**3GPP TSG-RAN WG4 Meeting # 96-e R4-2012547**

**Electronic Meeting, 17th – 28th August, 2020**

**Agenda item:** 7.4.1

**Source:** Moderator (Nokia)

**Title:** Email discussion summary for [96e][309] NR\_IAB\_RF\_Part\_2

**Document for:** Information

# Introduction

This email discussion covers Tx requirements except for output power requirements. The topics have been arranged on per the meeting agenda. In case a contribution has content for multiple topics, only the observations relevant to the specific topic have been captured under that topic, and therefore some documents may be included in multiple topic summaries. The covered topics are listed below.

* Transmit signal quality
* Unwanted emissions
* Others

# Topic #1: Transmit signal quality

This topic covers all IAB transmit signal quality related contributions.

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2011031 | Ericsson | **Observation#1:** The tracking frequency /time error of IAB-MT will be accumulated at multiple hop IAB network when IAB-MT is used for synchronization source and as such the # of total hop will be limited.  **Observation#2:** The IAB node holdover performance will be different at each IAB node for a multiple hop IAB network when IAB-MT is used for synchronization source.  **Observation#3:** if the tracking frequency/time error not considered and reported between IAB node, the cell phase timing or frequency accuracy requirement could be violated when IAB-MT is used for synchronization source.  **Proposal-1:** RAN4 discuss if there is network performance impact when using IAB-MT as synchronization source and how to proceed with below options:   1. It is other Working group task to continue discuss the IAB-MT synchronization issue, no need to discuss further in RAN4. 2. Discuss it in Rel-17 scope.   **Observation-#5:** The worst case of LO leakage is in the same direction of the wanted signal and fully correlated.  **Observation-#6**: The EVM test could be reused to evaluate the impact of carrier leakage on wide area IAB-MT.  **Proposal-2:** with not specifying the carrier leakage as one option, RAN4 should discuss if the carrier leakage could be tested indirectly in EVM test.   **Observation-#7:** The IQ modulation image may not already within the same carrier for IAB and this will rely on EVM test to test the overall RF imperfection distortion including the IQ image.  **Proposal-3:** RAN4 should discuss if the IQ image could be tested indirectly in EVM test.  **Proposal-4:** Additional relaxation may be needed for IAB general mask if IQ image and carrier leakage not specified.  **Proposal-5:** for wide area IAB-MT, option 1 in WF would be preferred to save the test effort.  *[moderator: option 1 in WF R4-2008783 from RAN4#95-e says: No carrier leakage, in-band emission and EVM equalizer spectrum flatness requirements are defined for both FR1 and FR2.]* |
| R4-2010951 | ZTE Corporation | **Proposal 1:** support option 1 for Wide-area IAB-MT  *[moderator: option 1 in WF R4-2008783 from RAN4#95-e says: No carrier leakage, in-band emission and EVM equalizer spectrum flatness requirements are defined for both FR1 and FR2.]*  **Proposal 2:** not to define in-band/leakage requirements and EVM flatness requirements for local area IAB-MT. |
| R4-2010296 | Nokia, Nokia Shanghai Bell | **Observation 1:** Meeting EVM requirements sufficiently demonstrates in-band emission, IQ-image and carrier leakage performance.  **Proposal 1:** For wide area IAB-MT, no carrier leakage, in-band emission and EVM equalizer spectrum flatness requirements are defined for both FR1 and FR2.  **Proposal 2:** For local area IAB-MT, no carrier leakage, in-band emission and EVM equalizer spectrum flatness requirements are defined for both FR1 and FR2. |
| R4-2009789 | CATT | **Proposal 1:** The whole UE EVM measurement process is reused by IAB-MT.  **Proposal 2:** For in-band emission requirements, keep the previous agreement for FR2 in [1] and the same approach is used for FR1.  *[moderator: [1] refers to R4-2008783 from RAN4#95-e]*  **Proposal 3:** IAB-MT type 1-O in-band emission requirement follows type 1-H requirements.  **Proposal 4:** Carrier leakage requirement treatment follows UE approach, i.e. the report mechanism is captured in the in-band emission requirement and in the test requirement.   **Proposal 5:** IAB-MT type 1-H and type 1-O in-band emission requirement reuses UE FR1 requirements.  **Proposal 6:** IAB-MT type 2-O in-band emission requirement reuses UE FR2 requirements.  **Proposal 7:** EVM equalizer spectrum flatness requirement is defined for both WA MT and LA MT.  **Proposal 8:** EVM equalizer spectrum flatness requirement for IAB-MT type 1-H reuses UE FR1 requirement.  **Proposal 9:** EVM equalizer spectrum flatness requirement for type 1-O is the same as IAB-MT type 1-H normal temperature requirement.  **Proposal 10:** EVM equalizer spectrum flatness requirement for IAB-MT type 2-O reuses UE FR2 requirement. |

Additionally, two text proposals listed below were submitted and comments to them can be provided in section 1.3.2. In addition to comments specific to these TPs, the content may need to be revised depending on outcome of subtopics 1-1 and 1-2.

* R4-2009790, CATT, TP for TS 38.174: IAB-MT Transmit signal quality
* R4-2009789, CATT, TP for TR 38.809: IAB-MT Transmit signal quality

## Open issues summary

### Sub-topic 1-1: IAB-MT transmit signal quality

This sub-topic covers the IAB-MT transmit signal quality related requirements: EVM, spectrum flatness, in-band emissions which include also LO leakage and IQ-imbalance.

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

**Issue 1-1: In-band emissions and spectrum flatness**

In the submitted contributions three companies support not specifying spectrum flatness, in-band emission, LO leakage and IQ-imbalance requirements for IAB-MT. One company sees the need for these requirements.

* Proposals
  + Option 1: Do not specify spectrum flatness, in-band emission, LO leakage and IQ-imbalance requirements for IAB-MT
  + Option 2: Specify in-band emission, LO leakage and IQ-imbalance requirements for IAB-MT

Companies are also requested to comment together with justification if the need for these requirements differ between FR1 and FR2 and IAB-MT classes.

