**3GPP TSG-RAN WG2 Meeting #118-e *R2-220xxxx***

**Electronic, 9th May – 20th May 2022**

Agenda Item: 7.2.1.2

Source: Ericsson (rapporteur)

Title: [AT118-e][055][IOT NTN] Stage-2 CR 36300 (Ericsson)

Document for: Discussion, Decision

[R2-2205864](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_118-e%5CDocs%5CR2-2205864.zip) IoT NTN Stage 2 corrections Ericsson, Eutelsat draftCR Rel-17 36.300 17.0.0 LTE\_NBIOT\_eMTC\_NTN Late

* QC think some details were provided by R1, should be really change those. Ericsson think that the R1 text was very detailed and duplicates the R1 TS.
* Ericsson think R1 didn’t do a good job when developing this text
* Review offline (Chair: maybe R1 delegates can participate)
* [AT118-e][055][IOT NTN] Stage-2 CR 36300 (Ericsson)

 Scope: In a first phase review proposed rapporteur modifications, e.g. for the RAN1 TP.

 Intended outcome: Agreeable draft (agreed CR in the end)

 Deadline: Set by Rapporteur (if possible progress offline only).

This document will contain a list of comments made during the review of the Stage 2 CR for IoT NTN and proposed resolutions.

The issues list is organized according to the spec sections so that companies can track comments from other companies and provide their views (and to eliminate duplicate comments).

Companies are encouraged to provide the input in the correct section. If a section is missing, add it at the correct location.

DO NO EDIT IN THE RUNNING CR.

Deadline for first phase is Monday 16th of May at 07.00 UTC.

## 3.1 Definitions

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| CompanyIssue number | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur  |
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## 4.12 Support of Non-Terrestrial Networks

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| CompanyIssue number | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur  |
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### 23.21.1 General

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| CompanyIssue number | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur  |
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#### 23.21.2.1 Scheduling timing

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| CompanyIssue number | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur  |
| Intel 01 | the description of Common TA is not correct | - $Common TA$ is a configured offset that corresponds to ~~half~~ ~~the~~ the RTT between the RP and the NTN payload.Common TA corresponds to the whole RTT between RP and NTN payload, not half of it. | Implemented in v01 |
| Intel 02 | the description of $K\_{mac}$ is not correct | $K\_{offset}$ is a configured scheduling offset that approximately corresponds to the sum of the service link RTT and the common TA.In the original wording, “TA” seems to be removed unintentionally. | Implemented in v01 |
| Qualcomm |  | There seems to be some confusion. The changes associated with the correction are fine to us in the draft. But removing the correct part that was added by RAN1 is not OK. In our understanding, it contains some general information that is very useful for readers across all 3GPP groups and who do not track RAN1 specs.For example, following text added by RAN1 but your proposed to remove is important. It is not just clear by reading RAN1 spec. “*For initial access, the information of* $K\_{offset}$ *is carried in system information. Update of* $K\_{offset}$ *after initial access is supported. The UE-specific* $K\_{offset}$ *can be provided and updated by the network with MAC CE*.”If you want to remove, you can definitely ask RAN1 to remove what are redundant, that is fine as this was added by RAN1. Let them decide.We have done same for NR NTN in the stage 2. Nobody asks to remove it. | For NR NTN, the stage 2 spec rapporteur commented that the there is too many details and if it was captured elsewhere, then it shall be removed. We have applied these instructions to this section.In general, stage 2 shall not describe delta changes for example “The timing relationships that need to be modified…” as these changes will not make sense a few releases from now. Further, the language used was not stage 2 like for example “And it is needed for UE action and assumptions…”.For Koffset and Kmac it is sufficient to say they are configured, no need to tell exactly where they are provided or if/how they can be modified for a UE. There is no need to send an LS to RAN1, stage 2 is the responsibility of RAN2.  |
| Huawei |  | we think that some general description are useful for the understanding we propose to keep the list of timing relationship that are modified and reword the introductionary sentence (same for eMTC)The timing relationships that ~~need to be~~ are modified for NB-IoT using $K\_{offset} $are ~~summarized as follows~~:we think the last paragraph is too detailed and some stage 3 decsription should be removed$K\_{mac}$ is a scheduling offset supported in NTN for MAC CE timing relationships enhancement. It is provided by the network if downlink and uplink frame timing are not aligned at eNB. ~~And~~ I~~i~~t is needed for UE action and assumption on downlink configuration indicated by a MAC-CE command in (N)PDSCH. The $K\_{mac}$ is also used in the pre-configured uplink resources to determine~~, if the UE has initiated an (N)PUSCH transmission using pre-configured uplink resources ending in subframe n, the UE shall~~ when to start or restart to monitor the N/MPDCCH ~~from DL subframe~~ $n+4+K\_{mac}$~~.~~ | See reply to QC above. |

