**3GPP TSG-RAN WG4 Meeting #100-e R4-211XXXX**

**Electronic Meeting, 16th Aug 2021 - 27th Aug 2021**

**Agenda item:** xx.xx.xx

**Source:** Moderator (Nokia, Nokia Shanghai Bell)

**Title:** Email discussion summary [100-e][322] NR\_IAB\_Demod\_Maintenance

**Document for:** Information

# Introduction

*Briefly introduce background, the scope of this email discussion (e.g. list of treated agenda items) and provide some guidelines for email discussion if necessary.*

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

* 1st round: TBA
* 2nd round: TBA

## Scope

This tdoc will be used to guide and summarize the email discussion for the topic of Rel-16 IAB demodulation and CSI requirements (AI 6.1.2.6), with the email thread identifier “[100-e][322] NR\_IAB\_Demod\_Maintenance”.

The scope of this email discussion are Rel-16 IAB demodulation and CSI requirements, and in particular the agenda items:

6.1.2.6 Demodulation and CSI requirements [NR\_IAB-Perf]

6.1.2.6.1 General [NR\_IAB-Perf]

6.1.2.6.2 IAB-DU performance requirements [NR\_IAB-Perf]

6.1.2.6.3 IAB-MT performance requirements [NR\_IAB-Perf]

Priority topics are marked directly in the open issues’ summaries.

## Notes on email discussions

From the meeting arrangement:

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| --- |
| * Delegates are strongly encouraged to provide comments/concerns asap   + Silence within a reasonable timeframe means no objection * It is strongly encouraged that each company/delegate consolidate their comments/views and send them out in one email for each email thread * Length of file names shall be reduced, e.g.   + At the beginning of first round, moderators share / ftp / tsg\_ran / WG4\_Radio / TSGR4\_98\_e / Inbox / Drafts / [98e][101] NR\_NewRAT\_SysParameters\Summary\_101\_1st round\_v01.docx   + After update by company A: Summary\_101\_1st round\_v02\_companyA   + After update by company B: Summary\_101\_1st round\_v03\_companyA\_companyB   + After update by company C: Summary\_101\_1st round\_v04\_companyB\_companyC |

## Notes on completeness of this summary

Please note the guidance received by the RAN4 chair on the reflector on 2021/05/13 (for RAN4#99-e):

|  |
| --- |
| [Xizeng]: It is encouraged for moderators to use email summary comments (initial version + revised versions) to organize the discussion, capture all the comments/responses and provide recommendations in both 1st round and 2nd round. Thus it is easy to track the progress afterwards since all the discussions are recorded in one document. Especial for the 2nd round, after the WF/LS/revised CR… are provided, delegates are encouraged to continue providing comments in the email summary document.  But considering that people may be used to directly comment in the reflector for 2nd round, we do not mandate the above approach. But if the moderators think it is better, they can follow it. |

This email summary will incorporate comments received by email on the reflector on a best effort basis.  
The contributors are invited to duplicate any email comments in this summary document, to order to be sure that these comments are captured.

# Topic #1: General and CRs

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-20xxxxx | Company A | Proposal 1:  Observation 1: |
| R4-2114031 | Intel Corporation | Draft CR to TS 38.176-1: Correction of applicability rules for demodulation performance requirements  CR. |
| R4-2114032 | Intel Corporation | Draft CR to TS 38.176-2: Correction of applicability rules for demodulation performance requirements  CR. |
| R4-2112021 | Nokia Germany | draftCR to TS 38.176-2 IAB-DU performance requirements and parts of DU and MT appendix  CR. |
| R4-2113357 | Ericsson | Draft CR to 38.176-1: Antenna terminology  CR. |
| R4-2113802 | Huawei, HiSilicon | draftCR on IAB conducted conformance testing (Manufacturer declarations) to TS 38.176-1  CR. |
| R4-2114544 | Nokia Germany | On 5MHz CBW in the IAB Rel-16 Specifications  **Observation 1**: It seems impossible to serve either IAB-MTs or normal access UEs on bands that support 5MHz CBW.  **Observation 2**: The current CBW manufacturer declaration structure allows to keep 5MHz CBW demodulation performance requirements.  **Proposal 2: RAN4 to let 5MHz CBW IAB-DU demodulation performance requirements remain in the IAB specification, and do trust in the manufacturer declarations to have these requirements be non-applicable.** |
| R4-2114540 | Nokia Germany | draftCR to TS 38.176-1 IAB-DU performance requirements  CR. |
| R4-2113355 | Ericsson | Draft CR to 38.176-1: IAB-MT applicability and declarations  CR. |
| R4-2113356 | Ericsson | Draft CR to 38.176-2: IAB-MT applicability and declarations  CR. |
| R4-2113800 | Huawei, HiSilicon | draftCR on IAB-MT conducted performance requirements (General and Demodulation) in TS 38.174  CR. |
| R4-2113801 | Huawei, HiSilicon | draftCR on IAB-MT conducted conformance testing (CSI reporting and Interworking) to TS 38.176-1  CR. |
| R4-2113803 | Huawei, HiSilicon | draftCR on IAB-MT radiated conformance testing (General and Demodulation) to TS 38.176-2  CR. |
| R4-2114542 | Nokia Germany | draftCR to TS 38.174 IAB-MT CSI reporting radiated performance requirements  CR. |

