**3GPP TSG-RAN WG4 Meeting #112-bis R4-2415237**

**Hefei, Anhui, China, 14th – 18th October, 2024**

**Agenda item:** 8.1

**Source:** Moderator (Qualcomm Incorporated)

**Title:** Topic summary for [112bis][133] UERF\_Spec\_Improvement

**Document for:** Information

# Introduction

Agenda 8.1.1, previous WF: R4-2414430.

Specification quality improvement RAN task (RP-240782)

# Topic #1: PRD

## Companies’ contributions summary

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Title** | **Company** | **Proposals / Observations** |
| [**R4-2415135**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415135.zip) | On usage of PRD for specs improvement | CATT | **Proposal 1: RAN4 to create the first PRD serving as the index of all PRDs in RAN4 with the information of PRD id, version, title and latest Tdoc, and the first PRD has PRD id as “R4-00”.**   |  |  |  |  | | --- | --- | --- | --- | | **PRD-id** | **Version** | **Title** | **Latest Tdoc** | | **R4-00** | 0 | Overview of R4-PRD Directory | R4-241xxxx | | **R1-01** | 0 | Improvements on specifying band combinations | R4-241xxxx | | **R1-02** | 0 | xx | xx | | **R1-03** | 0 | xx | xx | | **R1-04** | 0 | xx | xx |   **Proposal 2: RAN4 to create the second PRD (“R4-01”) for band combination specification improvement with the following skeleton:**   |  | | --- | | 1 General: description and principles  2 Specs structuring for specifying band combinations  2.1 “Identified issue #1” and recommended solution(s)  2.2 “Identified issue #2” and recommended solution(s)  …  3 Notation and terminology usage and alignment  3.1 “Notation #1”  …  4 Table usage  4.1 “Table – xx” for zz  …  5 Other improvements  5.1 xx  … | |
| [**R4-2416379**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2416379.zip) | On RAN4 PRD scope for Release 19 and beyond | Skyworks Solutions Inc. | **To be a solid reference for the band combinations related work, the PRD content and structure should document the following for FR1 band combinations:**   * **The current band combination baskets with corresponding valid DL and UL configurations.** * **The band combination completeness criteria for DL and UL fallbacks (especially for BCS 4 and 5).** * **The band combination request process.** * **The band combination TP/TR content and requirement (when available based on the templates recently approved) for:**   + **Intra-band UL/DL CA**     - **When needed, capture additional emissions requirement for ULCA and initiate A-MPR evaluation work.**     - **Add single CC UL and ULCA MSD detection tables.**     - **Intra-band ULCA Power class table**     - **Add MSD test point rules and if feasible/agreeable MSD calculation example.**   + **2 band DL inter-band CA with 1 or 2 band UL**     - **1UL 1/2CC and 2UL 2/3CC MSD detections tables**     - **Delta T/R**     - **Inter-band ULCA Power class table**     - **Add MSD test point rules and if feasible/agreeable MSD calculation example.**   + **3 band DL inter-band CA with 1 or 2 band UL**     - **2UL 2/3CC MSD detections tables**     - **Delta T/R**     - **Add MSD test point rules and if feasible/agreeable MSD calculation example.**   + **>3 DL bands inter-band CA: only Delta T/R rule constructing from lower orders.** * **To our understanding there is no band combination specific work on the BS or RRM side, but it may be worth adding some aspects related to additional aspects to consider for band combinations:**   + **Simultaneous Tx/Rx operation or not.**   + **Potential interruptions.** * **When appropriate, the above may also cover HPUE band combinations.** * **We realize that all the content is not yet available, and this should be contribution driven but we think the PRD skeleton should be compatible with the above content to be future proof.**   **A few examples of topics that may be a worth some content in future PRD(s):**   * **Single band REFSENS assumptions and calculations and related HPUE RSD(s).** * **What to do to introduce a new band, a new CBW.** * **Single CC MPR and A-MPR assumptions, PA calibration, table format for default power class and HPUE. Related allocation types.** * **Intra-band ULCA MPR and A-MPR assumptions, PA calibration, table format for default power class and HPUE. Related allocation types.** * **Band Co-existence assumptions and rules** * **PCmax equations and mechanism?** * **In general, any 38.101-1/2/3 topic/clause that has a large number of tables inputs and little explanation on how the table content is derived.** |
| [**R4-2414922**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2414922.zip) | On potential PRD scope for band combination | Huawei, HiSilicon | **Proposal**: The details on a potential PRD for MSD shall be discussed under basket WI related agenda item, since the content shall contain technical aspects. |
| [**R4-2416104**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2416104.zip) | Considerations on PRD usage for band combination in RAN4 | ZTE Corporation, Sanechips | **Observation 1. The PRD is a Permanent Reference Document which should be maintained and released within RAN4. Unlike TR in 3GPP, the PRD should be a cross-version document and remain valid when the involving WI/SIs moving forward in the future releases.**  **Proposal 1. The first PRD in RAN4 is suggested to be handled for band combinations. The suggested version numbering scheme for PRD could be as follows.**  **Version x.y.z**  **where:**  **x the first digit:**  **0 immature draft;**  **1 presented to TSG/WG for information;**  **2 presented to TSG/WG for approval;**  **3 or greater indicates TSG/WG approved document under change control.**  **y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.**  **z the third digit is incremented when editorial only changes have been incorporated in the document.**  **Proposal 2. It is suggested to create a PRD specific directory in RAN4 FTP server and an overview document is to indicate where to find the PRD and how to contribute to PRD. In addition, a specific agenda item is suggested to be set for each RAN4 meeting.**  **Proposal 3. It is suggested to include at least the following objectives for band combination PRD.**   * **Track the status of band combination related WI/SIs starting from Rel-19.** * **Handle the usage of band combination tool.** * **Enhance the working procedure of specifying band combinations.** * **Collect the new guidelines for band combinations.** * **Study the general technical issues for band combinations.** |
| [**R4-2416254**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2416254.zip) | RAN4 PRD input on Guidelines for harmonic MSD test points | Skyworks Solutions Inc., Qualcomm France, Nokia | 1. To ensure that RAN4 proponents evaluate MSDs in accordance to rules used to cleanup the the Rel-18 MSD test points [1..7]; 2. To provide a preliminary text proposal to the RAN4 draft PRD; and 3. To capture these proposals as formal "TP for PRD," once the first draft PRD is made available. |
| [**R4-2416422**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2416422.zip) | draft PRD on rules guidelines and ways of working for introduction of band combinations | Ericsson, AT&T, Nokia | PRD draft |

