**3GPP TSG RAN WG3 Meeting # 116-e R3-223687**

**e-meeting, 9- 20th May 2022**

**Title: CB: # NTN1\_NRNTN - Summary of email discussion (summary of 1st round)**

**Source: Thales (moderator)**

**Type: discussion**

**Document for: Agreement**

**Agenda Item: 9.1.7.1**

**Work Item: Rel-17 NR\_NTN\_solutions: Solutions for NR to support non-terrestrial networks (NTN)\**

# Introduction

This document aims at discussing and agree on BL CRs related to the Rel-17 WI NR\_NTN\_solutions.

Hereunder is recalled the description of the email discussion as defined by the RAN3 chair in its notes:

**CB: # NTN1\_NRNTN**

**- Check incoming LSs**

**- Add serving PLMN info in ULI?**

**- Introduce SIB 19 over F1?**

**- Reply LS to RAN2?**

**- Other stage2/3 updates if needed**

**- Capture agreements and provide CRs if agreeable**

(Thales - moderator)

Summary of offline disc [R3-223687](file:///C%3A%5CUsers%5Cchuberrn%5CDocuments%5C000_DATA_NICOLAS%5C02_3GPP%20Nicolas%5CRAN3%5CMeetings%5C220509_RAN3%23116-e%20meeting%5CSatellite%20contributions%5CD_Come%20backs%5CCB%23%20NTN1_NRNTN%5CInbox%5CR3-223687.zip)

The following TDOCs are considered as part of this discussion:

|  |  |  |
| --- | --- | --- |
| [R3-223009](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223009.zip) | LS on UE location during initial access in NTN (RAN2) | LS in |
| [R3-223020](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223020.zip) | LS on UE location in connected mode in NTN (RAN2) | LS in |
| [R3-223031](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223031.zip) | Reply LS on RAN Initiated Release due to out-of-PLMN area condition (SA2) | LS in |
| [R3-223099](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223099.zip) | Adding serving PLMN information in ULI for NTN (Qualcomm Incorporated) | CR0776r, TS 38.413 v17.0.0, Rel-17, Cat. F |
| [R3-223234](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223234.zip) | Discussion on remaining issues of NTN and NTN-IoT (Huawei, Deutsche Telekom) | discussion |
| [R3-223236](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223236.zip) | Correction to 38.473 for capturing SIB19 (Huawei, Deutsche Telekom) | CR0885r, TS 38.473 v17.0.0, Rel-17, Cat. F |
| [R3-223237](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223237.zip) | Correction to 38.470 for capturing SIB19 (Huawei, Deutsche Telekom) | CR0093r, TS 38.470 v17.0.0, Rel-17, Cat. F |
| [R3-223254](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223254.zip) | Discussion on corrections for LTE IOT NTN and NR NTN (Nokia, Nokia Shanghai Bell) | discussion |
| [R3-223256](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223256.zip) | Corrections for NR NTN (Nokia, Nokia Shanghai Bell) | draftCR |
| [R3-223271](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223271.zip) | Views on UE location aspects for NR NTN (CATT) | discussion |
| [R3-223272](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223272.zip) | draft CR to TS 38.300 correction on NR NTN (CATT) | draftCR |
| [R3-223339](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223339.zip) | [DRAFT] Reply LS on UE location during initial access in NTN (Ericsson LM) | LS out To: RAN2 CC: CT1, SA3, SA2 |

The following documents can be noted

* R3-223020 LS on UE location in connected mode in NTN (RAN2) LS in
	+ No action for RAN3

# For the Chairman’s Notes

Propose the following:

Propose to capture the following:

# 1st round discussion

## Out of PLMN handling

List of relevant TDOCs:

|  |  |  |  |
| --- | --- | --- | --- |
| [R3-223031](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223031.zip) | Reply LS on RAN Initiated Release due to out-of-PLMN area condition (SA2) | LS in | SA2 would like to thank RAN3 for the LS on RAN Initiated Release due to out-of-PLMN area condition (R3-221379). SA2 would like to confirm RAN3’s understanding and has agreed corresponding CRs as attached. |
| [R3-223099](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223099.zip) | Adding serving PLMN information in ULI for NTN (Qualcomm Incorporated) | CR0776r, TS 38.413 v17.0.0, Rel-17, Cat. F | A Serving PLMN IE is added to the NR NTN TAI Information IE.In addition, the UE location derived TAI in NR NTN IE is changed to a TAC, both in reference and its name (as the TAI can be derived using the newly signalled serving PLMN).This CR is strictly non-backward compatible as it introduces a new mandatory IE, and changes the reference of an existing IE.Impact Analysis:Impact assessment towards the previous version of the specification (same release): This CR has limited impact on the previous version of the specification, as it changes only an NTN specific IE within the User Location Information IE. |

