3GPP TSG-RAN WG2 Meeting #119bis electronic R2-2210858

Online, October 2022

Agenda Item: 6.10.5.

Source: Ericsson

**Title: [offline-115] RRC corrections (Ericsson)**

Document for: Discussion, Decision

# Introduction

* [AT119bis-e][115][NR NTN] RRC corrections (Ericsson)

Initial scope: Discuss remaining RRC corrections

Initial intended outcome: Summary of the offline discussion with e.g.:

* List of proposals for agreement (if any)
* List of proposals that require online discussions
* List of proposals that should not be pursued (if any)

Deadline (for companies' feedback): Thursday 2022-10-13 18:00 UTC

Deadline (for rapporteur's summary in R2-2210858): Thursday 2022-10-13 22:00 UTC

Proposals marked "for agreement" in R2-2210858 not challenged until Friday 2022-10-14 10:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue online).

R2-2208767 [Offline-111] RRC corrections Ericsson discussion Rel-17 NR\_NTN\_solutions-Core

# Contact Information

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

|  |  |  |
| --- | --- | --- |
| Company | Name | Email Address |
| Ericsson | Helka-Liina Määttänen | Helka-liina.maattanen@ericsson.com |
| MediaTek | Abhishek Roy | Abhishek.Roy@meidatek.com |
| Xiaomi | xiaowei jiang | jiangxiaowei@xiaomi.com |
| Google | Ming-Hung Tao | mhtao@google.com |
| Huawei, HiSilicon | Lili Zheng | zhenglili4@huawei.com |
| Lenovo | Min Xu | xumin13@lenovo.com |
| Apple | Fangli XU | fangli\_xu@apple.com |
| OPPO | Haitao Li | lihaitao@oppo.com |
| NEC | Yuhua chen | [Yuhua.chen@emea.nec.com](mailto:Yuhua.chen@emea.nec.com) |
| CATT | Xiangdong Zhang | zhangxiangdong@catt.cn |
| Samsung | Shiyang Leng | shiyang.leng@samsung.com |
| ZTE | GaoYuan | gao.yuan66@zte.com.cn |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

# Neighbour cell list

[R2-2209526](file:///C:\Data\3GPP\Extracts\R2-2209526%20-%20On%20neighbor%20cell%20SI.docx) On neighbour cell SI Ericsson discussion Rel-17

Proposal 1 RAN2 does not enhance further the release 17 neighbour cell SI broadcasting

[R2-2210663](file:///C:\Data\3GPP\Extracts\R2-2210663_Further%20consideration%20on%20NTN%20neighbour%20cell%20list%20in%20SIB19.docx) Further consideration on NTN neighbour cell list in SIB19 ZTE Corporation, Sanechips discussion Rel-17

[R2-2210664](file:///C:\Data\3GPP\Extracts\R2-2210664_REL-17_38.331_CR3559_Clarification%20on%20the%20NTN%20neighbour%20cell%20list%20in%20SIB19.docx) Clarification on the NTN neighbour cell list in SIB19 ZTE Corporation, Sanechips CR Rel-17 38.331 17.2.0 3559 - F NR\_NTN\_solutions-Core

| ***SIB19* field descriptions** |
| --- |
| ***ntn-NeighCellConfigList, ntn-NeighCellConfigListExt***  Provides a list of NTN neighbour cells including their *ntn-Config*, carrier frequency and *PhysCellId*. This set includes all elements of *ntn-NeighCellConfigList* (without suffix) and all elements of *ntn-NeighCellConfigListExt-v1720*. If *ntn-Config* is absent for an entry in *ntn-NeighCellConfigList* or *ntn-NeighCellConfigListExt*, the *ntn-Config* provided in the previous entry in *ntn-NeighCellConfigList* or *ntn-NeighCellConfigListExt* applies. |

[R2-2210412](file:///C:\Data\3GPP\Extracts\R2-2210412%20Remaining%20issues%20on%20neighbour%20cell%20ephemeris.doc) Remaining issues on neighbour cell ephemeris Huawei, HiSilicon discussion Rel-17 NR\_NTN\_solutions-Core

Proposal 1: Add the carrier frequency list and the neighbour cell list in SIB19.

Proposal 2: The neighbour cells not included in SIB19 can be neglected by UE implementation when performing measurements.

[R2-2209538](file:///C:\Data\3GPP\Extracts\38331_CR3492_(Rel-17)_R2-2209538%20Correction%20on%20neighbor%20cells’%20satellite%20ephemeris%20information_v1.docx) Correction on neighbour cells’ satellite ephemeris information (38.331) MediaTek Inc. CR Rel-17 38.331 17.2.0 3492 - F NR\_NTN\_solutions-Core

| ***SIB19* field descriptions** |
| --- |
| ***distanceThresh***  Distance from the serving cell reference location and is used in location-based measurement initiation in RRC\_IDLE and RRC\_INACTIVE, as defined in TS 38.304 [20]. Each step represents 50m. |
| ***ntn-Config***  Provides parameters needed for the UE to access NR via NTN access such as Ephemeris data, common TA parameters, k\_offset, validity duration for UL sync information and epoch. |
| ***ntn-NeighCellConfigList, ntn-NeighCellConfigListExt***  Provides a list of NTN neighbour cells including their *ntn-Config*, carrier frequency and *PhysCellId*. This set includes all elements of *ntn-NeighCellConfigList* (without suffix) and all elements of *ntn-NeighCellConfigListExt-v1720*. If *ntn-Config* is absent for an entry in *ntn-NeighCellConfigListExt*, the *ntn-Config* provided in the entry at the same position in *ntn-NeighCellConfigList* applies. If both *physCellId* and *carrierFreq* are configured, the corresponding *ntn-Config* is applicable to the neighbour cells listed in *SIB3/SIB4/measObjectNR* with the same *physCellId* and on the same carrier frequency as *carrierFreq*. If *physCellId* is not configured but *carrierFreq* is configured, the corresponding *ntn-Config* is applicable to the neighbour cells listed in *SIB3/SIB4/measObjectNR* on the same carrier frequency as *carrierFreq*. |

