**3GPP TSG-RAN WG4 Meeting # 99-e R4-2108432**

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

**Agenda item:** 6.3.2.1

**Source:** Moderator (Nokia)

**Title:** Email discussion summary for [99-e][307] NR\_IAB\_Conformance\_Part2

**Document for:** Information

# Introduction

This email discussion focuses on IAB conformance test. Following sub-AIs are covered in this discussion:

*6.3.2.3 Conducted conformance testing [NR\_IAB-Perf]*

*6.3.2.3.1 Transmitter characteristics [NR\_IAB-Perf]*

*6.3.2.3.2 Receiver characteristics [NR\_IAB-Perf]*

*6.3.2.3.3 Other test issues [NR\_IAB-Perf]*

*6.3.2.4 Radiated conformance testing [NR\_IAB-Perf]*

*6.3.2.4.1 Transmitter characteristics [NR\_IAB-Perf]*

*6.3.2.4.2 Receiver characteristics [NR\_IAB-Perf]*

*6.3.2.4.3 Other test issues [NR\_IAB-Perf]*

Most of contribution includes TPs for conducted or OTA test specification. Discussion is split for these two types of specifications.

List of candidate target of email discussion for 1st round and 2nd round

* 1st round: To discuss submitted TPs to TS 38.176-1 (conducted) and TS 38.176-2 (OTA).
* 2nd round: TBA

# Topic #1: Updated TS 38.176-1 and text proposals (conducted)

This topic includes submitted contributions and mainly test proposals (TPs) to conducted IAB conformance specification 38.176-1.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2111397 | Huawei | Title: TS 38.176-1 -Updated TS 37.176-1 |
| R4-2111399 | Huawei | Title: TP to TS 38.176-1 -Clean up |
| R4-2109019 | CATT | Title: TP for TS 38.176-1: Transmitted signal quality |
| R4-2111403 | Huawei | Title: TP to TS 38.176-1 - OTA Tx dynamic range, clause 6.3 |
| R4-2111177 | Ericsson | Title: TP for IBB, OBB and RX spurious of conducted receiver test |
| R4-2111405 | Huawei | Title: TP to TS 38.176-1 - Sensitivity, clause 7.2 |
| R4-2110609 | ZTE Corporation | Title: TP to TS 38.176-1: Annex G and H: In-channel TX test |
| R4-2109832 | Nokia, Nokia Shanghai Bell | Title: TP to TS 38.176-1 Clause 4.6 Declarations for IAB conducted test specification    Definition of share IAB hardware proposed:   |  |  |  |  |  | | --- | --- | --- | --- | --- | | D.IAB-1 | Shared or common RF implementation. | Declaration whether IAB-MT and IAB-DU have shared or identical RF implementation, used for testing efficiency improvement. | x | x | |
| R4-2111175 | Ericsson | Title: On IAB-MT dynamic range and power control test for conduct test  (Moderator note: no proposal 1 and 2, only 3 and 4 in Tdoc)  Proposal-3: Use the table 1 as the Tx dynamic test requirement.  Proposal-4: Z = [2] dB in the test point accuracy relating to the Y (RB change).   |  |  |  |  | | --- | --- | --- | --- | | Test point | Expected power step size (Down) | PUSCH (normal condition) | | |  | ΔP [dB] | [dB] | | | Test point 1 | 0 | Relative to the declare output power | f ≤ 3.0 GHz: ± 2.7 dB | | 3.0 GHz < f ≤ 6.0 GHz: ± 3.0 dB | | Test point 2 | 10 log(Maximum RB)+ 5 / 10 acc. to WA/LA IAB-MT Tx danymic range requirement | Relative to the Test point 2’ output power | -10 log(Maximum RB)- 5/10 ± 5.5 +/- (Z +TT) | |
| R4-2111181 | Ericsson | Title: IAB-MT specific declaration FR1  Definition of share IAB hardware proposed:   |  |  |  |  |  | | --- | --- | --- | --- | --- | | [D.IAB-1] | Share IAB hardware | Declaration whether IAB-MT and IAB-DU share the same hardware. | x | x | |
| R4-2111402 | Huawei | Title: Discussion on IAB-MT TX dynamic range testing  (Moderator note: Tdoc for discussion)  The MU for each of the IAB types has been proposed and they are the same in all cases:  ±0.7 dB, BW ≤ 40MHz  ±1.0 dB, 40MHz < f ≤ 100MHz  And with TT=MU the test requirement is for example FR1 conducted:  The issue of merging the DR test with the relative power requirement is also discussed and whilst the 2 core requirements are not fully aligned for such a merger it sufficient to test only the final step in the relative power tolerance and hence the 2 test can be merged. It is suggested that the power control step applied to test point 2 is left to the vendor to select (it is not strictly a free choice but the 1st step that can pass both requirements, which could differ depending on accuracy capability).  The test requirement is hence (for example):  For Local area IAB-MT  (BW≤40MHz)  PTest point 1- PTest point 2≥ 9.3dB + 10log10(Max RB)  And  STEP\_max – 6.2 ≤PTest point 1- PTest point 2 + 10log10(Max RB) ≤ STEP\_max + 6.2,  (40MHz < BW ≤ 100MHz)  PTest point 1- PTest point 2≥ 9.0dB + 10log10(Max RB)  And  STEP\_max – 6.5 ≤PTest point 1- PTest point 2 + 10log10(Max RB) ≤ STEP\_max + 6.5,  The relative power control requirement does not apply to wide area so the threshold requirement is sufficient for this. |