## Open issues summary

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

*Interested companies are expected to add their views directly under the respective issues in a dialogue-like form, i.e., identical to how the chair would record views during a f2f meeting.*

*Please add further table rows as required and do not change previous comments of your company or other companies. Answering to questions from other companies is encouraged.*

### Sub-topic 1-1: 5MHz CBW

*Sub-topic description:*

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

**Issue 1-1-1: Removal of requirements with 5MHz CBW**

* Background
  + The IAB RF session has removed all requirements with 5MHz CBW, since no 5MHz CBW bands are supported for IAB in the current RF spec.
* Proposals
  + Option 1 [Nokia]: Let 5MHz CBW IAB-DU demodulation performance requirements remain in the IAB specification and do trust in the manufacturer declarations to have these requirements be non-applicable.
  + Option 2: Other options not precluded.
* Recommended WF
  + Discuss in first round.

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| --- | --- |
| **Company** | **Comments** |
| XXX |  |
| YYY |  |
| XXX |  |

### Sub-topic 1-2: Other

*Sub-topic description:*

*In this sub-topic companies are invited to bring issues to the attention of the group, which have not been captured in the previous sub-topics.*

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

### 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** |
| XXX | Title, Source |
| Company A |
| Company B |
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| R4-2114031 | Draft CR to TS 38.176-1: Correction of applicability rules for demodulation performance requirements, Intel Corporation |
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| R4-2114032 | Draft CR to TS 38.176-2: Correction of applicability rules for demodulation performance requirements, Intel Corporation |
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| R4-2112021 | draftCR to TS 38.176-2 IAB-DU performance requirements and parts of DU and MT appendix, Nokia Germany |
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| R4-2113357 | Draft CR to 38.176-1: Antenna terminology, Ericsson |
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| R4-2113802 | draftCR on IAB conducted conformance testing (Manufacturer declarations) to TS 38.176-1, Huawei, HiSilicon |
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| R4-2114540 | draftCR to TS 38.176-1 IAB-DU performance requirements, Nokia Germany |
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| R4-2113355 | Draft CR to 38.176-1: IAB-MT applicability and declarations, Ericsson |
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| R4-2113356 | Draft CR to 38.176-2: IAB-MT applicability and declarations, Ericsson |
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| R4-2113800 | draftCR on IAB-MT conducted performance requirements (General and Demodulation) in TS 38.174, Huawei, HiSilicon |
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| R4-2113801 | draftCR on IAB-MT conducted conformance testing (CSI reporting and Interworking) to TS 38.176-1, Huawei, HiSilicon |
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| R4-2113803 | draftCR on IAB-MT radiated conformance testing (General and Demodulation) to TS 38.176-2, Huawei, HiSilicon |
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| R4-2114542 | draftCR to TS 38.174 IAB-MT CSI reporting radiated performance requirements, Nokia Germany |
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## 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** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
|  |  |

*Recommendations on WF/LS assignment*

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

*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)

