3GPP TSG-RAN WG2 Meeting #121bis-e, R2-230xxxx

17 – 26 April 2023

**Agenda item: 7.24.2**

**Source: Vodafone (Rapporteur)**

**Title: [AT121bis-e][412][POS] GNSS LOS/NLOS information**

**WID/SID: TEI-18**

**Document for: Discussion and Decision**

# 1 Introduction

This document is the report of the following email discussion:

* [AT121bis-e][412][POS] GNSS LOS/NLOS information (Vodafone)

      Scope: Discuss documents R2-2303163 / R2-2303196 / R2-2303200 / R2-2303206 and attempt to bring the CRs to an agreeable condition.

      Intended outcome: Report and agreeable CRs

      Deadline: Friday 2023-04-21 1000 UTC

**Phase 1 deadline of Thursday 2023-04-20 10:00 AM UTC for all company comments.**

Phase 2 deadline of Friday 2023-04-21 10:00 UTC AM for final agreed CRs.

Documents for the discussion:

[1] R2-2303163 GNSS LOS/NLOS assistance information-Follow up Vodafone, Spirent, Ericsson, Telecom Italia discussion Rel-18

[2] R2-2303196 GNSS LOS/NLOS assistance information Vodafone, Spirent, Ericsson, Telecom Italia CR Rel-18 37.355 17.4.0 0436 - B TEI18

[3] R2-2303200 GNSS LOS/NLOS posSIB broadcast assistance information Vodafone, Spirent, Ericsson, Telecom Italia CR Rel-18 38.331 17.4.0 3998 - B TEI18

[4] R2-2303206 GNSS LOS/NLOS posSIB broadcast assistance information Vodafone, Spirent, Ericsson, Telecom Italia CR Rel-18 36.331 17.4.0 4923 - B TEI18

# 2 Contact Points

Respondents to the email discussion are kindly asked to fill in the following table.

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| --- | --- | --- |
| Company | Name | Email Address |
| Vodafone (Rapporteur) | Alexey Kulakov | Alexey Kulakov |
| Ericsson | Fredrik Gunnarsson | fredrik.gunnarsson@ericsson.com |
| OPPO | Yang Liu | liuyangbj@oppo.com |
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# 3 Discussion

Discussion Document in R2-2303163[1] :

**Question 1**: Do you have any technical comments to the scope highlighted in R2-2303163. Please elaborate your opinion.

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| Answers to Question 1 | | |
| Company | Yes/No | Technical Arguments |
| Ericsson | No | We have no technical arguments against but a few comments: - the document describes in detail how a device can use and benefit from the provided LoS/NLoS information also when it has an uncertain position estimate – referred to the chicken-egg situation at the last meeting  - the document also makes clear that the feature does not need a precise position from the device reported  - there are also some size assessments made  Thereby, we think the questions raised online in Athens have been addressed |
| OPPO |  | It seems that R2-2303163 only states that the LOS/NLOS information is provided for the 2-D grid points in the real-time uncertain area, but not related with the 3-D altitude (height) point as indicated in the following stage-3 CR. My first question is that is the 3-D altitude necessary or not?  Also, in R2-2303163, the author states that the UE could ask for a finer granularity grid LOS information when the accuracy of the positioning result becomes better and the uncertain area shrinks. My second question is: how to achieve this by using the broadcast method? Only limited size of info could be conveyed to UE via broadcast |
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**Summary 1**: TBD.

**Proposal 1**: TBD.

**Question 2:** Please provide your view on the proposal in R2-2303163: It is proposed to proceed with the definition of stage 3 details to support LOS/NLOS information as described in R2-2303196, R2-2303200, R2-2303206

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| Answers to Question 2 | | |
| Company | Yes/No | Technical Arguments |
| Ericsson | Yes | We think the motivations in the discussion paper are sound and relevant and are fine to proceed with stage 3 |
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**Summary 2**: TBD.

**Proposal 2**: TBD.

CR in R2-2303196 [2] for 37.355

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| ***Reason for change:*** | The determination of the accuracy is one of the major tasks of GNSS receiver and the increased accuracy is very important especially in the multi-path environment like urban canyon for many use cases. In order to achieve it, the assistance information of Line of Sight (LOS) / Non Line of Sight (NLOS) of satellites of a particular satellite in a given location is required to assist GNSS receiver |
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| ***Summary of change:*** | The support of assistance information about LOS/NLOS GNSS satellites, corresponding UE capability and the information to request LOS/NLOS GNSS satellites assistance data are introduced |
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| ***Consequences if not approved:*** | There is no assistance information about LOS/NLOS GNSS satellites provided to the UE |

**Question 3**: Please provide your technical comments to the CR in R2-2303196

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| Answers to Question 3 | | |
| Company | Yes/No | Technical Arguments |
| Ericsson | Yes | The CR implements the feature correctly |
| OPPO |  | Confused with the IE definition of ‘referenceAltitude’. In the CR, it is defined as the upmost layer of the grid relative to the reference altitude, which seems not aligns with the IE name. In our opinion, the IE ‘reference altitude’ is to define the altitude of the reference layer but not the altitude of the highest layer of the grid. |
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**Summary 3**: TBD.

**Proposal 3**: TBD.

CR R2-2303200 [3] for 38.331

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| ***Reason for change:*** | The determination of the accuracy is one of the major tasks of GNSS receiver and the increased accuracy is very important especially in the multi-path environment like urban canyon for many use cases. In order to achieve it, the assistance information of Line of Sight (LOS) / Non Line of Sight (NLOS) of satellites of a particular satellite in a given location is required to assist GNSS receiver. |
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| ***Summary of change:*** | The support of assistance information about LOS/NLOS GNSS satellites, corresponding UE capability and the information to request LOS/NLOS GNSS satellites assistance data are introduced as two new posSIBs |
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| ***Consequences if not approved:*** | Broadcast of GNSS LoS/NLoS is not possible in NR |

**Question 4**: Please provide your technical comments to the CR in R2-2303200

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| Answers to Question 4 | | |
| Company | Yes/No | Technical Arguments |
| Ericsson | Yes | The CR implements the feature correctly |
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**Summary 4**: TBD.

**Proposal 4**: TBD.

CR in R2-2303206 [4] proposes the following changes to TS 36.331

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| ***Reason for change:*** | The determination of the accuracy is one of the major tasks of GNSS receiver and the increased accuracy is very important especially in the multi-path environment like urban canyon for many use cases. In order to achieve it, the assistance information of Line of Sight (LOS) / Non Line of Sight (NLOS) of satellites of a particular satellite in a given location is required to assist GNSS receiver. |
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| ***Summary of change:*** | The support of assistance information about LOS/NLOS GNSS satellites, corresponding UE capability and the information to request LOS/NLOS GNSS satellites assistance data are introduced as two new posSIBs |
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| ***Consequences if not approved:*** | Broadcast of GNSS LoS/NLoS is not possible in LTE |

**Question 5**: Please provide your technical comments to the CR in R2-2303206

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| Answers to Question 5 | | |
| Company | Yes/No | Technical Arguments |
| Ericsson | Yes | The CR implements the feature correctly |
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**Summary 5**: TBD.

**Proposal 5**: TBD.

# 4 Conclusion

TBD.