## Open issues summary

### Sub-topic 1-1 PRD use with band combination work

*Sub-topic description:*

*Open issues and candidate options before meeting:*

**Issue 1-1-1: PRD index**

* Proposals
  + Option 1: Proposal 1: RAN4 to create the first PRD serving as the index of all PRDs in RAN4 with the information of PRD id, version, title and latest Tdoc, and the first PRD has PRD id as “R4-00”.

|  |  |  |  |
| --- | --- | --- | --- |
| **PRD-id** | **Version** | **Title** | **Latest Tdoc** |
| **R4-00** | 0 | Overview of R4-PRD Directory | R4-241xxxx |
| **R4-01** | 0 | Improvements on specifying band combinations | R4-241xxxx |
| **R1-02** | 0 | xx | xx |
| **R1-03** | 0 | xx | xx |
| **R1-04** | 0 | xx | xx |

* + Option 2: An alternative for keeping track of PRDs??
* Recommended WF
  + Discuss how to manage the list of PRDs

CATT: In our understanding, RAN4 need decides to introduce the PRD that is the first decision.

Huawei: These should be discussed after we decide the introduction of PRD. We do not encourage many PRDs.

ZTE: For R4-00, there is no need “overview of PRD”. The first one should start from R4-01. The version should be in TR format.

MCC: If the layer higher, we should not follow the meeting structure. It should not be related to a certain meeting.

CHTTL: Share the similar view as Huawei. We do not expect too many PRDs. First discuss which PRDs are useful.

AT&T: RAN5 has no PRD as overview. RAN5 just uses on digit. The structure under RAN4 will not be stored under each meeting.

Moderator: suggest follow RAN5 approach.

Agreement:

* RAN4 to work on Text proposals for the first PRD until November meeting and further discuss PRD.
  + One PRD document is expected with the scope of
    - **Band combo work**
    - MSD
  + Maintain PRD document every half year
    - It is not expected to set the agenda for PRD maintenance in each RAN4 meeting
  + Handle the RPD in a dedicated agenda under one basket WI in RAN4.

