated that Note 11 is an unnecessary restriction on the deployment. If that were truly the case, adding Note 12 doesn’t seem to solve that problem. If the intention is to not impose Note 10 and Note 11 for SA operation, those notes don’t apply to SA anyways since the note is in the table for Inter-band EN-DC configurations.  Huawei: we are ok if removing Note 11, otherwise, the UE requirement has limitation on the network deployment, which may not be purposely. |

## 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.*

### 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** |
| R4-2006137 | There are several comments to remove emission requirements from 2UL coexistence table if they are associated with additional emission requirements based on NS.  Recommend revise the CR and continue to discuss the revised draft in the second round. |
| R4-2006138 | There are several comments to remove emission requirements from 2UL coexistence table if they are associated with additional emission requirements based on NS.  Recommend revise the CR and continue to discuss the revised draft in the second round.  Moderator will check with MCC if splitting CR to Cat A and Cat F is needed or not. Please continue discuss the technical contents of the CR in the second round. |
| R4-2006342 | CR is revised to keep band 42 in DC\_26\_n41 coexistence and then recommend approve in the second round. |
| R4-2006452  R4-2006453 | CR is revised and then recommend approve in the second round.  Cat A CR is already uploaded. The revision is necessary. |
| R4-2006454 | Recommend Approve. |
| R4-2006457 | CR is revised and then recommend approve in the second round. |
| R4-2006490 | Recommend Approve. |
| R4-2008229 | Recommend continue the second round.  Option 1: Revise CR by removing Note 11 (Huawei)  Option 2: No change (Nokia, Qualcomm) |

## Discussion on 2nd round (if applicable)

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| Please add if further comment or discussion is needed. R4-2008397  (Rev of R4-2006137) |  |
| R4-2008398  (Rev of R4-2006138) |  |
| R4-2008399 (Rev of R4-2006342) |  |
| R4-2008400 (Rev of R4-2006452)  Cat A R4-2008401 (Rev of R4-2006453) |  |
| R4-2008402 (Rev of R4-2006457) |  |
| R4-2008229 |  |

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

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| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #4: Editorial CRs (agenda 4.4.5)

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2006148 (CR on ACLR MBW definition in FR1)  R4-2006149 (Cat A CR) | Anritsu, Skyworks | Summary of change: Editorial correction to 38.101-1  Add MHz at the item of NR ACLR measurement bandwidth in Table 6.5.2.4-1-1.  Align the number of digits after decimal point of ACLR measurement band width in Table 6.5.2.4.1-1. |
| R4-2006390 (CR to TS 38.101-3: editorial corrections on wide band Intermodulation for intra-band contiguous EN-DC in FR1)  R4-2006392 (Cat A CR) **Moderator: Please do not upload Cat A CR before the original CR is approved.** | Xiaomi | Summary of change: Editorial correction to 38.101-3  Text “REFSENS + Aggregated BW specific value below” is added to table 7.8B.2.1-1. |
| R4-2006846 (CR on minor corrections to TS 38.101-1 (Rel-15))  R4-2006870 (Cat A CR) | ZTE | Summary of change: Editorial correction to 38.101-1  (1) Correct the table header in section 5.3, 5.3A, 5.5A.1, 5.5A.3 and 5.5C.  (2) Remove empty rows in the mapping table of synchronization raster to SS block resource element and correct some other typos. |
| R4-2006903 (CR on minor corrections to TS 38.101-2 (Rel-15))  R4-2006904 (Cat A CR) | ZTE | Summary of change: Editorial correction to 38.101-2  (1) Correct the table header in section 5.3.2, 5.3.3 and 5.3.5.  (2) Remove empty rows in the mapping table of synchronization raster to SS block resource element.  (3) Correct some other typos. |
| R4-2006905 (CR on minor corrections to TS 38.101-3 (Rel-15))  R4-2006906 (Cat A CR) | ZTE | Summary of change: Editorial correction to 38.101-3  (1) Correct the abbreviation in section 3.3.  (2) Typo corrections in section 4.2, 5.2A.1, 5.3B and 5.3B.1.3.  (3) Correct the Table 5.3B-1, 5.3B.1.2-1 and 5.3B.1.3-1. |
| R4-2006939 (Maintenance CR to 38101-1 on relative power tolerance R15)  R4-2006940 (Cat A CR) | Huawei, HiSilicon | Summary of change: Editorial correction to 38.101-1  Correct ‘monotically’ with monotonically. |
| R4-2006941 (Maintenance CR to 38307 on a reference spec number R15)  R4-2006942 (Cat A CR) | Huawei, HiSilicon | Summary of change: Editorial correction to 38.307  Correct 36.307 with 38.307. |