[R2-2210346](file:///C:\Data\3GPP\Extracts\R2-2210346_NR%20RRC%20CR%20on%20neighbour%20cell%20ephemeris%20signalling.docx) NR RRC CR on neighbour cell ephemeris signalling Nokia, Nokia Shanghai Bell CR Rel-17 38.331 17.2.0 3539 - F NR\_NTN\_solutions-Core

The current way the SIB19 is arranged will contain the full ntn-config including full ephemeris for all neighbors, even though most of the neighboring cells will be on the same satellite, so this is creating a lot of overhead. It is becoming even worse as at RAN2-119 it was decided to support up to 8 neighbour NTN cells.

1. ntn-ConfigID is added to NTN-NeighCellConfig
2. ntn-ConfigID is included in NTN-Config

**Question 1.** **Do you support to further enhance rel-17 neighbor cell SI? If yes, please indicate which enhancement(CR) you support**

|  |  |  |
| --- | --- | --- |
| Company | Yes/no | TDOC number of supported enhancement |
| Ericsson | No |  |
| Qualcomm | Yes | Nokia’s proposal in R2-2210346 is also ok. We should make use of such for measurement object configuration and when network requesting propagation delay difference report.  For other proposals, we could use SIB4 extension to indicate up to 8 frequencies for one satellite.  InterFreqCarrierFreqInfo-v1720 ::= SEQUENCE {  smtc4list-r17 SSB-MTC4List-r17 OPTIONAL -- Need R  }  InterFreqCarrierFreqInfo-v17x0 ::= SEQUENCE {  ntn-ConfigID-r17 INTEGER (1..8) OPTIONAL -- Need R  } |
| MediaTek | Yes | Support [R2-2209538](file:///C:\Data\3GPP\Extracts\38331_CR3492_(Rel-17)_R2-2209538%20Correction%20on%20neighbor%20cells’%20satellite%20ephemeris%20information_v1.docx) as it makes clear linkage between SIB3/SIB4/measObjectNR and SIB19. For example, if PCI is not configured in NTN-NeighCellConfig, how to apply the ntn-Config to the cells in SIB4? Current specification does not mention this. Regarding increasing the neighbor cells in SIB19, it can be also done not configuring PCI in NTN-NeighCellConfig but configuring multiple PCIs in SIB3/4/measObjectNR. |
| Xiaomi | No |  |
| Google | No | Overhead optimization can be considered in R18. The enhancement proposed in R2-2209538 can be achieved by UE implementation. |
| Huawei, HiSilicon | Yes | R2-2210412  The changes in R2-2210412 are backward compatible. |
| Lenovo | Yes | R2-2209538 or R2-2210412 would be OK. |
| Apple | No |  |
| OPPO | No |  |
| vivo | No | RAN2 previously discussed the issue of signalling optimization, and the consensus was that solutions for reducing signalling overhead will not be further discussed in Rel-17 NTN, we think this issue should not be discussed. |
| NEC | Yes for proposal from Nokia  Or no more enhancement | Nokia’s proposal is simple and make sense. If it is not agreeable, we should live without enhancement considering no more time left to discuss different flavour of solutions |
| CATT | Yes | Prefer R2-2210412. It seems more flexible. |
| Samsung | Yes | Prefer R2-2210412 |
| ZTE | Yes | Prefer [R2-2210663](file:///C:\Data\3GPP\Extracts\R2-2210663_Further%20consideration%20on%20NTN%20neighbour%20cell%20list%20in%20SIB19.docx), we understand it is the simplest way to go with sufficient flexibility and reduced signaling overhead. |
| Nokia | Yes | We are the proponent of R2-2210346. However, we are also open to other enhancements in this area, such as those in R2-2210412. |

# SMTC

R2-2209505 Correction on UE behavior on SMTC in TS 38.331 vivo CR Rel-17 38.331 17.2.0 3488 - F NR\_NTN\_solutions-Core

|  |
| --- |
| ***smtc***  Measurement timing configuration for intra-frequency measurement. If this field is absent, the UE assumes that SSB periodicity is 5 ms for the intra-frequnecy cells. If the field is broadcast by an NTN cell, the *offset* (derived from parameter *periodicityAndOffset*) is based on the assumption that service link propagation delay difference between the serving cell and neighbour cells equals to 0 ms, and UE can adjust the actual *offset* based on the actual propagation delay difference which can be calculated based on the ephemeris information in SIB19. |
| ***smtc2-LP***  Measurement timing configuration for intra-frequency neighbour cells with a Long Periodicity (LP) indicated by periodicity in *smtc2-LP*. The timing offset and duration are equal to the offset and duration indicated in *smtc* in *intraFreqCellReselectionInfo*. The periodicity in *smtc2-LP* can only be set to a value strictly larger than the periodicity in *smtc* in *intraFreqCellReselectionInfo* (e.g. if *smtc* indicates sf20 the Long Periodicity can only be set to sf40, sf80 or sf160, if *smtc* indicates sf160, *smtc2-LP* cannot be configured). The *pci-List*, if present, includes the physical cell identities of the intra-frequency neighbour cells with Long Periodicity. If *smtc2-LP* is absent, the UE assumes that there are no intra-frequency neighbour cells with a Long Periodicity. |
| ***smtc4list***  Measurement timing configuration list for NTN deployments, see clause 5.5.2.10. The offset of each SSB-MTC4 in *smtc4list* is based on the assumption that service link propagation delay difference between the serving cell and neighbour cells equals to 0 ms, and UE can adjust the actual *offset* based on the actual propagation delay difference which can be calculated based on the ephemeris information in SIB19. For a UE that supports all the SMTC configurations broadcast by the NW, the UE shall use all the SMTCs broadcast by the NW. For a UE that supports less SMTCs than what is broadcast by the NW, it is up to the UE to select which SMTCs to consider. |

