**3GPP TSG-RAN WG2 Meeting #109bis-e R2-2003896**

**Electronic, 20 – 30 April 2020**

**Agenda item: 6.18.2**

**Source: Nokia (Rapporteur)**

**Title: Offline discussion 105: PRN open issues - second round**

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

**Document for: Discussion and Decision**

# 1 Introduction

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

* [AT109bis-e][105][PRN] Open issues (Nokia)

Initial scope: Continue the discussion on PRN open issues, based on R2-2002659

Initial intended outcome: Set of proposals with full consensus agreeable via email, based on the list in Section 4.1 of R2-2002659 (final list to be reflected in R2-2003895)

Initial intermediate deadline (for companies' feedback): Tuesday 2020-04-21 09:00 UTC

Updated scope:

* + - for open issue 8: discuss the possibility to introduce an indication in SIB1 to allow UEs to search other cells on the same frequency
    - for open issue 9: discuss the possibility to signal PCI range(s) per PLMN per frequency vs just per frequency
    - continue the discussion on open issues 11 and 16

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

* + - Set of proposals with full consensus, if any (agreeable over email)
    - Set of proposals to discuss in the follow up conference call

Second intermediate deadline (for companies' feedback): Friday 2020-04-24 06:00 UTC

Second intermediate deadline (for rapporteur's summary in R2-2003896): Friday 2020-04-24 10:00 UTC

Proposed agreements in R2-2003896) indicated for email agreement and not challenged until Monday 2020-04-27 12:00 UTC will be declared as agreed by the session chair. For the other ones, the discussion will continue online.

# 2 Discussion

## 2.1 Issue 8: UE behaviour in unlicensed band with non-CAG member cell

**Open issue description:** The UE behaviour in unlicensed band is FFS when the cell belongs to the correct operator but it’s not a CAG member cell.

At RAN2#109 the following was agreed:

For unlicensed spectrum and for a UE with non-empty allowed CAG list, if the highest ranked cell or best cell according to absolute priority reselection rules is a cell which is not suitable due to not broadcasting the selected/registered/equivalent PLMN, the UE with no empty allowed CAG list shall behave according to NR-U agreement. FFS how to handle the case when the cell belongs to the correct operator but it’s not a CAG member cell. (We might come back to this if serious concerns / problems are found with this)

The relevant NR-U agreement is captured in the following way in 38.304:

“For operation with shared spectrum channel access, if the second highest ranked cell on this frequency also does not have a PLMN being equivalent to the registered PLMN, the UE may consider this frequency to be the lowest priority for a maximum of 300 seconds.”

During the online discussion of R2-2002659 it was concluded that a selection from the following options should be made:

* **Option A) Follow the NR-U behaviour:**   
  In unlicensed band when the highest ranked cell or best cell is not suitable due to belonging to the correct operator, but it is not a CAG member cell, the UE shall not consider this cell as candidate for reselection for a maximum of 300 seconds. If the second highest ranked cell on this frequency is not suitable due to belonging to the correct operator, but it is not a CAG member cell, the UE may consider this frequency to be the lowest priority for a maximum of 300 seconds.
* **Option B) Follow the licensed behaviour:**   
  In unlicensed band when the highest ranked cell or best cell is not suitable due to belonging to the correct operator, but it is not a CAG member cell, the UE shall not consider this cell and other cells on the same frequency, as candidates for reselection for a maximum of 300 seconds.
* **Option C)** Introduce a new flag in SIB1 that indicates whether the UE may (or shall not) consider other cells on the same frequency, as candidates for reselection.

**Question 1: Which option(s) do you prefer?**

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**Summary:**

## 2.2 Issue 9: PCI values for CAGs

**Open issue description:** FFS whether PCI values for CAGs are signalled per PLMN per frequency or no new ASN.1 IEs are introduced in Rel-16 for signalling of PCI values for CAGs

During the online discussion of R2-2002659 it was concluded that a selection from the following options should be made:

* **Option A** (used to be option 2 in R2-2002659): Signal PCI range(s) per PLMN per frequency. Number of ranges FFS.
* **Option B** (used to be option 4 in R2-2002659): Signal PCI range(s) per frequency as a list of blacklisted/whitelisted cells (no changes required to ASN.1 and NR-U CRs are the baseline).

**Question 2: Which option(s) do you prefer?**

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**Summary:**

## 2.3 Issue 11: Optionality to support reporting about the npn-IdentityInfoList

**Open issue description:** It is FFS if all Rel-16 are required to be able to report the *npn-IdentityInfoList*

At RAN2#109e the following was agreed

4.1: Extend the current measurement reporting procedures to include NPN information to support ANR. (It is FFS if it is mandatory for all Rel-16 UEs to support it.)

4.2: The CAG ID/SNPN NID information shall be added into the CGI-InfoNR. (It is FFS if it is mandatory for all Rel-16 UEs to support it.)

During the email discussion of this issue (see R2-2002659) the following options were discussed

* **Option A:** Reporting about the *npn-IdentityInfoList* is mandatory for all Rel-16 UEs
* **Option B:** Reporting about the *npn-IdentityInfoList* is mandatory for all NPN-capable UEs, but optional for non-NPN capable UEs (separate capability indication about CGI reporting for NPN may be needed)
* **Option C:** Reporting about the *npn-IdentityInfoList* is mandatory for all NPN-capable UEs, and not supported by non-NPN capable UEs (separate capability indication about NPN may be needed)

During the email discussion (see R2-2002659) most of the companies supported option C, but companies that do not support option C had the following technical concerns

* ANR reporting is important
* There is a justification for option A that “the UE reports all the broadcast NCGI(s)/ECGI(s) to the serving cell NG-RAN node reporting about broadcasted IDs” is a requirement in 38.300.
* There is a comment that if reporting about NPN information is not mandatory then an AS level capability indication is needed. (See also issue 18).

**Question 3: Which option do you prefer?**

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**Summary**:

## 2.4 Issue 16: UE capabilities

**Open issue description:** Views on UE NPN feature support and necessary capabilities.

NPN support in Rel-16 UEs is optional, but there has not been any discussion whether AS level capability indication is needed that the UE supports NPN.

NAS already has a capability for CAG, 24.501/9.11.3.1 (network provides CAG member list via NAS only if the UE supports this capability). The SNPN mode selection is a UE autonomous procedure.

During the email discussion of this issue (see R2-2002659) most of the companies’ view was that no capability indication is needed, one company proposed separate indication for SNPN and PNI-NPN capability and one company commented that CGI reporting for NPN capability indication is needed if it is not a mandatory feature for all Rel-16 UEs.

**Question 4:** Do you agree that AS level capability indication is needed for NPN support? If yes, then please also provide some proposals on the capabilities to be indicated.

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**Summary**:

# 3 Conclusions

## 3.1 The following proposals are proposed to be agreed without further discussion:

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