**3GPP TSG RAN WG2#116bis-e draft-R2-2201742**

**Online meeting, January 17-25, 2022**

Title: [Draft] Reply LS on NR NTN Neighbor Cell and Satellite Information

Response to: R2-2200129/R4-2120309

Release: Release 17

Work Item: NR\_NTN\_solutions-Core

Source: Qualcomm Inc. [to be RAN2]

To: RAN4

Cc: RAN1

**Contact Person:**

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**Send any reply LS to: 3GPP Liaisons Coordinator,** [**mailto:3GPPLiaison@etsi.org**](mailto:3GPPLiaison@etsi.org)

Attachments: None

**1. Overall Description:**

RAN2 would like to thank RAN4 for the LS. RAN2 would like to provide following response.

Question-1: Would the parameters listed above be relevant to measurements and mobility? If the answer is dependent on satellite types, e.g. GSO and NGSO, and RRC state, what would be the answers to the respective satellite types?

RAN2 answer: For measurement purpose, SMTCs, ephemeris, epoch time and DL polarization information would be relevant regardless of satellite types and RRC state.

RAN2 has agreed the assumption that feeder link delay is known to and compensated by the network. However, if network does not compensate the feeder link, common TA drift parameters of the neighbour cells are also provided to UE.

For handover, a UE would need those parameters listed in the LS regardless of satellite types except (B3) and (B4).

RAN2 assumes the UE can be configured with a validity duration of the orbital parameters (i.e., Keplerian format) of ephemeris of the neighbor cell to be longer than that of the PVT parameters of the serving cell. However, other information like common TA will have same validity duration for neighbor cell and the serving cell, i.e., (A3) and (B3) will be known to the UE.

RAN1-107e had made the conclusion that DL frequency compensation by gNB for the service link Doppler is not supported in Release 17, therefore, (A4) and (B4) are not needed.

Question-2: Would there be parameters that are not listed but necessary for measurements and mobility from RAN2 perspective? If the answer is dependent on satellite types, e.g. GSO and NGSO, and RRC state, what would be the answers to the respective satellite types?

RAN2 answer: For neighbor cell measurement, the parameters indicated in the response to the Question 1 are sufficient. Following additional parameters are also needed for handover.

(B6): For fixed cell, neighbor cell stop time and reference location.

(B7): Epoch time of the ephemeris

(B8): drift rates for common TA,

(B9): Kmac (to determine UE-gNB RTT and perform RACH to target),

(B10) beam information.

Question-3: Would the parameters be available to UE, e.g. provided by serving cell, for measurements and mobility? If the answer is dependent on satellite types, e.g. GSO and NGSO, and RRC state, what would be the answers to the respective satellite types?

RAN2 answer: Yes.

Questions-4: What would be the expected UE behavior from the perspective of handover, measurement, and measurement reporting if any or all of the information listed above is not provided to the UE by a serving cell or if any of all of the provided information cannot be used by the UE because, e.g. the validity timer expires? If the answer is dependent on satellite types, e.g. GSO and NGSO, and RRC state, what would be the answers to the respective satellite types?

RAN2 answer: RAN2 assumes all the information needed for measurement and handover would be provided to the UE by the network. If any of the information is not available or is not valid, then the UE would have to acquire the system information of the target or neighbor cell which is not desirable from power consumption point of view.

**2. Actions:**

**To** **RAN4.**

**ACTION:** RAN2 kindly asks RAN4 to take into account the above information and provide feedback if needed.

**3. Date of Next RAN2 Meetings:**

TSG-RAN WG2##117-e February 21st – March 3rd, 2022 Online meeting