**The CR proposes that 38.331 would state advice for idle mode UE on Ephemeris data usage as well as SMTC configuration usage.**

**Rapporteur thinks these are not corrections first of all and that 38.331 should not specify idle mode UE implementation.**

**Q2: Please give your view whether you support CR R2-2209505?**

|  |  |  |
| --- | --- | --- |
| Company | Ya/no | comment |
| Ericsson | no |  |
| Qualcomm | No | We also think for IDLE mode, this is up to UE. |
| MediaTek | No | Agree with Ericsson and Qualcom that this cannot be used in 38.331 for IDLE mode. |
| Xiaomi | No |  |
| Google | No |  |
| Huawei, HiSilicon | No | On association to SIB19, the logic is correct, but it seems there is no other interpretation even without this clarification.  On multiple SMTCs, we also think this should be left to UE implementation. |
| Lenovo | No |  |
| Apple | No |  |
| OPPO | No |  |
| vivo | Yes | Proponent. There are three changes in our CR. For the first change, we think it’s better to clarify idle/inactive mode UE behaviour and the UE behaviour of the RRC\_IDLE/RRC\_INACTIVE should align with RRC\_CONNECTED. For the second change, it is to solve the FFS from last meeting as below. For the third change, it intends to correct the condition when UE needs to select SMTCs (i.e, when a UE supports less SMTCs than what is **broadcast by the NW** instead of what is in *smtc4list*, it is up to the UE to select which SMTCs to consider).  *1. The NW can broadcast up to 4 SMTCs per frequency in SIB2/4. Add a sentence saying that, in case the UE does not support 4 SMTCs, it’s up to UE implementation which combination of SMTCs to consider. FFS whether any clarification/note is needed regarding the consistency of the information in SIB2/4 and SIB19.* |
| NEC | No | We can leave it to UE |
| CATT | No |  |
| Samsung | No | Up to UE |
| ZTE | No | No room for misunderstanding thus the first change is not necessary. For the second change, we can leave it to UE. |
| Nokia | No strong view | The changes seem to be correct, but not essential. |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

R2-2210646 Corrections to the SMTC Field Description in System Information Google Inc. CR Rel-17 38.331 17.2.0 3555 - F NR\_NTN\_solutions-Core

|  |
| --- |
| ***smtc***  Measurement timing configuration for intra-frequency measurement. If this field is absent, the UE assumes that SSB periodicity is 5 ms for the intra-frequnecy cells. If the field is broadcast by an NTN cell, the *offset* (derived from parameter *periodicityAndOffset*) is based on the assumption that service link propagation delay difference, as well as the common TA difference between the serving cell and neighbour cells equals to 0 ms, and UE can adjust the actual *offset* based on the actual service link propagation delay difference and common TA difference. |
| ***smtc2-LP***  Measurement timing configuration for intra-frequency neighbour cells with a Long Periodicity (LP) indicated by periodicity in *smtc2-LP*. The timing offset and duration are equal to the offset and duration indicated in *smtc* in *intraFreqCellReselectionInfo*. The periodicity in *smtc2-LP* can only be set to a value strictly larger than the periodicity in *smtc* in *intraFreqCellReselectionInfo* (e.g. if *smtc* indicates sf20 the Long Periodicity can only be set to sf40, sf80 or sf160, if *smtc* indicates sf160, *smtc2-LP* cannot be configured). The *pci-List*, if present, includes the physical cell identities of the intra-frequency neighbour cells with Long Periodicity. If *smtc2-LP* is absent, the UE assumes that there are no intra-frequency neighbour cells with a Long Periodicity. |
| ***smtc4list***  Measurement timing configuration list for NTN deployments, see clause 5.5.2.10. The offset of each SSB-MTC4 in *smtc4list* is based on the assumption that service link propagation delay difference, as well as the common TA difference between the serving cell and neighbour cells equals to 0 ms, and UE can adjust the actual *offset* based on the actual service link propagation delay difference and common TA difference. For a UE that supports less SMTCs than what is included in this list, it is up to the UE to select which SMTCs to consider. |