## Open issues summary

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

### Sub-topic 1-1

*Sub-topic description:*

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

**Issue 1-1: IAB declaration with definition of shared IAB hardware:**

* Proposals
  + Option 1: Nokia proposal from R4-2109832
  + Option 2: Ericsson proposal from R4-2111181
* Recommended WF
  + TBA

-----------GTW Note--------

Agreement: further work based on E/// proposal on option 2.

### Sub-topic 1-2

*Sub-topic description:*

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

There are two different views on Tx dynamic range test requirements. One view is as described in Tdoc R4-2111175 and second as described in Tdoc R4-2111402.

**Issue 1-2: Tx dynamic range test requirements**

* Proposals
  + Option 1: As proposed in R4-2111175 (Ericsson)
  + Option 2: As proposed in R4- 2111402 (Huawei)
  + Option 3: TBA
* Recommended WF
  + TBA

**-------------------GTW Note ----------------**

**-Option 1：(E////)**

|  |  |  |  |
| --- | --- | --- | --- |
| Test point | Expected power step size (Down) | PUSCH (normal condition) | |
|  | ΔP [dB] | [dB] | |
| Test point 1 | 0 | Relative to the declare output power | f ≤ 3.0 GHz: ± 2.7 dB |
| 3.0 GHz < f ≤ 6.0 GHz: ± 3.0 dB |
| Test point 2 | 10 log(Maximum RB)+ 5 / 10 acc. to WA/LA IAB-MT Tx danymic range requirement | Relative to the Test point 2’ output power | -10 log(Maximum RB)- 5/10 ± 5.5 +/- (Z +TT)  Z = 2 dB/0 dB |

**-Option 1a：(Samsung)**

IAB-MT type 1H/1O: -10 log(Maximum RB)- 5/10+/- (5.5+ TT)

IAB-MT type 2O: -10 log(Maximum RB)- 5/10 +/- (6+TT)

*Option 3: (Nokia)*

-10 log(Maximum RB)- 5/10 +/- (2.5 dB + TT) for 1-C and 1-O

-10 log(Maximum RB)- 5/10 +/- (3 dB + TT) for 2-O

*Agreement:*

IAB-MT type 1H/1O: -10 log(Maximum RB)- 5/10+/- ([5.5]+ TT)

IAB-MT type 2O: -10 log(Maximum RB)- 5/10 +/- ([6]+TT)

## Companies views’ collection for 1st round

### Open issues

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

Sub topic 1-1

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| --- | --- |
| **Company** | **Comments** |
| Ericsson | We have a WF agreement to use the shared hardwar wording, it will be even better to align with the TR 38.809 for the RF architecture. In declaration, there is no need to mention the purpose as it will be reflected in the performance specification. |
| Huawei | The name does not have to explain exactly what it is, replacing “identical” with “common” leaves “shared or common “ which is kind of the same thing. Ericsson name is probably better.  In the description I think there is no need to explain what the declaration is for (i.e. to reduce testing) only what it is, again the Ericsson proposal is probably simpler  So option 2  In both why have we changed the UID to D.IAB-x and not just carry on the list D.x ? ok these are IAB specific but the whole list is in the IAB spec so should be unique to this spec Both part 1 and part 2 start with D1 and they are different D1’s so its implicit that the list belongs to the spec in question, hence I don’t see the need to ass IAB to the UID – in fact its confusing as to why. |
| CATT | Agree with Huawei that wording “common” or something may be needed. But how to understand “share”? If part of the share still work? Such as only LO? And also “RF” may be needed, hardware includes BB hardware. Maybe “share the whole RF hardware” or other more accurate wording. |