## Open issues summary

## Companies views’ collection for 1st round

### Open issues

### CRs/TPs comments collection

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| **CR/TP number** | **Comments collection** |
| R4-2006148 | Qualcomm: It doesn’t make sense to specify resolution of 3 decimal places for MBW of ACLR. ACLR cannot be measured to that level of precision, nor does it need to be. |
| Anritsu: Thanks for the careful check. We double checked the actual possible resolution with the test equipment and agree with Qualcomm. So I would like to revise the CR and remove the changes of the MBW. Then remaining change will be only the correction of missing unit “MHz” for MBW. |
| Skyworks: Not sure to understand Qualcomm’s comment. MBW was previously defined with 3 decimal places for CBW 5,10,15,20,25,30,40, 50MHz. Example NR operation for CBW= 20MHz, ACLR is today measured with MBW = 19.095 MHz, so all NR test equipment must be able to handle MBW with 3 decimal places for these CBW. 1) To our knowledge, this format has not impacted measurement precision until now. The MBW defines the band power marker measurement bandwidth expressed in MHz, so the 3r decimal defines the MBW with kHz resolution. It does not impact power level accuracy reported by test equipment. 2) The motivation of this change is simply to align the consistency of the MBW decimal format for the remaining CBW of 60,80 ,90 and 100MHz with the previously agreed format for CBW<=50MHz. No impact on measurement level precision is to be expected from this CR. |
| R4-2006390 | Qualcomm: The note should not apply to the <= 100 MHz column. That column refers to 36.101 which already includes REFSENS+offset, so there is no need for adding offset again. |
| R4-2006846 | huawei: unnecessary change. |
| [ZTE2]: Response to HW’s comment. This CR is for editorial corrections to 38.101-1. The tables in chapter 5 are in different format and may cause misunderstanding to what the value in the table exactly refers to. The CR unifies the formats used in all the related tables and made the spec more readable. In addition, this CR also made some other editorial corrections, such as move the empty row in the table and unify the terms used in the table, etc. |
| Qualcomm: The change does not seem to be necessary. There doesn’t seem to be any possible misinterpretation even without the change. |
| [ZTE3]: Response to Qualcomm’s comment. The tables in the same section have different format. The purpose is to unify the table format in the same section for readability.        In addition, some other editorial corrections have been pointed out, such as removing the empty row in the tables. |
| R4-2006903 | Huawei: unnecessary change. |
| [ZTE2]: Response to HW’s comment. Similar to the CR R4-2006846 in 38.101-1, this CR is for editorial corrections to 38.101-2. The tables in chapter 5 are inaccurate and the readability is not good. The CR unifies the format of related tables in chapter 5. In addition, some other editorial corrections have been made in this CR. |
| R4-2006905 | Huawei: unnecessary change. |
| [ZTE2]: Response to HW’s comment. This CR is for editorial corrections to 38.101-3. As pointed in CR, some minor corrections should be made for the specification, such as the abbreviation in section 3.3 and typos in other sub-clauses. If no correction, the errors will be remain in the spec. |
| R4-2006939 | No comment received. |
| R4-2006941 | No comment received. |