**These seem like needed corrections to the rapporteur.**

**Q2: Please give your view whether you support CR R2-2210646?**

|  |  |  |
| --- | --- | --- |
| Company | Ya/no | comment |
| Ericsson | yes |  |
| Qualcomm | No | If we understand, the agreement was that network should be able to compensate the feeder link. |
| MediaTek | No | Agree with Qualcom that network should be able to take care of feederlink and current spec is enough. |
| Xiaomi | No |  |
| Google | Yes | The agreement made in RAN2#118-e meeting is as follows.   * ***Common TA parameters and Kmac*** *of the neighbour cell are used to support IDLE/Inactive UEs in NTN to perform SMTC adjustments.*   Also in TS 38.300, it is stated:   * idle/inactive mode UE can adjust SMTCs based on its location and satellite assistance information (e.g. ephemeris, **common TA parameters**)   Therefore, it is clear that the idle/inactive UE shall adjust the SMTC based on the propagation delay difference involving both the service link and feeder link. |
| Huawei, HiSilicon | No | 1) On the first part:  If the field is broadcast by an NTN cell, the *offset* (derived from parameter *periodicityAndOffset*) is based on the assumption that service link propagation delay difference, as well as the common TA difference between the serving cell and neighbour cells equals to 0 ms,  The NW can already compensate the feeder link when broadcasting the SMTC (or SMTC list), so no need to mention feeder link. Besides, this change is not backward compatible.  2) On the second part:  and UE can adjust the actual *offset* based on the actual service link propagation delay difference and common TA difference.  During UE autonomous adjustment, different UEs are faced with different feeder link propogation delay, so the NW cannot compensate feeder link delay any more. But the original text is not restricted to service link, it includes both service link and feeder link. So this modification is not changing anything. |
| Lenovo | No | Network compensates the feeder link difference. |
| Apple | Yes |  |
| OPPO | No | Agree with Huawei |
| vivo | Yes | Regarding the feeder link delay, RAN2 agreed that common TA parameters and Kmac of the neighbour cell are used to support IDLE/INACTIVE UEs in NTN to perform SMTC adjustments, the relevant description should be added to the field description of *smtc* and *smtc4list.* |
| NEC | Yes | We understand the change is align with the intention |
| CATT | Yes |  |
| Samsung | No | Agree with Huawei |
| ZTE | No | Same understanding as Huawei. |
| Nokia | No | Agree with Huawei. |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Conclusion:**

# UE behaviour if not able to acquire SIB19

[R2-2210034](file:///C:\Data\3GPP\Extracts\R2-2210034%20Discussion%20on%20not%20being%20able%20to%20acquire%20SIB%2019%20for%20NR%20NTN.doc) Discussion on not being able to acquire SIB 19 for NR NTN Xiaomi, CAICT discussion Rel-17

[R2-2210035](file:///C:\Data\3GPP\Extracts\R2-2210035%20Correction%20on%20the%20action%20upon%20not%20being%20able%20to%20acquire%20SIB19%20for%20NR%20NTN.docx) Correction on the action upon not being able to acquire SIB19 for NR NTN Xiaomi, CAICT CR Rel-17 36.331 17.2.0 4875 - F NR\_NTN\_solutions-Core

[R2-2210484](file:///C:\Data\3GPP\Extracts\R2-2210484_38.331CR3547_(Rel-17)_Clarification%20on%20the%20necessity%20of%20SIB19%20in%20NTN%20cell_v0.docx) Clarification on the necessity of SIB19 in NTN cell Apple CR Rel-17 38.331 17.2.0 3547 - F NR\_NTN\_solutions-Core

**The above papers suggest a note about SIB19 to Essential system information. However, SIB19 is not defined as Essential system information. Only MIB and SIB1 is.**

#### 5.2.2.5 Essential system information missing

The UE shall:

1> if in RRC\_IDLE or in RRC\_INACTIVE or in RRC\_CONNECTED while T311 is running:

2> if the UE is unable to acquire the *MIB*:

3> consider the cell as barred in accordance with TS 38.304 [20];

3> perform barring as if *intraFreqReselection* is set to allowed;

2> else if the UE is unable to acquire the *SIB1*:

3> consider the cell as barred in accordance with TS 38.304 [20];

3> if the UE is a RedCap UE:

4> peform barring as if *intraFreqReselectionRedCap* is set to allowed;

3> else:

4> perform cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20].

NOTE: For UE in RRC\_IDLE or in RRC\_INACTIVE or in RRC\_CONNECTED while T311 is running, if UE is unable to acquire SIB19, it is up to UE implementation to decide whether and when to reselect to another cell. If UE is still not be able to acquire SIB19 before establishing/reestablishing/resuming a RRC connection, UE should attempt to reselect to another cell by implementation.

**Q4: It is clear the suggested note cannot be added as SIB19 is not defined as Essential SI. Do companies prefer to have another way to clarify UE it is up to UE implementation to reselect to another cell?**

