**3GPP TSG-RAN WG4 Meeting # 99-e draft R4-2108372**

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

**Agenda item:** 4.1.10

**Source:** Moderator (Spirent Communications).

**Title:** Second round e-mail discussion summary: [99-e][242] NR\_NewRAT\_Positioning

**Document for:** Information

# Introduction

This Email thread covers Positioning maintenance for agenda item 4.1.10.

List of topics:

* Topic 1: Maintenance of the Positioning specs (36.171, 37.171 and 38.171)
* R4-2108881: CR Addition of missing data for BDS B1C, 38.171
* R4-2108882: CR Addition of missing data for BDS B1C, 36.171
* Topic 2: Reply to RAN5 LS R4-2100021, "LS on Frequency Bands for testing of A-GNSS Sensitivity requirements in NR and LTE"
* R4-2109002: Frequency bands for testing of A-GNSS sensitivity requirements in NR and LTE
* R4-2109326: Further discussion on testing of A-GNSS Sensitivity requirements in NR and LTE
* R4-2110199: Discussion on Frequency Bands for testing of A-GNSS Sensitivity requirements in NR and LTE
* R4-2110959: Discussion on frequency bands for testing of A-GNSS Sensitivity requirements in NR and LTE (originally in AI 13.2)

# Topic #1: Maintenance of the Positioning specs (36.171, 37.171 and 38.171)

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

## Companies’ contributions summary

(Cat A CRs are not listed)

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2108881**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2108881.zip) | Spirent Communications | Addition of missing data for BDS B1C (38.171) |
| [**R4-2108882**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2108882.zip) | Spirent Communications | Addition of missing data for BDS B1C (36.171) |

## Open issues summary

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

* Recommended WF: agree contents of CRs.

## Companies views’ collection for 1st round

### 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** |
| [**R4-2108881**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2108881.zip) | Company A |
| Company B |
|  |
| [**R4-2108882**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2108882.zip) | Company A |
| Company B |
|  |

## Summary for 1st round

### CRs/TPs

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

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| [**R4-2108881**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2108881.zip) | *Agreeable. (no comments received)* |
| [**R4-2108882**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2108882.zip) | *Agreeable. (no comments received)* |

# Topic #2: Reply to RAN5 LS R4-2100021, "LS on Frequency Bands for testing of A-GNSS Sensitivity requirements in NR and LTE"

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

## Companies’ contributions summary

(Cat A CRs are not listed)