* Recommended WF
  + Option 1.

**Issue 1-2: EVM measurement procedure**

Only one contribution touches the EVM measurement procedure and proposes to re-use UE EVM procedure. From moderator perspective there has been a lack discussion in previous meetings and this detailed part of specification is unlikely to be finished in this meeting. Therefore from moderator perspective it would be better to concentrate efforts to first agreeing other requirements, also in other topics, and return to EVM procedure in performance part of the WI.

* Proposals
  + Option 1: Re-use whole UE EVM measurement procedure for IAB-MT
  + Option 2: (Moderator proposal) Specify EVM measurement procedure in performance part of the WI.
* Recommended WF
  + TBA

### Sub-topic 1-2: IAB-MT as synchronization source

This sub-topic covers the remaining aspects on IAB-MT as synchronization source.

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

**Issue 1-3: Impact on network performance and possible further work**

Conclusions from RAN4#95-e agreed in R4-2008783:

* + No LS on frequency error needed in this meeting
  + No need to capture additional details to RAN4 specification

Taking into account both the agreements from previous meeting and proposals submitted to this meeting the

* Proposals
  + Option 1: It is other Working group task to continue discuss the IAB-MT synchronization issue, no need to discuss further in RAN4.
  + Option 2: Discuss it in Rel-17 scope
  + Option 3: No need to discuss further in RAN4 nor send LS
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

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| **Company** | **Comments** |
| Samsung | **Issue 1-1: In-band emissions and spectrum flatness**  Agree with recommended WF  **Issue 1-2: EVM measurement procedure**  Fine with Option 2  **Issue 1-3: Impact on network performance and possible further work**  Option 3. We should not make decision on behalf of other working group nor the other release scope. |
| Huawei | Sub topic 1-1: recommended WF ok  Sub topic 1-2: Agree we don’t need to go into the test procedure in the core spec beyond what is necessary for the core spec, clearly the reference signal will be based on the UL signal but the test method may be more similar to the BS (in terms of directions beams etc) but we don’t need to decide now.  Sub topic 1-3: (subtopic number is wrong above perhaps?), I think the requirement is quite clear, if we want a system with IAB-MT as a reference and hence some sort of cascading frequency error then its perhaps beyond RAN 4. |
| Ericsson | Sub topic 1-1: ok with recommended WF.  Sub topic 1-2: Ok with recommended WF.  Sub topic 1-3: option 2 is preferred. |
| CATT | **Issue 1-1: In-band emissions and spectrum flatness**  I’m ok with the WF, then I’ll revise the TP and send out for review.  **Issue 1-2: EVM measurement procedure**  I don’t understand the WF very well that my understanding is EVM measurement procedure is in the core spec, BS and UE core specs capture it and it’s already in TS 38.174 for DU. If we discuss it in the performance part, how to handle the 38.174? Should the DU EVM measurement be removed or should we update it for the MT part after the performance discussion?  **Issue 1-3: Impact on network performance and possible further work**  We think it’s not RAN4 scope to discuss this. |
| Nokia, Nokia Shanghai Bell | **Issue 1-1: In-band emissions and spectrum flatness**  Agree with the WF  **Issue 1-2: EVM measurement procedure**  Agree with the WF. For EVM measurement procedure is linked together not only with core requirements but also with the performance requirements. Therefore we see it sufficient to specify the measurement procedure only in performance part of the work. More detailed evaluation is needed on differences between EVM procedure in TS 38.104 and 38.101. For example, there are differences in using PT-RS and depending on decision on spectrum flatness requirement not all parts of UE EVM procedure may apply.  **Issue 1-3: Impact on network performance and possible further work**  Should follow the RAN4 agreement R4-2008783, and no need to discuss further nor send LS |
| Qualcomm | **Issue 1-1:** We believe at least IBE would be useful because multiple IAB-MTs can be FDM-ed or IAB-MT can be FDM-ed with another UE. Since there is no such desire from the parent gNB to have such a requirement we would be fine not having it so proposed WF is fine for us  **Issue 1-2:** We agree to discuss this during the testing discussions  Issue 1-3: We do not see the need to discuss this further. If there is a desire to have this discussion in Rel.17, it should be proposed in the plenary. |

### 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.*

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| **CR/TP number** | **Comments collection** |
| R4-2009790 | Huawei: IAB-DU is referenced, IAB-MT is written out. I prefer the written out approach but can’t see why same is not used on both. For EVM clearly this is not yet agreed, so we need to see what outcome of discussion is, but similar comment on reference or copy. The Annexes just reference 38.101-1 so they may as well do that directly. |
| Ericsson: 6.5.1.2: replace the "parent node" with IAB-DU; |
| CATT: Thanks for the comments. I’ll revise the whole TP according to the agreements. First response some other comments.  Response to Huawei comments: Do you mean “*IAB-DU*” is reference and “IAB-MT” is written out? I’ll align the style to be written out. Actually, I didn’t know if I should use reference or written out because BS and UE spec have different styles?  Response to Ericsson comments: My understanding is that there’re many IAB-DU’s including the IAB-DU in the same IAB node and also the parent node may not be a IAB node, maybe a gNB. But I’m not sure if there’s other better wording. |
| Nokia, Nokia Shanghai Bell: This needs to be updated according to outcome of sub-topic 1-1. In case LO leakage requirement is not specified also referring the related RAN2 IE is not needed. Overall, we see that there is room to simplify the general part for EVM, by adopting more general wording from TS 38.104. Also the wording used for type 2-O requirements need to be aligned with 1-O.  We also think Annex D and Annex E should be left out at this point of time, and to be returned to in performance part. More detailed evaluation is needed on differences between EVM procedure in TS 38.104 and 38.101. For example, there are differences in using PT-RS and depending on decision on spectrum flatness requirement not all parts of UE EVM procedure may apply. |
| R4-2009789 | Huawei: Assumes that decisions are made on the carrier leakage etc, so must wait for that decision. For the EVM value it’s a bit misleading as agreement was as BS and UE are the same values it doesn’t matter – not that we are using UE for various given reasons. |
| Ericsson: the comments of TP to TR: 7.5.2.1 Frequency error : considering the physical layer difference between NR and LTE, should 36.922 be refered in TR or NR TR should be refered? 7.5.2.2.2. Carrier leakage: UE reporting would mean the BS can avoid the scheduling such RB for carrier leakage impact. This text has nothing to do with carrier leakage requirments itself and recommedation to remove. IBE text should wait the conclusion from RAN4 whether or not IBE apply to WA IAB-MT. |
| CATT: Thanks for the comments. I’ll revise the whole TP according to the agreements. First response some other comments.  Response to Huawei comments: My understanding is that UE Tx signal and IAB-MT Tx signal are UL signals but BS Tx signal is DL signals. Current EVM requirements for BS and UE are the same because there were link or system simulations showing that same requirements can be OK. In theory, IAB-MT EVM should follow UE but not BS.  Response to Ericsson comments: Maybe to let things simple, I can just remove the reference of 36.922. |
| Nokia, Nokia Shanghai Bell: This needs to be updated according to outcome of sub-topic 1-1. Measurement and test tolerance related content should be removed. Discussion on forward compatibility and Doppler can be removed as IAB is fixed node in rel-16 and also in rel-17 |

