**3GPP TSG-RAN WG2 Meeting #110e R2-2005795**

**Elbonia, 01 – 12 June 2020**

**Agenda item: 6.18.2**

**Source: Nokia (Rapporteur)**

**Title: Report from email discussion [AT110e][104][PRN] RRC CR (Nokia) – first round**

**WID/SID: NG\_RAN\_PRN-Core - Release 16**

**Document for: Discussion and Decision**

# 1 Introduction

This document is the report about first round of the following email discussion

* [AT110e][104][PRN] RRC CR (Nokia)

Initial scope: Continue the discussion on RRC open issues, based on [R2-2004481](file:///C%3A%5CData%5C3GPP%5CRAN2%5CDocs%5CR2-2004481.zip), considering the new LSs from SA1 and the proposals marked "to be discussed in offline [104]". Also discuss RILs: Z112, B200 and H422.

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

* Set of proposals with full consensus agreeable over email (based on the list in Section 3.1 of [R2-2004481](file:///C%3A%5CData%5C3GPP%5CRAN2%5CDocs%5CR2-2004481.zip), possibly extended with new easy agreements)
	+ - Set of proposals to discuss in the follow up conference call

Initial deadline (for companies' feedback): Wednesday 2020-06-03 10:00 UTC

Initial deadline (for rapporteur's summary in R2-2005795): Wednesday 2020-06-03 22:00 UTC

Proposed agreements in R2-2005795 indicated for email agreement and not challenged until Thursday 2020-06-04 10:00 UTC will be declared as agreed by the session chair. For the other ones, the discussion will continue online.

# 2 Discussion of the open issues of R2-2004481

## 2.1 Issue 1: Role of manually selected CAG ID

**Open issue description:** What is the role of the manually selected CAG ID; only used during initial cell selection or it is used later during cell reselection and connected mode mobility.

* FFS if the UE shall prioritize it during cell reselection
* FFS if it has a role in Connected mode mobility
* FFS if the UE should send it during Resume procedure

Based on the majority's view on Q1a and Q1b of R2-2004481 the followings are proposed:

**Proposal 1a: RAN2 assumes that the manually selected CAG ID has no impact to cell reselection. (This requires no change in the existing draft CRs.) The final decision will happen after reply LS from SA2 on this issue is received.**

**Proposal 1b: RAN2 assumes that the UE shall select a cell supporting the manually selected CAG ID provided by NAS for initial cell selection. The relevant changes should be added to the running 38.304 CR. The final decision will happen after reply LS from SA2 on this issue is received.**

## 2.2 Issue 2: Selected PLMN-Identity in *RRCResumeComplete*

**Open issue description:** Whether the selected PLMN-Identity can refer to a NPN in the description of *RRCResumeComplete* messages and the relevant procedures

According to clause 5.3.13.4 the selected PLMN-Identity may be added into *RRCResumeComplete*

1> set the content of the of *RRCResumeComplete* message as follows:

2> if the upper layer provides NAS PDU, set the *dedicatedNAS-Message* to include the information received from upper layers;

2> if the upper layer provides a PLMN, set the *selectedPLMN-Identity* to PLMN selected by upper layers (TS 24.501 [23]) from the PLMN(s) included in the *plmn-IdentityList* in *SIB1;*

Based on the views on Q2a of R2-2004481 the following is proposed:

**Proposal 2a: The SNPN ID is never added to the *RRCResumeComplete.***

Based on the majority's view on Q2b of R2-2004481 the following is proposed:

**Proposal 2b: RAN2 assumes that the CAG ID is never added to the *RRCResumeComplete*. (This assumption is to be captured in the running RRC CR.) The final decision will happen after reply LS from SA2 on this issue is received.**

## 2.3 Issue 3: Granularity of advertised UAC parameters

**Open issue description:** Whether it is sufficient to broadcast the Unified Access Control (UAC) parameters per PLMN (assuming that using the operator-defined access categories with access category criteria type set to the S-NSSAI used for PNI-NPN is sufficient to provide CAG specific UAC) or there is need to enable the broadcast of CAG ID specific configuration of UAC parameters?

An LS in [R2-2002417](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e/Docs/R2-2002417.zip) was sent with the following questions:

Question 2.1; TO: SA1:
Is there a requirement to enable PNI-NPN (CAG ID) specific access control in cells that are shared among PNI-NPNs belonging to the same PLMN?

* Reply in [R2-2005991](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2005991.zip) (S1-202265): SA1 currently does not have a specific requirement to enable PNI-NPN (CAG ID) specific access control in cells that are shared among PNI-NPNs belonging to the same PLMN.

Question 2.2; TO: CT1, SA1:
If there is a requirement to enable PNI-NPN (CAG ID) specific access control in cells that are shared among PNI-NPNs belonging to the same PLMN, then is it sufficient to broadcast the Unified Access Control (UAC) parameters per PLMN (assuming that using the operator-defined access categories with access category criteria type set to the S-NSSAI used for PNI-NPN is sufficient to provide CAG specific UAC) or there is need to enable the broadcast of CAG ID specific configuration of UAC parameters?