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2109002**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109002.zip) | Qualcomm Incorporated | Frequency bands for testing of A-GNSS sensitivity requirements in NR and LTE  **Proposals for EN-DC.**  **Proposal 1:** The EN-DC configurations for testing the A-GNSS Sensitivity requirements should be those UL band combinations that can generate second or third order intermodulation (IM) products falling into the GNSS L1/E1/G1/B1 typical receiver bands:  - GPS L1 C/A : 1574.3970 – 1576.4430 MHz  - Galileo E1 / GPS L1C: 1573.3740 – 1577.4660 MHz  - GLONASS G1: 1597.5515 – 1605.8860 MHz  - BDS B1I: 1559.0520 – 1563.1440 MHz  **(Table with 2nd or 3rd IMDs provided)**  **Proposal 2:** EN-DC configurations that can generate second or third order intermodulation (IM) products falling into the GNSS bands of a not supported GNSS do not need to be tested.  **Proposal 3:** For the A-GNSS Sensitivity Test in EN-DC operation mode, TS 38.171 should specify the E-UTRA and NR frequencies, carrier bandwidth, RB allocation, and other channel configurations which may impact the test result for each GNSS signal.  **Proposal 4:** Divide the EN-DC configurations into groups with similar IMD level and risks according to Annex B. For each group, only one of the EN-DC configurations in the group need to be tested.  **Proposals for LTE and NR SA.**  **Proposal 5:** For the A-GNSS Sensitivity Test in LTE or NR single carrier operation mode, the test should be repeated in the following E-UTRA/NR bands (if supported by the UE): Bands 13, 14, 24, 44.  **Proposal 6:** For the A-GNSS Sensitivity Test in LTE or NR single carrier operation mode, TS 38.171 should specify the E-UTRA and NR frequencies, carrier bandwidth, RB allocation, and other channel configurations which may impact the test result for each GNSS.  **Proposal 7:** If any of the operating bands 13, 14, 24, 44 is already tested as part of EN-DC operation mode, the A- GNSS sensitivity tests should still be repeated for LTE and NR only operation mode in these bands (if supported by the UE).  **Proposals for GNSS bands to be considered**  **See proposals 1 and 2**  **Proposals for documentation.**  **See proposals 3 and 6.**  **Proposal 8:** Agree on the Text Proposal in Annex C as baseline for TS 38.171. |
| [**R4-2109326**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109326.zip) | Apple | Further discussion on testing of A-GNSS Sensitivity requirements in NR and LTE  **Proposals for EN-DC.**  ***(Table with 2nd or 3rd IMDs provided)***  **Proposals for LTE and NR SA.**  ***Proposal 1: For LTE bands operating in SA single carrier modes, only four bands, i.e., 13, 14, 24, 44 may have interference to A-GNSS operating in the RNSS band 1559-1610MHz and should be tested.***  ***Proposal 2: For NR bands operating in SA single carrier modes, only five bands, i.e., n13, n14, n24,*** ***n79 and n96 may have interference to A-GNSS operating in the RNSS band 1559-1610MHz and should be tested.***  **Proposals for GNSS bands to be considered**  ***Proposal 3: 1559-1610MHz is considered in RAN4 analysis when identifying LTE/NR bands or high-risk UL band combinations for testing.***  **Proposals for documentation.**  ***Proposal 4: The list based on RAN4 agreement is documented in TS 37.571-1, i.e., maintained by RAN5.***  ***Proposal 5: RAN4 sends a reply LS to RAN5 with the agreed list of bands and band combinations at this meeting.*** |
| [**R4-2110199**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110199.zip) | Xiaomi | Discussion on Frequency Bands for testing of A-GNSS Sensitivity requirements in NR and LTE  **Proposals for EN-DC.**  **(Two tables with 2nd or 3rd IMDs for the two GNSS bands provided)**  **Proposal 4: above “high-risk UL band combinations” shall be considered when testing of A-GNSS Sensitivity in EN-DC.**  **Proposals for LTE and NR SA.**  **Proposal 1: for the supported bands which can be operated for both LTE and NR, only NR side is tested when testing A-GNSS sensitivity**  **Proposal 2: option 2 is preferred. (**Repeat the test in a subset of UE supported bands)  **Proposal 3: FR2 bands can be excluded when testing A-GNSS sensitivity**  **Proposals for GNSS bands to be considered**  **None (but both GNSS bands analyzed for EN-DC)**  **Proposals for documentation.**  **None** |
| [**R4-2110959**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110959.zip) | Spirent Communications | Discussion on frequency bands for testing of A-GNSS Sensitivity requirements in NR and LTE (originally in AI 13.2)  **Proposals for EN-DC.**  **Proposal 2: for the EN-DC band combinations for testing we adopt the lists of UL band combinations that generate 2nd or 3rd IMDs falling into the GNSS bands as proposed by other companies, while allowing that GCF and PTCRB may further select from these lists.**  **Proposals for LTE and NR SA.**  **Proposal 1: for the LTE and NR (SA) bands for testing we should maintain the current status with Option 1:**  **• Option 1: Repeat the test in all UE supported bands**  **Proposals for GNSS bands to be considered**  **Proposal 3: for the GNSS band(s) to be considered in RAN4 analysis when identifying LTE/NR bands or high-risk UL band combinations for testing:**   * **The analysis is performed on both GNSS bands** * **In the case a UE only supports one of the GNSS bands then (obviously) only the analysis for that GNSS band is used for the testing** * **In the case a UE supports both of the GNSS bands then only the analysis for the “primary” (or “acquisition”) GNSS band is used for the testing**   **Proposals for documentation.**  **Proposal 4: for the documentation and maintenance we should adopt Option 2:**   * **Option 2: the list is documented in TS 37.571-1, i.e. maintained by RAN 5** |