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| --- | --- |
| Nokia | In WF R4-2103857 following is documented: “Detailed declaration wording shall be agreed in TP  drafting phase.”, thus we think this is not finally decided.  But if it is somehow documented that "shared HW" can mean the same implementation even though MT and DU would not be in same physical enclosure, we are fine. Agree with Ericsson, it will be fine to not mention the purpose. |

|  |  |
| --- | --- |
| Nokia | In WF R4-2103857 following is documented: “Detailed declaration wording shall be agreed in TP drafting phase.”, thus we think this is not finally decided.  But if it is somehow documented that "shared HW" can mean the same implementation even though MT and DU would not be in same physical enclosure, we are fine. Agree with Ericsson, it will be fine to not mention the purpose. |

Sub topic 1-2

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Ericsson | Th dynamic range required is in place of the power control requirement for local area IAB-MT (ΔP <10 dB). There is no need to go beyond 10 dB which is TX PSD dynamic range requirement. From this perspective, the output power accuracy needs to be considered in the test requirement as the radio chain condition cannot be the same (TX gain and PA operationg point needs to be changed for different PSD ) and thus it cannot be cancel out. We are however ok with reduced the MU as the test point 1 and 2 measurment setup will be kept the same and thus the uncertainty of measurement can be cencle out. |
| Huawei | The Ericsson proposal adds the relative power tolerance uncertainty onto the target power for the dynamic range test. As such if the accuracy is +5.5dB, the total DR is only 4.5dB hence will not meet the DR requirement (which is at least 10dB). If we merge these we need to meet both requirements5 |
| Nokia | Option 1 and Option 2 result in the test becoming meaningless. The proposals in option 1 allow tolerances up to +/- 9 dB +/- TT. This means that if the expected power change would be 25 dB, the allowed power change to pass the test is from –16 – TT to +34 + TT. This test does not have value.  In option 2 there are cases where there is no accuracy requirement, which also makes the test meaningless. The power change from change in number of RBs becomes meaningless if you can pass the test just by dropping PSD by a very large amount.  Our suggestion would be to define a meaningful test with reasonable power tolerance. Our suggestion is that the power change compared to the measured power of test point 1 is:  -10 log(Maximum RB)- 5/10 +/- (2.5 dB + TT) for 1-C and 1-O  -10 log(Maximum RB)- 5/10 +/- (3 dB + TT) for 2-O  It should be noted that test point 1 already has tolerance of normal power measurement, so static errors are cancelled out. Taking the same numerical example of 25 dB ideal power change, our proposal would result the test to be passed when power change is from 22-TT to 28+TT dB. This allows for additional tolerance due to lower PSD, but keeps also the power change from change in number of RBs meaningful.  We propose above as Option 3 to have meaningful tests:  -10 log(Maximum RB)- 5/10 +/- (2.5 dB + TT) for 1-C and 1-O  -10 log(Maximum RB)- 5/10 +/- (3 dB + TT) for 2-O |
| Samsung | We believe our discussion logic would be more closed to option 1 from Ericsson. However, it is not sure why RB change accuracy should be taken into account if this has not been considered before for BS “total power dynamic range”. Hence we suggest below modified option 1 for delta between test point 1 and point 2 as:  IAB-MT type 1H/1O: -10 log(Maximum RB)- 5/10+/- (5.5+ TT)  IAB-MT type 2O: -10 log(Maximum RB)- 5/10 +/- (6+TT) |
| CATT | We tend to support the idea from Ericsson. The DR step should not be larger than the core requirement but the test requirement can consider the tolerance and TT. One point is not understood by us is the RB change accuracy. There’s total dynamic range requirement for BS, our understanding is that that’s similar with UE RB change, and there’s no tolerance for BS, then should this be considered by IAB-MT? |