**Issue 1-1-2 Numbering**

* Proposal 1 in R4-2415135 CATT
  + Option 1: Use numbering R4-00, R4-01…in PRDs
  + Option 2: Other
* Recommended WF
  + Use R4-xy numbering as proposed

**Issue 1-1-2: Band combo work PRD**

* Proposals
  + Option 1:
    - **Proposal 1. (ZTE) The first PRD in RAN4 is suggested to be handled for band combinations**
    - Draft PRD for band combinations in R4-2416422 (Ericsson, AT&T, Nokia)
    - (CATT) Proposal 2: RAN4 to create the second PRD (“R4-01”) for band combination specification improvement with the following skeleton:
  + Option 2: Other, is there overlap with RAN task to simplify band combo work?
* Recommended WF
  + Agree to use PRD for band combo work and use R4-2416422 as draft skeleton to build on. Consider input in (R4-2416104, ZTE) for details

**Issue 1-1-3: PRD for MSD**

* Proposals
  + Option 1: (HW) **Proposal**: The details on a potential PRD for MSD shall be discussed under basket WI related agenda item, since the content shall contain technical aspects.
  + Option 2: Create MSD PRD with following contents
    - (Skyworks) Proposal 1: Guidelines for the uplink (UL) band configuration
    - (Skyworks) Proposal 2: Guidelines for the downlink (DL) band configuration
    - (Skyworks) Proposal 3: Guidelines on UL/DL fc condition
    - (Skyworks) Proposal 4: Guidelines on UL/DL harmonic order
    - With targets (Skyworks, Nokia):
      * To ensure that RAN4 proponents evaluate MSDs in accordance to rules used to cleanup the the Rel-18 MSD test points [1..7];
      * To provide a preliminary text proposal to the RAN4 draft PRD; and
      * To capture these proposals as formal "TP for PRD," once the first draft PRD is made available.
* Recommended WF
  + Discuss between options 1 and 2 and if option 2 is agreeable, then work MSD PRD and work on skeleton based on proposals. Anyway, consensus seems to be that such PRD should be created

# Topic #2: Dual TX

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

## Companies’ contributions summary

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Title** | **Company** | **Proposals / Observations** |
| [**R4-2414923**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2414923.zip) | (NR\_newRAT-Core) Replacement of dual with 2Tx | Huawei, HiSilicon, Ericsson, Qualcomm, Samsung | Proposal 1:  Observation 1: |

## Open issues summary

Seems only one contribution in the agenda.

### Sub-topic 2-1

Sub-topic description: replace dualTX with 2Tx

**Issue 2-1: Change dualTX to 2Tx**

* Proposals
  + Option 1: Agree the CR [**R4-2414923**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2414923.zip)
  + Option 2: TBA
* Recommended WF
  + Agree the CR, note that “2Tx” is not in definitions or symbols, consider revisioning

Skyworks: there should be definition. 2Tx is tied to signalling.

Huawei: Fine to define 2Tx. It is also related to 3Tx. We can discuss it separately.

CATT: Definition is needed. It should be Cat-D.

T-Mobile USA: TxD and Divesity used somewhere. Not sure if we need also address them.

Moderator: It can be Cat-F in stead of D.

Huawei: there are similar issues in the spec. it is very hard to clean-up all the issue unless there is confusion.