## 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: Proposals/WF for EN-DC

* Proposals
  + Already agreed that only 2nd or 3rd IMDs will be considered
  + Option 1: only consider GNSS “L1” typical receiver bands, and EN-DC configurations whose (IM) products fall into the GNSS bands of a not supported GNSS do not need to be tested. (Qualcomm)
  + Option 2: consider GNSS “L1” band (Apple)
  + Option 3: consider GNSS “L1” and “L5” band (Xiaomi – assumed, Spirent)
  + Option 4: in addition, divide the EN-DC configurations into groups with similar IMD level and risks. For each group, only one of the EN-DC configurations in the group need to be tested (Qualcomm)
  + Other proposal (Qualcomm):
    - carrier bandwidth, RB allocation, and other channel configurations should be specified
* Recommended WF
  + Already agreed that only 2nd or 3rd IMDs will be considered.
  + Agree that “L1” band will be considered, but further discuss if whole band should be considered or only typical receiver bands of supported GNSSs
  + For “L5” band further discussion needed.
  + Discuss Option 4 as an addition to one of Option 1, 2, 3
  + Discuss “Other proposal” as detailed above.

### Sub-topic 2-2: Proposals/WF for LTE and NR SA

* Proposals
  + Option 1: only consider E-UTRA/NR bands: Bands 13, 14, 24, 44 (Qualcomm)
  + Option 2: as option 1 plus NR Bands n79 and n96 (Apple, Xiaomi - assumed)
  + Option 3: all UE supported bands (Spirent)
  + Other proposals:
    - carrier bandwidth, RB allocation, and other channel configurations should be specified (Qualcomm)
    - If any of the operating bands 13, 14, 24, 44 is already tested as part of EN-DC operation mode, the tests should still be repeated for LTE and NR only operation mode in these bands (Qualcomm)
    - FR2 bands can be excluded (Xiaomi)
* Recommended WF
  + Options 1 and 2 can probably be merged?
  + Further discussion needed

### Sub-topic 2-3: Proposals/WF for GNSS bands to be considered

Covered by sub-topic 2-1

### Sub-topic 2-4: Proposals/WF for documentation

* Proposals
  + Option 1: RAN 4 should document (and maintain?) (Qualcomm)
  + Option 2: RAN 5 should document and maintain (Apple, Spirent)
  + Other proposals (Apple):
    - RAN4 sends a reply LS to RAN5 with the agreed list of bands and band combinations
* Recommended WF
  + Further discussion needed. If RAN 5 is selected, then proposal to send agreed lists can be agreed.

## Companies views’ collection for 1st round

### Open issues

|  |  |  |
| --- | --- | --- |
| **Company** |  | **Comments** |
| Apple |  | Sub topic 2-1: We are ok with option 1 or option 2. Option 1 is even more targeted as it further narrows down to the exact GPS bands. We also think option 4 can be pursued in RAN4 since it strikes a good balance of good test coverage and limited testing overhead.  Sub topic 2-2: Option 2  Sub topic 2-4: As said in our contribution, We don’t have a strong preference, as long as the list of bands or band combinations are based on RAN4 agreement. Meanwhile, if RAN4 agrees to adopt option 4 for sub topic 2-1, maybe we can have a bit more discussion which group, RAN4 or RAN5 should do the work.  Others: Apple volunteers to draft the reply LS to RAN5. |
| Qualcomm |  | Sub topic 2-1:  Support Option 1: Some EN-DC combinations have IM2/3 in e.g., BDS or GLONASS bands only. Those EN-DC combinations would not need to be tested if a device does not support e.g., BDS or GLONASS.  Support Option 4: There are several EN-DC combinations which result in similar interference mechanism for GNSS victim bands. It is sufficient to test only one such EN-DC combination in each group of EN-DC combinations.  Other:  Carrier frequency etc. need to be specified to meet the test purpose. Leaving it to test equipment implementation and/or as currently specified in TS 38.171, Annex B.1.7 may lead to different test outcome on different test equipment.Sub topic 2-2:  Support Option 1, but would also be O.K. with Option 2.  Other:  Similar to sub topic 2-1, we think carrier frequency etc. need to be specified to meet the test purpose.  Sub topic 2-4:  Support Option 1. I think it is common practice that RAN4 defines the relevant test details; e.g., Annexes of TS 38.133.Otherwise, some description on selecting bands, band-combinations, test frequencies/channel configuration, etc. would have to be added in TS 38.171 which allows RAN5 to define the relevant details.  As mentioned in the RAN5 LS, this "repeated testing in different bands" was introduced in RAN5 long time back, but without proper documentation of the motivation. I believe also GCF/PTCRB did not always follow the "RAN5 rule" (?) Having this as part of the core requirements may avoid similar issues/confusion in the future.  Others: |
| Spirent |  | Sub topic 2-1:  For L1, Option 1 seems sensible assuming the UE filtering cuts off round the supported bands only.  For L5, we are OK to ignore this for now, assuming that no UEs will use L5 for acquisition. If this ever changes then we will have to re-consider.  Option 4 sounds sensible but we want to consider some more.  Agree b/w, RB, etc. should be specified.  Sub topic 2-2:  Still support Option 3.  Agree b/w, RB, etc. should be specified.  Sub topic 2-4:  Agree RAN 4 should define all the test conditions as is done in 38.133. Our only concern is the maintenance as new bands and combinations appear – RAN 4 is often reluctant to do maintenance.  Others: |
| R&S |  | Sub topic 2-2:  We prefer Option 3. The test reduction was motivated by the numerous EN-DC combinations. In case of single band RAT, we prefer to test as done so far, each single band.  Sub topic 2-4:  We prefer detailed maintenance to take place in RAN5, as closer to the industry requirements. |
| Xiaomi |  | Sub topic 2-1: Support option 1.  Sub topic 2-2: Option 2. for the supported bands which can be operated for both LTE and NR side, only one side is tested when testing A-GNSS sensitivity |