## Summary for 1st round

### Open issues

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

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|  | **Status summary** |
| **Sub-topic#1** | **Issue 1-1: In-band emissions and spectrum flatness**  All companies agree option 1: Do not specify spectrum flatness, in-band emission, LO leakage and IQ-imbalance requirements for IAB-MT  *Agreement:* Option 1  **Issue 1-2: EVM measurement procedure**  5 companies agree with option 2: Specify EVM measurement procedure in performance part of the WI. One company is unclear of this as it sets the DU and MT requirements to have different status.  *Agreement:* Option 2, EVM measurement procedure will be included in the core specs.  CATT: EVM measurement procedure still will be includes in core spec and address in performance phase?  **Issue 1-3: Impact on network performance and possible further work**  Opinions are varied between this being not in RAN4 domain, this needing no further discussion or that this could be discussed in Rel-17.  *Tentative agreement:* None.  No further discussion in Rel-16 IAB WI.  *Recommendations for 2nd round:*  Revise the TPs to reflect the agreements for issue 1-1 and 1-2 and also comments to the TPs. For issue 1-3 stop discussion in this meeting without conclusion. |

*Recommendations on WF/LS assignment*

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|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### CRs/TPs

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

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
| R4-2009790 | To be revised |
| R4-2009789 | To be revised |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

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

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

# Topic #2: Unwanted emissions requirements

This topic covers all IAB unwanted emissions requirements related contributions

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2010912 | Qualcomm incorporated | **Observation:** The LA IAB-MT operation has a lot of similarities to that of a UE, hence, it is more appropriate to define the unwanted emission requirements based on the UE specifications.  **Proposal 5:** The UE out of band emissions (SEM) should be re-used for the LA IAB-MT.  **Proposal 6:** The UE boundary between in-band and spurious region (channel BW dependent) should be re-used for the LA IAB-MT.  **Observation:** Absolute ACLR is not needed for the LA IAB-MT.  **Proposal 7:** The spurious emissions defined in Section 6.5.3 of 38.101-1 including the spurious emission band UE co-existence should be re-used for the LA IAB-MT. |
| R4-2011297 | Huawei | **Proposal 1:** For LA IAB-MT relative ACLR is 45dBc  **Proposal 2:** for IAB-MT transmitting in DL the BS ACLR is met.  **Proposal 3:** BS absolute ACLR requirements are adopted.  **Proposal 4:** the BS OBUE requirements are used for LA IAB-MT  **Proposal 5:** The LA IAB-MT meets the BS spurious emissions requirements. |
| R4-2011033 | Ericsson | **Observation#1:** IAB-MT TX RF requirements to be defined when IAB-MT transmit at downlink time slot.  **Observation#2:** IAB-MT transmitting at downlink time slot has the same coexisting scenario as BS so legacy NR coexisting should apply.  **Proposal#1:** When IAB-MT transmitting during downlink time slot, the IAB-DU unwanted emission applies to IAB-MT irrespective of IAB-MT class.  **Proposal#2:** Vendor declare the FDM/SDM support in Rel-17. The FDM/SDM related requirement could be specified in addition in Rel-17.  **Proposal#3:** Confirm the RAN4 understanding on the co-location necessity of the IAB-MT and IAB-DU of one IAB node irrespective how they would be implemented.  **Proposal-4:** LA IAB-MT ACLR need consider both the maximum output power and Tx dynamic range.  **Proposal-5:** Reuse the WA BS absolute ACLR for WA IAB-MT.  *[Moderator: Proposals 6-7 are missing from the contribution.]*  **Proposal-8:** Reuse the BS definition for boundary of OBUE for LA IAB-MT for FR2 and FR1.  **Proposal-9:** For OBUE of local area IAB-MT reuse the OBUE requirement of BS.  **Proposal-10:** Scaling factor of 9 dB should be kept for IAB-MT type 1-O considering the co-location of IAB-MT and IAB-DU  **Proposal-11:** Reuse BS spurious for all IAB-MT class spurious requirement for FR2 and FR1. |
| R4-2010952 | ZTE Corporation | **Proposal 1:** to define FR1 IAB MT ACLR as 45dBc;  **Proposal 2:** for FR2 local area IAB-MT, propose to use local area BS OBUE requirements;  **Proposal 3:** for FR1 local area IAB-MT, propose to use local area BS OBUE requirements;  **Proposal 4:** follow BS requirements for FR1 and FR2 FOBUE boundary.  **Proposal 5:** for local-area IAB-MT, either follow BS or UE for IAB-MT is fine. *[Moderator: This is for spurious emissions]* |
| R4-2010298 | Nokia, Nokia Shanghai Bell | **Proposal 1:** Absolute ACLR for wide area IAB-MT in FR1 shall be -13 dBm/MHz for Category A and -15 dBm for Category B.  **Proposal 2:** ACLR for local area IAB-MT in FR1 shall be 45 dBc.  **Observation 1:** OBUE protects against narrowband emissions, therefore relaxed ACLR does not automatically motivate relaxed OBUE or relaxed absolute ACLR.  **Proposal 3:** Use the local area BS requirements for local area IAB-MT OBUE and ACLR absolute limit in FR2.  **Proposal 4:** Local area IAB-MT ACLR (24 dBc) for both 24.25 – 33.4 GHz and 37 – 52.6 GHz.  **Proposal 5:** Absolute ACLR for local area IAB-MT in FR2 shall be -20 dBm/MHz, i.e. the same as for medium range and local area base stations.  **Proposal 6:** IAB-MT shall re-use the BS category A and category B spurious emissions in FR2.  **Observation 2:** IAB-MT needs to understand NS signalling exists as from RAN2 perspective cell is considered barred if NS-value is not recognized.  **Proposal 7:** Adopt co-location and co-existence requirements from TS 38.104 for IAB-MT and IAB-DU.  **Proposal 8:** Protection of own or other BS receiver requirement is not defined as it applies only for FDD operation and no FDD bands are included in IAB specification. |
| R4-2009793 | CATT | **Proposal 1:** LA IAB-MT reuses UE relative ACLR.  **Proposal 2:** Absolute ACLR is not needed for LA IAB-MT.  **Proposal 3:** LA IAB-MT reuses UE SEM requirements.  **Proposal 4:** UE ASEM requirement is not needed for LA IAB-MT before there’s clear request from regulations.  **Proposal 5:** LA IAB-MT reuses UE general spurious emissions requirements.  **Proposal 6:** Spurious emissions for UE co-existence and additional spurious emissions are not needed for LA IAB-MT before there’s clear request from regulations. |