# Topic #3: Notes

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

## Companies’ contributions summary

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Title** | **Company** | **Proposals / Observations** |
| [**R4-2414926**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2414926.zip) | NOTE(s) handling in a table for future specifications | Huawei, HiSilicon | **Observation 1**: There are NOTEs in tables, which are elaborated in other sub-clauses, e.g., the sub-clause for symbols in the same specification.  **Observation 2**: Splitting a table just for sake of reducing the number of NOTEs per table brings more tables and more maintenance work given that each table may have more NOTEs in the future.  **Proposal 1**: In case there are too many notes in a table,   * For the latest specifications, check whether or not each of the NOTEs is covered by other sub-clauses or if it is essential, and make it void if would like to avoid redundancy. * For CRs to introduce a new NOTE(s), care must be taken if adding NOTEs not to introduce NOTEs which can be covered by some other sub-clauses in the specification.   **Proposal 2**: In case there are similar notes in a table,   * If they are an item specific, merge the notes into one whenever possible, and keep it in the table * If they are not item specific, but rather general, capture the merged note in the main body of the specification   **Proposal 3:** If notes for specific item(s) in a table are not used by mistake, add the NOTEs or their superscripts to appropriate places in the table.  **Proposal 4:** If NOTEs are general and applicable to the entire table, they should be captured in the main body of the specification.  **Proposal 5**: If a NOTE in the bottom of a table is or becomes “void”, all the corresponding NOTEs and/or superscripts placed in the table shall be deleted except for the NOTE in the bottom of the table.  **Proposal 6**: No need to make NOTE indication (superscript number or number in a note column) and note definition placed in the same page, unless we find out a practical solution.  **Proposal 7**: Add a NOTE column in a table as default, where still adding a superscript(s) to an item in a square(s) in the table is allowed if necessary.  **Observation 3**: According to TR 21.801, NOTEs in the main body of the specification is normative and NOTEs in a table/figure can be informative or normative.  **Proposal 8**: Confirm whether or not the Observation 3 is correct or not  **Proposal 9**: Application of any agreements on the UE RF specification quality enhancements shall be also considered for at least all the specifications of the same release that RAN4 is the primary responsible group. |
| [**R4-2415140**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415140.zip) | Further discussion on notes usage in UE RF specifications | CATT | **Proposal 1: RAN4 to modify all note indication via superscripts to explicit note notation.**  **Proposal 2: General or common notes in a table which is applicable to every row in the table should be moved to the main body just before the table** |
| [**R4-2416286**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2416286.zip) | Discussion on the improvement of table notes in RF specifications | Anritsu Limited | ***Observation 1: Using “NOTE x” (with x as a number) for specific items in a table (like with superscript number) and move general notes to the main body of the text with the table to which it applies, makes the reading of tables much easier allowing to distinct easily notes that are specific vs general.***  ***Observation 2: Using “NOTE x” (with x as a number) for specific items in a table (like with superscript number) and move general notes to the main body of the text with the table to which it applies, reduces significantly the number of notes at the bottom of tables, saving time to the reader particularly for big tables.***  ***Proposal 1: Use “NOTE x” (with x as a number) for specific items in a table (like with superscript number) and move general notes to the main body of the text with the table to which it applies to clearly mentioned.*** |
| [**R4-2416105**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2416105.zip) | Considerations on NOTEs usage for spec quality improvement | ZTE Corporation, Sanechips | **Observation 1. Option 2 and 4 in WF R4-2414430 are to some extent similar and could be further improved and denoted as Option 2a.**   * + Option 2a: Do not use NOTEs in tables for requirements that apply every cell/line or general requirements in the table. Use text above the table instead   **Observation 2. For the issue of “void NOTEs”, to delete the reference to “void NOTEs” without a remark to mention the removal of NOTEs in old release is a reasonable solution.**  **Observation 3. For the issue of “Distance between NOTE indication and NOTE definition”, a solution by setting a hyperlink to NOTEs Tag can facilitate the reference of NOTEs. Using “Alt ←” can browse back from the location of NOTEs Tag to the location of NOTEs indicator.**  **Proposal 1. The following drafting rules for NOTEs are suggested.**   * + **Option 1: Proposal 6 in R4-2411237 (HW) RAN4 should discuss necessity of more practical drafting rule for NOTEs handling in a table for the future specifications.**   + **Option 2a: Do not use NOTEs in tables for requirements that apply every cell/line or general requirements in the table. Use text above the table instead.**   + **For the issue of “void NOTEs”, it is suggested to delete the reference to “void NOTEs” without a remark.**   + **For the issue of “Distance between NOTE indication and NOTE definition”, it is suggested to set a hyperlink to NOTEs Tag.**   **Proposal 2. It is suggested to endorse the draft CRs in [3-5] as examples for the drafting rules for NOTEs as proposed in proposal 1.** |

CRs

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Title** | **Company** |  |
| [**R4-2416106**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2416106.zip) | (TEI18) Draft CR for TS 38.101-1 on In-band emissions for NOTEs usage | ZTE Corporation, Sanechips |  |
| [**R4-2416107**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2416107.zip) | (TEI18) Draft CR for TS 38.101-1 on reference sensitivity exceptions due to harmonic interference for NOTEs usage | ZTE Corporation, Sanechips |  |
| [**R4-2416108**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2416108.zip) | (TEI18) Draft CR for TS 38.101-1 on three bands inter-band CA configurations for NOTEs usage | ZTE Corporation, Sanechips |  |
| [**R4-2416106**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2416106.zip) | (TEI18) Draft CR for TS 38.101-1 on In-band emissions for NOTEs usage | ZTE Corporation, Sanechips |  |

## Open issues summary

Many papers and proposal discuss general drafting rules and every delegate wring CRs should read those for consideration. We should strictly follow drafting rule and if we need to change, it should be discussed elsewhere.