## 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:** Proposals/WF for EN-DC | ***Status after round 1:***  *Option 1: “limited” L1 only: Apple, Qualcomm, Spirent, Xiaomi*  *Option 2: all of L1 only: Apple*  *Option 4: group EN-DC configurations: Apple, Qualcomm, Spirent*  *Other proposal carrier bandwidth, RB allocation, and other channel configurations should be specified: Apple, Qualcomm, Spirent.*  ***Agreements:***  *1. “Limited” L1 (only) to be used (option 1).*  *2. Group EN-DC configurations to be created (option 4).*  *3. Carrier bandwidth, RB allocation, and other channel configurations to be specified (other proposal)*  ***Recommendations for 2nd round:***  *1. Apple prepares LS to RAN 5 with these agreements.* |
| **Sub-topic 2-2:** Proposals/WF for LTE and NR SA | ***Status after round 1:***  *Option 1: “limited” bands only: Apple, Qualcomm*  *Option 2: “limited” bands plus extras only: Apple, Qualcomm, Xiaomi*  *Option 3: all UE supported bands: Spirent, R&S*  *Other proposal carrier bandwidth, RB allocation, and other channel configurations should be specified: Qualcomm, Spirent, (no objections).*  ***Agreements:***  *No agreement on Bands.*  *1. Carrier bandwidth, RB allocation, and other channel configurations to be specified (other proposal)*  ***Recommendations for 2nd round:***  *1. We agree that no agreement will be reached on the issue of LTE and NR SA Bands and therefore we do not discuss further, and the existing status quo will remain (all Bands are tested).*  *2. Apple prepares LS to RAN 5 with these agreements.* |
| **Sub-topic 2-4:** Proposals/WF for documentation | ***Status after round 1:***  *Option 1: RAN 4: Apple, Qualcomm, Spirent*  *Option 2: RAN 5: Apple, Spirent, R&S*  ***Agreements:***  *1. Propose we combine the two options so that RAN 4 defines the conditions for the tests e.g. rules for EN-DC combinations, rules for LTE and NR SA bands, Carrier bandwidth, RB allocation, and other channel configurations etc. and then RAN 5 maintains the details as new bands appear.*  ***Recommendations for 2nd round:***  *1. Apple prepares LS to RAN 5 with this agreement.*  *2. We discuss when and who will create TPs for RAN 4 specifications 36.171 and 38.171 (likely more discussion will be needed for the details of the TPs).*  *3. We produce a WF with the agreements and the WF for the TPs.* |

*Suggestion on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| LS to RAN 5 | ?? | Apple |
| WF | ?? | ?? |