### CRs/TPs comments collection

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

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2111397  Huawei | Company A  Company B |
| R4-2111399  Huawei | Ericsson: ok  Company B |
| R4-2109019  CATT | Ericsson: ok  Huawei: Freq error IAB-MT MU is different (if the current spreadsheet values re accepted)  In core spec we have separate sub-clauses for IAB-DU and IAB-MT As the test req (and MU) are also different I think that would be better here also.  TAE the test req its not clear its IAB-DU only (although it’s clear elsewhere maybe it’s worth pointing out here also)  Still have 5MHZ channel BW in tables, also should the column header be IAB Channel BW or whatever the correct term is?  CATT: Thanks Huawei for the comments. MU will be updated according to the agreements in this meeting. The separate clauses issue can be fixed in the revision, I’ll see if I can find a good structure especially for the modulation quality sub-clauses. My point was that there was so many common parts like EVM window length for DU and MT, I’m not sure if a good way can be found for the structure to avoid so many duplicate texts. 5MHz will be removed in the revision. |
| R4-2111403  Huawei | Ericsson: need more discussion on issue 1-2  Nokia: The condition of declared maximum power step >= 10dB as proposed in R4-2111402 is not stated. Also discussed in issue 1-2 |
| R4-2111177  Ericsson | Huawei: TP doesn’t actually say what document its for (probably 38.176-1). Many of the updates have been implemented in the editorial update already (R4-2111399) its better to update references in this docent (as this uses a different update of the reference list)  Nokia: Not all references are corrected in line with Editor of 38.176-1 spec proposal in R4-2111399. Perhaps it is better to keep such corrections of references for Editor. Corrections proposed to i.e. tables numbers in text are valid. |
| R4-2111405  Huawei | Ericsson;ok  Nokia: OK  ZTE: okay |
| R4-2110609  ZTE Corporation | Ericsson: CATT has a CR on corresponding core part, maybe need to double check after the CR is agreed.  Huawei: As with e the CATT doc Ericsson mention, this has hanging text introduced, also references to H1 to H7 I think should be annex H1 to annex H7.  ZTE: this could be updated in the revision and this is also align with CATT’s one. |
| R4-2109832  Nokia, Nokia Shanghai Bell | Ericsson: need discussion in issue 1-1  Huawei: As discuses din 1-1 I think the Ericsson proposal (1181) is better |
| R4-2111175  Ericsson | Huawei: ongoing discussion on issue 1-2  Nokia: As commented in issue 1-2. |
| R4-2111181  Ericsson | Huawei: as per issue 1-1 this is ok  Nokia: Pending agreement on issue 1-1 |
| R4-2111402  Huawei | Moderator note: This Tdoc is not a TP, but document for discussion. Included here to collect companies’ comments and views.  Ericsson: need discussion in issue 1-2.  Nokia: As commented in issue 1-2. |

## Summary for 1st round

### Open issues

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

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic #1-1** | *Recommendations for 2nd round:*  Agreement: further work based on E/// proposal on option 2. |
| **Sub-topic 1-2** | Following GTW agreement to be capture in respective revised TPs  *Agreement:*  IAB-MT type 1H/1O: -10 log(Maximum RB)- 5/10+/- ([5.5]+ TT)  IAB-MT type 2O: -10 log(Maximum RB)- 5/10 +/- ([6]+TT) |

### CRs/TPs

Moderator: Tdocs and TPs recommendations provided in section 3.

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

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

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

**Issue 1-1: IAB declaration with definition of shared IAB hardware**

Further discussion on definition text for shared IAB hardware.

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| --- | --- |
| **Company** | **Comments** |
|  |  |

Further discussion on revised TPs to conducted IAB conformance test specification 38.176-1:

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2108575  Huawei | Revision of R4-2111403  Title: TP to TS 38.176-1 - OTA Tx dynamic range, clause 6.3  Nokia:  - clause 6.3.2.1.4.2 for TM names ‘NR’ should be removed for IAB-MT-FR1-….. (this could be also updated by Editor, as all TMs should be checked in spec)  - In the beginning of section 6.3.2.1.5, deltaP should be comparison between step 4 and step 6.  - Note 1 in Table 6.3.2.1.5 can be removed, Step\_max is not used. |
| R4-2108576  Nokia | Revision of R4-2109832  Title: TP to TS 38.176-1 Clause 4.6 Declarations for IAB conducted test specification |
| R4-2108577  ZTE | Revision of R4-2110609  Title: TP to TS 38.176-1: Annex G and H: In-channel TX test  Nokia: OK |
| R4-2108710  CATT | Revision of R4-2109019  Title: TP for TS 38.176-1: Transmitted signal quality  Nokia: OK |

# Topic #2: Updated TS 38.176-2 and text proposals (OTA)

This topic includes submitted contributions and mainly test proposals (TPs) to OTA IAB conformance specification 38.176-2.