## 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.*

### 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** |
| R4-2006148 | For the second round, continue to discuss the minimum resolution of measurement bandwidth for ACLR requirement.   * option 1: two decimal bits (down to 10 kHz resolution) * option 2: three decimal bits (down to 1 kHz resolution) |
| R4-2006390 | A question is raised whether this editorial change is necessary not.  Recommend continue the 2nd round. |
| R4-2006846 | A question is raised whether this editorial change is necessary not.  Recommend continue the 2nd round. |
| R4-2006903 | A question is raised whether this editorial change is necessary not.  Recommend continue the 2nd round. |
| R4-2006905 | A question is raised whether this editorial change is necessary not.  Recommend continue the 2nd round. |
| R4-2006939 | Recommend Approve |
| R4-2006941 | Recommend Approve |

## Discussion on 2nd round (if applicable)

Please add if further comment or discussion is needed.

|  |  |
| --- | --- |
| R4-2006148 |  |
| R4-2006390 |  |
| R4-2006846 |  |
| R4-2006903 |  |
| R4-2006905 |  |

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #5: LS on CA/DC fallback (agenda 4.4.1.2/13)

**Moderator: A reply to the RAN2 LS R4-2006132/R2-2004267 “*Reply LS on Handling of Fallbacks for combined contiguous and non-contiguous CA or DC configurations in FR2”* is discussed in Topic #5.**

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2006496 | Nokia | A1: RAN4 does not intend to specify exceptional band combinations in RAN4 specification. All Fallbacks for combined contiguous and non-contiguous CA or DC configurations in FR2 can be considered as exceptional.  A2: See A1 |
| R4-2006570 | Intel | A1: In the original RAN4 agreement, RAN4 agreed a general criteria where fallback exception is being allowed:  “A CA or DC configuration which include FR2 intra-band CA combinations with multiple subblocks, where at least one of the subblocks consists of a contiguous CA combination.”  The following is implemented in section 4.2 Applicability of minimum requirements in TS 38.101-2 and TS 38.101-3:  “A terminal which supports CA or DC configurations, which include FR2 intra-band CA combinations with multiple subblocks, where at least one of the subblocks consists of a contiguous CA combination, is not required to support all possible fallback combinations but can directly fall back to a single FR2 carrier. Deactivating carriers within the CA or DC combination is still possible.”  Depending of RAN4 discussion and necessity, RAN4 might further consider introducing a note or a new column in Table 5.5A.2-2 (NR CA configurations and bandwidth combination sets for intra-band non-contiguous CA) to indicate fallback exception.  A2: As long as the criteria unchanged, there is no chance one band combination where exception is allowed, becomes non “exceptional” band combination. |
| R4-2006577 | MediaTek | Observation 1: According to current RAN2 spec, UE can skip the capability report of fallback BC, and network can assume that UE supports all fallback BCs.  Observation 2: RAN4 agreed that UE is not required to support all possible fallback BC for an FR2 intra-band CA combinations with multiple subblocks, where at least one of the subblocks consists of a contiguous CA combination.  Observation 3: RAN4 can revert the previous agreement, only if RAN4 achieves the consensus to do so.  Proposal 1: Before a consensus to revert the agreement is reached, RAN4 should keep the previous agreement and focus on answering the questions from RAN2 in the reply LS.  Proposal 2: It is still up to RAN2 on which solution they would take to implement RAN4’s agreement in their spec.  Proposal 3: Answer to Q1 of R2-2004267: The exceptional band combination could at least be the fallback band combinations without corresponding RF requirements in RAN4 specs.  Proposal 4: Answer to Q2 of R2-2004267: No |
| R4-2006578 | MediaTek | A1: The exceptional band combination could at least be the fallback band combinations without corresponding RF requirements in RAN4 specs.  A2: No |
| R4-2006625 | Apple | A1: RAN4 asked for not mandating all fallbacks generally for all band combinations including a combination of contiguous and non-contiguous FR2 CA or MR-DC, as especially these band combinations result in a huge amount of fallback combination permutations. Out of this class of combinations the UE can choose which combinations to support with fallbacks and which combinations to support with just falling back to a single carrier. The UE would signal the combinations for which it supports all fallbacks in the usual container and the specific band combinations where it doesn’t support the fallbacks in the new container “supportedBandCombinationList-FR2CAFallbackException” proposed by RAN2. There is no plan to introduce an additional list of “exceptional” combinations in 38.101-2 or 38.101-3, as all FR2 combinations with combined contiguous and non-contiguous intra-band CA/MR-DC are allowed to directly fall back to a single carrier.  A2: There is no plan to separately list “exceptional” or non-“exceptional” band combinations in 38.101-2 or 38.101-3, but to define the “exceptional” combinations as a specific class of combinations like a combination of intra-band contiguous and non-contiguous FR2 CA/MR-DC band combinations. There is no plan to add this feature to other existing classes of band combinations. This does not preclude that for future classes of combinations RAN4 might consider to introduce this feature, too. |