## 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: IAB-MT

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

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-20xxxxx | Company A | Proposal 1:  Observation 1: |
| R4-2113358 | Ericsson | Declaration of IAB-MT optional features  **Proposal 1: Include both capability signaling related test applicability tables and feature declaration in declaration tables for IAB-MT.** |
| R4-2114033 | Intel Corporation | View on IAB-MT performance requirements applicability definition in conformance specifications  **Observation #1**: IAB-MT has mandatory features with capability signaling that control requirements applicability.  **Observation #2**: IAB-MT capability signaling does not impact BS test style.  **Observation #3**: Definition of IAB-MT declarations for IAB-MT mandatory features with capability signaling is not justified and leads to contentions between RAN2 and RAN4 agreements.  **Observation #4**: Defining PMI and RI reporting requirements as optional requirements in RAN4 spec requires changing such features from mandatory to optional  **Proposal #1: Adopt Option 1 on applicability rules definition in IAB-MT conformance specifications.** |
| R4-2114543 | Nokia Germany | On IAB-MT Performance Requirements  **Observation 1**: Section D.3.3 title from 38.176-1 mentions only CQI reporting, but the diagram shall cover all CSI reporting tests. There is no note on the feedback link under the Figure D.3.3-1 in TS 38.176-1, and the caption does not mention CSI feedback.  **Proposal 1: Do not introduce a new scheme for CSI reporting for IAB-MT, i.e., use the same scheme as for demodulation performance (including IAB-MT and IAB-DU) also for CSI reporting.  a. Keep only one feedback link on the scheme.  b. Add text in the Note that the feedback is also used for CSI reporting as follows: NOTE 1: The feedback could be done as an RF feedback, either using NR channels or using other means, or as a digital feedback. The HARQ Feedback should be error free. CSI feedback is used only in CSI reporting tests.  c. Add a synchronization source.**  **Proposal 2: RAN4 to add the synchronisation note as per prior agreement:  “In tests performed with signal generators, a synchronization signal may be provided between the IAB node and the signal generator, or a common (e.g., GNSS) source may be provided to both IAB node and the signal generator, to enable correct timing of the wanted signal.”**  **Proposal 3: RAN4 to add the synchronisation note as per prior agreement with the following change:  “In tests performed with signal generators, a synchronization signal may be provided between the IAB node and the signal generator, or a common (e.g., GNSS) source may be provided to both IAB node and the signal generator, to enable correct timing of the wanted signal. The method of synchronization with the TE is left to implementation.”**  **Observation 2**: As far PMI reporting is a mandatory IAB-MT feature, its support cannot be left for manufacture declaration.  **Proposal 4: RAN4 to copy paste the “Requirements applicability” tables from the UE test specs to the MT test specs. Replace “FDD” with “TDD”.**  **Proposal 5: RAN4 to include the phrase “Testing of performance requirements for RI and PMI reporting is optional” in the “General” subsection of each “Applicability of requirements” section.**  **Proposal 6: RAN4 to not add any declaration on this in the manufacturer declaration section.**  **Proposal 7: Clause 11.2.3.2.1.1 with Applicability of requirements for IAB-MT CSI reporting radiated shall be left void.** |

## Open issues summary

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

*Interested companies are expected to add their views directly under the respective issues in a dialogue-like form, i.e., identical to how the chair would record views during a f2f meeting.*

*Please add further table rows as required and do not change previous comments of your company or other companies. Answering to questions from other companies is encouraged.*

### Sub-topic 2-1: Test setup for CSI reporting

*Sub-topic description:*

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

**Issue 2-1-1: Test setup figure in test specifications**

* Background
  + In RAN4#99-e it was left open how to represent the test setup for CSI reporting in the test specifications.
    - Option 1: Using the following test setup for CSI reporting for IAB-MT



* + - Option 2: Do not introduce a new scheme for CSI reporting for IAB-MT, i.e., use the same scheme as for demodulation performance (including IAB-MT and IAB-DU) also for CSI reporting.
      * Keep only one feedback link on the scheme, but add text or note that the feedback is used for CSI (only for PMI and RI reporting).
      * Add a synchronization source
      * Use "termination" for unused transceiver array boundary connectors.
    - Option 3: Other options not precluded.
* Proposals
  + Option 1:



* + Option 2 [Nokia]: Do not introduce a new scheme for CSI reporting for IAB-MT, i.e., use the same scheme as for demodulation performance (including IAB-MT and IAB-DU) also for CSI reporting.  
     a. Keep only one feedback link on the scheme.  
     b. Add text in the Note that the feedback is also used for CSI reporting as follows: NOTE 1: The feedback could be done as an RF feedback, either using NR channels or using other means, or as a digital feedback. The HARQ Feedback should be error free. CSI feedback is used only in CSI reporting tests.  
     c. Add a synchronization source.

transceiver unit array

#1

#2

#K

transceiver array boundary

Transceiver array boundary connector TAB(n)

Load

AWGN Generator

AWGN GeneratorAWGN Generator

IAB tester

Feedback

Synchronization source

* + Option 3: Other options not precluded.
* Recommended WF
  + Discuss in first round.