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2110944 | Nokia, Nokia Shanghai Bell | Title: TS 38.176-2 v.0.1.0 - update after RAN4#98bis meeting |
| R4-2110945 | Nokia, Nokia Shanghai Bell | Title: TP to 38.176-2 Editor update - editorials |
| R4-2109021 | CATT | Title: TP for TS 38.176-2: OTA transmitted signal quality |
| R4-2110142 | Nokia, Nokia Shanghai Bell | Title: TP to TS 38.176-2: clauses 6.1, 6.2, 6.3 and 6.7 |
| R4-2111404 | Huawei | Title: TP to TS 38.176-2 - OTA Tx dynamic range, clause 6.4 |
| R4-2110608 | ZTE Corporation | Title: TP to TS 38.176-2: RX ICS requirements |
| R4-2111178 | Ericsson | Title: TP on IBB, OBB and RX spurious for OTA receiver characteristic test |
| R4-2111406 | Huawei | Title: TP to TS 38.176-2 - OTA Sensitivity, clause 7.2, 7.3 |
| R4-2109833 | Nokia, Nokia Shanghai Bell | Title: TP to TS 38.176-2 Clause 4.6 Declarations for IAB radiated test specification  Declaration proposed:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | D.IAB-1 | Shared or common RF implementation | Declaration whether IAB-MT and IAB-DU have shared or common RF implementation, used for testing efficiency improvement. | c | x | x | |
| R4-2109999 | Samsung | Title: TP to TS38.176-2 on Annex I and Annex K |
| R4-2110610 | ZTE Corporation | Title: TP to TS 38.176-2: Annex L and M: In-channel TX test |
| R4-2110818 | Qualcomm Incorporated | Title: TP to TS 38.176-2 – Clause 3 |
| R4-2111182 | Ericsson | Title: IAB-MT specific declaration FR2  Proposed declarations:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | [D.IAB-1] | Share IAB hardware | Declaration whether IAB-MT and IAB-DU share the same hardware. | c | x | x | | D.IAB-2 | IAB-MT test model PT-RS configuration | Declaration of PT-RS configuration in IAB-MT test model: without PT-RS, with PT-RS or both. |  |  | x | |
| R4-2111176 | Ericsson | Title: On IAB-MT dynamic range and power control test for OTA test  Proposal-3: Use the table 1 and 2 as the Tx dynamic test requirement.  Proposal-4: Z1 = Z2 = [3] dB in the test point accuracy relating to the Y (RB change).  Table 1: Test requirement of the Tx dynamic range/power control for LA IAB-MT   |  |  |  |  | | --- | --- | --- | --- | | **Test point** | **Expected power step size (Down)** | **PUSCH (normal condition)** | | |  | **ΔP [dB]** | **[dB]** | | | Test point 1 | 0 | relative to the manufacturer's declared rated beam EIRP (D.11) value | For IAB-MT type 1-O, see table 2 below | | For IAB-MT type 2-O, see table 2 below | | Test point 2 | 10 log(Maximum RB) +5 / 10 acc. to WA/LA IAB-MT Tx danymic range requirement | Relative to the Test point 2’ output power | For IAB-MT type 1-O :  -10 log(Maximum RB)- 5/10 +/-5.5 +/- (Z1+ TT) | | For IAB-MT type 2-O:  -10 log(Maximum RB)- 5/10 +/-6 +/- (Z2+TT) |   **Table 2: Output power accuracy for test requirement of test point 1**   |  |  |  | | --- | --- | --- | |  | **Normal test environment** | **Extreme test environment** | | IAB-MT type 1-O | f  ≤ 3 GHz: ± 3.3 dB | f  ≤ 3 GHz: ± 5.2 dB | |  | 3 GHz < f ≤ 6 GHz: ± 3.5 dB | 3 GHz < f ≤ 4.2 GHz: ± 5.3 dB | |  |  | 4.2 GHz < f ≤ 6 GHz: ± 5.3 dB | | IAB-MT type 2-O | 24.15 GHz < f ≤ 29.5 GHz: ± 5.1 dB  37 GHz < f ≤ 43.5 GHz: ± 5.4 dB  … | 24.15 GHz < f ≤ 29.5 GHz: ± 7.6 dB  37 GHz < f ≤ 43.5 GHz: ± 7.8 dB | |

## 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

*Sub-topic description:*

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

**Issue 2-1: IAB declarations**

* Proposals
  + Option 1: Ericsson proposal from R4-2111182 (on share HW)
  + Option 2: Nokia proposal from R4-2109833 (on share HW)
  + Option 3: Ericsson proposal from R4-2111182 (on test model PT-RS configuration)
* Recommended WF
  + TBA

### Sub-topic 2-2

*Sub-topic description:*

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

There are two different views on Tx dynamic range test requirements. One view is as described in Tdoc R4-2111175 and second as described in Tdoc R4-2111402 o (submitted in conducted agenda but cover both conducted and OTA parts).

