**3GPP TSG RAN WG1 Meeting #110bis-e R1-22xxxxx**

**e-meeting, Oct 10th – 19th, 2022**

**Source: Intel Corporation, CATT, Ericsson**

**Title: Comments to Draft TR 38.859 v020: Study on expanded and improved NR positioning**

**Agenda item: 9.5**

**Document for: Discussion**

# Introduction

A draft for TR 38.859: Study on expanded and improved NR positioning incorporating decisions until week #1 of RAN1 #110bis meeting are presented.

This document aims to collect any feedback to the draft TR shared in [R1-2210233](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_110b-e/Inbox/R1-2210233.zip).

Please follow the naming convention in this example:

* *Comments to draftTR38859v020-v000.docx*
* *Comments to draftTR38859v020-v001-CompanyA.docx*
* *Comments to draftTR38859v020-v002-CompanyA-CompanyB.docx*
* *Comments to draftTR38859v020-v003-CompanyB-CompanyC.docx*

If needed, you may “lock” a spreadsheet file for 30 minutes by creating a checkout file, as in this example:

* Assume CompanyC wants to update *SLPosScenReq\_FLS-v002-CompanyA-CompanyB.docx*.
* CompanyC uploads an empty file named *SLPosScenReq\_FLS-v003-CompanyB-CompanyC.checkout*
* CompanyC checks that no one else has created a checkout file simultaneously, and if there is a collision, CompanyC tries to coordinate with the company who made the other checkout (see, e.g., contact list below).
* CompanyC then has 30 minutes to upload *SLPosScenReq\_FLS-v003-CompanyB-CompanyC.docx*
* If no update is uploaded in 30 minutes, other companies can ignore the checkout file.
* Note that the file timestamps on the server are in UTC time.

Please note that there is NO need to send an info email to the reflector just to inform that you have uploaded a new version of this document. Companies are invited to enter the contact info in the table below.

# Company views

Please provide any feedback to the draft TR shared in [R1-2210233](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_110b-e/Inbox/R1-2210233.zip) below.

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| Company | Comments |
| InterDigital | Thank you very much for capturing and compiling agreements. We may have more comments later but here are some comments related to 6.1.1.* Could we assume that all proposals that are relevant to studies will be removed from the final version of TRP, for example the paragraphs starting with “For timing-based positioning methods, the following error sources are studied:…”.
* Could we assume that error sources with FFS be removed from Table 6.1.1-1 in the final version of TR if they are not resolved by the end of the study item? These are error sources under the study and only identified error sources should appear in Table 6.1.1-1.
* In Table 6.1.1-2, in the second column first row, could you change “Distribution for error model” to “Candidate(s) for distribution for error source” since more than one distribution were identified as a candidate for some error sources (e.g., inter-TRP sync error)
* Similarly, could you change the heading of Table 6.1.1-2 to “Identified candidates of distributions to model the errors due to different error sources”
* For Table 6.1.1-1, we should differentiate UE-based/assisted DL-TDOA or DL-AoD in the table. For example, for UE-assisted DL-TDOA, RSTD measurement is an error source. For UE-based DL-TDOA, TRP location or inter-TRP sync error are error sources.
* If it helps, in the FL’s summary (R1-2209460 or R1-2210428), Figure 1 illustrated association between error sources, different positioning methods and integrity mode. It can be used instead of Table 6.1.1-1, if the editor prefers.
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| CMCC | Thank you Debdeep for the efforts, some quick comments regarding LPHAP sections:1) Regarding the newly added agreement under Section 6.4.1 of enhancements on SRS, in my views, this is just an agreement for further study the potential solutions, and I’m not sure if it is needed to be captured in the TR. In the next meeting, if such enhancements are agreed to be recommended for normative work, then it can be captured under Section 6.4.3, no?2) Regarding the following two conclusions under Section 6.4.2:* Evaluations show that UE (re)entering RRC\_CONNECTED state to obtain SRS (re)configuration increases power consumption.
* Evaluations show that extending paging DRX cycles beyond 10.24s provides power saving gains with respect to that with the baseline DRX cycle of 1.28s and is beneficial towards meeting the device battery life requirement.

As these are intermediate conclusions to encourage companies to further provide additional results in the next meeting so that proper observations can be made, I don’t think these two conclusions should be captured in the TR. |
| CATT | Thanks for the great effort. Some initial comments regarding carrier phase positioning in Section 6.3.1:1. Suggest moving the 1st sentence to the end of the Section.
2. Suggest adding the new agreement “For UL UE-assisted NR carrier phase positioning, at least conside the carrier phase measured from the UL SRS for positioning purpose…” after the paragraph “For UE-assisted NR carrier phase positioning, at least the following options are considered…”.
3. Suggest change “For UE-assisted NR carrier phase positioning, at least the following options are considered…” to “For DL UE-assisted NR carrier phase positioning, at least the following options are considered…”, since we have use “For UL UE-assisted NR carrier phase positioning…” in another agreement.
4. Suggest moving the paragraph of “The impact of integer ambiguity on NR carrier phase positioning and potential solutions to resolve the integer ambiguity…” after the new “new agreement “For UL UE-assisted NR carrier phase positioning…”
5. Suggest adding a new paragraph to capture the new agreement “The impact of multipath/NLOS on NR carrier phase positioning is evaluated during the study item…”
6. Suggest adding a new paragraph in Section 6.3.1, saying that “The potential Solutions for NR Carrier Phase Positioning are evaluated with the consideration of v*arious error sources, which include: Phase noise (FR2), carrier frequency offset (CFO)/Doppler, oscillator-drift, transmitter/receiver antenna reference point (ARP) location errors, transmitter/receiver initial phase error, antenna phase center offset (PCO) etc. More detailed evaluation methodology and assumptions are presented in Annex A.3.”*
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