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

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

**Agenda item:** 9.25

**Source:** Moderator(Ericsson)

**Title:** Email discussion summary for RAN4#94e\_#37\_NR\_n65\_BW

**Document for:** Information

# Introduction

The scope of this email discussion is to specify REFSENS and A-MPR requirements when introducing 50 MHz channel BWs in band n65.

The focus of the discussion should be on getting possible agreement on REFSENS values and A-MPR assumptions (1st round) and capturing agreements in w Way Forward (2nd round).

# Topic #1: 50 MHz CBW

*Main technical topic overview:* Addition of 50 MHz channel BWin band n65.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2000089 | Qualcomm | **Proposal 1**: Use at least 5MHz protection region for B34 so upper channel BW is restricted to 2005MHz.**Proposal 2**: No AMPR requirement for B3 protection is FFS pending agreement on n65 filter rejection at B3 frequency to be at least 37dB.**Proposal 3**: Define n1 AMPR for B34 protection as shown in section 2.3 with B3 filter rejection assumption

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Channel Bandwidth, MHz | Carrier Center Frequency, Fc, MHz | Regions | A-MPR | Meas. A-MPR DFT/CP |
| RBend\*12\*SCSMHz | LCRB\*12\*SCSMHz |
| 50 MHz | Fc = 1945 |  |  |  |  |
| ≤ 9 | > 0 | A3 | 16.5 |
| > 9, < 37.8 | ≥ 9.0 | A4 | 8/9.5 |
| > 9, < 37.8 | < 9.0 | A5 | 4/5.5 |
| ≥ 37.8 | > 0 | A3 | 16.5 |
|  |  |  |  |
| 50 MHz | 1945 < FC ≤ 1980 |  |  |  |  |
| ≤ 18 | > 0 | A1 | 24/22 |
| > 18, < 27.0 | ≥ 0 | A2 | 12.5 |
| ≥ 27.0 | > 0 | A1 | 24/22 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Modulation/Waveform | A1 | A2 | A3 | A4 | A5 |
| Outer/Inner | Outer/Inner | Outer/Inner | Outer/Inner | Outer/Inner |
| DFT-s-OFDM PI/2 BPSK | 22 | 12.5 | 17 | 8 | 4 |
| DFT-s-OFDM QPSK | 22 | 12.5 | 17 | 8 | 4 |
| DFT-s-OFDM 16 QAM | 22 | 12.5 | 17 | 8 | 4 |
| DFT-s-OFDM 64 QAM | 22 | 12.5 | 17 | 8 | 4 |
| DFT-s-OFDM 256 QAM | 22 | 12.5 | 17 | 8 | 4 |
| CP-OFDM QPSK | 24 | 12.5 | 17 | 9.5 | 5.5 |
| CP-OFDM 16 QAM | 24 | 12.5 | 17 | 9.5 | 5.5 |
| CP-OFDM 64 QAM | 24 | 12.5 | 17 | 9.5 | 5.5 |
| CP-OFDM 256 QAM | 24 | 12.5 | 17 | 9.5 | 5.5 |

 |
| R4-2001210 | Ericsson | **Proposal: Approve the REFSENS values and RB allocation for 50MHz CBW as proposed in this contribution (Table 2 and Table 3).**

| Operating Band | SCS kHz | 50MHz(dBm) | Duplex Mode |
| --- | --- | --- | --- |
| n65 | 15 | **-79.3** | FDD |
| 30 | **-89.3** |
| 60 | **-89.4** |

 |
| R4-2001211 | Ericsson | **Proposal1: Add NS to protect band 33 and band 34, avoiding then any scheduling restriction, as it was already done for bands n1 and n38. A-MPR simulations should then be done based on below assumptions.****Proposal2: If confirmed by Japanese operators, NS\_05 (PHS service protection) will not be considered for 50MHz channel BW and corresponding A-MPR table would not be updated.** |

## Open issues summary

A-MPR assumptions and bands protection should be further discussed add agreed.

REFSENS values might be agreeable.

### Sub-topic 1-1

*Sub-topic description:* A-MPR -PHS protection.

**Issue 1-1: A-MPR - PHS protection**

* Proposals
	+ Option 1: 50MHz CBW will not be regulated where PHS service exists, no need to udpate NS\_05 for 50MHz CBW.
* Recommended WF

### Sub-topic 1-2

*Sub-topic description:* A-MPR –5 MHz offset in the upper band.

**Issue 1-2: A-MPR – 5 MHz offset**

* Proposals
	+ Option 1: Use at least 5MHz protection region for B34 so upper channel BW is restricted to 2005MHz
* Recommended WF

### Sub-topic 1-3

*Sub-topic description:* A-MPR – Band 3 protection

**Issue 1-3: A-MPR – Band 3 protection**

* Proposals
	+ Option 1: No AMPR requirement for B3 protection is FFS pending agreement on n65 filter rejection at B3 frequency to be at least 37dB.
* Recommended WF

### Sub-topic 1-4

*Sub-topic description:* A-MPR – Band 34 protection

**Issue 1-4: A-MPR – Band 34 protection**

* Proposals
	+ Option 1: A-MPR values according to proposal 3 in R4-2000089
	+ Option 2: Protect Band 34 and Band 33 to avoid RB restriction.
* Recommended WF

### Sub-topic 1-5

*Sub-topic description:* REFSENS

**Issue 1-5: REFSENS**

* Proposals
	+ Option 1: REFSENS values and RB allocation according to R4-2001210.
* Recommended WF

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Qualcomm Inc. | Sub topic 1-5: 1. Regarding R4-2001210: The 15K SCS REFSENS is too high. There is no distortion to cause this REFSENS value. This is possibly a typo. Value should be -89.1dBm when scaled with BW at 15K SCS.
2. The UL configuration is ok.

Sub topic 1-2, 1-3, 1-4:1. Regarding R4-2001211: Finalizing requirements is mandatory before finalizing AMPR, which includes maximum carrier frequency location for 50MHz BW.

….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.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| NA | 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*

|  |  |
| --- | --- |
| **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”* |