**Issue 2-2: Tx dynamic range test requirements**

* Proposals
  + Option 1: As proposed in R4-2111176 (Ericsson)
  + Option 2: As proposed in R4- 2111402 (Huawei)
  + Option 3: TBA
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

Sub topic 2-1

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Ericsson | We have a WF agreement to use the shared hardwar wording, it will be even better to align with the TR 38.809 for the RF architecture. In declaration, there is no need to mention the purpose as it will be reflected in the performance specification. |
| Huawei | Similar to conduced Ericsson proposal is better. Same comment on the use of D.IAB.x for the UID the D.x list should just be continued I think. |
| Nokia | Issue commented in Topic 1 in issue 1-1.  Proposal to keep discussion in issue 1-1 to avoid double discussion. |

Sub topic 2-2

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| --- | --- |
| **Company** | **Comments** |
| Ericsson | Th dynamic range required is in place of the power control requirement for local area IAB-MT (ΔP <10 dB). There is no need to go beyond 10 dB which is TX PSD dynamic range requirement. From this perspective, the output power accuracy needs to be considered in the test requirement as the radio chain condition cannot be the same (TX gain and PA operationg point needs to be changed for different PSD ) and thus it cannot be cancel out. We are however ok with reduced the MU as the test point 1 and 2 measurment setup will be kept the same and thus the uncertainty of measurement can be cencle out. |
| Huawei | Same discussion as 1-2, if the tests are merged then both must be passed. |
| Nokia | Issue commented in Topic 1 in issue 1-2.  Proposal to keep discussion in issue 1-2 to avoid double discussion. |
| Samsung | Please see comment to sub topic 1-2. |

### 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** |
| R4-2110944  Nokia, Nokia Shanghai Bell | Company A  Company B |
| R4-2110945  Nokia, Nokia Shanghai Bell | Nokia: To avoid duplication on clause 3 that was also submitted in R4-2110818, more practical will be removed clause 3 from this TP and focus on R4-2110818 as starting point (to be check if all references, abbreviations are used etc.).    Company B |
| R4-2109021  CATT | Ericsson: For PT-RS signal configuration for IAB-MT, should the declaration mentioned here, note there is new IAB-MT declaration for PT-RS signal to be agreed.  Huawei: similar comments as conducted, Freq error I thin k separate sub-clause fo IAB-DU and IAB-MT, IAB-MT is likely different MU/TT. 5MHz Channel BW in tables.  Nokia: Typo in 6.6.3.1: space missing in “idealsignal”  CATT: Thanks for the comments. They’ll be fixed in the revision. |
| R4-2110142  Nokia, Nokia Shanghai Bell | Ericsson: there are some place reference to 38.174 still “x” and other place is [2].  Huawei: IAB-MT type 2-H is in table 6.2.5-1. MU (and hence TT) for IAB-MT 2-O is currently proposed as different to IAB-DU 2-O this assumes they are the same. Obviously the agreemnst made about MU/TT need to be implemented.  If they are different I think having separate sub-clauses for IAB-DU nd IAB-MT makes more sense (avoids direct comparison)  Nokia: To Ericsson, thanks for spotting, to be corrected. To Huawei, agree, if different MU than make sense to have separate sub-clauses. |
| R4-2111404  Huawei | Ericsson: more discussion in issue 2-2  Nokia: as discussed in issue 1-2 (as mirror to 2-2) |
| R4-2110608  ZTE Corporation | Ericsson:ok  Nokia: number of references to be corrected, but this could be done by Editor when merging. |
| R4-2111178  Ericsson | Huawei: again references are probably better cleared up by editor, but some other clause references cleared up so useful.  Nokia: Similar comment as Huawei. |
| R4-2111406  Huawei | Ericsson:ok |
| R4-2109833  Nokia, Nokia Shanghai Bell | Ericsson: disccsion in issue 2-1  Huawei: issue 2-1 (we prefer Ericsson approach)  Ericsson: disccsion in issue 2-1 |
| R4-2109999  Samsung | Ericsson: ok  Huawei: This is ok, I think it’s a direct copy form 38.141-2? However this is quite detailed technical text and is quite hotly debated and seems subject to change quite often. I wonder if its more maintenance proof just to reference 38.141-2?  Samsung: fine to update according to HW’s comment if it is OK for group. |
| R4-2110610  ZTE Corporation | Ericsson: CATT has a CR on corresponding core part, maybe need to double check after the CR is agreed.  Huawei: similar comments to conducted, hanging text, way sub-annexes are referenced.  ZTE: this could be done in the revision |
| R4-2110818  Qualcomm Incorporated | Ericsson: ok  Huawei: I think this is ok or a start, the editor needs to go through identify which terms are used and which are not (and removed them) and add ny terms which have appeared (Aggregated IAB-DU channel bandwidth for example)  Nokia: There is also clause 3 added in R4-2110945, however, to avoid duplication, as commented in R4-2110945 we can focus on this TP.  Samsung: same comment as to R4-2110916 as two more definitions of “IAB-DU channel bandiwdth” and “IAB-MT channel bandwidth” are agreed to be introduced in R4-2106042 for TS38.174 which can be included in conformance testing spec as well. |
| R4-2111182  Ericsson | Huawei: the declaration and description are ok – as discussed earlier the UID I think should just be D.63, or even D.80 if yu want some room for potential new declarations in the NR specs which will be copied in here. Changing the D to D.IAB I think is confusing. |
| R4-2111176  Ericsson | Huawei: no spec number/version. Discuss under issue 2-2 and 1-2 |