## Discussion on 2nd round

## Open issues summary 2nd round

### Sub-topic 2-1: Proposals/WF for EN-DC for 2nd round

* Agreements from round 1:
  + Group EN-DC configurations to be created.
  + Carrier bandwidth, RB allocation, and other channel configurations to be specified
* Proposals for round 2:
  + #1: Group EN-DC configurations to be created:
    - Proposal (Qualcomm [R4-2109002](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109002.zip)):

The LTE and NR bands be divided into different Band Groups based on the frequency range. When the two UL bands of two EN-DC configurations are from the same group, the IMD level and risks are similar for these two EN-DC configurations. In general, the EN-DC configuration with UL frequency closer to GNSS victim bands can be selected as the representative EN-DC configuration for this band group combination. If this particular EN-DC configuration is not supported by the DUT, another EN-DC configuration within the same band group combination can be selected instead.

The following Band Groups are defined:

- VHF: 400.0 – 458.0 MHz

- LB: 662.0 – 916.0 MHz

- MLB: 1426.0 – 1518.0 MHz

- MB: 1626.0 – 2025.0 MHz

- HB: 2300.0 – 2690.0 MHz

- UHB1: 3300.0 – 4201.0 MHz

- UHB2: 4400.0 – 5000.0 MHz

Table 1 of [R4-2109002](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109002.zip) summarizes the EN-DC Group-Combinations with High Risks based on the analysis in Annex A of [R4-2109002](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109002.zip) (note now agreed to only consider L1).

Annex B of [R4-2109002](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109002.zip) proposes these EN-DC configurations in groups with similar IMD level and risks.

* + #2: Carrier bandwidth, RB allocation, and other channel configurations to be specified:
    - Proposal (Qualcomm [R4-2109002](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109002.zip)):
      * E-UTRA and NR frequencies
      * Carrier bandwidth
      * RB allocation
      * other channel configurations to be discussed below
* Recommended WF
  + Discuss proposals as detailed above.

### Sub-topic 2-2: Proposals/WF for LTE and NR SA for 2nd round

* Agreements from round 1:
  + Carrier bandwidth, RB allocation, and other channel configurations to be specified
* Proposal for round 2:
  + Carrier bandwidth, RB allocation, and other channel configurations to be specified:
    - Proposal (Qualcomm [R4-2109002](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109002.zip)):
      * E-UTRA / NR frequencies
      * Carrier bandwidth
      * RB allocation
      * other channel configurations to be discussed below
* Recommended WF
  + Discuss proposal as detailed above.

### Sub-topic 2-3: Proposals/WF for GNSS bands to be considered

Covered by sub-topic 2-1

### Sub-topic 2-4: Proposals/WF for documentation for 2nd round

* Agreements from round 1:
  + RAN 4 defines the conditions for the tests e.g. rules for EN-DC combinations, rules for LTE and NR SA bands, RAN 5 maintains the details as new bands appear.
* Proposals
  + Companies volunteer to create TPs for RAN 4 specifications 36.171 and 38.171 (see for example Qualcomm [R4-2109002](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109002.zip)) for review.
  + (Apple) creates reply LS to RAN5 with the agreements and details of planned work for 36.171 and 38.171.
* Recommended WF
  + Discuss proposals as detailed above.
  + Create WF document.