Additionally, two text proposals listed below were submitted and comments to them can be provided in section 2.3.2. In addition to comments specific to these TPs, the content may need to be revised depending on outcome of subtopics 2-1 to 2-6.

* R4-2010725, Nokia, Nokia Shanghai Bell, TP to TS 38.174: Unwanted emissions requirements
* R4-2010298, Nokia, Nokia Shanghai Bell. TP to TR 38.809: IAB-MT unwanted emission requirements

## Open issues summary

### Sub-topic 2-1: LA IAB-MT ACLR, general OBUE/SEM and general spurious requirements

The biggest open issue for unwanted emission requirements is which requirements are applied for local area IAB-MT. Overall, based on the input contributions the company views are very similar to previous meeting with three to four companies favoring re-use of BS requirements while two companies prefer re-use of UE requirements.

There is dependency between the requirements and polling the preference for UE or BS requirement for each individual requirement seems not useful, as the views are clear for the input contributions. From moderator perspective a solution to apply BS or UE requirements could be trying to achieve in online discussion, and that is always possible. Another option is to try to find some compromise combining some aspects from both UE and BS requirements.

As also maximum output power for LA IAB-MT is open in FR1, one possible compromise could be to tie the emissions to output power, and require better ACLR together with other BS emissions requirements in case the higher output power option is adopted for LA IAB-MT.

For FR2 output power is not tied to BS class so similar compromise seems not feasible

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

**Issue 2-1-1:** FR1 LA IAB-MT ACLR, general OBUE/SEM and general spurious requirements

* Proposals
  + Option 1: Re-use BS relative ACLR, absolute ACLR, OBUE, OOB boundary and general spurious emissions for IAB-MT
    - Whether to apply local area BS or medium range BS requirements depends on outcome of maximum output power, i.e. whether 24 dBm or 38 dBm is the baseline.
  + Option 2: Re-use UE relative ACLR, SEM, OOB boundary and general spurious emissions for IAB-MT. Do not define absolute ACLR requirement.
    - To be discussed separately if different requirement applies for transmission during UL and DL timeslot
  + Option 3: (compromise proposal by moderator): If 38 dBm (per connector) output power is agreed, re-use BS requirements for emissions. If 24 dBm output power is agreed, re-use UE requirements.
    - To be discussed separately if different requirement applies for transmission during UL and DL timeslot
* Recommended WF
  + TBA

**Issue 2-1-2:** FR2 LA IAB-MT ACLR, OBUE/SEM and spurious requirements

In FR2 LA IAB-MT relative ACLR has previously agreed to be 24 dBc, which has only 2-4 dB difference to BS and wide area IAB-MT ACLR. As output power is not limited by class in FR2 so similar compromise as proposed for FR1 seems not feasible. Based on the slight majority supporting BS requirements in input contributions it is proposed as recommended WF.

* Proposals
  + Option 1: Re-use BS absolute ACLR, OBUE, OOB boundary and general spurious emissions for IAB-MT
    - To be discussed separately if different requirement applies for transmission during UL and DL timeslot
  + Option 2: Re-use UE SEM, OOB boundary and general spurious emissions for IAB-MT. Do not define absolute ACLR requirement.
    - To be discussed separately if different requirement applies for transmission during UL and DL timeslot
* Recommended WF
  + Option 1.

### Sub-topic 2-2: LA IAB-MT: Additional SEM/OBUE and spurious emissions

For additional requirements two different views were raised. One company sees that additional requirements are not needed before there is clear regulatory need, one view is to use UE requirements, and finally some companies would like to re-use gNB requirements.

**Issue 2-2: LA IAB-MT: Additional SEM/OBUE and spurious emissions**

* Proposals
  + Option 1: Requirements are not needed before there is clear regulatory need
  + Option 2: Use gNB requirements for additional requirements
  + Option 3: Use UE requirements for additional requirements
* Recommended WF
  + TBA

### Sub-topic 2-3: Absolute ACLR for WA IAB-MT

Absolute ACLR is still open for WA IAB-MT, while for other emission requirements it was agreed to re-use WA BS requirements.