* CT1 answer in [C1-202846](https://www.3gpp.org/ftp/tsg_ct/WG1_mm-cc-sm_ex-CN1/TSGC1_123e/Docs/C1-202846.zip)/[R2-2004177](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109bis-e/Docs/R2-2004177.zip): As this question is dependent on service requirements which do not exist yet, this question can be answered only if and when the service requirements are specified by SA1.
* Reply in [R2-2005991](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2005991.zip) (S1-202265): Since the answer to Q2.1 is no, answer to Q2.2 is not needed

Based on SA1 answers the following is proposed:

**Proposal 3: UAC parameter set for a PNI-NPN is selected based on the PLMN ID of PNI-NPNs. There is no need to broadcast CAG ID specific UAC parameter sets.**

## 2.4 Issue 4: Network indexing for NPNs

**Open issue description:** A definition of network indexing for NPNs is FFS

Based on SA1 answers in [R2-2005991](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2005991.zip) (S1-202265) (see issue 3) and the majority's view on Q2b of R2-2004481 the following is proposed:

**Proposal 4a: The PNI-NPNs belonging to the same PLMN have a common (shared) index value.**

[R2-2005592](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2005592.zip) contains the following proposal

Proposal: RAN2 to discuss the three options of PNI-NPN indexing:

* Option 1: Each PNI-NPN has its own index. When including *selectedPLMN-Identity* in MSG5, UE only considers the PLMN part (i.e. UE can include whichever index among the PNI-NPNs with the same PLMN ID).
* Option 2: PLMN and PNI-NPNs with the same PLMN ID share an index. An indication is added to indicate whether the UE is accessing through PLMN or PNI-NPN.
* Option 3: PNI-NPNs with same PLMN ID share an index. The sharing does not involve PLMNs.

Based on proposal 4a it is assumed that all PNI-NPNs belonging to the same PLMN have a common (shared) index value.

Section 2.1 of R2-2004483 contains text proposals when all PNI-NPNs belonging to the same PLMN share an index value (for option 2 above).

**Question 4a: Which option do you prefer?**

* **Option A:** PLMN and PNI-NPNs with the same PLMN ID share an index.
* **Option B:** PNI-NPNs with same PLMN ID share an index. The sharing does not involve PLMNs.

**Question 4b: If option A is selected then do you agree that an indication is added to indicate whether the UE is accessing through PLMN or PNI-NPN?**

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| **Company** | **Answer to Q14a** | **Answer to Q14b** | **Comment** |
| ZTE | Option B |  | We prefer option B due to less spec impact. |
| CATT |  |  | Option B is preferred. We think it is option B is straightforward.  |
| Intel | Option A  | depends | For Q4a: Our assumption is that it is possible to have the same PLMN ID in the PLMN list as well as in the NPN list for CAG. In order to prevent indexing the same PLMN ID twice, Option A should be used, as this may have overhead for the sending of the UAC configuration for the same PLMN ID.For Q4b: The network index is purely for AMF selection. There is no requirement to use the CAG ID for network selection. Hence we do not see the purpose of providing the indication, unless there is a requirement from RAN3 spec requiring RAN to decide whether to provide the cell broadcast CAG list. |
| Huawei | Option A | Yes | For Q4a: Agree with Intel that Option A avoids indexing the same PLMN ID twice.For Q4b: From RAN3 perspective, the AMF needs to know the supported CAG list of the cell and the allowed CAG list of the UE. By comparing the two lists, the AMF can verify the access of the UE. But the verification process is only needed if the UE is accessing through CAG.It was agreed in R3-197776 that, the gNB transmits the supported CAG List of the selected PLMN of the selected cell via the Initial UE Message to AMF for further admission control. However, there is no need for the gNB to transmit the supported CAG List to AMF when the UE (e.g., PLMN UE) is not requesting to access via CAG cell. |
| Sony | A |  | Agree with Intel |
| Futurewei | Option A |  | Agree with Intel and Huawei |
| Qualcomm | Option B | No | We agree it is possible to have a PLMN ID in the PLMN list as well as NPN list for CAG. The UE logic is simplest to not have to correlate these lists and come up with a common index value (which is what option A will require). UE logic stays simplest with Option B. Note the PLMN and CAGs may be hosted in different logical cells (from a RAN3 perspective) that reside on the same physical cell. |
| Nokia | Option A | No | There is no requirement that the UE should indicate if a cell is selected as a CAG cell or as a PLMN cell. Moreover, there may be privacy/security concerns of adding this indication (explicitly or implicitly with Option B).  |
| vivo | Option B |  | Option B is preferred. If Option A is adopted, a indication should be introduced to indicate whether UE is accessing through PLMN or CAG, which has both RAN2 and RAN3 impact. For example, RAN have to determine whether provide the supported CAG list to AMF or not base on the indication provided by UE. Thus, we prefer to select a solution with less spec impact.For Q4b: Given that a logical cell provide only one network type (PLMN or PNI-NPN or SNPN), an example is provided to show the necessity of providing the indication:For a cell:PLMN ID=1,cell ID=1;PLMN ID=1(CAG ID=1),cell ID =2;If UE only indicate NW that it is accessing network through PLMN ID=1, RAN node is confused that which cell the UE locates. If RAN node assume that UE is located in cell with cell ID=2 and provide supported CAG ID (i.e. CAG ID=1) to AMF, UE registration may fail even though UE can register successfully via PLMN. |
| Ericsson | B |  |  |
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## 2.5 Issue 5: Manual CAG selection indication

**Open issue description:** RAN2 received a LS from CT1 in [R2-2004178](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109bis-e/Docs/R2-2004178.zip)/C1-202927 asking if a RAN can specify the broadcast of a new indication that the PLMN allows a user to manually select a CAG-ID supported by the CAG cell.

SA1 further clarified the requirement in the reply LS ([R2-2005993](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2005993.zip)/S1-202277)

SA1 has discussed about the following existing SA1 Rel-16 requirement (from TS 22.261):

*The 5G system shall support a mechanism for a PLMN to control whether a user of a UE can manually select a non-public network hosted by this PLMN that the UE is not authorized to select automatically.*

and agreed that the indication allowing to manually select a CAG-ID supported by the CAG cell but outside the UE’s allowed CAG list, is per CAG ID.

