**3GPP TSG RAN WG1#118bis**  **R1-2409036**

**Hefei, China, October 14th – 18th, 2024**

Agenda Item: 8.1

Source: Moderator (CATT)

Title: FL Summary for maintenance on NR carrier phase positioning

Document for: Discussion and Decision

# Introduction

This document provides a summary of the maintenance issues on NR carrier phase positioning based on the submitted draft CR ([1]) (Note: Draft CRs that might be considered as alignment CRs are not included here).

# Discussion

***Background***

The following agreement was made in RAN1#115 related to the time window for differential positioning:

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| **Agreement**  When an LMF requests a UE, which can be a target UE and a PRU, to perform measurements on indicated DL PRS resource set(s) occurring within an indicated time window.  • The UE may use the indicated DL PRS resource set(s) occurring outside the indicated time window for legacy measurements in addition to the indicated DL PRS resource set(s) occurring inside the indicated time window.  • Introduce an optional UE capability for supporting to perform legacy measurements inside the indicated time window only, and an associated configuration to enable legacy measurements inside the time window only. |

The above agreement introduced an optional UE capability for supporting to perform legacy measurements inside the indicated time window only. In [1], it said that “There is no clear statement whether such a procedure applies to TRP, i.e., the legacy UL measurements for UL-TDOA and Multi-RTT are performed within the indicated time window(s) only or are not restricted to the indicated time window”. This issue has triggered the discussion in RAN3 with the concern on potential misalignment between RAN1/RAN2/RAN3.

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| Huawei, HiSilicon [1] | ***Proposal 1: Agree to the following:***   * ***When an LMF requests a TRP to perform UL RSCP measurements on indicated SRS resource set(s) occurring within an indicated time window.***   ***The TRP may use the indicated SRS resource set(s) occurring outside the indicated time window for legacy measurements in addition to the indicated SRS resource set(s) occurring inside the indicated time window.***  ***Introduce an associated request to enable legacy measurements inside the time window only.***  ***Proposal 2: Send a LS to RAN3: informing the agreement once the proposal 1 is agreed.*** |

FL Comments:

For supporting UL differential positioning, RAN1 has made the following agreements for the simultaneous transmission of UL SRS for positioning by a target UE and a PRU, and the measurements of the serving gNB and neighboring gNBs of UL SRS for positioning from the target UE.

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| **Agreement (RAN1#112bis)**  Adopt the following modifications on the agreements made in RAN1#112bis-e:  To enable simultaneous transmission of UL SRS for positioning by a target UE and a PRU, support the following enhancements:   * Enabling LMF to request the serving gNB of a UE to configure the transmission of the UL SRS resources from the UE within indicated time window(s).   + FFS: the details of the time window, e.g., the start time, duration, periodicity for the time window(s), within the vicinity of a reference SRS configuration or use the existing message of Scheduled Location time * Enabling LMF to request the serving gNB and neighboring gNBs of the UE to measure the UL SRS resources from the UE within indicated time window(s).   + Note: this may be a different indicated time window |

The above agreement shows that R18 supports “Enabling LMF to request the serving gNB and neighboring gNBs of the UE to measure the UL SRS resources from the UE within indicated time window(s)’. It does not mean the serving gNB and neighboring gNBs have to measure the UL SRS resources from the UE within the indicated time window(s), although the serving gNB and neighboring gNBs will normally follow the LMF’s request, unless there is a very special reason that makes the serving gNB and/or the neighboring gNBs decide not to follow the LMF’s request.

For the proposal to request the serving gNB and/or the neighboring gNBs to measure the UL SRS within indicated time window(s) only, in FL’s understanding, it will still not mandate the gNBs to do so. Thus, it may not make much difference between request the gNBs to measure UL SRS resources “within indicated time window(s)” and “within indicated time window(s) only” unless we want to further define the conditions and corresponding behaviors of the gNBs if the gNBs are requested to measure UL SRS resources “within indicated time window(s) only”, but for any reason the gNBs do not, or cannot fulfill the request.

### (Round1) Q&A

**Interested companies are invited to provide their views on the following options:**

***Option 1:***

* ***When an LMF requests a TRP to perform UL RSCP measurements on indicated SRS resource set(s) occurring within an indicated time window.***
  + ***The TRP may use the indicated SRS resource set(s) occurring outside the indicated time window for legacy measurements in addition to the indicated SRS resource set(s) occurring inside the indicated time window.***
  + ***Introduce an associated request to enable legacy measurements inside the time window only.***
  + ***FFS: What happens if the TRP cannot follow the request to enable legacy measurements inside the time window only***
* ***Send a LS to RAN3 to inform the agreement if the above is agreed.***

***Option 2:***

* ***When an LMF requests a TRP to perform UL RSCP measurements on indicated SRS resource set(s) occurring within an indicated time window, there is no need to introduce an associated request to enable legacy measurements inside the time window only.***
* ***Send a LS to RAN3 to inform the agreement if the above is agreed.***

***Option 3 (as a conclusion)***

* ***Unless explicitly requested by an LS from another WG, RAN1 will not further discuss whether to introduce an associated request to enable legacy measurements inside the time window only, when an LMF requests a TRP to perform UL RSCP measurements on indicated SRS resource set(s) occurring within an indicated time window.***

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| **Company** | **comments** |
| Qualcomm | Option 1 |
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# References

1. R1-2408180, Extend the measurement time window to TRP, Huawei, HiSilicon