### Sub-topic 3-1

**Issue 3-1-1: How to reference to a note in a table**

* Proposals
  + Option 1:
    - Proposal 1 (CATT): RAN4 to modify all note indication via superscripts to explicit note notation.
    - Proposal 1(Anritsu):  **Use “NOTE x” (with x as a number) for specific items in a table (like with superscript number)**
    - Proposal 7 (Huawei): Add a NOTE column in a table as default, where still adding a superscript(s) to an item in a square(s) in the table is allowed if necessary.
  + Option 2: TBA
* Recommended WF
  + Agree option 1, continue to draft an example CR (ZTE) and then follow up with more changes in next meetings

Apple: We place all the superscripts which is not good thing to do. It extends things quite big. There are multiple numbers for some band combination tables.

Huawei: CATT approaches work for single table only. For some table the column is quite narrow. If we follow proposal 1, we have widened the table. We are OK to have further discussions.

Nokia: Superscipts should be used. There is space. Somewhere we have four notes. WF is a good idea.

Skyworks: We should clarify. It is difficult to find the notes in the bigger table.

T-Mobile USA: Moving to data base. It is best to add the column and add all the notes into column. We should make clear which notes to apply to which table.

ZTE: The approach of superscripts are more suitable. The new column makes the table difficult to read. For note, we also find the text and notes are separated far away.

CATT: In RAN4 spec, superscripts are suitable for the big table. We should follow MCC guidance and make them consistent.

Samsung: support moderator suggestions.

Nokia: For drafting, it is not Rel-19. The drafting rule was created when the table is small. The data base need take into account.

MCC: hope data base could be available in 2025. The tables could be removed. Before that, maybe we should not do something.

Skyworks: For bigger table, there would be problem to follow the drafting rule. Smaller table would be OK.

Huawei: This should be case by case based.

**Issue 3-1-2: How to reduce number of notes for improved readability**

* Proposals
  + Option 1:
    - **Proposal 2 (CATT): General or common notes in a table which is applicable to every row in the table should be moved to the main body just before the table.**
    - Proposal 1 (ZTE): Option 2a: Do not use NOTEs in tables for requirements that apply every cell/line or general requirements in the table. Use text above the table instead
    - **Proposal 1 (Anritsu): … move general notes to the main body of the text with the table to which it applies to clearly mentioned.**
  + Option 2: TBA
* Recommended WF
  + Agree option 1 and continue to draft an example CR and follow with more CRs in next meetings

Huawei: When we move some notes applying to table, we should be careful about whether the notes are informative or normative.

CHTTL: We would like to do it case by case. There is some note which may not be directly related to the table.

ZTE: We want to check CR case by case. Can we check CR provided in this meeting as the first step.

Nokia: There are a great number of notes. There are some regulatory documents referring the note, which would be void. Maybe we do not update it now.

Apple: It does not help so much. The new notes can follow the new rule.

MCC: outside they may not know the excersice that RAN4 did. But the note is moved somewhere else.

Agreement:

* RAN4 does not move the existing notes outside the table.
* The new note contents, which apply to the whole table, should be put in the normative text before the table.