## Open issues summary

**To summarize the contributions,**

1. **The consensus is that RAN4 agreements in R4-1908028**/**R4-1910238/R4-1910239 are kept in principle, i.e., the exception is for CA or DC configurations including FR2 intra-band CA combinations with multiple subblocks, where at least one of the subblocks consists of a contiguous CA combination.**
2. **For A1, two companies think no further change in RAN4 is needed, but two companies think more discussion may be needed.**
   1. **Exceptional band combinations are not captured other than already clarified in RAN4 specs. (Apple, Nokia)**
   2. **RAN4 might further consider introducing a note or a new column in Table 5.5A.2-2 to indicate fallback exception. (Intel)**
   3. **The exceptional band combination could at least be the fallback band combinations without corresponding RF requirements in RAN4 specs. (Mediatek)**
3. **For A2, the consensus is that RAN4 does not foresee a change in exception and non-exception for exiting classes of band combinations.** 
   1. **One company comments future classes may not be precluded. (Apple)**

### Sub-topic 5-1: How to capture exceptional band combinations (A1)

* **Please comment whether if RAN4 specs (i.e., TS 38.101-2 and/or TS 38.101-3) shall be further clarified on exceptional/non-exceptional band combinations, such as indicating which band combinations is allowed for the fallback exception.**
  + **If it shall, please provide more detail how these RAN4 specs, TS 38.101-2 and/or TS 38.101-3shall be modified and also whether other specs (such as TS 38.307) should be modified or not.**
  + **If it shall not, Nokia’s or Apple’s A1 text can be used for the LS. Please also leave comments which text is better, and what change in text is needed.**
* **Options for Sub-topic 5.2-1:**
  + **Option 5.2.1-1: Prepare draft RAN4 CRs to TS 38.101-2 and TS 38.101-3 to further clarify the previous RAN4 agreement in R4-1908028 and inform it to RAN2.**
  + **Option 5.2.1-2: No change to RAN4 specs. Provide information to RAN2 based on Nokia or Apple LS text (R4-2006496 or R4-2006625).**
  + **Option 5.2.1-3: Other than 5.2.1-1 or 5.2.1-2**

### Sub-topic 5-2: Whether a change in exception/non-exception is foreseen (A2)

* **The consensus seems to be to answer “NO”. Please comment if that is not the case.**
* **Moderator believes it is not necessary to mention a future class, as a future spec is always open for discussion. Please comment what level of addition information (other than saying “NO”) is necessary for RAN2 to complete CRs. Or is it not necessary to provide more information, as it is up to RAN2 to decide the rest?**
* **Options for Sub-topic 5.2-2:**
  + **Option 5.2.2-1: Answer “No”**
  + **Option 5-2-2-2: Answer “No” and provide additional LS text based on R4-2006625 (Apple)**
  + **Option 5.2.2-3: Other than 5.2.2-1 or 5.2.2-2.**