|  |  |  |
| --- | --- | --- |
| Company | Ya/no | comment |
| Ericsson | no | This can be left to UE implementation without a note |
| Qualcomm |  | May be in the essential SIB section, we can add a note SIB19 is an essential SIB. We are not clear on the scenario in NR case if UE can read SIB1, then why it cannot read SIB19. |
| MediaTek | No | Agree with Ericsson hat UE impmentation can take care of this and UE can try to access and read SIB 19 multiple times. |
| Xiaomi | Yes | In last RAN2 meeting, it is agree that:  => RAN2 understands that SIB19 is essential for NTN cell, and it could be up to UE implementation if UE cannot acquire SIB19. FFS if a note is needed in the spec for this.  Thus, we suggest the note also says that SIB19 is essential system information. Given that if SIB19 is not acquired, UE cannot perform establishment/reestablishment procedure, which requires UE has valid essential system information.  NOTE: SIB19 is essential system information. For UE in RRC\_IDLE or in RRC\_INACTIVE or in RRC\_CONNECTED while T311 is running, if UE is unable to acquire SIB19, it is up to UE implementation to decide whether and when to reselect to another cell. If UE is still not be able to acquire SIB19 before establishing/reestablishing/resuming a RRC connection, UE should attempt to reselect to another cell by implementation. |
| Google | No | Agree with Ericsson. |
| Huawei, HiSilicon | No | Prefer to leave it to UE implementation. |
| Lenovo | No | UE implementation would be OK. |
| Apple | Yes | In LTE RRC, the SIB31 is the essential SIB for NTN cell, and the procedural text specifies the UE behavior when the essential SIB31 is missing (see below).  Therefore, if there is no any description on the necessity of the SIB19 for NTN connection in the spec, this will cause misunderstanding. |
| OPPO | Yes | Even though SIB19 is not defined as an essential SI, we still have the agreement in last meeting to say SIB19 is essential for NTN cell, but the UE behavior when UE cannot acquire SIB19 is up to UE implementation. Currently, there is nothing captured in TS 38.331 for this when an NTN UE is not able to acquire SIB19. We think it is suitable to add a note in this sub-clause for this to make spec clearer.  We have also provided a CR (R2-2210091 which should be in the scope of this offline discussion) regarding that:  NOTE: *SIB19* is essential for NTN access, and it is up to UE implementation whether to treat the cell as barred for NTN access if the UE is unable to acquire the *SIB19*. |
| vivo | No | Writing nothing more can correctly convey the meaning that it is based on UE implementation if UE cannot acquire SIB19, such a note is not needed. |
| NEC |  | We also think SIB19 literally is essential SIB. |
| CATT | Yes | Agree with Qualcomm that we can illustrate that SIB19 is an essential SIB. The behavior of UE cannot acquire SIB19 need to be specified. We suggest the note as:  NOTE: For NTN cell, SIB19 is essential system information, if the UE is unable to acquire the SIB19, whether and when to consider the cell as barred is up to UE implementation. If the cell is considered as barred, perform barring in accordance with TS 38.304 [20].  Additionally, 38.304 need to modified correspondingly refer to R2-2210743:  - If the cell is to be treated as if the cell status is "barred" due to being unable to acquire the *SIB1* or *SIB19*:  - the UE may exclude the barred cell as a candidate for cell selection/reselection for up to 300 seconds; |
| Samsung | Yes | Prefer a note to capture last meeting RAN2 agreement ”RAN2 understands that SIB19 is essential for NTN cell, and it could be up to UE implementation if UE cannot acquire SIB19. FFS if a note is needed in the spec for this”. |
| ZTE | No | We have already agreed SIB19 to be essential SIB for NTN, which is similar as SIB2/3/4, but we did not specify the UE behavior if unable to acquire these SIB2/3/4 so we prefer not to further capture anything also for SIB19. |
| Nokia | No | We think it is not up to the UE implementation, but UE needs to acquire SIB19. If not possible in the current cell, the UE needs to reselect to another cell. And SIB19 is essential SIB for NTN. Shall be reflected somewhere, but not with a NOTE. Notes are for minor things; this is not a minor aspect. |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

[R2-2210743](file:///C:\Data\3GPP\Extracts\R2-2210743.docx) Discussion on leftover issues CATT discussion Rel-17 NR\_NTN\_solutions-Core Late

**The paper has one change suggested for TS 38.331 and that is adding a note:**

5.2.2.5 Essential system information missing

The UE shall:

1> if in RRC\_IDLE or in RRC\_INACTIVE or in RRC\_CONNECTED while T311 is running:

2> if the UE is unable to acquire the *MIB*:

3> consider the cell as barred in accordance with TS 38.304 [20];

3> perform barring as if *intraFreqReselection* is set to allowed;

2> else if the UE is unable to acquire the *SIB1*:

3> consider the cell as barred in accordance with TS 38.304 [20];

3> if the UE is a RedCap UE:

4> peform barring as if *intraFreqReselectionRedCap* is set to allowed;

3> else:

* 4> perform cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20].

NOTE: For NTN cell, if the UE is unable to acquire the SIB19, whether and when to consider the cell as barred is up to UE implementation. If the cell is considered as barred, perform barring in accordance with TS 38.304 [20].

**It is clear the suggested note cannot be added as SIB19 is not defined as Essential SI. Further, in previous meeting we concluded cell should not be barred if UE cannot read SIB19. Hence it is assumed this suggestion does not need to discussed further.**

# Ephemeris

[R2-2209537](file:///C:\Data\3GPP\Extracts\38331_CR3491_(Rel-17)_R2-2209537%20Correction%20on%20the%20coincidence%20of%20ECI%20and%20ECEF_v1.docx) Correction on the coincidence of ECI and ECEF MediaTek Inc. CR Rel-17 38.331 17.2.0 3491 - F NR\_NTN\_solutions-Core

Add the abbreviations of ECI and ECEF.

Capture RAN1 agreement in RAN1#109 as a Note in IE description of EphemerisInfo:

“Note: The ECI and ECEF coincide at Epoch time (e.g. x,y,z axis in ECEF are aligned with x,y,z axis in ECI)”

**Q5: Please give your view whether you support CR R2-2209537?**

|  |  |  |
| --- | --- | --- |
| Company | Ya/no | comment |
| Ericsson | No strong view |  |
| Qualcomm | Ok |  |
| MediaTek | Yes | The alignment between ECEF and ECI shall be specified in the specifications; otherwise, it is impossible for UE to perform conversion between ECI and ECEF. |
| Xiaomi | Ok |  |
| Google | yes |  |
| Huawei, HiSilicon | Yes |  |
| Lenovo | Yes |  |
| Apple | Yes |  |
| OPPO | Yes |  |
| vivo | Yes |  |
| NEC | Yes |  |
| CATT | No strong view | The structure of EphemerisInfo is CHOICE, NW will not configure ECI and ECEF at the same time. We are not clear if there is case that UE need to perform conversion between ECI and ECEF  EphemerisInfo-r17 ::= CHOICE {  positionVelocity-r17 PositionVelocity-r17,  orbital-r17 Orbital-r17  } |
| Samsung | ok |  |
| ZTE | Yes |  |
| Nokia | No | This is not RAN2-related information. Shall not be captured in our specification (at most as a reference to other place). |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

[R2-2209981](file:///C:\Data\3GPP\Extracts\R2-2209981%20Discussion%20on%20the%20ephemeris%20information%20in%20CHO%20procedure.doc) Discussion on the ephemeris information in CHO procedure Spreadtrum Communications discussion Rel-17

**Proposal 1:** RRC dedicated message shall be applied to provide ephemeris information of neighbour cells.  
**Proposal 2:** Multiple neighbor cell’s ephemeris information in CHO window could be provided to UE via one dedicated RRC message.  
**Proposal 3:** The SFN and subframe of target cell shall be the reference of epoch time for target cell.