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

**Issue 2-3: Absolute ACLR for WA IAB-MT**

* Proposals
  + Option 1: IAB-MT shall re-use both category A and category B absolute ACLR requirements defined for WA gNB.
  + Option 2: TBA
* Recommended WF
  + Option 1

### Sub-topic 2-4 Co-location and co-existence requirements

Also for co-location and co-existence requirements there are two views. Some want to re-use UE requirements, like UE-to-UE co-existence requirements, whereas others see that as IAB-MT may use gNB-like output power in similar deployment location as gNB, emission levels need to be similar to BS as synchronization with other bands is not guaranteed.

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

**Issue 2-4-1: Co-location and co-existence requirements**

* Proposals
  + Option 1: Use gNB requirements
  + Option 2: Use UE requirements
* Recommended WF
  + Option 1

**Issue 2-4-2: Co-location of IAB-DU and IAB-MT**

One company wanted to confirm that while IAB-DU and IAB-MT may be implemented with separate enclosures and separate HW, they are still always co-located on the same site.

* Proposals
  + Option 1: IAB-MT and IAB-DU need to be always co-located on the same site
    - Possible specification impact to be clarified
  + Option 2: TBA
* Recommended WF
  + TBA

### Sub-topic 2-5 FDM/SDM forward compatibility and requirements for DL timeslot

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

**Issue 2-5-1: Emission requirements during transmission in DL timeslot**

Two companies raised the fact that to guarantee co-existence when transmission takes place during DL timeslots, emission requirements of IAB-DU need to be similar to IAB-DU. Naturally the other option is not the treat UL and LD timeslot differently.

* Proposals
  + Option 1: In case IAB-MT transmits during DL timeslot, it needs to meet the same emission requirements (ACLR, OBUE, spurious emissions) as IAB-DU.
  + Option 2: No separation for requirements for transmissions during UL and DL timeslot.
* Recommended WF
  + Option 1

**Issue 2-5-2: Declaration for FDM/SDM forward compatibility and SDM/FDM requirements in rel-17**

One company raised the need to declare FDM/SDM support while also additional SDM/FDM requirements can be specified in rel-17.

* Proposals
  + Option 1: Vendor declare the FDM/SDM support in Rel-17. The FDM/SDM related requirement could be specified in addition in Rel-17.
  + Option 2: TBA
* Recommended WF
  + TBA

### Sub-topic 2-6 Emission scaling for IAB-MT type 1-O

In those cases where gNB requirements are re-used for IAB-MT type 1-H and 1-O emission scaling becomes applicable. It is being discussed in output power related requirements whether there is a minimum number of TRX requirement for IAB-MT type 1-O, which related to the scaling of the max output power. For IAB-DU type 1-O scaling is fixed to 8x i.e. 9 dB as there is a requirement for minimum number of TRX. One company has proposed to use the same scaling for emissions as IAB-MT does not need better emissions performance as IAB-DU.

**Issue 2-6: Emission scaling for IAB-MT type 1-H and 1-O**

* Proposals:
  + Option 1: For those cases where gNB emission requirements are re-used, IAB-MT type 1-O emission scaling is 9 dB.
  + Option 2: For those cases where gNB emission requirements are re-used, emission scaling follows the decision on minimum number of TRX, i.e. if only one TRX is allowed then emissions are scaling is also variable from 1x to 8x similar to IAB-MT type 1-H.
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