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| OPPO | Sub topic 5-1: Support option 5.2.1-2, No need to specify exceptional/non-exceptional band combinations in RAN4 spec. Wording in either Nokia or Apple is ok.  Sub-topic 5-2: Option 5.2.2-1 |
| Verizon | For options of both 5-1 and 5-2, we shared same concern of Ericsson in their contributions ([R4-2003863](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_eBis/Docs/R4-2003863.zip) and [R4-2003864](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_eBis/Docs/R4-2003864.zip)) to the last RAN4 meeting. Particularly, we agree if the specifications don’t support all of the fall-back configurations, it will impact to the designed systems and even if not all the combos are conformance tested. We suggest RAN4 to rescosider the early deicsion before send LS response on CA/DC fallback back to RAN2 in case if Ericsson maintianed the same concner. |
| ZTE | **Sub-topic 5-1: How to capture exceptional band combinations (A1)**  * + 1. we prefer option 5.2.1-2, i.e. no need to indicate exceptional/non-exceptional band combinations, In last Aug. meeting, RAN4 had an agreement that new band configurations request should include only necessary ones ( not have to automatically propose all the fallback modes) ,which means it is not mandate all fallbacks mode for all FR2 CA or MR-DC band combinations including contiguous and non-contiguous.   **Options for Sub-topic 5.2-1:**  We refer Option 5.2.1-2, i.e. no change to RAN4 spec.  **Sub-topic 5-2: Whether a change in exception/non-exception is foreseen**  **Options for Sub-topic 5.2-2:**  Option 5.2.2-1: Answer “No” |
| Ericsson | Like Verizon, for options of both 5-1 and 5-2, Ericsson have the same concerns as in our previous contributions (R4-2003863 and R4-2003864) at the last RAN4 meeting. If the UE’s don’t support all of the fallback configurations, it will impact to the already designed systems and limit CA deployment flexibility.  Please also note that the CR’s changing the RAN4 specification to allow skipping FR2 fallbacks were never agreed when presented in August 2019; instead R4-1908028 and R4-1910238 were endorsed since we were awaiting reply on the RAN2 LS (R4-1910239). From our understanding, there are several companies supporting reverting these RAN4 endorsements, so that UE’s continue supporting all fallback combinations.  We see it as inappropriate that RAN4 start maintaining and classifying band combinations into priority levels, which would have been the case by creating lists of exceptional band combinations. |
| MTK | **Sub topic 5-1: How to capture exceptional band combinations (A1)**  Support Option 5.2.1-2: No change to RAN4 specs.  The exception is only needed in one place. (Either RAN4 spec or RAN2 spec). Given that RAN2 is now trying to specify new signaling for UE to report this exception. We do not think it is necessary to further add any clarification in RAN4 specs.  **Sub-topic 5-2: Whether a change in exception/non-exception is foreseen (A2)**  Support Option 5.2.2-1: Answer “No”  In our understanding, the main motivation of introducing exception is to avoid those band combination without requirements in RAN4 spec. We may see more such kind of band combinations which need exception in later release. But we do not think a normal band combination (i.e. non “exceptional”) in previous releases will become an exception in later releases.  Regarding whether to reconsider the previous RAN4 agreement in #92 meeting, we are open to discuss, but prefer to keep previous agreement before we achieve consensus to revert it. |
| Huawei | **Sub topic 5-1: How to capture exceptional band combinations (A1)**  No change to RAN4 specs.  **Sub-topic 5-2: Whether a change in exception/non-exception is foreseen (A2)**  Option 5.2.2-1: Answer “No”. the specific signaling depend on RAN2. |
| CHTTL | Normally all of the fallback combinations need to be supported in the spec. There is no need to specify exceptional band combinations in RAN4 spec. We also have some concern on all of the wording proposed for A1 here, since from our understanding there is no “exceptional” band combination in the RAN4 spec. |
| Apple | **Sub topic 5-1: How to capture exceptional band combinations (A1)**  It would not be beneficial to have another list or column stating for which combination all fallbacks are mandatory and for which not. This additional information would result in fragmentation in that way that a UE may be allowed to fall back to “A” for one combination but needs to support all fallbacks for another one. It is better to define a specific class of combinations for which fallbacks are mandatory and for which not, as RAN4 did in the CRs already, Mandatory for all combinations except combined contiguous/non-contiguous FR2 combinations and direct fallback allowed for these. Also if this mandatory or not decision will be changed during the spec development there will be an issue to find out if mandatory support is needed or not.  We are also wondering, how a fallback combination without corresponding RF requirements would look like. Our understanding is a fallback combination is just another stand-alone combination, which happens to be a combination that can be derived from a higher order combination by removing a carrier, and for all combinations, being it a fallback or not, RAN4 specified RF requirements.  We propose to use our text for the reply LS.  **Sub-topic 5-2: Whether a change in exception/non-exception is foreseen (A2)**  We see that every proposed LS basically answers this question with no. However, we prefer to have some more explanation as we have in our proposed LS.  As some companies wanted to add information, for example with an additional column, to each band combination on fallbacks, the information in these columns would change during spec development. Therefore adding a per band combination information in sub-topic 1 would contradict answering “no” to this sub-topic. This is another reason not to add a per band combination information on fallbacks in sub-topic 1.  **Others:**  As Apple already wrote the original LS, we propose to use our LS as a basis and do eventually necessary changes |
| Ericsson | Ericsson prefer to use Nokia draft LS reply as a base for further discussions since this draft LS reply is shorter and clearer to the point in only answering RAN2’s questions. There are some improvements to make in the Nokia LS reply also, but it is a better base to start from. |
| NTT DOCOMO, INC. | We have same view with Verizon and Ericsson.  We should answer to RAN2 question but we would like to revisit the previous agreement on FR2 fallback exception for mixed intra contiguous and non-contiguous. |