Per CAG ID indication is needed the following extension can be used:

**SOLUTION B**

NPN-Identity-r16 ::= CHOICE {

 pni-npn-r16 SEQUENCE {

 plmn-Identity-r16 PLMN-Identity,

 cag-IdentityList-r16 SEQUENCE (SIZE (1..maxNPN-r16)) OF CAG-IdentityInfo-r16

 },

 snpn-r16 SEQUENCE {

 plmn-Identity PLMN-Identity,

 nid-List-r16 SEQUENCE (SIZE (1..maxNPN-r16)) OF NID-r16

 }

}

CAG-IdentityInfo-r16 ::= SEQUENCE {

 CAG-Identity-r16 BIT STRING (SIZE (32)),

 manualCAGselectionAllowed-r16 BOOLEAN

}

Based on reply from SA1 and on the majority's view on Q5b of R2-2004481 the following is proposed:

**Proposal 5: Solution B will be used as baseline for indicating if it is allowed to manually select a CAG-ID supported by the CAG cell but outside the UE’s allowed CAG list.**

## 2.6 Issue 6 (RIL Q006): NEED code for SIB10

**Open issue description (SIB10 in 6.3.1):**

SIB10-r16 ::= SEQUENCE {

 hrnn-List-r16 HRNN-List-r16 OPTIONAL, -- Need R

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 ...

}

Based on the majority's view on Q6 of R2-2004481 the following is proposed:

**Proposal 6a: No changes are needed in 38.331 due to comment in RIL Q006.**

[**R2-2005658**](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2005658.zip) **contains the following additional clarification proposals**

* Proposal 1: Confirm that UE stores hrnn-List for each cell, if received, and the stored hrnn-List information can be valid up to 3 hours.
* Proposal 2: Confirm that, with hrnn-List being optionally present with Need R, if UE identifies a cell for which hrnn-List is stored, the expected UE behaviours are:
	+ Case a) If non-empty SIB10 is scheduled by the cell Replace the stored hrnn-List of the cell with the new one being signalled (hence, Need R is not applied)
	+ Case b) If empty SIB10 is scheduled by the cell Replace the stored hrnn-List of the cell with the new one (new one is empty) being signalled, i.e. delete the stored hrnn-List of the cell (hence, Need R is not applied)
	+ Case c) If SIB10 is not scheduled by the cell Delete the stored hrnn-List of the cell (Need R is applied)
* Proposal 4: Clarify that reselection to another cell does not affect the hrnn-List stored in the previous cell.

**Question 6: Which of the above proposals do you agree?**

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| **Company** | **Answer** | **Comment** |
| ZTE | both | Although we agree with the above proposals, we think it has already been reflected by the current specs and there is no room for misunderstanding thus no clarification is needed. |
| CATT |  | We support one-shot treatment on the hrnn-List information. UE does not need to store the HRNN info. |
| Intel | - | SIB 10 should follow the same update mechanism as other SIBs associated with a value tag. No new requirement is needed. |
| Huawei | All of them | Agree with ZTE that the proposals have no spec impact. |
| Sony |  | Agree with ZTE |
| Futurewei | All three | No further spec impact |
| Qualcomm | All three |  |
| Nokia | Pr1 | We think that the SIB10 validity could be handled in the same way as with other SIBs:valid for 3 hours, and area and valutag could be used to indicate to the UE that it has changed. It is up-to UE implementation if it stores values from other areas (cells). Therefore, Pr1 is OK. Pr2 and Pr3 requires some modifications. |
| vivo | All  | Agree with ZTE, the current spec is clear. |
| Ericsson |  | We also think current spec ensures wanted behaviour. |
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## 2.7 Issue 7 (RIL Z102): Definition of selected PNI-NPN

**Open issue description:** There is the following open RIL in 5.2.2.4.2 Actions upon reception of the SIB1:

1> if the cell is not an NPN-only cell and the *cellAccessRelatedInfo* contains an entry with the *PLMN-Identity* of the selected PLMN:

2> in the remainder of the procedures use *plmn-IdentityList*, *trackingAreaCode*, and *cellIdentity* for the cell as received in the corresponding *PLMN-IdentityInfo* containing the selected PLMN;

1> if the *cellAccessRelatedInfo* contains an entry with the *NPN-Identity* of the selected NPN:

2> in the remainder of the procedures use *npn-IdentityList*, *trackingAreaCode*, and *cellIdentity* for the cell as received in the corresponding *NPN-IdentityInfo* containing the selected NPN;

Based on the views on Q7 of R2-2004481 there was conclusion for the solutions for RIL Z102:

[R2-2004482](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2004482.zip) (Nokia) contains the following observations and proposal:

**Observation 1: There is no selected CAG ID (PNI-NPN) in case of automatic network selection.**

**Observation 2: The selected and registered SNPN are defined in TS 38.304, no need to define them in TS 38.331.**

**Proposal: Endorse the following text changes in 38.331:**

\*\*\*\*\* Start of Changes \*\*\*\*\*

##### 5.2.2.4.2 Actions upon reception of the *SIB1*

Upon receiving the *SIB1* the UE shall:

1> store the acquired *SIB1*;

1> if a PLMN is selected

2> if the PLMN-ID of that PLMN is broadcast by the cell with no associated CAG-IDs and CAG-only indication in the UE for that PLMN is absent or false:

3> in the remainder of the procedures use *plmn-IdentityList*, *trackingAreaCode*, and *cellIdentity* for the cell as received in the corresponding *PLMN-IdentityInfo* containing the selected PLMN;

2> else if the Allowed CAG list in the UE for that PLMN includes a CAG-ID broadcast by the cell for that PLMN:

3> in the remainder of the procedures use *npn-IdentityList*, *trackingAreaCode*, and *cellIdentity* for the cell as received in the corresponding *NPN-IdentityInfo* containing CAG-IDs for the selected PLMN;

1> else if an SNPN is selected and the *cellAccessRelatedInfo* contains an entry with the *SNPN-Identity* of the selected SNPN:

2> in the remainder of the procedures use *npn-IdentityList*, *trackingAreaCode*, and *cellIdentity* for the cell as received in the corresponding *NPN-IdentityInfo* containing the selected SNPN;

\*\*\*\*\* End of Changes \*\*\*\*\*

**Question 7: Do you agree that the proposal in R2-2004482 as the solution for RIL Z102?**

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| **Company** | **Answer** | **Comment** |
| ZTE | No | The following solutions have been proposed by QC and ZTE during the email discussion [Post109bis-e][934][PRN] Remaining open issues and we think both of them have less spec impact:* **QC** - proposed change in email discussion [Post109bis-e][934][PRN] Remaining open issues

Upon receiving the *SIB1* the UE shall:1> store the acquired *SIB1*;1> if the cell is not an NPN-only cell and the *cellAccessRelatedInfo* contains an entry with the *PLMN-Identity* of the selected PLMN:2> in the remainder of the procedures use *plmn-IdentityList*, *trackingAreaCode*, and *cellIdentity* for the cell as received in the corresponding *PLMN-IdentityInfo* containing the selected PLMN;1> if the *cellAccessRelatedInfo* contains an entry with the *NPN-Identity* of the selected PLMN or SNPN:2> in the remainder of the procedures use *npn-IdentityList*, *trackingAreaCode*, and *cellIdentity* for the cell as received in the corresponding *NPN-IdentityInfo* containing the selected PLMN or SNPN;* **ZTE** - proposed change in email discussion [Post109bis-e][934][PRN] Remaining open issues

Upon receiving the *SIB1* the UE shall:1> store the acquired *SIB1*;1> if the *cellAccessRelatedInfo* contains an entry with the *PLMN-Identity* or *NPN-Identity* of the selected PLMN:2> in the remainder of the procedures use *plmn-IdentityList*, *trackingAreaCode*, and *cellIdentity* for the cell as received in the corresponding *PLMN-IdentityInfo* or *NPN-IdentityInfo* containing the selected PLMN;1> else if the *cellAccessRelatedInfo* contains an entry with the *NPN-Identity* of the selected SNPN:2> in the remainder of the procedures use *npn-IdentityList*, *trackingAreaCode*, and *cellIdentity* for the cell as received in the corresponding *NPN-IdentityInfo* containing the selected SNPN; |
| CATT | No | As we commented in [Offline-105][PRN] 38.304 CR (Qualcomm), the following sentence “if the PLMN-ID of that PLMN is broadcast by the cell with no associated CAG-IDs and CAG-only indication in the UE for that PLMN is absent or false” is to cover two cases:Case 1: The PLMN-ID of that PLMN is broadcast by the cell, but there is no CAG-IDs associated to the corresponding PLMN-ID, and CAG-only indication in the UE for that PLMN (TS 23.501 [10]) is absent or false;Case 2: PLMN-ID of that PLMN is broadcast by the cell and one or more CAG-IDs is/are associated to the PLMN-ID, but the associated CAG ID to the PLMN ID is not included in the allowed CAG ListUnfortunately, the current text does not cover Case 2, so we propose the following:“If the PLMN-ID of that PLMN is broadcast by the cell with no associated CAG-IDs matching with allowed CAG list in the UE and CAG-only indication in the UE for that PLMN (TS 23.501 [10]) is absent or false;” |
| Intel | No | For the PLMN selected case, we think we just need to indicate that NPN-IdentityList can be used, as it can be left to UE which should be used in the case PLMN is selected. ZTE or QC update seem to be fine with us and is simple. |
| Huawei | No | The change proposed by the rapporteur is complicated and requires the definition of “allowed CAG list”. The change proposed by ZTE, but by using “the NPN-Identity” SNPN is also involved. We suggest the following:1> if the cell is not an NPN-only cell and the *cellAccessRelatedInfo* contains an entry with the *PLMN-Identity* (either with or without a *cag-IdentityList*) of the selected PLMN:2> in the remainder of the procedures use *plmn-IdentityList*, *trackingAreaCode*, and *cellIdentity* for the cell as received in the corresponding *PLMN-IdentityInfo* containing the selected PLMN;1> if the *cellAccessRelatedInfo* contains an entry with the *NPN-Identity* of the selected SNPN:2> in the remainder of the procedures use *npn-IdentityList*, *trackingAreaCode*, and *cellIdentity* for the cell as received in the corresponding *NPN-IdentityInfo* containing the selected SNPN; |
| Sony | No | We are fine with either Qualcomm or ZTE version |
| Futurewei | No | Qualcomm, ZTE, or Huawei’s approaches are simpler. |
| Qualcomm  | No | The text proposals from Qualcomm, ZTE or Huawei are ok. |
| vivo | No | HW’s solution is acceptable to us. |
| Ericsson | No | We are fine with either Qualcomm or ZTE version |
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## 2.8 Issue 8 (RIL Z103): Definition of registered PNI-NPN

**Open issue description:** There is the following open RIL in 5.2.2.4.2 Actions upon reception of the SIB1:

3> if *trackingAreaCode* is not provided for the selected PLMN nor the registered PLMN nor PLMN of the equivalent PLMN list nor the selected NPN nor the registered NPN:

At RAN2#109-e it was agreed that TAC is mandatory for NPN cells:

4. (Proposal 14 from R2-2002659): TAC is “mandatory” within NPN-IdentityInfoList. To be captured into ASN.1 review file as RIL comment (by the rapporteur).

