**3GPP TSG RAN WG1 Meeting #100b-e                     R1-200xxxx**

**eMeeting, April 20 - 30, 2020**

**Agenda Item: 7.2.2.2.2**

**Source: Moderator (Charter Communications)**

**Title: Draft-100b-e-NR-unlic-NRU-InitAccessProc-03 [RRM/RLM]**

**Document for: Discussion and Decision**

# Introduction

Three email discussions have been sanctioned in RAN1#100b-e on initial access procedures for NR-U. This third discussion that aims to converge by 4/24 has the following scope:

[100b-e-NR-unlic-NRU-InitAccessProc-03] Email discussion/approval on following issues related to RRM/RLM by 4/23; if necessary, followed by endorsing the corresponding TPs by 4/28 – Amitav (Charter)

* TP to 38.215 for RSSI definition
* Finalize the number of OFDM symbols for RSSI measurement duration configuration

These issues have been selected based on the preparatory discussion summarized in [14].

# Company views

## TP to 38.215 for RSSI definition

Choose between the following:

TP1 [7]:

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| **Definition** | Received Signal Strength Indicator (RSSI), comprises the linear average of the total received power (in [W]) measured by the UE from all sources, including co-channel serving and non-serving cells, adjacent channel interference, thermal noise etc. The UE measures ~~observed~~ only in configured OFDM symbols and in the ~~configured~~ measurement bandwidth ~~over~~ *~~N~~* ~~number of resource blocks~~ corresponding to the ~~LBT~~ channel bandwidth [TS 37.213 §4.0] where the channel has center frequency ~~of~~ configured by *ARFCN-ValueNR*~~, by the UE from all sources, including co-channel serving and non-serving cells, adjacent channel interference, thermal noise etc.~~  Higher layers configure the ~~measurement bandwidth,~~ *ARFCN-ValueNR,* reference subcarrier spacing and the measurement duration ~~and~~, i.e. which OFDM symbol(s) should be measured by the UE.  For frequency range 1, the reference point for the RSSI shall be the antenna connector of the UE. If receiver diversity is in use by the UE, the reported RSSI value shall not be lower than the corresponding RSSI of any of the individual receiver branches. |
| **Applicable for** | RRC\_CONNECTED intra-frequency,  RRC\_CONNECTED inter-frequency |

TP2 [3][6]:

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| **Definition** | Received Signal Strength Indicator (RSSI), comprises the linear average of the total received power (in [W]) observed only in the configured OFDM symbol~~s~~ and in the configured measurement bandwidth over *N* number of resource blocks corresponding to LBT bandwidth with the center frequency of configured ARFCN, by the UE from all sources, including co-channel serving and non-serving cells, adjacent channel interference, thermal noise etc.  Higher layers configure the reference numerology, measurement bandwidth, measurement duration and which OFDM symbol(s) should be measured by the UE.  For frequency range 1, the reference point for the RSSI shall be the antenna connector of the UE. If receiver diversity is in use by the UE, the reported RSSI value shall not be lower than the corresponding RSSI of any of the individual receiver branches. |
| **Applicable for** | RRC\_CONNECTED intra-frequency,  RRC\_CONNECTED inter-frequency |

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## Finalize the number of OFDM symbols for RSSI measurement duration configuration

See [1][8].

Alt. 1: The number of OFDM symbols for RSSI measurement duration should be scale with configured reference SCS. i.e.

· For 15 kHz: {sym1, sym14, sym28, sym42, sym70}

· For 30 kHz: {sym2, sym28, sym54, sym84, sym140}

· For 60 kHz+NCP: {sym4, sym56, sym108, sym168, sym280}

· For 60 kHz+ECP: {sym4, sym48, sym96, sym144, sym240}

Alt. 2: Add extra symbols or modify supported symbols of baseline set {sym1, sym14, sym28, sym42, sym70} to account for ECP.

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# References

1. R1-2001535 Maintainance on the initial access procedures Huawei, HiSilicon
2. R1-2001653 Remaining issues on initial access procedure for NR-U vivo
3. R1-2001706 Remaining issues on the initial access procedure for NR-U ZTE, Sanechips
4. R1-2001760 Discussion on the remaining issues of enhancements to initial access procedure OPPO
5. R1-2001936 Remaining issues of initial access and mobility for NR-U LG Electronics
6. R1-2001988 Enhancements to initial access and mobility for NR-unlicensed Intel Corporation
7. R1-2002032 Enhancements to initial access procedures Ericsson
8. R1-2002118 Initial access procedures for NR-U Samsung
9. R1-2002248 Remaining issues on initial access procedure for NR-U ETRI
10. R1-2002263 Remaining issues on initial access procedure Spreadtrum Communications
11. R1-2002278 On Enhancements to Initial Access Procedures for NR-U Nokia, Nokia Shanghai Bell
12. R1-2002407 Remaining issues on initial access procedure for NR-U operation MediaTek Inc.
13. R1-2002531 TP for Initial access and mobility procedures for NR-U Qualcomm Incorporated
14. R1-2001701 FL summary 72222 NRU Charter Communications