**Q5: Please give your view whether RAN2 should work further on proposals in R2-2209981?**

|  |  |  |
| --- | --- | --- |
| Company | Ya/no | comment |
| Ericsson | No strong view | Can discuss further if companies think this is necessary correction for Rel-17 |
| Qualcomm | P1: yes  P2: No  P3: yes | P1 should be clarify if SIB19 does not provide the neighbor cell information or UE is not configured with search space in active BWP where SIB19 can be read. |
| MediaTek | P1: No  P2: No  P3: No | For P1, SIB19 can be provided by dedicated signaling if UE is not configured with common search space in the active BWP.  For P2, for CHO, neighbor cell’s ephemeris information in the SIB19 is enough. Network can estimate the ephemeris information to configure multiple CHO configurations.  For P3, the current spec is clear. It is not clear how the proposal impacts the current spec. |
| Xiaomi | P1/P3: yes  P2: No | For P2, network is not be able to predict multiple ephemeris information, because network cannot predict accurately the future ephemeris information far way. The validity duration actually set the upper bound time that network can predict with in the allowed error range. |
| Google | No strong view |  |
| Huawei, HiSilicon |  | P1: Agree with the intention, but it seems no specific agreement is needed. For UEs with an active BWP not configured with common search space, the NW will use dedicated signalling to transfer SIB19, that has been discussed and agreed. Neighbour cell information is no exception compared with other information in SIB19.  P2: We are not sure whether there is any spec impact, no?  P3: We already had the agreement for HO:   1. During HO, the target cell’s epoch time (i.e. SFN and subframe number) is based on target cells’ timing.     P3 is to extend it to CHO? Then we are supportive of this. But maybe it needs to be reworded:  **During CHO, the candidate target cell’s epoch time (i.e. SFN and subframe number) is based on target cells’ timing.** |
| Lenovo | Yes to P1 and P3  No to P2 | P2 is not necessary. |
| Apple | P1: Yes  P2: No  P3: Yes | P1: SIB19 can be provided via dedicated signaling.  P3: It’s correct, but it has been captured in current spec. |
| OPPO | P1: yes  P2: No  P3: yes | For P1, agree with QC that dedicated signaling can be applied if SIB19 does not include neighbor cell’s ephemeris information.  For P2, if network has ability to provide multiple ephemeris information for a neighbor cell to cover the CHO window, why does network not provide one ephemeris information with longer validity duration?  For P3, we share the same view as Huawei. |
| vivo | No | Dedicated signaling provides ephemeris information in the following two aspects: 1) provide assistance information in SIB19 to the UE with an active BWP with no common search space configured (through *dedicatedSystemInformationDelivery*); 2) provide target cell’s assistance information during HO (through *ServingCellConfigCommon*). We think other enhancements/optimization are not needed. |
| NEC | yes | we support to further work/discuss on these issues in general.  P2: it seems propose to provide ephemeris information of one satellites at different epoch time, this is different from provide ephemeris information of multiple satellites, we need to discuss the feasibility and the signaling overhead issue |
| CATT | P1: No  P2: No  P3: No | Agree with MediaTek. |
| Samsung | No | P1 is already supported that SIB19 is sent by dedicated signaling if UE has no common search space. P2 is not needed. P3 is already agreed that target cell epoch time follows target cell timing. |
| ZTE |  | **P1:** SIB19 can be provided via RRC dedicated signaling if there is no common search space configured.  **P2:** It seems that the intention is to say that we should allow NW to provide ephemeris of multiple candidate target cells via one message, we understand it is already allowed via the following fields: condReconfigToAddModList-r16->condRRCReconfig-r16->masterCellGroup->spCellConfig-> reconfigurationWithSync->spCellConfigCommon->ntn-Config-r17.  **P3**: lready agreed that target cell epoch time follows target cell timing. |
| Nokia | P2 – not OK, other acceptable | P2 is unclear, what is CHO window in fact? P1 and P3 seem to be OK, but not essential for R17. |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

# Measurement gap configuration

[R2-2209800](file:///C:\Data\3GPP\Extracts\R2-2209800_38.331CR3508_(Rel-17)_Clarification%20on%20the%20concurrent%20measurement%20gap%20configuration_v0.docx) Clarification on the concurrent measurement gap configuration Apple CR Rel-17 38.331 17.2.0 3508 - F NR\_NTN\_solutions-Core

**Summary of change:** Clarify in the condition part:  
Clarify that the associatedMeasGapSSB2 can be configured only when associatedMeasGapSSB is configured  
Clarify that the associatedMeasGapCSIRS2 can be configured only when associatedMeasGapCSIRS is configured  
**Consequences if not approved:** It’s possible that 4 measurement gap configurations are within one MO for NTN, which exceeds the NTN UE capability.

