**3GPP TSG-RAN Meeting # 91-e RP-21xxxx**

**Electronic Meeting, 22 – 26 March, 2021**

**Agenda item:** 9.1.4

**Source:** RAN4 chair (Apple)

**Title:** Email discussion summary of [91E][12][Spectrum\_WIs]

**Document for:** Information

# Introduction

In RAN#91-e, an email thread [91E][12][Spectrum\_WIs] is assigned to discuss the following tdocs: RP-210352, RP-210356, RP-210357, RP-210360, RP-210362, RP-210380, RP-210381, RP-210382, RP-210383, RP-210384, RP-210385, RP-210524, RP-210525, RP-210543, RP-210544, RP-210545, RP-210546, RP-210359.

RP-210543, RP-210544, and RP-210546 are all basket WIs so it is proposed to move them to thread [91E][06][Basket\_WI].

RP-210359 is not exactly a spectrum related WI, but since there is no other email thread, we can have discussions in this thread.

# Discussions and comments

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| **Company** | **Topic #1: Rail Mobile Radio spectrum, i.e. 900MHz and 1900MHz (RP-210352, RP-210356, RP-210357)** |
| Company name | Comments… |
| ZTE | One clarification question for RP-210356/357): are the proposed bands intended for operation up to 500km/h as claimed in RP-210352? If so, it is seemly not covered by defining a spectrum-related WI, but maybe extend the ongoing HST WI instead.  More clarifications/discussions may be needed before approval. |
| Intel | The WI proposes to introduce PC1 support for FDD. There are ongoing studies on HPUE for FDD and the conclusions may need to be taken into account. Suggest focusing on PC3 first. |
| MTK | We have a question for clarification: Do we have frequency overlap with GSM-R? If so, do we need any co-existing study? |
| OPPO | For clarification, the PC1 UE is smart phone or other UE type? |
| Nokia | To answer ZTE this WI is for defining the bands. HST WI should handle the high speed issues on band agnostic way which then applies also to these bands. |
| Skyworks | For NR PC1 some MPR work might be needed for BW >10MHz because of the higher SU. This may already be needed for n71 PC1. |
| Vodafone | It is important that the high power railway devices do not cause negative impacts to existing deployed equipment in bands (n)8 and (n)1. |

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| **Company** | **Topic #2: Introduction of FR2 FWA UE with maximum TRP of 23dBm for band n259 (RP-210362, RP-210360)** |
| Company name | Comments… |
| ZTE | We are fine with the proposal. |
| KDDI | We support the proposal and fine with the draft WID. |
| Qualcomm | We support this proposal |
| vivo | We support the proposed WI. |
| Intel | We support the proposal. In case it is decided to introduce the PC5 for other bands (based on topic 5), then it is preferable to combine all topics into the same WI. |
| Ericsson | We are fine with the WID |
| OPPO | Support |

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| **Company** | **Topic #3: High power UE (power class 1.5) for NR band n79 (RP-210380, RP-210381)** |
| Company name | Comments… |
| ZTE | We support the proposed WI to meet market demands. |
| Qualcomm | No concern with this work, but instead of a separate work item, it may be more efficient to include this within the ongoing work item for PC1.5 in Band n77/n78. Is this for FWA, handset, or both? Is there a priority? |
| vivo | Support |
| Nokia | Qualcomm’s comment for combining this to PC1.5 in Band n77/n78 makes sense. |
| CMCC | Band n77/n78 is the same frequency, the ongoing work item for PC 1.5 in band n77/n78 is not a basket WI. Following the existing procedure, it is not appropriate to add n79 to n77/n78 WI. This WI has not restriction on the UE type, both FWA and hansdset are considered. |
| CATT | We support this WI to meet the operator’s market demand. Basket WI approach is a good proposal, but I am not sure whether it is straight forward starting from this meeting. Maybe Basket WI approach is better for future requests rather than from this one? |
| Ericsson | We are ok with the objectives and support the WI. |
| OPPO | Support this WI. |
| Skyworks | Since there is no AMPR involved, we think that it would be easier to add n79 to the currently running PC1.5 WI for n77/78. |

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| **Company** | **Topic #4: High power UE (power class 2) for NR band n34 and n39 (RP-210382, RP-210383, RP-210384, RP-210385)** |
| Company name | Comments… |
| ZTE | We support the proposed WI-s to meet market demands |
| Qualcomm | No concern with this work, but from organizational perspective should a basket WI be created? |
| vivo | Support |
| Intel | Agree with QC that basket WI can be a good alternative. |
| Nokia | Support basket WI idea. |
| CMCC | There are already some TDD bands in FR1 supporting power class 2. We are wondering whether it is worthwhile to create a basket WI since not much work left for TDD bands HPUE. We prefer to approve the proposed HPUE WIs. |
| CATT | We support this WI to meet the operator’s market demand. Basket WI approach is a good proposal, but I am not sure whether it is straight forward starting from this meeting. Maybe Basket WI approach is better for future requests rather than from this one? |
| Ericsson | We are ok with the objectives and support the WI. |
| OPPO | Support the WI. Maybe basket can be considered in the future WIs, there already some WIs for each band. |
| Skyworks | Basket WI approach is preferred since general requirement is already done for TDD and the only additional work is related to potential A-MPR. |

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| **Company** | **Topic #5: LTE/NR downlink and uplink spectrum sharing from UE perspective in Band 1/n1 (RP-210524, RP-210525)** |
| Company name | Comments… |
| ZTE | We support the proposed WI. |
| Apple | This looks to be a new feature. Is there any implication or specifications impact to other working groups? |
| China Telecom | Thanks for the question from Apple. We have checked that the only impact to other WG is the additional UE capability signaling in RAN2. |
| Qualcomm | This seems to be DL and UL sharing from the UE perspective in the same channel. This was discussed before but is not currently supported. This cannot be handled as a spectrum item, should be handled as a separate WID and discussed. |
| Nokia | This item is supported by Nokia but it should not be treated as a spectrum item. |
| OPPO | The impact to other group and UE implementations need to be considered carefully. And is the intention to introduce in Rel-17 or Rel-18 since this is non-spectrum WI? |
| China Telecom 2 | This WI has no impact on other WG excepting RAN2 capability signaling, and also only covers operator’s deployment need in band 1/n1, so we submitted it as a spectrum proposal, which is similar to several other spectrum proposals. We understand this EN-DC combination is different from the existing ones, that’s why we didn’t try to add it the existing basket WIs. |

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| **Company** | **Topic #6: addition of PC5 to Band n261 and n262 (RP-210545)** |
| Company name | Comments… |
| ZTE | One clarification question: is the proposed PC5 to n261 and n262 used only for FWA purpose? |
| T-Mobile USA | We also added PC5 to the revised with for n262 in RP-210705. It should not be in both WIDs. If PC5 for n262 is toing to be NR\_FR2\_PC5\_NewBand then we will need to revise RP-210705. |
| Apple | n261 is US only band and PC1 for FWA has been defined. Not sure why we need another power class for FWA in the same band. Is there any operator’s request on PC5 for this band? |
| Qualcomm | Before agree to this objective it would be useful to know if there is demand from carriers with n261 and n262 spectrum for this type of product. PC1 can be used in these bands, in our understanding |
| Intel | We are overall ok with the proposal to extend PC5 use case to additional bands.  Agree with T-Mobile USA that a single item shall be used for PC5 |
| Ericsson | We support to add PC5 to the WID |
| OPPO | Ok with the WI. |

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| **Company** | **Topic #7: supporting non-colocated scenarios for band 42 and n77/n78 (RP-210359)** |
| Company name | Comments… |
| ZTE | For MRTD, perhaps it should be treated in FeRRM WI, not in a Demod WI. |
| Apple | We have concern on the support of non-collocated scenarios for band 42 and n77/n78 as this would be considered as intra-band EN-DC where the time alignment between B42 and n77/n78 needs to be tightly controlled to avoid simultaneous Rx/Tx and the impact to UE AGC and APC performance. |
| KDDI | We support the proposal of Softbank and are agreeable with the relevant part of the revised WI for NR\_demod\_enh2-Perf. |
| Qualcomm | We have concerns on the implementation feasibility of this proposal. This is also proposed for baseband, we expressed the same view there. There will be a big performance degradation with larger MRTD because of shared LNA and characterization of performance degradation will be very difficult. |
| SoftBank | As a proponent of this contribution, we would emphasize again that this functionality is very important from the deployment point of view. As a capability has already been introduced in Rel-17, a subsequent work is anyway necessary in order to make this functionality complete.  We agree the comment by ZTE. MRTD (if not finalized in Rel-16) should be covered in FeRRM. |
| Intel | Support the proposal.  Further discussion on how to structure the work is needed. We see two basic options:   1. Split the work across different WIs (e.g. handle MRTD in feRRM and perf requirements in the Enhanced Demodulation WI) 2. Keep all RRM/Demod objectives within a single WI.   In terms of work organization, the second option is preferable. |
| Nokia | We understand the UE implementation concerns but from network deployment flexibility point of view this would be beneficial. |
| MTK | We have concern on this objective. Increasing the MRTD for intra-band CA would bring serious degradation to UE demodulation performance due to LNA operation limitation  Procedure-wise, we think we should stop the discussion of this issue here and move all discussion to the corresponding RRM and Demod WIs. |
| Ericsson | We support the addition of this objective. But this should be aligned with discussion on FeRRM thread. |
| OPPO | We understand the demands from operators, but the impacts to UE is not trivial needs to be considered carefully. We would like to understand better on how big this kind of deployments are in the real network. |

# Final proposals/recommendations