Based on the views on Q8 of R2-2004481 the following is proposed:

**Proposal 8: To resolve RIL Z103 the following changes are needed in 5.2.2.4.2 of 38.331:**

3> if trackingAreaCode is not provided for the selected PLMN nor the registered PLMN nor PLMN of the equivalent PLMN list:

## 2.9 Issue 9 (RIL I902 and I903): Selected PLMN ID in *RRCSetupComplete*

**Open issue description:** There are the following open RIL in 5.3.3.4 Reception of the RRCSetup by the UE:

2> if upper layers selected a PLMN or an SNPN (TS 24.501 [23]):

3> set the *selectedPLMN-Identity* to the PLMN or SNPN selected by upper layers (TS 24.501 [23]) from the PLMN(s) included in the *plmn-IdentityList* or npn-IdentityInfoList in *SIB1*;

Editor's Note: It is FFS how to set the the *selectedPLMN-Identity* when a PNI-NPN is selected.

Based on the views on Q9 of R2-2004481 the following is proposed:

The following proposal can be agreed without further discussion:

**Proposal 9: To resolve RIL I902 and I903 the following changes are needed in 5.3.3.4 of 38.331:**

2> set the *selectedPLMN-Identity* to the PLMN or SNPN selected by upper layers (TS 24.501 [23]) from the PLMN(s) included in the *plmn-IdentityList* or the PLMN(s) or SNPN(s) included in the *npn-IdentityInfoList* in *SIB1*;

# 3 Discussion of new open issues

## 3.1 Issue 11 (RIL Z112): Reference of CAG cells definition

**Open issue description:** There is the following RIL in SIB3 description:

| *SIB3* field descriptions |
| --- |
| ***intraFreqBlackCellList***List of blacklisted intra-frequency neighbouring cells. |
| ***intraFreqCAG-CellList***List of intra-frequency neighbouring CAG cells per PLMN. |
| ***intraFreqNeighCellList***List of intra-frequency neighbouring cells with specific cell re-selection parameters. |
| ***intraFreqWhiteCellList***List of whitelisted intra-frequency neighbouring cells, see TS 38.304 [20], clause 5.2.4. |
| ***q-OffsetCell***Parameter "Qoffsets,n" in TS 38.304 [20]. |
| ***q-QualMinOffsetCell***Parameter "Qqualminoffsetcell" in TS 38.304 [20]. Actual value Qqualminoffsetcell = field value [dB]. |
| ***q-RxLevMinOffsetCell***Parameter "Qrxlevminoffsetcell" in TS 38.304 [20]. Actual value Qrxlevminoffsetcell = field value \* 2 [dB]. |
| ***q-RxLevMinOffsetCellSUL***Parameter "QrxlevminoffsetcellSUL" in TS 38.304 [20]. Actual value QrxlevminoffsetcellSUL = field value \* 2 [dB]. |
| ***ssb-PositionQCL***Indicates the QCL relationship between SS/PBCH blocks for a specific intra-frequency neighbor cell as specified in TS 38.213 [13], clause 4.1. If provided, the cell specific value overwrites the value signalled by *ssb-PositionQCL-Common* in *SIB2* for the indicated cell. |

**Question 11: Do you agree of adding a reference to TS38.304 for CAG cell definition as proposed in RIL Z112?**

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| **Company** | **Answer** | **Comment** |
| ZTE | Yes |  |
| CATT | No | This is related to issue 14 on whether CAG cells or CAG only cells should be included in PCI range. We may need to check this issue after issue 14 is concluded as we cannot add a reference to TS38.304 for CAG cell definition if it is concluded that CAG only cells will be included in PCI range. |
| Intel | Yes |  |
| Huawei | - | Agree with CATT that it is related to Issue 14. |
| Sony | Yes | We think the reference could still be added if issue 14 requires any changes to the CAG cell definition |
| Futurewei | Yes |  |
| Qualcomm | Yes |  |
| Nokia |  | This reference can only be added after issue 14 is concluded |
| vivo | Yes |  |
| Ericsson | - | We suppose we can refer to 38.304 for definition of “CAG cell” in either case, if that definition is defined and used in 38.304. What remains with issue 14 then is to define if the term needed in this case is really “CAG cell”. So, yes to reference, but it seems unclear if it applies here, for this we need to first sort out issue 14. |
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## 3.2 Issue 12 (RIL B200)

**Open issue description:** There is the following RIL in *CellAccessRelatedInfo* definition:

***CellAccessRelatedInfo* information element**

-- ASN1START

-- TAG-CELLACCESSRELATEDINFO-START

CellAccessRelatedInfo ::= SEQUENCE {

 plmn-IdentityList PLMN-IdentityInfoList,

 cellReservedForOtherUse ENUMERATED {true} OPTIONAL, -- Need R

 ...,

 [[

 cellReservedForFutureUse-r16 ENUMERATED {true} OPTIONAL, -- Need R

 npn-IdentityInfoList-r16 NPN-IdentityInfoList-r16 OPTIONAL -- Need R

 ]]

}

-- TAG-CELLACCESSRELATEDINFO-STOP

-- ASN1STOP

**Question 12: Do you agree of the proposed conclusion of the rapporteur ("reject the proposal") for RIL B200?**

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| --- | --- | --- |
| **Company** | **Answer** | **Comment** |
| ZTE | Yes |  |
| CATT | Yes | Agreed with rapporteur |
| Intel | No | Using such extension marker will increase huge overhead. We should follow the principle as suggested by Lenovo. |
| Huawei | Yes |  |
| Sony | Yes |  |
| Futurewei | Yes | Consistent with other extensions in SIBs. |
| vivo | Yes |  |
| Ericsson | Yes | CellAccessRelatedInfo is not a list-element, which the Description in the RIL suggests. Hence the overhead is not huge. We think we can leave the spec as is.If indeed it would have been a list element we should of course do as the RIL-comment suggests. |
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## 3.3 Issue 13 (RIL H422): Duplication of field description for TAC