## 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** | *Recommendations for 2nd round:*  This is the same text declaration on shared hardware as for conducted thus the same agreement apply:  Agreement: further work based on E/// proposal on option 2.  Agreement on PT-RS declaration proposed in R4-2111182 is agreed (to be included in revision of R4-2111182) |
| **Sub-topic#2-2** | Following GTW agreement to be capture in respective revised TPs  *Agreement:*  IAB-MT type 1H/1O: -10 log(Maximum RB)- 5/10+/- ([5.5]+ TT)  IAB-MT type 2O: -10 log(Maximum RB)- 5/10 +/- ([6]+TT) |

### CRs/TPs

Moderator: Tdocs and TPs recommendations provided in section 3.

*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** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

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

Discussion on IAB declaration for shared hardware is placed in topic #1.

|  |  |
| --- | --- |
| Further discussion on revised TPs to OTA IAB conformance test specification 38.176-2:**CR/TP number** | **Comments collection** |
| R4-2108578  Nokia | Revision of R4-2110945  Title: TP to 38.176-2 Editor update - editorials |
| R4-2108579  CATT | Revision of R4-2109021  Title: TP for TS 38.176-2: OTA transmitted signal quality  Nokia:  - Wrong TDoc number used (8759 instead of 8579)  - content OK, some corrections to TMs names (removal of space in acronym) can be update by Editor. |
| R4-2108580  Nokia | Revision of R4-2110142  Title: TP to TS 38.176-2: clauses 6.1, 6.2, 6.3 and 6.7 |
| R4-2108582  Huawei | Revision of R4-2111404  Title: TP to TS 38.176-2 - OTA Tx dynamic range, clause 6.4  Nokia:  -clause 6.4.1.3.4.2: to remove ‘NR’ from NR-IAB-MT-FR2…. (this could be also updated by Editor, as all TMs should be checked in spec)  - Note 1 in Table 6.4.2.1.5.1-1 and 6.4.2.1.5.2-1 can be removed, Step\_max is not used. the titles of these table have type 1-zero and 2-zero so “0“ instead “O” |
| R4-2108583  Nokia | Revision of R4-2109833  Title: TP to TS 38.176-2 Clause 4.6 Declarations for IAB radiated test specification |
| R4-2108584  Samsung | Revision of R4-2109999  Title: TP to TS38.176-2 on Annex I and Annex K  Nokia: OK |
| R4-2108585  ZTE | Revision of R4-2110610  Title: TP to TS 38.176-2: Annex L and M: In-channel TX test  Nokia: OK |
| R4-2108586  Qualcomm | Revision of R4-2110818  Title: TP to TS 38.176-2 – Clause 3  Nokia: Not available yet |
| R4-2108587  Ericsson | Revision of R4-2111182  Title: IAB-MT specific declaration FR2  Nokia: OK |