# Topic #4: Others

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

## Companies’ contributions summary

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Title** | **Company** | **Proposals / Observations** |
| [**R4-2414927**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2414927.zip) | Miscellaneous proposals on spec quality improvement | Huawei, HiSilicon | **Observation 1**: There may be several wrong filed [and/or IE] names such as “modifiedMPR-Behavior” (the correct name is modifiedMPR-Behaviour) or inconsistent terminology such as simultaneous Rx/Tx and simultaneous Tx/Rx.  **Proposal 1**: Check all the filed names and IE names in the specifications and tackle to correct them all together if the corrections in Observation 1 are made.  **Observation 2**: Using a common fixed phase to capture filed names and/or IE names in the specifications may help find out where filed names and associated requirements are in the specifications even if the names are wrong.  **Observation 3**: MSD is used across 38.101-1 and we see Maximum Sensitivity Degradation only in abbreviation subclause. On the other hand, MOP is NOT used across 38.101-1 and we see MOP only in abbreviation subclause.  **Observation 4**: There are variations to indicate probably the same meaning which make readers confused by making them think of if there have different purposes and meanings.   * Maximum Output power, Maximum transmitted power, Maximum transmit power * configured transmitted power, configure transmit power, configured output power * UE maximum output power, maximum UE power   **Proposal 2**: If time allows, non-controversial, address followings.   * Use abbreviations and symbols in the specification as much as possible like MSD and correct them if there are errors. * Use consistent terminologies as much as possible through the specifications, i.e., not to use variations   **Observation 5**: If we address the issues in observation 1 – 4, it may be better to address it in a targeted fashion where we set to one or a few limited targets per quarter, e.g., one quarter addresses to thoroughly correct filed names, the next quarter addresses abbreviations and symbols and so on. The target(s) and the number can be selected e.g., depending RAN4 meeting intervals. |
| [**R4-2415392**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415392.zip) | On UE RF specifications table improvement | Nokia | Observation 1: Currently it is not possible to condense all the information and requirements for a single DL configuration into a single table.  Observation 2: The long-term goal is to move the listing of band combinations to a database managed by MCC.  Observation 3: Multiple tables are now listing band combinations meaning that there are numerous long tables in the specification.  Observation 4: Currently the RAN4 UE RF specification has separate tables for each UE relaxation type, e.g. MSD due to harmonica mixing issues.  Observation 5: Providing a list of supported band combinations together with their “issues” requiring relaxation would provide an overview instead of spreading the information over multiple tables in the specification.  Observation 6: Statistics and investigations conducted for the currently defined UE relaxations in TS 38.101-1 clause 7 is presented in [3, 6, 7].  Observation 7: RAN4 could reduce the length of TS 38.101-1 by 21 pages using the approach presented here.  Proposal 1: RAN4 shall further develop the unified table approach for UL configurations as presented in this Toc and adopt this in the specification.  Proposal 2: RAN4 shall further investigate whether a unified tabled can be developed for DL configurations. |
| [**R4-2415607**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415607.zip) | Worthy Tips to Improve Spec Table Readability | Murata Manufacturing Co Ltd. | ***Observation 1:***  The requirement stated in TR 21.801 V18.0.0 (2024-03) Specification Drafting Rules, Section 6.6.5.5, i.e. to repeat tables column headings on each page, is not widely adopted.  ***Observation 2:***  Large tables that are more than 1 page long and tables that extend beyond their beginning pages often have large blank spaces between the table titles and the table contents. In fact, long tables that are more than 1 page long often have an entire blank page below their table titles. This not only wastes a lot of space (and paper if printed) but also makes reading tables cumbersome (low quality). This needs quality improvement. ***Proposal 1:***  Comply with the requirement in Section 6.6.5.5 in TR 21.801, i.e. to display column headings on each page of long tables that occupy more than 1 page, for all UE RF specs, by taking by the following steps:  1. Click anywhere within the existing table’s column heading, 2. Click on the MS Word’s ***Layout*** menu, 3. Click on the “***Repeat Header Rows***” button,   Then the column headings will appear in the 1st row on each page.  ***Proposal 2:*** Remove blank spaces between spec tables and table contents by following these steps:   1. Select the entire table including its table title row (ie. The text on top of the table itself), 2. Mouse right-click and select “***Paragraph***”, 3. Un-check the option boxes of “***Keep with Next***” and “***Page Break Before***”,   Now the blank spaces between table titles and table contents will be eliminated. |
| [**R4-2415141**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415141.zip) | On potential table modifications for UE RF specs | CATT | **Proposal 1: For configuration EN-DC tables, do not consider order of increasing carrier frequency for LTE and NR carriers and remove redundant symmetric table cells for each BCS as illustrated in Table - 1.**  **Proposal 2: RAN4 to introduce the template-based approach for simplifying ΔTIB,c and ΔRIB,c tables, which keeps both lexicographic order of band combinations and readability as shown in Table – 2.** |
| [**R4-2416109**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2416109.zip) | Considerations on grouping rules for inter-band DC configuration tables | ZTE Corporation, Sanechips | **Observation 1. It is observed that in the current RAN4 spec, for the grouping of the DC configurations, the following rules are applied.**  **- Grouping of DC configurations is based on common band combination.**  **- In case E-UTRA or/and NR has non-contiguous CA, it will be on a separate row compared to cases when DC configuration has only single carrier or contiguous CA operation.**  **- Common band combination should be considered as the configurations having the same band sequence, such as DC\_x-y-y\_nz and DC\_x-x-y\_nz are different band combinations, while all configurations with DC\_x-y\_nz(\*) having non-contiguous parts in band nz are considered as common band combination.**  **Observation 2. It is observed that in the current RAN4 spec, some DC configurations having the same constituent bands and with only contiguous CA parts in the configurations have been specified into different groups which should be corrected to the same contiguous group.**  **Observation 3. It is observed that in the current RAN4 spec, some DC configurations with non-contiguous CA parts have been specified into the same group as DC configurations with only contiguous CA parts. They should be corrected to different groups.**  **Observation 4. It is observed that in the current RAN4 spec, some DC configurations in the same group do not have the “common band combination” basis, which means the constituent bands in the same group having the different band sequence.**  **Proposal 1. It is suggested to regroup the inter-band DC configurations with the guidelines in Observation 1 and take the following aspects into consideration.**  **- To categorize DC configurations having only contiguous CA parts into one group.**  **- To differentiate the DC configurations having non-contiguous CA parts with the DC configurations having only contiguous CA parts.**  **- To group the DC configurations on the basis of “common band combination”, i.e. the constituent bands having the same band sequence.**  **Proposal 2. It is suggested to endorse the Draft CRs in [2-4] for regrouping the inter-band EN-DC configurations within FR1.** |