**Open issue description:** There is the following RIL in the description of *NPN-IdentitityInfoList*:

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| --- |
| *NPN-IdentityInfoList* field descriptions |
| ***NPN-IdentityInfo***The *NPN-IdentityInfo* contains one or more NPN identities and additional information associated with those NPNs. Only the same type of NPNs (either SNPNs or PNI-NPNs) can be listed in a *NPN-IdentityInfo* element. |
| ***npn-IdentityList***The *npn-IdentityList* contains one or more NPN Identity elements. |
| ***trackingAreaCode***Indicates the Tracking Area Code to which the cell indicated by cellIdentity field belongs.  |
| ***ranac***Indicates the RAN Area Code to which the cell indicated by cellIdentity field belongs.  |
| ***trackingAreaCode***Indicates Tracking Area Code to which the cell indicated by cellIdentity field belongs.  |
| ***cellReservedForOperatorUse***Indicates whether the cell is reserved for operator use (for the NPN(s) identified in the *npn-IdentyList*) as defined in TS 38.304 [20]. |

As this is clearly an editorial error the rapporteur has the following proposal:

**Proposal 13: Remove the duplicated field description for TAC from *NPN-IdentitityInfoList* as proposed in RIL H422.**

## 3.4 Issue 14: Meaning of new PCI ranges for CAGs

[**R2-2004521**](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2004521.zip) **lists two options for the cells to be included in PCI range:**

Option 1: All cells support CAG, which includes CAG only cells and shared CAG cells;

Option 2: CAG only cells, mimicked from LTE CSG cell.

**Question 14a: Which option do you prefer to be included in PCI ranges for CAG cells?**

* **Option 1:** All cells support CAG(s), which includes CAG only cells and shared CAG cells;
* **Option 2:** CAG only cells, mimicked from LTE CSG cell

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| **Company** | **Answer** | **Comment** |
| ZTE | Option 1 | We cannot see any obvious advantages of one option over the other. Slightly prefer option 1. |
| CATT | Option 2 | Including CAG only cells in PCI range will have more benefit, it will benefit both CAG capable UE and non CAG capable UE-For CAG capable UE, the PLMN ID indicated in SIB3/4 could be used to filter part of the PCI ranges; -For non-CAG capable UE, all the PCIs in the CAG PCI range could be ignored for cell reselection evaluation;If include CAG cells(mixed CAG cells and CAG only cells) in PCI range, it will only benefit CAG capable UE with CAG-only indication setting to TRUE as explained some companies. All the other UEs including CAG capable UE with CAG-only indication is absent/false and non-CAG capable UE cannot benefit from the PCI range. Given this,we think the benefit of introducing the PCI range for CAG will be very limited as we are wondering how many UE will be configured with CAG only indication only as TRUE. |
| Intel | Option 1 |  |
| Huawei | No strong view | If the reserved PCI is for “CAG-only cells”, then non-CAG UE can exclude the PCIs, whereas CAG UEs still need to search other PCIs apart from the reserved PCIs; If the reserved PCI is for both CAG-only cells and mixed cells, CAG UEs only need to consider the reserved PCIs whereas non CAG UEs cannot exclude them. So either way has its own benefits. |
| Sony | Option 2 | Hybrid cells are not in scope for rel-16 so don’t see a reason for adding shared CAG cells to the PCI list and will have no predictable behaviour for the PCI range list for UEs of different capabilities.  |
| Futurewei | Option 1 | Non-CAG UE don’t need to read/understand CAG related info, so PCI ranges for CAG cells should mainly benefit CAG UEs. Option 1 would allow CAG UE to focus on the reserved PCIs. |
| Qualcomm  | Option 1 | In response to CATT comment, the non-CAG UE has to evaluate CAG cells also to determine the frequency barring behaviour (different from LTE where non-CSG UEs don’t even evaluate CSG PCIs for reselection). |
| Nokia | Option 1 | The purpose of the new lists is to help CAG UEs to find CAG cells, and normal UEs can ignore it. Option 1 (CAG-only +shared cells) means that - CAG-only UEs can use it, as only cell from the list could be suitable- Non-CAG UEs cannot use, as there can be suitable cells in the list and outside the list Option 2 (CAG-only cells) means:- CAG-only UEs cannot use the list, as there can be other suitable cells (shared cells)- Non-CAG UEs may use the list, as those cells cannot be suitableTherefore, we think that Option 1 should be selected. (None of the options help for UEs that can select PLMN and CAG cells.) |
| vivo | Slightly option 1 |  |
| Ericsson | - | The descriptions of the options are not clear to us. But perhaps RAN2 need to first get a common understanding of if the PCI-range is an **exhaustive** list of PCIs. And then **which types of cells** it includes (CAG-only PCIs or PCIs which have both CAG and non-CAG cells |
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## 3.5 Issue 15: Other proposals on PCI lists

**Proposals related to PCI lists that are not covered by other issues.**

[**R2-2004572**](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2004572.zip) **contains the following proposal:**

* Proposal 1: The validity area of the PCI range can be the entire PLMN.
* Proposal 3: For the Public network and non-public network sharing scenario, a new Neighbor cell list shall be added for the NPN, the normal UE and the NPN UE can refer to the different Neighbor cell lists accordingly.

[**R2-2005148**](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2005148.zip) **contains the following proposals:**

* Proposal 1: RAN2 to discuss if the definition of CAG cells needs to include the relationship with the cellReservedForOtherUse IE.
* Proposal 2: RAN2 to discuss if this is the common understanding that there is no associated UE behaviour defined for a CAG capable UE for PCI range.
* Proposal 3: RAN2 to discuss that if the IE cellReservedForOtherUse=true condition is added to the definition of CAG cell then non-CAG capable UE “may” ignore the cells in the PCI range

[**R2-2005689**](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2005689.zip) **contains the following proposals:**

* Proposal 1: During cell reselection, UEs that are not interested in CAG may optionally not rank cells in the CAG PCI list if the following criteria is met: based on the synchronization signals the cell is not strong enough to be the highest ranked cell.
* Proposal 2: UE may use knowledge of the CAG PCIs to improve implementation dependent search procedures for CAGs.
* Proposal 3: UEs that are configured to only connect to CAG cells matching the UE’s Allowed List shall search for all PCIs, irrespective of availability of CAG PCI ranges.