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| --- | --- |
| **Company** | **Comments** |
| Samsung | **Issue 2-1-1:** FR1 LA IAB-MT ACLR, general OBUE/SEM and general spurious requirements  It should be clarified that all the option is to use the BS basic limit or UE requirement as basic limit. The scaling factor should be decided based on [308] conclusion.  **Issue 2-2: LA IAB-MT: Additional SEM/OBUE and spurious emissions**  Prefer option 1  **Issue 2-4-1: Co-location and co-existence requirements**  The co-located requirement for UE is derived based on deterministic calculation based on certain PL assumption which is not assumed to be applicable for IAB-MT case at least in current release. Hence option 2 is not preferred. Even for option 1 the applicability of BS co-existence requirement for IAB-MT class should be clarified.  **Issue 2-4-2: Co-location of IAB-DU and IAB-MT**  Clarification needed on the necessity of restriction to co-located  **Issue 2-5-2: Declaration for FDM/SDM forward compatibility and SDM/FDM requirements in rel-17**  As we agreed in last year “The RF requirements shall be defined in an architecture agnostic way for backhaul and access function. Both separate and shared architecture shall be kept and no priority is adopted at this stage.” Not quite understand the motivation to have such proposal  **Issue 2-6: Emission scaling for IAB-MT type 1-H and 1-O**  Option 1 is preferred |
| Huawei | Sub topic 2-1-1: Still favor option1, the compromise is no longer a compromise as such as we agreed 24dBm in the GTW meeting. In terms of SE and the boundaries the BS approach we think is necessary. Outside the band there is not a enough difference between BS and UE but in band scaling is allowed for the BS specs but not for UE as the IAB-MT may have many transceivers (probably more than a UE) we feel that is needed, the band centric approach means that in these circumstances BS has band filter to help with out of band emissions. For relative ACLR there were varied results from the simulations but most seemed to indicate with eth DR we have already agreed that 30dBc was not sufficient ALCR (although 45dBc was arguably to much). Although it’s simple to treat all requirements as either all BS or all UE, if we cannot come to agreement then maybe we need to separate them again  Sub topic 2-1-2: Similar arguments for FR2 as FR1, in this case the UE has a bandwidth relaxation to allow for higher power narrow band emissions to account for the LO. Is this needed for an IAB-MT where the same design restrictions do not apply and filtering can perhaps be implemented? If so once again the band centric approach for the BS SE boundaries is more suitable we think.  Sub topic 2-2: In terms of deployment this is like a BS so is there are additional limits protecting other systems it seems necessary to have the same limits as a BS. The question is why are the same limits not applied to a UE as the victim systems don’t care if it’s a UE or a BS interfering with them? Probably because the lower power and the deployment scenarios, but as we have similar power and deployment to BS then we should include any additional requirements like a BS (or course if none are identified for IAB bands then we don’t need any).  Sub topic 2-3: option1  Sub topic 2-4-1: For co-existence as with additional systems, non-synchronized 3GPP systems in the same geographical area don’t care if it’s a UE or a BS interfering with them. As we have similar deployment scenarios as BS then the BS requirements should be used. Co-location should clearly follow the BS approach. Option 1.  Sub topic 2-4-2: I am not sure I understand why this needs clarifying, the 2 nodes are specified separately, what does it matter if they are co-located?  Sub topic 2-5-1: We have not yet agreed all the emissions requirements they might end up being the same as DU? In which case we don’t need to discuss further But if they are different then it seems clear that if transmitting in DL then the DU requirements should be met. We could perhaps handle this in the compliance matric rather than writing either/or in every requirement.  Sub topic 2-5-2: This looks like a Rel 17 issue?  Sub topic 2-6-1: This is also discusses as part of the output power topic, but this is maybe a better location. Whilst it seems reasonable to state in black box it doesn’t matter how many TRX there are if you are a victim, and hence the scaling can be fixed at 9dB, that’s not quite the case. For in-band requirements (where scaling is applied) there is always a trade on network throughput, greater capability in terms of throughput can be traded against slightly worse interference to others as the overall network throughput increases. This is the background and justification for allowing scaling as we increase the BS capability. A system with fewer TRX cannot get the same throughput as one with many so increased emissions through fixed scaling is not justified. Ideally then we should use the 1-H approach for scaling – this brings its own issues in how do we identify how many TRX there are when we can’t count connectors? However option 2 worst case is still option 1 so its still better than a fixed number. |