CRs

|  |  |  |  |
| --- | --- | --- | --- |
| **T-doc number** | **Title** | **Company** |  |
| [**R4-2415612**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415612.zip) | draftCR to TS 38.101-1 on ?T\_IB and ?R\_IB tables | CATT |  |
| [**R4-2415616**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415616.zip) | draftCR to TS 38.101-3 on intra-band EN-DC configuration tables | CATT |  |
| [**R4-2416110**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2416110.zip) | (DC\_R18\_2BLTE\_1BNR\_3DL2UL) Draft CR for TS 38.101-3 on 2L and 1N bands EN-DC configuration grouping | ZTE Corporation, Sanechips |  |
| [**R4-2416111**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2416111.zip) | (DC\_R18\_xBLTE\_1BNR\_yDL2UL) Draft CR for TS 38.101-3 on (3-5)L and 1N bands EN-DC configuration grouping | ZTE Corporation, Sanechips |  |
| [**R4-2416112**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2416112.zip) | (DC\_R18\_xBLTE\_2BNR\_yDL2UL) Draft CR for TS 38.101-3 on (1-4)L and 2N bands EN-DC configuration grouping | ZTE Corporation, Sanechips |  |
| [**R4-2416113**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2416113.zip) | (DC\_R18\_xBLTE\_yBNR\_zDL2UL) Draft CR for TS 38.101-3 on (1-3)L and (3-5)N bands EN-DC configuration grouping | ZTE Corporation, Sanechips |  |

## Open issues summary

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

### Sub-topic 4-1: Correcting names, abbreviations etc

**Issue 4-1-1: IE and capabilities**

* Proposals
  + Option 1: Proposal 1 (Huawei): Check all the filed names and IE names in the specifications and tackle to correct them all together if the corrections in Observation 1 are made.
    - Observation 1: There may be several wrong filed [and/or IE] names such as “modifiedMPR-Behavior” (the correct name is modifiedMPR-Behaviour) or inconsistent terminology such as simultaneous Rx/Tx and simultaneous Tx/Rx.
  + Option 2: Other, keep errors(?)
* Recommended WF
  + Correct IE names, assign CR (Huawei) at least to correct some names.
    - Moderator note that please distinguish the use between IE that is assigned to the UE and UE capability. Use “*italic*” to indicate the names.

**Agreement:**

* Correct IE names, assign CR (Huawei) at least to correct some names.

**Issue 4-1-2: IE and capabilities**

* Proposals
  + Option 1: Proposal 2 (Huawei): If time allows, non-controversial, address followings.
    - Use abbreviations and symbols in the specification as much as possible like MSD and correct them if there are errors.
    - Use consistent terminologies as much as possible through the specifications, i.e., not to use variations
    - See Huawei observation 2 and 3 for more info.
  + Option 2: Other, keep ambiguity(?)
* Recommended WF
  + Target to correct abbreviations and align terminology, discuss which one is the correct name, assign draft CR (Huawei) at least to correct some names.

Agreement:

* Target to correct abbreviations and align terminology, discuss which one is the correct name, at least to correct some names.
  + Companies to propose corrections and discuss the list in November meeting

### Sub-topic 4-2: formatting

**Issue 4-2-1: Header rows**

* Proposals
  + Option 1: Proposal 1 (Murata): Comply with the requirement in Section 6.6.5.5 in TR 21.801, i.e. to display column headings on each page of long tables that occupy more than 1 page, for all UE RF specs, by taking by the following steps:
    - Click anywhere within the existing table’s column heading,
    - Click on the MS Word’s Layout menu,
    - Click on the “Repeat Header Rows” button,
    - Then the column headings will appear in the 1st row on each page.
  + Option 2: Other
* Recommended WF
  + Agree option 1, can MCC do this or do we need a CR?