**Q15: Please indicate which of the above proposals do you think should be agreed (at least in principle) during to meeting to be able to finalize Rel-16 specifications?**

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| --- | --- | --- |
| **Company** | **Proposals to be agreed** | **Comment** |
| ZTE |  | Proposal 1: The validity area of the PCI range can be the entire PLMN.[ZTE]Last meeting we made the following agreements:*All cells including cells that do not support CAGs can optionally broadcast PCI ranges for CAGs per frequency per PLMN.**The validity time for PCI ranges advertised for CAGs is 3 hours (as for other SIB parameters).*Considering that the CAG PCI range can be optionally broadcast, we would like to clarify whether UE is allowed to apply the CAG PCI range from the previously camped cell after moving to a cell not broadcasting CAG PCI range.Proposal 3: For the Public network and non-public network sharing scenario, a new Neighbor cell list shall be added for the NPN, the normal UE and the NPN UE can refer to the different Neighbor cell lists accordingly[ZTE] In the neighbour cell list, the cell specific offset is included for NW to prioritize a specific cell. We suggest to introduce a NPN neighbour cell list in which NPN cell specific offset can be configured to prioritize NPN cells for NPN-capable UEs. |
| Intel | Proposal 1 of R2-2004572 | This will reduce the network having to broadcast the PCI range for every cell. |
| Huawei | Proposal 2 of R2-2005148 | We agree that how the UE utilizes the PCI range is left to UE implementation.Comments to other proposals:On R2-2004572:Proposal 1: Currently the reserved PCI is used to facilitate UE measurements and the UE is not asked to have specific actions based on the reserved PCI. If UE wants to store the PCI range for other cells of the same PLMN, it is left to UE implementation. We think adding a special validity area for PCI range is really unnecessary.Proposal 3: Not necessary. If we want to prioritize CAG neighbor cells for CAG capable UEs, we can add a common CAG offset in the R criteria, which introduces less overheadOn R2-2005148:Proposal 1: Even if a CAG cell only provides emergency service, it is still a CAG cell. *cellReservedForOtherUse* is a R15 legacy IE, we don’t need a definition for “PLMN cell” and specify that *cellReservedForOtherUse* cannot be set to true, so why bother adding it for CAG?Proposal 3: UE does not know the *cellReservedForOtherUse* of neighour cells unless it tries to acquire the SIB1, which takes place when the UE determines the target cell for reselection. So proposal 3 is not feasible.On R2-2005689: How the UE utilizes the PCI range is left to UE implementation. |
| Sony | At least P3 in 5148 and P1 in 5689 | For non-CAG UEs, a CAG only cell is treated as a barred cell. There should be some room for battery saving for such UEs if these UEs are able to determine the presence of CAG cells from the PCI range (no need to read target cell system information and act based on stored PCI range). This behaviour already exist for CSG and has a “may” requirement. |
| Futurewei | None | There is no critical issue if they are not agreed. |
| Qualcomm | P2 from 5689. | This can be an informative statement in RRC or 38.304. “UE may use knowledge of the CAG PCIs to improve implementation dependent search procedures for CAGs.” |
| Nokia | Proposals of R2-2005148 to be discussed | Our evaluation of the proposals in these papers is the following:R2-2004172: Enhancements (optimization) proposals and thus they are not essentialR2-2005148: These proposals strongly depend on the outcome of issue 14, and thus they should be discussed after Issue 14 is concluded.R2-2005689: Enhancements (optimization) proposals and thus they are not essential |
| vivo | P2 in R2-2005148 to be discussed |  |
| Ericsson | P2 [**R2-2005689**](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2005689.zip) | P2 would not end up in the specification, we assume though. |
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## 3.6 Issue 16: Other proposals

**Proposals that are not covered by other issues.**

[**R2-2004690**](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2004690.zip) **contains the following proposals:**

* Proposal 2 Agree the CR text included below to be transferred to a CR on 38.306 for inclusion of CGI reporting capability for NPN. [See Annex 1 below]
* Proposal 3 Include SIB10 in SI-SchedulingInfo using valueTags as for any other SIB (except SIB6,7,8). [See Annex 2 below]

[**R2-2004743**](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2004743.zip) **contains the following proposals:**

* Proposal 1: For NPN-only cell, the *plmn-IdentityInfoList* is not reported.

[**R2-2005593**](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2005593.zip) **contains the following proposals:**

* Proposal 1: The following solutions for network controlled manual CAG selection should be discussed:
	+ Option 1: The CAG cell broadcasts a new indication to indicate whether a CAG-ID supported by the cell can be selected manually, and the new indication can be include in SIB1 or SIB10.
	+ Option 2: The UE is pre-configured with an allowed manually selected CAG list, which contains the CAGs that the UE is allowed to select manually.
	+ Option 3: UE reports that the access is based on manual CAG selection in RRC message.
* Proposal 2: SIB10 can be requested on-demand by UEs in RRC\_CONNECTED.
* Proposal 3: For CAG capable UE with CAG-only indication set to TRUE, it reads the PCI ranges but how it use the PCI ranges is up to UE implementation. For other UEs, whether it reads the PCI ranges and how it uses the PCI ranges are up to UE implementation.

[**R2-2005659**](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2005659.zip) **contains the following proposals:**

* Proposal 2: While the UE is camped on a allowed CAG cell, the UE may consider the current frequency to be the highest priority frequency (i.e. higher than any of the network configured values), irrespective of any other priority value allocated to this frequency.
* Proposal 3: If the UE detects one or more suitable CAG cells on different frequencies, then the UE may reselect to one of the detected cells irrespective of the frequency priority of the cell the UE is currently camped on, if the concerned CAG cell is the highest ranked cell on that frequency.
* Proposal 4: RAN2 does not introduce any enhancements to enable network to prioritize manually selected CAG for mobility in connected mode.