## Companies views’ collection for 2nd round

### Open issues

|  |  |  |
| --- | --- | --- |
| **Company** |  | **Comments** |
| Qualcomm |  | Sub topic 2-1: Agree (proponent)  Sub topic 2-2: Disagree. This proposal is not needed since the rapporteur concluded that "the existing status quo will remain". The status quo in RAN4 is that there is no repetition of tests in different bands needed (e.g., no such "repetition" requirements are specified in the core specifications 36.171/38.171).  Sub topic 2-4: Since new EN-DC combinations are introduced in RAN4 (and not in RAN5), RAN4 should also list the EN-DC combinations for each group.  Others: |
| Apple |  | Sub topic 2-1: We support  Sub topic 2-2: As analyzed in our contribution, where the possible RF interference mechanisms include harmonic interference, cross band isolation, and RX harmonic mixing are analyzed, only 4 LTE bands 13, 14, 24, 44 and 5 NR bands n13, n14, n24, n79 and n96 should be considered for testing. In additional, we agree with Xiaomi and in case of the same LTE and NR band supported by a UE, i.e. 14/n14, it suffices to test either LTE band 14 or NR band n14 because of the same interference mechanism. This is similar to the grouping idea for EN-DC case as agreed in the first round.  Sub topic 2-4: We are ok for RAN4 to capture the rules and maintain the lists as proposed by QC, which can be captured in the WF at this meeting and detailed CRs can be agreed at the next RAN4 meeting.  Others: |
| Xiaomi |  | Sub topic 2-1: We are ok the proposal on band group concept.  Sub topic 2-2: We share the same view with Apple. Only some of bands need to be tested and we think the test configuration can be left to RAN5  Sub topic 2-4: we are ok the proposals  Others: |
| Spirent |  | Sub topic 2-1: We agree on both proposals. For proposal #2 we consider that the proposed channel configurations are sufficient (E-UTRA and NR frequencies, Carrier bandwidth, RB allocation) and nothing extra is needed.  Sub topic 2-2: We think there is possibly some misunderstanding here ….  The “existing status quo” is that RAN 4 is **silent** on the issue of Bands for LTE and NR SA (so nothing specified). However, RAN 5 specifies the testing takes place in every supported Band. In Round 1 there was no agreement on any new proposal (3 companies for a change, 2 companies against a change), so as is normal in 3GPP, nothing will change.  So there will be no changes to the Bands in RAN 4 (so RAN 4 will remain silent) but there was an **additional** proposal that RAN 4 **could** specify the channel configurations to be used such as bandwidth etc. If we have understood correctly, other companies seem to be against this. We are neutral on this so if other companies do not want to do this, we can accept that.  Sub topic 2-4: We agree with Apple for RAN4 to capture the rules and maintain the lists as proposed by QC, which can be captured in the WF at this meeting and detailed CRs can be agreed at the next RAN4 meeting.  Others: |
| AT&T |  | Sub topic 2-2: RAN4 should only provide information concerning the harmonic cases and where they exist to RAN5 and should not conclude that testing is only required in specific bands with harmonics (this is a RAN5 decision). RAN4 should highlight these cases but let RAN5 decide concerning the bands for test since RAN5 needs to address the needs of the certification bodies which can include a wider set of operating bands.  Concerning the comment related to the case of the same LTE and NR band being supported by a UE, we believe that the RAN4 conclusion that the same interference mechanism exists can be communicated to RAN5. However, it is ultimately a RAN5 decision concerning test applicability in this case to decide if testing is done in LTE and/or NR.  We believe that the WF and any reply LS should be updated to provide information/guidance to RAN5 but to let RAN5 decide on test points. |

## Summary on 2nd round

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

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic 2-1:** Proposals/WF for EN-DC | ***Status after round 2:***  ***Final Agreements:***  *1. “Limited” L1 (only) to be used (from Round 1).*  *2. Group EN-DC configurations to be created (from Round 1).*  *3. For channel configurations* E-UTRA and NR frequencies, Carrier bandwidth and RB allocations *should be specified and nothing extra is needed.*  ***Recommendations for WF and LS:***  *1. Above agreements are documented in WF, LS.*  *2. CR for 38.171 to be prepared for next meeting.* |
| **Sub-topic 2-2:** Proposals/WF for LTE and NR SA | ***Status after round 2:***  *Discussion continued from round 1 with some confusion and Companies re-stating their positions. New “Option 4” added by AT&T:*  *Option 4: RAN4 should only provide information concerning the harmonic cases and where they exist to RAN5 and should not conclude that testing is only required in specific bands with harmonics (this is a RAN5 decision).*  ***Final Agreements:***  *No agreement on Bands. Additional Option 4 added by AT&T.*  ***Recommendations for WF, LS:***  *Discussion to continue in next meeting.* |
| **Sub-topic 2-4:** Proposals/WF for documentation | ***Status after round 2:***  ***Agreements:***  *1. RAN 4 will define the conditions for the tests*  *2. Detailed CR for 38.171 can be agreed at the next RAN4 meeting.*  ***Recommendations for WF and LS:***  *1. Above agreements are documented in WF, LS.* |