**3GPP TSG-RAN WG5 Meeting #99 R5-233672**

**Incheon, Korea, 22nd -26th May 2023**

Title: LS on clarifications for Non-Terrestrial Networks

Response to: -

Release: Rel-17

Work Item: NR\_NTN\_solutions, LTE\_NBIoT\_eMTC\_NTN\_req

Source: RAN WG5

To: RAN WG4

Cc: -

**Contact Person:**

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Attachments:

**1. Overall Description:**

In TS 38.101-5 Sections 6.1 and 7.1, it is indicated that all requirements for NR NTN in such specification, except for frequency error, shall be verified when Doppler conditions are set to zero. Even when not yet in TS 36.102, similar agreement was achieved for IoT NTN in R4-2303538 Issue 2-6.

In TS 38.101-5 Section 6.4.1, it is indicated that NR NTN frequency error requirement will be verified for at least 2 cases of which one has zero Doppler conditions. Similar statements for IoT NTN frequency error requirements appear in TS 36.102 sections 6.4A.1 and 6.4B.1

Q1a: Are all the section 6 and section 7 RF Tx/Rx requirements defined in TS 38.101-5 applicable to both GSO and NGSO?

Q1b: Similarly, are the section 6 and section 7 RF Tx/Rx requirements defined in TS 36.102 applicable to both GSO and NGSO?

Q2a: Can RAN4 clarify what zero Doppler conditions imply for the section 6, and section 7 RF requirements defined in TS 38.101-5? Specifically, but not only for NGSO where satellite orbit introduces a time varying Doppler shift and time varying propagation delay. For GSO (different from GEO) any Doppler shift/propagation delay needs to be considered? For GEO any Doppler shift/propagation delay needs to be considered?

Q2b. Above questions apply to TS 36.102 as well.

Q2c: Under constant Doppler conditions, what are RAN4 assumptions for UE Doppler and delay pre-compensation mechanisms: activated or deactivated?

Q2d: Are these zero doppler or time varying assumptions also applicable for RRM requirements in TS 38.133 and TS36.133?Q2e: Are these zero doppler or time varying assumptions also applicable for demod performance requirements in section 8 in TS 38.101-5 and 36.102?

Q3a: For the NTN frequency error requirements defined in section 6.4.1 of TS 38.101-5, what is RAN4 assumption in terms of constant/variable Doppler and delay conditions for the 2nd case not labelled as zero Doppler conditions for GSO (different from GEO), GEO and NGSO?

Q3b: Above question applies to frequency error requirements defined in TS 36.102 section 6.4A.1 and 6.4B.1

Q4a: For section 6, section 7, section 8 requirements defined in TS 38.101-5, is RAN4 assuming implementation of a satellite propagator model in the Test equipment for the service link?

Q4b: Similarly, is RAN4 assuming implementation of a satellite propagator model in the test equipment for service link for requirements defined in TS 36.102?

Q4c: Which RRM requirements are assuming a satellite motion trajectory based on the ephemeris using Eckstein-Hechler model as defined in TS 38.133 Annex B.5 (applicable also to 36.133 as per agreement in R4-2306370)?

Q5: Should UE location updates follow UE motion in multipath propagation tests?

**2. Actions:**

**To RAN WG4:**

**ACTION:** RAN5 would like to kindly ask RAN4 to provide above requested clarifications.

**3. Date of Next RAN WG5 Meetings:**

TSG RAN WG5 Meeting #100 August 21st – 25th, 2023 Toulouse, FR

TSG RAN WG5 Meeting #101 November 13th – 17th, 2023 Chicago, US