#### 23.21.2.2 Pre-compensation by the UE

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| CompanyIssue number | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur  |
| Xiaomi 1 | The following sentence “UE shall acquire its GNSS position as well as the satellite ephemeris and common TA before connecting to an NTN cell” is not align with RRC spec: “If s*ystemInformationBlockType31* (*systemInformationBlockType31-NB* in NB-IoT) is broadcast, a RRC connection is initiated only if the UE has a valid GNSS position.NOTE: The UE may need to re-acquire the GNSS fix before establishing the connection to avoid interruption during the connection.” | “UE shall acquire its GNSS position as well as the satellite ephemeris and common TA before connecting to an NTN cell” is rewording to““UE shall have valid GNSS position as well as the satellite ephemeris and common TA before connecting to an NTN cell”” | Implemented in v01 |
| Qualcomm |  | The changes associated with the correction are fine to us in the draft. But removing the correct part that was added by RAN1 is not OK. In our understanding, it contains some general information that is very useful for readers across all 3GPP groups and who do not track RAN1 specs.If you want to remove, you can definitely ask RAN1 to remove what are redundant, that is fine as this was added by RAN1. Let them decide.We have done same for NR NTN in the stage 2. Nobody asks to remove it. | The RAN1 added parts were too detailed for stage 2. The stage 2 is RAN2 responsibility, no need to ask RAN1 in an LS.It is incorrect that nobody asked to remove RAN1 details in NR NTN. This was the NR stage 2 rapporteurs’ comment on the NR NTN stage 2 CR:“Much of the text agreed is very detailed for a Stage 2, if the same content is captured elsewhere, it should be removed”This discussion is ongoing now. |
| Huawei |  | we have sympathy for removing details that are clearly stage 3. e.g. the TA calculationwe think the paragraph at the end of the section should be kept‘The UE shall be capable of using its acquired GNSS position and satellite ephemeris information (when provided by the network) to calculate frequency pre-compensation to counter shift the instantaneous Doppler shift experienced on the service link.’ | We think that sentence is covered by the modified sentence in the beginning of the section (at least that was the intention of the changes to this sentence).In v01 we modified this sentence to make it clearer: “To achieve synchronisation, before and during connection to a cell, the UE shall autonomously pre-compensate the Timing Advance (TTA), see Figure 23.21.2.2-1, as well as the frequency doppler shift by considering the common TA, UE position and the satellite position through the satellite ephemeris.” |

### 23.21.3 Support of discontinuous coverage

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#### 23.21.4.1 Mobility Management in ECM-IDLE

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| Huawei  | it would be good to clarify in stage 2 that that legacy UEs are explicitly barred to access a NTN cell and that NTN UEs are barred separately. |  | We think this is already covered by this sentence in the section 23.21.1:UEs not supporting NTN are barred from accessing an NTN cell. |
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#### 23.21.4.2 Mobility Management in ECM-CONNECTED

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#### 23.21.5.1 Definitions

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#### 23.21.5.2 Assumptions

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#### 23.21.5.3 Procedures

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### 23.21.6 Signalling

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### 23.21.7 MME(Re-)Selection by eNB

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### 23.21.8 O&M Requirements

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Annex P (informative):
Example implementation of Non-Terrestrial Networks

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