### CRs/TPs comments collection

## 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#5-1** | Although there was no contribution in RAN4#95-e (but was in the last meeting), some companies propose to revisit the previous RAN4 agreement (R4-1908028/R4-1910238/R4-1910239) during the email discussion.   * Option 1: The agreement should be revisited. (Verizon, Ericsson, Docomo, [CHTTL?]) * Option 2: No change to RAN4 spec (OPPO, ZTE, MTK, Huawei, Apple)   Assuming Option 2 is confirmed, LS reply draft can be based on either Nokia or Apple’s draft. There was no majority view but there were more supports to use Nokia’s reply text for A1 to start with.  In the second round, we discuss if option 1 should be still pursued or not and if we can focus on LS draft based on Option 2. |
| **Sub-topic#5-2** | Assuming Option 2 is confirmed in topic #5-1, the majority view is to answer only “No” for A2 in the reply LS. |

*Suggestion on WF/LS assignment*

A1 is based on Nokia text to start with.

As is “No.”

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 Revision of R4-2006578 | Reply LS on Handling of Fallbacks for combined contiguous and non-contiguous CA or DC configurations in FR2 | MediaTek |

### CRs/TPs

## Discussion on 2nd round (if applicable)

Moderator: Proponents of Option 1 in #5-1 should provide more technical justifications to revisit the agreement, although NBC issue was not communicated in the LS reply from RAN2. Is it critical to change RAN4 spec and revert the previous RAN4 LS R4-1910239? What are the critical issues for network deployment, operation, and performance?

|  |  |
| --- | --- |
| **Sub-topic#5-1** |  |
| **Sub-topic#5-2** |  |
| **LS draft**  **R4-2008403 (Rev of R4-2006578)** |  |

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |