**3GPP TSG-RAN WG4 Meeting #94-e R4-20xxxxx**

**Electronic Meeting, Feb.24th – Mar.6th 2020**

**Agenda item:** 10.3

**Source:** Moderator (Huawei)

**Title:** Email discussion summary for RAN4#94e\_#40\_FS\_7to24GHz\_NR

**Document for:** Information

# Introduction

This is the email discussion summary for RAN4#94e\_#40\_FS\_7to24GHz\_NR on 7 – 24 GHz SI, with the following topics covered:

* Topic 1: general issues
* Topic 2: spectrum and regulatory matters
* Topic 3: BS classes
* Topic 4: BS RF

There are multiple TPs submitted to the TR 38.820 on 7 – 24 GHz SI. Conclusion of the first round should conclude if these TPs can be agreed or need to be revised.

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

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

# Topic #1: general issues

Two TPs submitted for clean-up and for a placeholder of TPs to be agreed during the e-meeting.

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2001837 | Huawei | TP to TR 38.820: cleanup |
| R4-2001838 | Huawei | TR 38.820, v2.0.0: implementation of TPs from RAN4#94-e |

## Open issues summary

### Sub-topic 1-1

*Sub-topic description:*

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

**Issue 1-1: TBA**

* Proposals
  + Option 1: TBA
  + Option 2: TBA
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 1-1:  Sub topic 1-2:  ….  Others: |

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2001837 | Moderator: To be agreed. In case of comments received, keep this TP as placeholder for any other corrections identified during the e-meeting: to be revised. |
| Ericsson: Ok |
| Nokia: Please provide a list of changes in the cover page tdoc, very difficult to check through the whole TR. |
| R4-2001838 | Moderator: Keep as placeholder for implementation of the TPs from this e-meeting into TR 38.820 v 2.0.0: To be revised |
| 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

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| R4-2001837 | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
| R4-2001838 |  |

## 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 #2: Spectrum and regulatory matters

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2001834 | Huawei | Proposal: Agree on the attached TP to TR 38.820, capturing the updated list of frequency ranges of interest in the 7 - 24 GHz range. |
| R4-2001835 | Huawei | WRC-19 conclusions on IMT in 7 – 24 GHz range  It is proposed to capture relevant information in the TR 38.820, including the following:  - Studies on 10 – 10.5 GHz for IMT in Region2, as new agenda item for WRC-23  - Studies on IMT in fixed services bands in FWA deployments. |
| R4-2001836 | Huawei | TP to TR 38.820: WRC-19 conclusions  This contribution provides summary of the WRC-19 outcomes for IMT in 7 – 24 GHz range and related deployment scenarios. |

## Open issues summary

### Sub-topic 2-1

*Sub-topic description:*

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

**Issue 2-1: TBA**

* Proposals
  + Option 1: TBA
  + Option 2: TBA
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 1-1:  Sub topic 1-2:  ….  Others: |

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2001834 | Ericsson: First we shall not refer to bands, there are not any bands defined. Instead we shall refer to spectrum potentially to be used for IMT. We should capture the outcome from WRC-19, not what was said at RAN before SI start. A revision is required |
| Apple: We have some concerns with this proposal as it might give a misleading and even wrong impression about bands in that frequency range. As noted by Ericsson, there are no bands defined yet. There has been an interest from other companies and operators to study this frequency range, which was a motivation to instantiate SI. However, quite many band proposal in that range were not agreed at WRC19, so we would prefer not to reflect (at least in the TR) this information. |
| Dish Network: Based on the comments above, could we simply revise the TP can replace word “band” by word “range”? That way all the information would be captured, including frequency ranges of operator interest. |
| Huawei: agree not to use the “band” wording – this is misleading indeed. We would be fine with the Dish Networks proposal. Motivation of this TP is to capture information, which is not captured in RAN4 so far. This information may be useful closer to the WRC-23 conference, especially that this information comes from operators camps like ETNO and GSMA. |
| R4-2001835 /  R4-2001836 | Ericsson: We don’t need to and shall not copy text from other groups into 3GPP docs. Instead reformulate this in text and refer to proper ITU/R document. We could indicate in text that it’s on the agenda for WRC23 and document what happened at WRC19. A revision is required. |
| Apple: We are Ok with the principle to capture agreements from WRC19. Echoing comments from Ericsson, the TP can be more concise just referring to the corresponding agreements made at WRC19. |
| Huawei: agree with the suggestions. Revision will address those. |
| ZTE: For subclause 4, we might need some conclusion and tables capturing the outcome of WRC-19. For the content of WRC-19 file, they can be merged to Annex as for information. |

## 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** |
|  |  |

*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** |
| R4-2001834 | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
| R4-2001836 |  |

## 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: BS classes

There are two TPs to the same topic of BS classes. Depite technical comments to be collected, the baseline TP will have to be selected out of those two.

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2000686 | Nokia, Nokia Shanghai Bell | withdrawn |
| R4-2000687 | Nokia, Nokia Shanghai Bell | withdrawn |
| R4-2001017 | Ericsson | TP to TR 38.820: Addition of technical background for BS classes in subclause 7.3 |
| R4-2000673 | Nokia, Nokia Shanghai Bell | TP to TR 38.820: BS classes for 7-24 GHz frequency range |

## Open issues summary

### Sub-topic 2-1: select the baseline TP for BS classes

* Proposals
  + Option 1: Follow TP in R4-2001017 based on the existing BS classes
  + Option 2: Follow TP in R4-2000673 based on the consideration of the carrier frequency based derivation of the BS to UE minimum coupling loss and minimum distance derivation.
* Recommended WF
  + Depending on the feedback from companies as in 3.3.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 2-1:  Sub topic 2-2:  ….  Others: |
|  |  |

### 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** |
| R4-2001017 | Huawei:  - There is also related Nokia contribution for BS classes (R4-2000673).  - "The associated deployment scenarios for each class are exactly the same for all BS types." meaning of this sentence has been changed compared to the NR specification, i.e. in NR spec it refers to the BS with the w/o connectors. Now it refers to the BS types, while its meaning is not sufficiently clear.  - For the BS classes specification for conducted and OTA requirements: we have already defined the following terms: BS type xFR-C, BS type xFR-H, BS type xFR-O. It is suggested to re-use those terms in this TP. |
| Nokia: Not clear what would be the MCL and minimum distance of each BS class within the 7 - 24 GHz frequency range (or each frequency sub-range), is the proposal to keep the current MCL and minimum distance (calculated based on 2GHz carrier frequency) to the whole 7 - 24 GHz frequency range? |
| ZTE: Maybe some more background about why there are two different ways to differentiate the BS classes and potential methods for 7-24GHz range. |
| R4-2000673 | Ericsson: Today we have a concept for FR1 and FR2 documented in TS 38.104. For this frequency range we need to support the same concept. For BS type 1-O and BS type 2-O we have the same definitions of BS classes. Hence, we shall keep that concept for 7 to 24 GHz also. We have a TP capturing that to TR 38.820. With the proposal if this TP, we challenge the decision behind the concept used for FR1 and FR2. |
| Huawei:  - related TP in R4-2001017 (Ericsson), decide on the baseline TP first. As this approach was not really discussed during previous meetings, our preference is to revise Ericsson paper (and possibly include some inputs from Nokia contribution).  - what is missing the is general conclusion on the BS classes to be considered (WA, MR, LA), which was discussed during past meetings.  - TP shall not imply, that there will be 7-24 specific BS classes (due to the motivation on the carrier frequency- such motivation was not used when BS classes were defined for FR1 and FR2).  - if FR1 will be extended (e.g. considering the WRC-19 outcomes on 10-10.5GHz band for Region 2) then the content of BS classes is expected to be reused from FR1.  - If this TP is revised, we need to clarify how the BS classes concept aligns among FR1/7-24/FR2 to make it consistent. |
| ZTE: The information is good, but we think the table for example minimum distance is not needed. |

## 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:* |

*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** |
| R4-2001017 | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
| R4-2000673 |  |

## 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 #4: BS RF

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2001018 | Ericsson | TP to TR 38.820: Phase noise trends and example parameterized phase noise model in subclause 5.5.3 and Annex B |
| R4-2000674 | Nokia, Nokia Shanghai Bell | TP to TR 38.820: Update of BS receiver requirements for 7-24 GHz frequency range |
| R4-2001016 | Ericsson | TP to TR 38.820: Addition of technical background relevant for co-location out-of-band receiver blocking in subclause 7.4 |

## Open issues summary

## Companies views’ collection for 1st round

### Open issues

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2001018 | Huawei:  - if we would introduce this TP to the TR, it is confusing what is the delta to the existing text in 5.5.3.  - there is similar text on the frequency re-tuning. This is already covered in 5.5.3 and shall be aligned, not repeated.  - editorial: with the new text added, section 5.5.3 becomes a hanging paragraph. |
| Nokia: This TP is not needed. A phase noise profile with instructions how to scale it with operating frequency already exists in the TR, and together with that model examples of performance levels of both published scientific results and commercial components have been captured. Rest of the content is more general text-book like information on how a phase locked loop works and is not needed in the TR. |
| Ericsson: Scaling is captured in the TR, but we also need to be able to model the phase noise characteristics for a complete frequency generation sub-system. In our TP we have a generalized model on how to do that. The phase noise background is currently not complete.  I will start to draft a revised version with less information, but an addition to what we currently have. |
| R4-2000674 | Ericsson: An editorial update, we have also an update to fix the structure. |
| Huawei:  - Proposed corrections are OK.  - for the topics indicated to be completed in WI: those shall be included into the Rx summary table, there a dedicated column for the items to be concluded during WI is already included.  - revision needed to update with the above. |
| R4-2001016 | Huawei:  - TP to be aligned with the existing text in 7.4.1.10 where the OoB colocation blocking is also listed (cross-references to be added, at least).  - open items for the WI phase to be captured in the summary Table 7.4.2.1-1.  - suggest to capture this section within the existing OoB Blocking section 7.4.2.5, as it is done in NR specifications. |
| Nokia: 2nd line in 2nd paragraph of 7.4.2.8 should be 'between FR1 and FR2 BS'; 5th paragraph of 7.4.2.8 has long sentence without break, better have some ','. |
| Ericsson: We can move it to section proposed by Huawei and include corrections from Nokia. I will prepare a revised version. |
| ZTE： The co-location scenario has been discussed within the section 7.4.1.10 and the co-location blocking was listed there. A better solution is to capture the co-location blocking requirement in current OOBB section and then refere the co-location scenario analysis to section 7.4.1.10 as that no redundancy will occur. |

## Summary for 1st round

### Open issues

### CRs/TPs

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| R4-2001018 | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
| R4-2000674 |  |
| R4-2001016 |  |

## 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”* |