| Ericsson | Sub topic 2-1-1: option 1. The relative ACLR needs to be 45 dB considering the 10 dB Tx dynamic range, 30 dB ACLR will worsen the adjacent channel power leakage. Boundary of OOB needs to be band centric as the same as IAB-DU as the IAB band is to be shared between IAB-DU and IAB-MT carrier.  Sub topic 2-1-2: ok with recommended WF.  Sub topic 2-2: Option 2. For regulatory requirements, IAB-MT can be treated the same as IAB-DU, IAB node shall know in advance which the regulatory requirement it should meet before it deployed in network. The way to treat regulatory is different between UE and BS. If taken the BS way to treat the regulatory requirement, there is no need to specify the additional SEM /spurious as the UE does. While BS additional spurious requirement /co-location requirement are optional and they are used to protect the coexisting other system /regulatory / other BS receiver. The more flexible to treat emission requirement and tight connection to the deployed site should be taken as IAB approach.  Sub topic 2-3: ok with recommended WF.  Sub topic 2-4-1: Ok with the recommend WF. As explained in sub topic 2-2, gNB co-location is optional requirement where apply only IAB needs to be deployed the same site with other band BS.  Sub topic 2-4-2: option 1. This is an important RAN4 common understanding to derive the emission requirement. Seems ok to agree on this for the shared architecture IAB node. it needs to confirm that for separate architecture or even the separate enclosure, RAN4 IAB spec only consider the case where IAB-MT co-located with IAB-DU. If IAB-MT is not co-located with IAB-DU or other band BS, from RF perspective, UE spec could apply directly on IAB-MT but such IAB-MT may be treated differently with IAB-MT that complying with TS 38.174.  Sub topic 2-5-1: ok with recommended WF. Related to sub topic 2-5-2.  Sub topic 2-5-2: Option 1. It seems declaration way to support FDM/SDM is best way to answer the forward compatibility of FDM/SDM. |
| CATT | **Issue 2-1-1:** FR1 LA IAB-MT ACLR, general OBUE/SEM and general spurious requirements  And  **Issue 2-1-2:** FR2 LA IAB-MT ACLR, OBUE/SEM and spurious requirements  My understanding is that the opinions may depend on what form factor the IAB-MT is assumed. If the LA IAB-MT is assumed like a local area BS, then the requirements of LA BS should be ok because it’s tighter. But if LA IAB-MT is like a CPE or like a WIFI router, then the LA BS requirement would be difficult.  **Issue 2-2: LA IAB-MT: Additional SEM/OBUE and spurious emissions**  Here, it seems several requirements are discussed together. We proposed no ASEM requirements taken UE ASEM as a reference. For the BS OBUE requirement, it seems it’s needed assuming IAB-node is a network node and other network node should be protected. So maybe Option 2 is ok if there are no implementation difficulties. |
| Nokia, Nokia Shanghai Bell | **Issue 2-1-1: FR1 LA IAB-MT ACLR, general OBUE/SEM and general spurious requirements**  Option 1: We prefer to Re-use BS relative ACLR, absolute ACLR, OBUE, OOB boundary and general spurious emissions for IAB-MT.  The max output power has been agreed to be 24 dBm per connector  **Issue 2-1-2: FR2 LA IAB-MT ACLR, OBUE/SEM and spurious requirements**  Agree with the WF  **Issue 2-2: LA IAB-MT: Additional SEM/OBUE and spurious emissions**  For both LA and WA IAB-MT gNB requirements should be the baseline. For unwanted emission the UL-DL synchronization cannot be guaranteed with the system being interfered, and as such the IAB-MT deployment scenario and output power levels align better with gNB.  **Issue 2-3: Absolute ACLR for WA IAB-MT**  We prefer option 1.  **Issue 2-4-1: Co-location and co-existence requirements**  For co-location or co-existence with other operating bands the UL-DL sync cannot be guaranteed and IAB-MT may transmit when co-located or co-existing gNB is receiving. Therefore gNB requirements need to be applied. Co-location within same operating band is covered by Tx IMD, not this requirement.  **Issue 2-4-2: Co-location of IAB-DU and IAB-MT**  It is also our understanding that IAB-DU and IAB-MT are in the vicinity of each other, though they may be in different enclosures and pointing at different directions.  **Issue 2-5-1: Emission requirements during transmission in DL timeslot**  We agree with option 1, but this has specification impact only in case some requirements are agreed to be different from gNB requirements.  **Issue 2-5-2: Declaration for FDM/SDM forward compatibility and SDM/FDM requirements in rel-17**  As rel-17 requirements are open, it is difficult to specify declaration which would guarantee meeting requirements which are not defined. We agree that new requirements may be specified in rel-17, if there is a need. We see that the forward compatibility mentioned in the WI is covered by designing rel-16 requirements so that they are unlikely to need changes in rel-17 with the knowledge we have now. This of course cannot be guaranteed as rel-17 design is not done yet.  **Issue 2-6: Emission scaling for IAB-MT type 1-H and 1-O**  We prefer option 2 as it provides more flexibility. |
| Qualcomm | **Issue 2-1-1:** Consdering the operation mode(most likely in UL slots, this is what was discussed in RAN1 also), we still believe it would be more appropriate to re-use the UE requirements. Hower, to finalize the work we can adopt Option 1. Which requirements to use seems more of a philosophical question.  Issue 2-1-2: We favor Option 2 for several reasons: operation mode and forward computability when we will have mobile IABs. The typical operation will be in UL slots. Also, even for UE we have PC1 which is higher power and still has the same emission requirements. In order to finalize the work we can accept Option 2. Question to the group is what will we do when mobile IABs are specified? We will change the requirement?  Issue 2-2: If gNB requirements are adopted then we should adopt Option 2.  Issue 2-4-1: we can adopt Option 1 based on the logic that if there is a DU on the IAB then the IAB-MT should also have a minimum distance relative to other UEs that is similar to the DU.  Issue 2-4-2: actual issue should be clarified. What does co-located mean in this case?  Issue 2-5-2: we do not understand the need for such a declaration. The problem that we are trying to solve should be clarified. |