**Question 3.1.1: Do companies agree to the proposed CR 38.413 in [R3-223099] ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Agree |  |
| CATT | Agree |  |

**Moderator’s summary:**

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## Capturing SIB19

List of relevant TDOCs:

|  |  |  |  |
| --- | --- | --- | --- |
| [R3-223234](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223234.zip) | Discussion on remaining issues of NTN and NTN-IoT (Huawei, Deutsche Telekom) | discussion | Observation 1: Lack of accurate GNSS location information after AS security has no severe impact to functionality and RAN3 for NR NTN.Observation 2: The information in the SIB19 is more related with the configuration in the gNB-DU.Observation 3: During handover, the gNB-DU needs to configure the NTN information including the ephemeris information to the UE.Proposal 1: It is suggested to align NTN-IoT stage 2 with NR NTN stage 2 regarding the cell mapping.Proposal 2: The SIB 19 is encoded by the gNB-DU. Corresponding changes in 38.473 and 38.470 are needed. |
| [R3-223236](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223236.zip) | Correction to 38.473 for capturing SIB19 (Huawei, Deutsche Telekom) | CR0885r, TS 38.473 v17.0.0, Rel-17, Cat. F | Add SIB 19 in gNB-DU System information IE which should contain all the system information generated by gNB-DU |
| [R3-223237](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223237.zip) | Correction to 38.470 for capturing SIB19 (Huawei, Deutsche Telekom) | CR0093r, TS 38.470 v17.0.0, Rel-17, Cat. F | Add SIB 19 related descriptions in the section of 5.2.2 System Information management function |

**Question 3.2.1: Is the CR 38.473 in [R3-223236] agreeable ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Agree |  |
| CATT | Agree |  |

**Question 3.2.2: Is the CR 38.470 in [R3-223237] agreeable ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Agree |  |
| CATT | Agree |  |

**Moderator’s summary:**

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## Mapped cell Id handling

List of relevant TDOCs:

|  |  |  |  |
| --- | --- | --- | --- |
| [R3-223254](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223254.zip) | Discussion on corrections for LTE IOT NTN and NR NTN (Nokia, Nokia Shanghai Bell) | discussion | Proposal 1: clarify the mapped cell ID determination and MME (re-)selection is also applicable to NB-IOT UE that supports S1-U data transfer or User Plane CIOT EPS optimisation.Proposal 2: agree the corrections to LTE Stage-2 TP ([2]).Proposal 3: agree the corrections to NR Stage-2 TP ([3]).Proposal 4: Update S1AP to remove LTE-M Satellite Indication IE, and the related behavior text.Proposal 5: rapporteur CR to add the assigned criticality “ignore” for the RAT Restriction IE in S1AP and X2AP. |
| [R3-223256](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223256.zip) | Corrections for NR NTN (Nokia, Nokia Shanghai Bell) | draftCR | Move the text for the mapped configuration from the NOTE paragraph to a normative paragrah.Impact Analysis:Impact assessment towards the previous version of the specification (same release): This CR has limited impact under funtional point of view, since it clarifies the mapping configuration for the Mapped Cell ID is configured in the RAN and Core Network |
| [R3-223272](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223272.zip) | draft CR to TS 38.300 correction on NR NTN (CATT) | draftCR | The description of Mapped Cell ID in section 16.14.5 is not accurate enough, which may cause confusion, even lead to mis-understanding.“The Cell Identity, as defined in TS 38.413 [26] and TS 38.423 [50], used in following cases corresponds to a Mapped Cell ID, irrespective of the orbit of the NTN payload or the types of service links supported. “- Actually, the cell ID in the following cases may not always be the mapped Cell ID, e.g. the in the ULI of the INITIAL UE MESSAGE message, as there’s no UE location info to do accurate CGI mapping, the gNB may not be able to map the Cell ID to a geographysical area.“The Cell Identity included within the target identification of the handover messages allows identifying the correct target cell.”- Not clear enough what’s the handover messages means here, Uu handover messages or Xn/NG handover messages? As mapped Cell ID is only known by gNB and Core Network, obviously, it means Xn/NG. “The mapping between Cell Identities and geographical areas is configured in the RAN and Core Network.”- The Cell Identities here should represent for Mapped Cell IDs.=> Make corresponding changes to make the texts more accurate. |