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| --- | --- |
| **Company** | **Comments** |
| XXX |  |
| YYY |  |
| XXX |  |

**Issue 2-1-2: Synchronisation note 2 text**

* Background
  + The notes “NOTE 2” pertaining to the testing setups on synchronization are inconsistent between specifications:
  + TS 38.176-2:  
    “In tests performed with signal generators, a synchronization signal may be provided between the IAB node and the signal generator, or a common (e.g., GNSS) source may be provided to both IAB node and the signal generator, to enable correct timing of the wanted signal.”
  + In 38.176-1:  
    “The method of synchronization with the TE is left to implementation. Neither the use of downlink signal configuration nor the use of proprietary means is precluded. In tests performed with signal generators, a synchronization signal may be provided between the IAB node and the signal generator, or a common (e.g., GNSS) source may be provided to both IAB node and the signal generator, to enable correct timing of the wanted signal.”
* Proposals
  + Option 1 [Nokia]: RAN4 to add the synchronisation note as per prior agreement:   
    “In tests performed with signal generators, a synchronization signal may be provided between the IAB node and the signal generator, or a common (e.g., GNSS) source may be provided to both IAB node and the signal generator, to enable correct timing of the wanted signal.”
  + Option 2 [Nokia]: RAN4 to add the synchronisation note as per prior agreement with the following change:   
    “In tests performed with signal generators, a synchronization signal may be provided between the IAB node and the signal generator, or a common (e.g., GNSS) source may be provided to both IAB node and the signal generator, to enable correct timing of the wanted signal. The method of synchronization with the TE is left to implementation.”
  + Option 2: Other options not precluded.
* Recommended WF
  + Discuss in first round.

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

### Sub-topic 2-2: Test applicability with respect to capabilities/features

*Sub-topic description*

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

**Issue 2-2-1: RI/PMI test applicability tables and feature declaration**

* Proposals
  + Option 1 [Ericsson]: Include both, capability signalling related test applicability tables and feature declaration, in declaration tables for IAB-MT.
  + Option 2 [Intel]: Adopt Option 1\* on applicability rules definition in IAB-MT conformance specifications.
    - Option 1\*:
      * Include capability signalling related test applicability tables.
      * Define IAB-MT declaration to support testing of PMI and RI reporting.
      * Do not capture in RAN4 specification that RI/PMI requirements are optional.
  + Option 3 [Nokia]: Adopt the following in specification
    - Copy paste the “Requirements applicability” tables from the UE test specs to the MT test specs. Replace “FDD” with “TDD”.
    - Include the phrase “Testing of performance requirements for RI and PMI reporting is optional” in the “General” subsection of each “Applicability of requirements” section.
    - Not add any declaration on RI/PMI testing in the manufacturer declaration section.
    - Clause 11.2.3.2.1.1 with Applicability of requirements for IAB-MT CSI reporting radiated shall be left void.
  + Option 4 [Huawei]: Use manufacturer declaration method.
  + Option 5: Other options not precluded.
* Recommended WF
  + Agreement:
    - Include capability signalling related test applicability tables. Replace “FDD” with “TDD”.
  + Open:
    - Declaration of RI/PMI testing (chose only one)
      * Alt1: Testing declaration in manufacturer declarations.
      * Alt2: Text stating optionality of RI/PMI testing in applicability of requirements.
      * Alt3: No declaration/text.
  + Please discuss the open issues in the first round and verify agreement.

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

### Sub-topic 2-3: Other

*Sub-topic description:*

*In this sub-topic companies are invited to bring issues to the attention of the group, which have not been captured in the previous sub-topics.*

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

### 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** |
| XXX | Title, Source |
| Company A |
| Company B |
|  |
| YYY | Title, Source |
| Company A |
| Company B |
|  |

## 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** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
|  |  |

*Recommendations 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 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)

## 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”* |
|  |  |

# 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 |  |
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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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-210xxxx | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-210xxxx | LS on … | ZZZ | Agreeable, Revised, Noted |  |
|  |  |  |  |  |

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

# Annex

Contact information

|  |  |  |
| --- | --- | --- |
| **Company** | **Name** | **Email address** |
| Moderator (Nokia) | Mueller, Axel | axel.mueller@nokia-bell-labs.com |
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Note:

1. Please add your contact information in above table once you make comments on this email thread.
2. If multiple delegates from the same company make comments on single email thread, please add your name as suffix after company name, when making comments, i.e. Company A (XX, XX).