### 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.*

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| **CR/TP number** | **Comments collection** |
| R4-2010725 | Huawei: Assuming the agreements in the discussion match the captured specs they look ok. |
| Ericsson: strucure wise, suggest to considering the separation of the IAB-DU and IAB-MT. IAB-DU could reference to 38.104 if possble. More detail: 6.6.5.3, the scaling parameter Ntxu-countedperCell need differentiated for IAB-Du and IAB-MT. 9.7.5.2.4, maybe up to RAN4 decision, there could be no min number of TXU for IAB-MT type 1-O, thus the scaling factor for IAB-MT has nothing to do with N\_TXU\_countedperCell. |
|  |
| R4-2010298 | Huawei: Text make assumptions on agreements so can’t be agreed yet, the text is quite vague, but it’s perhaps better than nothing ok. If it needs more detail then others can contribute |
| Ericsson: ok, though the TP need to wait the RAN4 agreement on LA IAB-MT. |
|  |

## Summary for 1st round

### Open issues

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

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| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | **Issue 2-1-1: FR1 LA IAB-MT ACLR, general OBUE/SEM and general spurious requirements**  All companies who provided comments can agree option 1: Re-use BS relative ACLR, absolute ACLR, OBUE, OOB boundary and general spurious emissions for IAB-MT.  **Issue 2-1-2: FR2 LA IAB-MT ACLR, OBUE/SEM and spurious requirements**  Despite different preferences, 4 companies can agree option 1. One company sees there are further dependencies.  **Issue 2-2: LA IAB-MT: Additional SEM/OBUE and spurious emissions**  5 companies agree to use gNB requirements, one company prefers to wait for clear regulatory need.  **Issue 2-3: Absolute ACLR for WA IAB-MT**  All companies who provided comments agree to with WA gNB requirements, both category A and category B  **Issue 2-4-1: Co-location of IAB-DU and IAB-MT**  All companies who provided comments agree to use gNB requirements, one of the companies still sees need to further clarify applicability of co-location.  **Issue 2-4-2: Co-location of IAB-DU and IAB-MT**  Several companies asked for clarifications for this topic.  **Issue 2-5-1: Emission requirements during transmission in DL timeslot**  All companies who provided comments agree that gNB requirements need to be met during DL transmission.  **Issue 2-5-2: Declaration for FDM/SDM forward compatibility and SDM/FDM requirements in rel-17**  Several companies asked for clarifications for this topic, some see no need for declaration or this is to be discussed in rel-17  **Issue 2-6: Emission scaling for IAB-MT type and 1-O**  2 companies prefer variable scaling, one company prefers fixed scaling.  E///: Hard to define Num of TXU connector, also need to align the approach with IAB-DU. Using variable approach will tighten the requirements for 1-O IAB-MT.  Samsung: we also prefer fixed scaling. Preference from other companies?  Huawei: If hardware with less transceivers, IAB-MT should follow the 1-H approach considering degradation performance with increased interference.  Separate scaling factor for wide area IAB\_MT with fixed scaling, for local area IAB using 1-H approach with variable scaling.  ZTE: prefer variable scaling, we didn’t have any restriction on minimum number of transceivers for IAB-MT.  Another issue: why we have Ncell in the scaling factor?  E///: We have another topic IAB\_DU and IAB\_MT co-location. If we assume they collocated, then there is dependency on IAB-DU and IAB-MT requirements. From emission perspective, no need to tighten compared IAB\_DU.  Nokia: On minimum number of transceiver, if we using fixed values means we will have minimum values. The same scaling approach should be applied for both power scaling and emission scaling.  I didn’t see Ncell comments in GTW and emails.  Huawei: As comprise, regulatory don’t want to see different situation for different IAB-MT class.  In-band interference for IAB\_DU and IAB-MT is difference.  If we link to number of transceivers and fixed values, we don’t want to see that.  Wide area IAB-MT 1-O:  Huawei/Nokia/ZTE: Assuming number of transceivers >=8, should be same with both approaches.  E//: How to clarify the number of transceivers? Declaration basis?  Tentative agreements for 1-O:  Using variable scaling for 1-O emission requirements (both wide-area IAB-MT and local-area IAB-MT).  - The number of transceivers should be declaration basis; details can be further discussed in the corresponding TPs.  The final decision also applied for power scaling on IAB-MT 1-O.  We will check the status in 2nd round .  ZTE: For variable scaling, why we include Ncell?  E///: we don’t need to tighten the requirements following BS approach.  Huawei: If we have 3 cells to share transceivers, including Ncell allow such operation. We can’t the possibility and no harm to include Ncell even in the end, this operation not applied for IAB-MT.  FFS clarification needed or not for number of Ncells limitation of IAB-MT transmission in uplink . This can be further discussed in conformance phase.  *Agreements:*  FR1 LA IAB-MT re-uses BS relative ACLR, absolute ACLR, OBUE, OOB boundary and general spurious emissions  FR2 LA IAB-MT Re-use BS absolute ACLR, OBUE, OOB boundary and general spurious emissions  Note: relative ACLR was agreed already earlier.  WA IAB-MT shall re-use WA gNB absolute ACLR, both category A and category B.  gNB requirements are adopted for co-existence and co-location requirements, but further clarifications are needed especially for co-location. Further working on TPs for applicable rules.  Samsung: For DU and MT classes, the TP seems more generic for Both. We have 3 classes for IAB\_DU, and IAB-MT with 2 classes. Need to further clarify the class for IAB-DU and IAB-MT.Huawei: For IAB-MT wide area applied with BS wide area , so on with mapping one by one.  Nokia: Agree with Huawei.  ZTE: Even for mixed classes with IAB\_DU and IAB-MT, even in the past we didn’t consider that cases, we focused on typical cases.  E///: Pre-assuming the same class applied for the site and co-location.  QC: We are proposing to follow UE approach, but fine for the agreements for sake of progress. Then how about for mobile IAB cases in Rel-17?  Huawei: BS requirements are TRP basis, beam shaping not matter. No significant difference among BS and UE for actual emission.  Transmission in DL timeslot requires meeting gNB requirements, , capturing the agreements into TR. Further work on TP drafting for TP and TS.  Additional emission requirements will be specified based on gNB requirements, we can further revise the requirements if needed pending on RAN2 responses.  E//: The regulatory requirements always can be added based on demand and regulatory suitations.  E/// will prepare the TPs for above the issue.  Huawei: we have an exception case for FR2.  *Candidate options:*  *Recommendations for 2nd round:*  Revise the TPs and work with them on 2nd round to reflect the reached agreements and comments to TPs. Clarifications for co-location to be handled in TP discussion. Further discussion is needed for emission scaling, which is discussed together with output power scaling. Discussion for declaration is stopped in this meeting to concentrate efforts on critical topics. |

*Suggestion on WF/LS assignment*

|  |  |  |
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|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### CRs/TPs

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

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
| R4-2010725 | To be revised |
| R4-2010298 | To be revised |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

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

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

# Topic #3: Others

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

## Companies’ contributions summary

Two text proposals were submitted

* R4-2010148, Samsung, TP for TR38.809: conclusion on IAB-MT BC requirement
* R4-2010953, ZTE corporation, TP to TS 38.174 on IAB TX IMD

## Open issues summary

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

As only TPs were submitted, discussion shall take place by comments to text proposals in section 3.3.2.

## Companies views’ collection for 1st round

### Open issues

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| **Company** | **Comments** |
| Moderator | Please provide comments in section 3.3.2. |

### 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.*

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| **CR/TP number** | **Comments collection** |
| R4-2010148 | Huawei: It would be nice to capture some reasons why the decision was made, but as its stands its perhaps accurate. |
| Ericsson: ok |
|  |
| R4-2010953 | Samsung: as indicated in agreed TP R4-209062, there are restrictions on scenario to apply IAB OTA TX IMD requirement as: “For FR1 the IAB node could be co-located if the IAB TDD pattern for transmission and receiving is the same for both IAB-DU and IAB-MT of both co-located nodes, i.e. just coordinating the UL/DL timeslots is not sufficient but the actual Tx and Rx time instants of both IAB-DU and IAB-MT need to be aligned.” This constraint seems not be included in the TP. |
| Huawei: If the requirement applies to IAB-DU explicitly then the BS type should be “IAB-DU type 1-H” not just “IAB type 1-H”, if the same requirement applies to both we should use the generic term, if its node specific then we should specify. As the requirements are the same then maybe this is a better approach and 6.7.2 can be merged into 6.7.1. The Unwanted emissions TP takes this approach? Maybe we can discuss, it should be consistent across the spec anyway and better to solve now as it involves sub-clause heading which can’t be changed once approved. |
| Ericsson: would directly refer the BS requirement ok ? |
| Nokia, Nokia Shanghai Bell: As Samsung notes, there are restrictions when co-location within same operating band can happen. We would not like to preclude such co-location scenario, but as it seems unlikely, one option could be to declare support for co-location within same operation band, and then the requirement applies only when support is declared. |

## Summary for 1st round

### Open issues

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

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|  | **Status summary** |
| **Sub-topic#1** | R4-2010148, recommendation is to approve it as there is no objections. Further additions may be provided in future meetings if necessary, and work in this meeting can concentrate on more critical issues.  R4-2010953, to be revised reflecting the comments.  TX IMD  Nokia: Does the declaration applied for the same band under co-location?  Huawei: TX IMD is generic for in-band and out of band. We define only in-band since more critical in-band. Assuming sync operation.  Further work the TP based on the assumption with in-band only. |

*Suggestion on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### CRs/TPs

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

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| R4-2010148 | To be approved |
| R4-2010953 | To be revised |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

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

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