**Rapporteur view is that this is ok correction.**

**Q6: Please give your view whether you support CR R2-2209800?**

|  |  |  |
| --- | --- | --- |
| Company | Ya/no | comment |
| Ericsson | yes |  |
| Qualcomm |  | Why would network provide configuration exceeding UE capability? |
| MediaTek | No | This is not needed and current specs seem enough. |
| Xiaomi | No | Network configuration should not exceed UE capability. Besides, the CR restrict network from configuring 2 SSB Gap and 2 CSI-RS gap at the same time. |
| Google | yes |  |
| Huawei, HiSilicon | Yes |  |
| Lenovo | No | Current spec is OK. |
| Apple | Yes | The key point is when NW configures the two gaps for NTN, the associated frequency layer should be only one. That is to say, the two NTN gaps can only be associated with either SSB or CSI-RS but cannot be associated with mixed reference signals. Please note that SSB and CSI RS are considered as different frequency layers in RAN4 discussions.  In addition, from ASN.1 syntax perspective, we should avoid the possibility to have the configuration with more than 2 measurement gaps. |
| OPPO | No | A proper NW configuration can avoid this issue. |
| vivo | No strong view | We can follow majorities. |
| NEC | Yes |  |
| CATT | Not essential |  |
| Samsung |  | No strong view |
| ZTE |  | Can be handled by NW implementation but the proposed change acceptable is the majority wants it. |
| Nokia | No | This is a redundant clarification. Agree with QC and MTK. |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

# Coarse UE location

[R2-2209506](file:///C:\Data\3GPP\Extracts\R2-2209506%20Correction%20on%20UE%20coarse%20location%20reporting%20in%20TS%2038.331.docx) Correction on UE coarse location reporting in TS 38.331 vivo CR Rel-17 38.331 17.2.0 3489 - F NR\_NTN\_solutions-Core

**The CR proposes to add an additional note for coarse location reporting:**

2> include *coarseLocationInfo,* if available;

NOTE X: It is up to UE implementation to decide whether to obtain and report its coarse location in *coarseLocationInfo*.

**Rapporteur view is that this note should not be specified as this situation does not differ from Rel-16 or LTE location reporting where “if available” means that UE implementation will decide whether it is reported or not .**

**Q7: Please give your view whether you support CR R2-2209506?**

|  |  |  |
| --- | --- | --- |
| Company | Ya/no | comment |
| Ericsson | no | Share the Rapp view |
| Qualcomm | No | No, there is no need to bring old discussion. |
| MediaTek | No | Agree the reppaorteur’s view, ”if available” already means it is up to the UE. |
| Xiaomi | No | Discussed before, follow SA3 on the user consent. If network has user consent, then network can request UE for coarse location, otherwise cannot. |
| Google | No | Agree with rapporteur’s view |
| Huawei, HiSilicon | no |  |
| Lenovo | No |  |
| Apple | Yes |  |
| OPPO | No |  |
| vivo | Yes | Proponent. From our perspective, the wording "if available" seems like that upon network request, the UE has to follow the request to obtain the GNSS location, and if UE has obtained its location information, the UE shall report *coarseLocationInfo*, which does not include the case where UE decides to not report its coarse location even if UE has obtained its location information. So, some clarification about when UE reports *coarseLocationInfo* is needed. |
| NEC | No |  |
| CATT | No | According to the LS from SA3, only the network has the user consent, it will request UE location. Then if UE has available location, UE should report it, but not up to UE implementation.   |  | | --- | | *In other words, the network should request for the location if there is user consent (based on subscription-based or proprietary mechanisms) and the network should not request for the location if there is no user consent. The UE should provide the location information (if available) if the network request for it.”* | |
| Samsung | No | ”if available” is sufficient |
|  |  |  |
| ZTE | No | We understand the case when there is no user consent, NW would not request coarse location report.  Based on the LS from SA3, it is clear that it is the NW not the UE who decide whether there is user consent thus such change is not correct.  ------------------------  SA3 would like to observe the following:  1) SA3 will study potential solutions for User Consent for the NTN use case in Rel-18. For Rel-17 SA3 would like to remind RAN2 that whether user consent is required would depend on local regulations. For Rel-17, in regions where user consent is required for NTN, SA3 recommends that the user consent requirement be met via provisional means, e.g. per gNB/NTN-GW configuration (consent granted for all UEs subscribing for NTN) based on the service-level agreement between the operator and its NTN subscribers.  2) With respect to the coarse-grained GNSS location reporting by the UE with an accuracy of 2km without explicit consent, it is up to local regulations whether it is acceptable or not. In case explicit user consent is required by local regulation it is up to proprietary mechanisms for Rel-17.  3) With respect to the implicit user consent approach which is considered by RAN2 LS R2-2204257 for Rel-17, SA3 would like to suggest that it shall be the network that decides whether there is a user consent for the aforementioned location request (based on subscription-based means or proprietary mechanisms) and not the UE. In other words, the network should request for the location if there is user consent (based on subscription-based or proprietary mechanisms) and the network should not request for the location if there is no user consent. The UE should provide the location information (if available) if the network requests for it.  ------------------------ |
| Nokia | No | The preceding subclause already contains the term ''if available'', pointing to the case where the UE does not have such information to be shared with the NW. No need to further change the specification by adding this NOTE. |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

# Misc corrections

[R2-2210197](file:///C:\Data\3GPP\Extracts\R2-2210197%20(R17%20NTN%206.10.4.2)%20331%20CR%20for%20Measurement%20events.docx) Draft 331 CR – Addition of missing descriptions of Event D1 and CondEvent T1 Interdigital, Inc. draftCR Rel-17 38.331 17.2.0 NR\_NTN\_solutions-Core

