**3GPP TSG RAN Meeting #93-e RP-21xxxx**

**Electronic Meeting, September 13 - 17, 2021**

**Agenda item:** 9.4.1.3

**Source:** RAN Vice-Chair (AT&T)

**Title:** Moderator's summary for email discussion [93e-26-6GHz-NR-U]

**Document for:** Discussion

# Introduction

In this document, we will provide a summary for the email discussion on [93e-26-6GHz-NR-U] at RAN#92-e.

# Topic #1: Consideration of Aspects beyond ECC Decision (20)01

## Proposed objectives

Topic #1 will capture the outcome of the discussions related to aspects beyond ECC Decision (20)01 in the set of reference documents [1] to [6].

## Initial round

### Open issues

Issue 1.2-1: RAN needs to consider if the unlicensed operation in the frequency range 5945 MHz to 6425 MHz in Europe shall be based on available ECC Decision (20)01 or RAN4 shall consider other aspects as well.

The other aspects could consist of Radio Equipment Directive 2014/53/EU, receiver blocking requirements that will be necessary for coexistence with 6GHz IMT systems after WRC 2023, the technical requirements for the 6GHz band established through ETSI EN 303 687, and/or potential future regulations.

The following summarizes the options to consider for Issue 1.2-1.

* **Option 1: RAN4 to consider the unlicensed operation in the frequency range 5945 MHz to 6425 MHz in Europe shall be based on available ECC Decision (20)01.**
* **Option 2: RAN4 to consider other aspects in addition to ECC Decision (20)01 which could consist of Radio Equipment Directive 2014/53/EU, receiver blocking requirements that will be necessary for coexistence with 6GHz IMT systems after WRC 2023, the technical requirements for the 6GHz band established through ETSI EN 303 687, and/or potential future regulations.**
* **Option 3: Put** **WI (NR\_6GHz\_unlic\_EU) on hold pending potential future regulations for the upper 6 GHz range (6425 MHz to 7125 MHz).**

### Collection of company views

Issue 1.2-1: Indicate which option is preferred concerning aspects beyond ECC Decision (20)01 and impact to WI (NR\_6GHz\_unlic\_EU).

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| **Company** | **Comments** |
| OPPO | Option 2 is preferred |
| Huawei | All the applicable regulatory decision needs to be followed by default, including RED directive for EU. Therefore Option 2 to be considered as baseline.  For option 3: it would be good to clarify the timeline of the possible decision to put the WI on hold, so that it would be clear when to re-open technical discussion ,e.g. WRC 2023 outcomes? |
| Vodafone | Option 2. Article 3(2) of the directive states “Radio equipment shall be so constructed that it both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference”, and this must be complied with before products can be sold within the EU. If we do not define a new 6 GHz NR-U band, it is unclear how tighter requirements can be reliably specified and applied for 5945 – 6425 MHz to ensure compliance with 2014/53/EU  following the WRC23 decision. Operating with the n96 band and associated hardware within Europe would result in either unnecessary receiver blocking impacts for NR-U or a need to limit the Tx power of future licensed operation above 6425 MHz, both of which are unacceptable and not in line with the statement quoted above from 2014/53/EU. It is clear that an RF implementation targeted specifically for the 5945 – 6425 MHz range is the most effective way to ensure both licensed and unlicensed bands can coexist efficiently and avoid harmful interference. |
| BT | Option 2.  The ECC Decision is an important element of the identification of this band in Europe, however there are other elements which also need to be considered.  As previously noted, the RED requires efficient use of the radio spectrum to avoid harmful interference, and it is understood that this requires that receivers should have sufficient blocking protection. Whilst it is recognised that further clarity will be gained following the next WRC in 2023, we believe that using the band n96 receiver blocking requirements would not be appropriate in the meantime, as this would leave UEs vulnerable to interference in the future.  The figure in RP-211906 does propose a blocking mask which we believe would be appropriate, using the n96 blocking mask shifted downwards in frequency by 700 MHz, so that the UE requires the same mask at the top of the European band (i.e. above 6425 MHz) as that used at the top of the n96 band (i.e. above 7125 MHz). |

### Summary and recommendation for further discussion

In this section, the summary of comments on Topic#1 and the corresponding moderator recommendations are provided.

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|  | **Summary and recommendation** |
| **Moderator (RAN Vice-Chair, AT&T)** | **Moderator Recommendation:** |

## Intermediate round

### Open issues

### Collection of company views

### Summary and recommendation for further discussion

## Final round

### Open issues

### Collection of company views

### Summary and recommendation for further discussion

## Final comments

# Topic #2: Band Definition for Lower 6GHz NR Unlicensed Operation for Europe

## Proposed objectives

Topic #2 will capture the outcome of the discussions related to band definition for lower 6GHz NR unlicensed operation for Europe in the set of reference documents [1] to [4] and [6].

## Initial round

### Open issues

Issue 2.2-1: RAN needs to decide which options RAN4 shall follow to introduce unlicensed operation in the frequency range 5945 MHz to 6425 MHz in Europe.

The following summarizes the options to consider for Issue 2.2-1.

* **Option 1: Re-using already defined band n96, for the frequency range 5945 MHz to 6425 MHz.**
* **Option 2: Defining a new band n[xx], for the frequency range 5945 MHz to 6425 MHz.**
* **Option 3: Proceed with both option 1 and option 2 by specifying a new band for lower 6GHz NR unlicensed operation for Europe and amending the n96 specification with the NS values relevant for operation in Europe.**

### Collection of company views

Issue 2.2-1: Indicate which option is preferred to introduce unlicensed operation in the frequency range 5945 MHz to 6425 MHz in Europe.

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| **Company** | **Comments** |
| OPPO | Option 2 is preferred |
| Huawei | Option 2.  Regarding option 3: Option 3 was proposed during last RAN4 discussion due to lack of progress on option 1 vs 2. Considering further inputs during this RAN meeting, the option 3 is discouraged. |
| Vodafone | Option 2. |
| BT | Option 2 |

### Summary and recommendation for further discussion

In this section, the summary of comments on Topic#2 and the corresponding recommendations are provided.

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|  | **Summary and recommendation** |
| **Moderator (RAN Vice-Chair, AT&T)** | **Moderator Recommendation:** |

## Intermediate round

### Open issues

### Collection of company views

### Summary and recommendation for further discussion

## Final round

### Open issues

### Collection of company views

### Summary and recommendation for further discussion

## Final comments

# Final Conclusions

**Moderator Recommendations:**

# References

[1] RP-211823: On Introduction of lower 6GHz NR unlicensed operation for Europe; Nokia, Nokia Shanghai Bell

[2] RP-211906: Requirements for 6GHz NR-U band plan in Europe; BT plc, Telecom Italia, Telefonica, Vodafone, Deutsche Telekom, Orange, Telia Company, Telenor, Bouygues Telecom

[3] RP-212050: On progress for WI on introduction of lower 6GHz NR unlicensed operation for Europe; Qualcomm Incorporated

[4] RP-212125: On the introduction of lower 6GHz NR unlicensed operation for Europe; Ericsson

[5] RP-212300: Summary of the regulatory requirements for in- and out-of-band blocking in the 6GHz EU/CEPT band; Apple Inc.

[6] RP-212409: Discussion on band plan for Europe unlicensed 6GHz; ZTE, Sanechips