# Recommendations for Tdocs

## 1st round

**New tdocs**

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

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-2111397 | TS 38.176-1 -Updated TS 37.176-1 | Huawei | Agreeable |  |
| R4-2111399 | TP to TS 38.176-1 -Clean up | Huawei | Agreeable |  |
| R4-2109019 | TP for TS 38.176-1: Transmitted signal quality | CATT | Revised | *To include comments* |
| R4-2111403 | TP to TS 38.176-1 - OTA Tx dynamic range, clause 6.3 | Huawei | Revised | *To include comments* |
| R4-2111177 | TP for IBB, OBB and RX spurious of conducted receiver test | Ericsson | Agreeable | *References numbers to be checked and update if needed by spec Editor when implementing to TS.* |
| R4-2111405 | TP to TS 38.176-1 - Sensitivity, clause 7.2 | Huawei | Agreeable |  |
| R4-2110609 | TP to TS 38.176-1: Annex G and H: In-channel TX test | ZTE Corporation | Revised | *To include comments and align with core spec.* |
| R4-2109832 | TS 38.176-1 Clause 4.6 Declarations for IAB conducted test specification | Nokia, Nokia Shanghai Bell | Revised | *To include final agreement on declaration text* |
| R4-2111175 | On IAB-MT dynamic range and power control test for conduct test | Ericsson | Noted | *Agreement from GTW to be included in revision of R4-2111402 that includes all clause.* |
| R4-2111181 | IAB-MT specific declaration FR1 | Ericsson | Noted | *Declaration definition in revised R4-2109832* |
| R4-2111402 | Discussion on IAB-MT TX dynamic range testing | Huawei | Noted | *Document submitted for discussion.* |
| R4-2110944 | TS 38.176-2 v.0.1.0 - update after RAN4#98bis meeting | Nokia, Nokia Shanghai Bell | Agreeable |  |
| R4-2110945 | TP to 38.176-2 Editor update - editorials | Nokia, Nokia Shanghai Bell | Revised | *To remove addition for clause 3 to avoid overlapping with R4-2110818* |
| R4-2109021 | TP for TS 38.176-2: OTA transmitted signal quality | CATT | Revised | *To include comments* |
| R4-2110142 | TP to TS 38.176-2: clauses 6.1, 6.2, 6.3 and 6.7 | Nokia, Nokia Shanghai Bell | Revised | *To include comments* |
| R4-2111404 | TP to TS 38.176-2 - OTA Tx dynamic range, clause 6.4 | Huawei | Revised | *To include comments and GTW agreement* |
| R4-2110608 | TP to TS 38.176-2: RX ICS requirements | ZTE Corporation | Agreeable |  |
| R4-2111178 | TP on IBB, OBB and RX spurious for OTA receiver characteristic test | Ericsson | Agreeable | *References numbers to be checked and update if needed by spec Editor when implementing to TS.* |
| R4-2109833 | TP to TS 38.176-2 Clause 4.6 Declarations for IAB radiated test specification | Nokia, Nokia Shanghai Bell | Revised | *To include final agreement on declaration text* |
| R4-2109999 | TP to TS38.176-2 on Annex I and Annex K | Samsung | Revised | *To include comments* |
| R4-2110610 | TP to TS 38.176-2: Annex L and M: In-channel TX test | ZTE Corporation | Revised | *To include comments* |
| R4-2110818 | TP to TS 38.176-2 – Clause 3 | Qualcomm Incorporated | Revised | *To includes comments, i.e. add some missing definitions.* |
| R4-2111182 | IAB-MT specific declaration FR2 | Ericsson | Revised | *To includes only PT-RS related declaration, as common hardware declaration in revised R4-2109833* |
| R4-2111176 | On IAB-MT dynamic range and power control test for OTA test | Ericsson | Noted | *Agreement on declaration text will be capture in revision of R4-2111404, that includes TP for full subclause* |

Notes:

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

## 2nd round

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2108575 | TP to TS 38.176-1 - OTA Tx dynamic range, clause 6.3 | Huawei | Revised |  |
| R4-2108087 | TP to TS 38.176-1 - OTA Tx dynamic range, clause 6.3 | Huawei | Agreeable | Revision of R4-2108575 |
| R4-2108576 | TP to TS 38.176-1 Clause 4.6 Declarations for IAB conducted test specification | Nokia | Agreeable |  |
| R4-2108577 | TP to TS 38.176-1: Annex G and H: In-channel TX test | ZTE | Agreeable |  |
| R4-2108710 | TP for TS 38.176-1: Transmitted signal quality | CATT | Agreeable |  |
| R4-2108578 | TP to 38.176-2 Editor update - editorials | Nokia | Agreeable |  |
| R4-2108579 | TP for TS 38.176-2: OTA transmitted signal quality | CATT | Agreeable |  |
| R4-2108580 | TP to TS 38.176-2: clauses 6.1, 6.2, 6.3 and 6.7 | Nokia | Agreeable |  |
| R4-2108582 | TP to TS 38.176-2 - OTA Tx dynamic range, clause 6.4 | Huawei | Revised |  |
| R4-2108088 | TP to TS 38.176-2 - OTA Tx dynamic range, clause 6.4 | Huawei | Agreeable | Revision of R4-2108582 |
| R4-2108583 | TP to TS 38.176-2 Clause 4.6 Declarations for IAB radiated test specification | Nokia | Agreeable |  |
| R4-2108584 | TP to TS38.176-2 on Annex I and Annex K | Samsung | Agreeable |  |
| R4-2108585 | TP to TS 38.176-2: Annex L and M: In-channel TX test | ZTE | Agreeable |  |
| R4-2108586 | TP to TS 38.176-2 – Clause 3 | Qualcomm | Agreeable |  |
| R4-2108587 | IAB-MT specific declaration FR2 | Ericsson | Agreeable |  |

Notes:

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