**Question 3.3.1: Is the draft CR 38.300 in [R3-223256] agreeable ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Agree |  |
| CATT | Agree | Just one thing to be mentioned:As we defied the  “Mapped Cell ID” , we should use it to replace the “Mapped Cell Identities” or “ Mapped Cell identifiers”. |

**Question 3.3.2: Is the draft CR 38.300 in [R3-223272] agreeable ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Agree |  |
| CATT | Agree | Maybe the draft CR 3256 and 3272 could be merged together. |

**Moderator’s summary:**

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## UE location aspects

List of relevant TDOCs:

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| --- | --- | --- | --- |
| [R3-223009](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223339.zip) | LS on UE location during initial access in NTN (RAN2) | LS in | RAN2 had decided (see R2-2109216) that the UE may report to the NG-RAN its coarse GNSS coordinates during initial access (before AS security is activated).The reporting would be under network control (i.e. it could be disabled if/when needed). Following liaisons from SA2, SA3 and RAN3 (see R2-2200145/S2-2109337, R2-2200149/S3-214360, R2-2202542/S3i200056) on this, RAN2 is discussing how to progress and requires the views of SA2 and RAN3 to take its decision.Due to possible privacy issues indicated by SA3, RAN2 is likely to decide that UE does not report to the NG-RAN its coarse GNSS coordinates during initial access (before AS security is activated), for example, for service request and registration area update procedures. RAN2 assumes UE location information can be reported after AS security is activated and network has NTN specific user consent. RAN2 has asked SA3 to work on the NTN specific user consent in Rel-17. RAN2 also understands that, if needed, NG-RAN can reselect an AMF serving a PLMN corresponding to the available UE's current location. This location can be determined by the AMF by invoking UE location procedure (LCS) in connected mode(once AS security is activated) and provided to the NG-RAN.RAN2 would then like to ask SA2/RAN3 if it's acceptable that no UE location information is reported at the NG-RAN in a NTN network during initial access. |
| [R3-223339](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223339.zip) | [DRAFT] Reply LS on UE location during initial access in NTN (Ericsson LM) | LS out To: RAN2 CC: CT1, SA3, SA2 | Proposal to RAN2 as follow:“At initial access the RAN uses user location information, if available and/or provided by the UE, to assist the selection of an appropriate core network node for the UE. In the absence of any such information, core network node selection will be performed based on available information, typically including serving cell, PLMN, and TAC.RAN3 confirms RAN2’s assumption that in case an incorrect AMF is selected, the NG-RAN can re-select a correct one upon triggering UE context release. Appropriate deployment and network configuration should make this a rare case.Whether an AMF which is not the appropriate one for the UE can trigger a location procedure (LCS) for that UE, may depend on AMF configuration.With the above in mind, RAN3 considers it acceptable that no UE location information is reported to the NG-RAN at initial access for NTN.” |
| [R3-223271](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_116-e%5CDocs%5CR3-223271.zip) | Views on UE location aspects for NR NTN (CATT) | discussion | Observation 1: From RAN3 point of view, it’s acceptable that no UE location information is reported from UE in a NTN network during initial access.Observation 2: RAN3 understands that it’s feasible for AMF to obtain the UE location info via LCS services, but RAN3/SA2 never discussed and agreed to provide the UE location info from 5GC to NG-RAN for any purpose.Observation 3: RAN3 share the view with RAN2 that implicit user consent approach could be considered in Rel-17.Observation 4: No further action required for RAN3 on the out-of-PLMN release case.Proposal 1: Reply the LS to RAN2 with following info:- it’s acceptable that no UE location information is reported from UE in a NTN network during initial access.- it’s feasible for AMF to obtain the UE location info via LCS services, but RAN3/SA2 never discussed and agreed to provide the UE location info from 5GC to NG-RAN for any purpose.Proposal 2: Discuss and agree the draft LS reply in the section 5. |
| *R3-221357* | *LS on UE location during initial access in NTN* | *LS in* | *RAN2 had decided (see R2-2109216) that the UE may report to the NG-RAN its coarse GNSS coordinates during initial access (before AS security is activated).The reporting would be under network control (i.e. it could be disabled if/when needed).* *Following liaisons from SA2, SA3 and RAN3 (see R2-2200145/S2-2109337, R2-2200149/S3-214360, R2-2202542/S3i200056) on this, RAN2 is discussing how to progress and requires the views of SA2 and RAN3 to take its decision.**Due to possible privacy issues indicated by SA3, RAN2 is likely to decide that UE does not report to the NG-RAN its coarse GNSS coordinates during initial access (before AS security is activated), for example, for service request and registration area update procedures. RAN2 assumes UE location information can be reported after AS security is activated and network has NTN specific user consent. RAN2 has asked SA3 to work on the NTN specific user consent in Rel-17. RAN2 also understands that, if needed, NG-RAN can reselect an AMF serving a PLMN corresponding to the available UE's current location. This location can be determined by the AMF by invoking UE location procedure (LCS) in connected mode(once AS security is activated) and provided to the NG-RAN.**RAN2 would then like to ask SA2/RAN3 if it's acceptable that no UE location information is reported at the NG-RAN in a NTN network during initial access.* |
| *R3-222861* | *Reply LS on UE location during initial access in NTN (Thales)* |  | *RAN3 thanks RAN2 for its Liaison in which the following questions was submitted:**Is it acceptable that no UE location information is reported at the NG-RAN in a NTN network during initial access ?**RAN3’s response can be found below:**Without knowledge of the UE location during the initial access, the gNB may not be able to select the correct AMF.**If this happens, the incorrect AMF de-registers the UE, asks the UE to re-register and may inform NG-RAN with an appropriate NGAP cause value in the NGAP UE CONTEXT RELEASE COMMAND message. On subsequent network access attempt by the UE, the NG-RAN may be able to select the right AMF based on the information from the UE. This translates into a risk of extended UE registration (or connection set-up), but only in extreme cases of large radio cell covering more than 1 country, and only at the transition to RRC CONNECTED state or after significant UE movement.**In addition, the initial mapped cell ID reported over NGAP may not be able to provide the level of granularity that has been requested by SA groups, but it has previously been clarified that this is acceptable at initial access.**There are no significant impacts in RAN3 specifications resulting from this change.**Overall RAN3 confirms that the above is acceptable from RAN3 point of view.* |