**Q16: Please indicate which of the above proposals do you think should be agreed (at least in principle) during to meeting to be able to finalize Rel-16 specifications?**

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| --- | --- | --- |
| **Company** | **Proposals to be agreed** | **Comment** |
| ZTE | Proposal 2 and 3 in R2-2004690  | Proposal 2 Agree the CR text included below to be transferred to a CR on 38.306 for inclusion of CGI reporting capability for NPN. [ZTE] Since the capability is a totally a RAN2 introduced one, we think a 38.306 CR is needed for this WI and can be merged to the big 306 CR afterwards.Proposal 3 Include SIB10 in SI-SchedulingInfo using valueTags as for any other SIB (except SIB6,7,8). [See Annex 2 below][ZTE]Agree with this correction. |
| CATT |  | We think the following proposals could be agreed,1.Proposal 2 and Proposal 3 in [**R2-2004690**](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2004690.zip)2.Proposal 1 in [**R2-2004743**](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2004743.zip)3.Option 3 in Proposal 1 in [**R2-2005593**](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2005593.zip) |
| Intel | Proposal 2 and Proposal 3 of R2-2004690 | We need to include SIB10 in the SI-SchedulingInfo using valueTags. |
| Huawei | Proposal 2 and 3 in R2-2004690, Proposal 2 of R2-2005593 | In the previous meeting, on-demand SI topic could not decide whether SIB10 can be requested on-demand by UEs in RRC\_CONNECTED. Therefore a decision is needed in NPN session. |
| Futurewei | Proposals 2 & 3 of R2-2004690Proposal 2 of R2-2005593 |  |
| Nokia | R2-2004690, and P2, P3 of R2-2005593 are to be discussed | Our evaluation of the proposals in these papers is the following:R2-2004690: It addresses missing essential items.R2-2004743: Potential optimizations, not essential to be discussedR2-2005593: * P1: If proposal 5 of this email discussion is agreed then P1 is not relevant.
* P2: This was left open at R2#109bis.
* P3: This depends on Issue 14, and could be discussed with R2-2005148

R2-2005659:* P2 and P3: potential optimizations, not essential to be discussed

P4: Not essential, as it is a "negative" proposal. |
| vivo |  | We think the at least the following proposals could be agreed,1.Proposal 2 and Proposal 3 in [R2-2004690](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2004690.zip)2.Proposal 1 in [R2-2004743](http://3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2004743.zip) |
| Ericsson | Proposal 2 and 3 in R2-2004690 | On Proposal 2 of R2-2005593: The motivation for on-demand for the SIB with HRNN is not clear to us. If the UE is already connected, it shouldn’t need to the HRNN. |
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# 4 Conclusions

## 4.1 Proposals to be agreed over email

**Proposal 2a: The SNPN ID is never added to the *RRCResumeComplete.***

**Proposal 3: UAC parameter set for a PNI-NPN is selected based on the PLMN ID of PNI-NPNs. There is no need to broadcast CAG ID specific UAC parameter sets.**

**Proposal 4a: The PNI-NPNs** **belonging to the same PLMN have a common (shared) index value.**

**Proposal 5: Solution B will be used as baseline for indicating if it is allowed to manually select a CAG-ID supported by the CAG cell but outside the UE’s allowed CAG list.**

**SOLUTION B**

NPN-Identity-r16 ::= CHOICE {

 pni-npn-r16 SEQUENCE {

 plmn-Identity-r16 PLMN-Identity,

 cag-IdentityList-r16 SEQUENCE (SIZE (1..maxNPN-r16)) OF CAG-IdentityInfo-r16

 },

 snpn-r16 SEQUENCE {

 plmn-Identity PLMN-Identity,

 nid-List-r16 SEQUENCE (SIZE (1..maxNPN-r16)) OF NID-r16

 }

}

CAG-IdentityInfo-r16 ::= SEQUENCE {

 CAG-Identity-r16 BIT STRING (SIZE (32)),

 manualCAGselectionAllowed-r16 BOOLEAN

}

**Proposal 6a: No changes are needed in 38.331 due to comment in RIL Q006.**

**Proposal 8: To resolve RIL Z103 the following changes are needed in 5.2.2.4.2 of 38.331:**

3> if trackingAreaCode is not provided for the selected PLMN nor the registered PLMN nor PLMN of the equivalent PLMN list:

**Proposal 9: To resolve RIL I902 and I903 the following changes are needed in 5.3.3.4 of 38.331:**

2> set the *selectedPLMN-Identity* to the PLMN or SNPN selected by upper layers (TS 24.501 [23]) from the PLMN(s) included in the *plmn-IdentityList* or the PLMN(s) or SNPN(s) included in the *npn-IdentityInfoList* in *SIB1*;

**Proposal 13: Remove the duplicated field description for TAC from *NPN-IdentitityInfoList* as proposed in RIL H422*.***

## 4.2 The following issues are proposed to be discussed further

**Proposal 1a: RAN2 assumes that the manually selected CAG ID has no impact to cell reselection. (This requires no change in the existing draft CRs.) The final decision will happen after reply LS from SA2 on this issue is received.**

**Proposal 1b: RAN2 assumes that the UE shall select a cell supporting the manually selected CAG ID provided by NAS for initial cell selection. The relevant changes should be added to the running 38.304 CR. The final decision will happen after reply LS from SA2 on this issue is received.**

**Proposal 2b: RAN2 assumes that the CAG ID is never added to the *RRCResumeComplete*. (This assumption is to be captured in the running RRC CR.) The final decision will happen after reply LS from SA2 on this issue is received.**