Agreement:

* Agree option 1, MCC can do this for TS38.101-1/2/3.

**Issue 4-2-2: Blank spaces**

* Proposals
  + Option 1: Proposal 2 (Murata): Remove blank spaces between spec tables and table contents by following these steps:
    - * Select the entire table including its table title row (ie. The text on top of the table itself),
      * Mouse right-click and select “Paragraph”,
      * Un-check the option boxes of “Keep with Next” and “Page Break Before”,
    - Now the blank spaces between table titles and table contents will be eliminated.
  + Option 2: Other
* Recommended WF
  + Agree option 1, can MCC do this or do we need a CR?

Agreement:

* It is agreed not to remove blank spaces between spec tables and table contents.

### Sub-topic 4-3: MSD tables

Many proposals for changing formats of the many different tables. While proposals are all good individually and would improve some aspects of the specifications, care should be takes not to change requirements. Moderator encourages proponents to work with other companies offline to see if there is consensus and maybe get more support behind their proposals. It is unlikely that tables formats can be discussed nor agreed online.

If agreements can not be made, it is recommended to at least capture problems indicated with each proposal to enable some progress in next meeting.

**Issue 4-3-1: General table formatting and content**

* Proposals
  + Option 1:
    - Proposal 1 (Nokia): RAN4 shall further develop the unified table approach for UL configurations as presented in this Toc and adopt this in the specification.
    - Proposal 2: RAN4 shall further investigate whether a unified tabled can be developed for DL configurations.
    - Please see R4-2415392 for examples
  + Option 2: Leave tables as they are
* Recommended WF
  + Discuss, can be separated for UL and DL

**Agreement:**

* Defer the discussions on this issue until the conclusion is made for HPUE MSD in Rel-19.

**Issue 4-3-2: Intra-band EN-DC tables**

* Proposals
  + Option 1: Proposal 1 CATT: For configuration EN-DC tables, do not consider order of increasing carrier frequency for LTE and NR carriers and remove redundant symmetric table cells for each BCS as illustrated in Table - 1.
    - Please see CR R4-2415616 for detailed examples
  + Option 2: Leave table as is
* Recommended WF
  + Discuss

CHTTL: Check CR. One of configuration change leads to broken of the feature. We cannot agree on the CRs. LTE uses it. It is too late to change EN-DC now.

MCC: encourage to look into Rel-18. Not change from earlier than Rel-18.

CATT: We want to remove the redundant. We just show the examples.

ZTE: in current CR, it cannot support asymmetric bandwidth configuration. Do you need consider asymmetric configuration in the future.

**Issue 4-3-3: Template based ΔTIB,c and ΔRIB,c**

* Proposals
  + Option 1: Proposal 2 (CATT): RAN4 to introduce the template-based approach for simplifying ΔTIB,c and ΔRIB,c tables, which keeps both lexicographic order of band combinations and readability as shown in Table – 2.
    - Please see CR: R4-2415612 for more details
  + Option 2: Other
* Recommended WF
  + Discuss

CHTTL: Using three columns for delta T and delta R will lead to trouble for introducing the new configurations.

Apple: Same opinion. This complicated things very much.

CATT: We can consider further improvement.

ZTE: share the same view as CHTTL. If using the current approach, it will be complicated.

**Issue 4-3-4: Categorization of DC combinations**

* Proposals
  + Proposal 1 (ZTE). It is suggested to regroup the inter-band DC configurations with the guidelines in Observation 1 and take the following aspects into consideration.
    - To categorize DC configurations having only contiguous CA parts into one group.
    - To differentiate the DC configurations having non-contiguous CA parts with the DC configurations having only contiguous CA parts.
    - To group the DC configurations on the basis of “common band combination”, i.e. the constituent bands having the same band sequence
    - Please see R4-2416110, R4-2416111, R4-2416112, R4-2416113 for detailed examples
  + Option 2: Other
* Recommended WF
  + Discuss

Qualcomm: there will be ambiguity.

Apple: this CR is useful but not too important.

ZTE: CR depends on previous guidance in the TR. In the spec, some combinations are grouped according to the TR. Others are not. That will be ambiguity. We should follow the one general guidance.

CATT: For this re-groupping, the uplink configuration information may be different. If we merge them the uplink information will be lost.

CHTTL: This CR is aligned with the previous agreement for the structure. I think that is not a new issue. CR is agreeable.

Moderator: Check them until tomorrow.