**Question 3.4.1: Does RAN3 agree to prepare a response to RAN2 LS in [R3-223009] ?**

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| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Not agree | Actually R3-223009 = R3-221357.Already RAN3 responded to R3-221357 with R3-222861We do not think it is necessary to send a 2nd response to the same LS |
| CATT | Neutral | CATT also provide a draft LS Reply in 3271.1. For the RAN2 question in the Lsin,

*RAN2 would then like to ask SA2/RAN3 if it's acceptable that no UE location information is reported at the NG-RAN in a NTN network during initial access.*It seems RAN3 has answered this question in previsous LS out, not necessarily to repeat.1. But in the LS, RAN2 also provided the following assumption, which is mismatched with RAN3 agreements/designs.

*RAN2 also understands that, if needed, NG-RAN can reselect an AMF serving a PLMN corresponding to the available UE's current location. This location can be determined by the AMF by invoking UE location procedure (LCS) in connected mode(once AS security is activated) and provided to the NG-RAN.***[RAN3 view]**:From RAN3 point of view, it’s feasible for AMF to obtain the UE location info via LCS services, but RAN3/SA2 never discussed and agreed to provide the UE location info from 5GC to NG-RAN for any purpose.Should we reply on this to clarify the progress of RAN3? |

**Question 3.4.2: Can Ericsson proposed LS response [R3-223339] be considered as basis for the discussion ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Not agree | See above |
| CATT | Neutral | If reply, we should indicate that RAN2 made the wrong assumption in their LS that NG-RAN could obtain the UE location info from 5GC, refer to the 2nd part of 3271. |

**Question 3.4.3: Can RAN3 agree with Ericsson proposed LS response [R3-223339] ?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/not agree** | **Comment** |
| Thales | Not agree | See above |
| CATT | Neutral | See comments above. |

**Moderator’s summary:**

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# 2nd round discussion

***END***