*Start of changes*

#### 5.5.4.15 Event D1 (Distance between UE and referenceLocation1 is above threshold1 and distance between UE and referenceLocation2 is below threshold2)

\*\*\*\*\*\*\*omitted\*\*\*\*\*\*\*

#### 5.5.4.16 CondEvent T1 (Time measured at UE is within a threshold and duration)

\*\*\*\*\*\*\*omitted\*\*\*\*\*\*\*

**Editorial corrections which can be added. Question is whether formulation could be improved.**

**Q8: Please give any suggestions to improve the proposed text?**

|  |  |
| --- | --- |
| Company | comment |
| Qualcomm | Not essential. |
| MediaTek | We agree as it could be beneficial. The final text might need to be finalized though. |
| Huawei, HiSilicon | Agree, other events also have the descriptions in the title. |
| Lenovo | OK to improve. For CondEventT1 the description shall be more accurate. |
| Apple | Not essential. But we are fine to have it and align with the title style for other measurement events. |
| OPPO | For CondEvent T1, perhaps reworded as ”Time measured at UE is within a duration starting from a threshold” |
| NEC | Text suggestion  Event D1: Distance to referenceLocation1 is above Threshold1, and to refereceLocation2 is below threshold2  CondEvent T1: Time measured at UE reach Thresh1  (intention is to make the titles shorter and not have leave condition mentioned in title as for other events ): |
| CATT | Not essential but we can accept it. |
| Samsung | Ok to add |
| ZTE | OK |
| Nokia | Text for CondEvent T1 could be improved as it is now lacking details (e.g. exact parameter names, unclear what ‘threshold and duration’ are), to make it aligned with Event D1 description. |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

[R2-2210570](file:///C:\Data\3GPP\Extracts\R2-2210570%20CR%20corrections%20for%2038331.docx) Corrections to TS 38.331 for Rel-17 NR NTN Samsung Research America CR Rel-17 38.331 17.2.0 3554 - F NR\_NTN\_solutions-Core

**Q8: Please give your view whether support CR R2-2210570?**

|  |  |  |
| --- | --- | --- |
| Company | Ya/no | comment |
| Ericsson | Yes | Except the second change can be implemented by replacing “serving cell” with “target SpCell” |
| Qualcomm | Yes | We don’t need to do first change. For second change, we agree with Ericsson. |
| MediaTek | Partially Yes | Agree with Qualcomm that the first change is not needed. The original text seems better. However, the second change could be agreed with Ericsson’s suggestions. |
| Xiaomi | Yes | Agree with Ericsson on the second change. |
| Google | Yes | Agree with Qualcomm and Ericsson regarding the 1st and 2nd changes. |
| Huawei, HiSIlicon | Yes | Agree with QC. |
| Lenovo | Yes | Agree with Qualcomm. |
| Apple | Yes | Fine with Ericsson on the second change. |
| OPPO | Partially Yes | 1st change: It seems not need to change, since it does not add anything.  2nd change: Agree with Ericsson.  3rd change: fine on these editorial changes |
| vivo | OK for first change and third change;  disagree second change | Upon receiving assistance information for target cell, UE can consider the information valid and it is DL synchronized with target cell, the target cell becomes serving cell at this time, so the current wording does not need to be modified. |
| NEC | Yes for first and third changes | for second change, there seems no room to understand as other cell than target serving cell, since the whole configuration is for target cell |
| CATT | Partially Yes | Agree with the first change.  The second change is not needed, at this time there will be no misunderstanding by using serving cell. |
| Samsung | Yes | Fine to follow majority for the first change. Agree with Ericsson for the second change |
| ZTE | Yes | 1st change: ok  2nd change: agree with Ericsson  3rd change: fine with the editorial changes |
| Nokia | Yes | Changes seem to be correct. |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

[R2-2210740](file:///C:\\Data\\3GPP\\Extracts\\R2-2210740.docx" \o "C:Data3GPPExtractsR2-2210740.docx) Corrections on validity of SIB19 CATT CR Rel-17 38.331 17.2.0 3565 - F NR\_NTN\_solutions-Core Late

|  |  |
| --- | --- |
| ***Reason for change:*** | 1. For SIB19, the changes of ephemerisInfo, epochTime, ntn-UlSyncValidityDuration etc should neither result in system information change notification nor in a modification of valueTag in SIB1. Besides the valueTag, the validity of these parameters is under timer control.  Upon cell re-selection or return from out of coverage, if the valueTag of SIB19 has not changed, with the judgement criterions in section 5.2.2.2.1, UE will still think SIB19 is valid. However, it is couldn’t present validity of the parameters like ephemerisInfo, epochTime, ntn-UlSyncValidityDuration. Hence, it is better for the UE not to use a stored version of SIB19 e.g. after cell re-selection, upon return from out of coverage. |
| ***Summary of change:*** | 1. Add the sentence “The UE doesn’t think the stored SIB19 is valid e.g. after cell re-selection, upon return from out of coverage” in section 5.2.2.2.1. |

**Q9: Please give your view whether support CR R2-2210740?**

|  |  |  |
| --- | --- | --- |
| Company | Ya/no | comment |
| CATT | Yes |  |
| Nokia | No | Why there needs to be a separate behavior for SIB19 (other than for other SIBs) here?  BTW, this is a late contribution, maybe the decision can be postponed to next meeting? |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Conclusion:**

# Conclusion

TBA

# References

1. RP-201256, “Solutions for NR to support non-terrestrial networks (NTN),” 3GPP TSG RAN #88e, June 2020.