3GPP TSG-RAN WG2 Meeting #111e R2-2008289

Online, August 17th - 28th *R2-20xxxxx*

**Agenda item: 6.12**

**Source: Nokia**

**Title: Summary of [AT111][104][PRN] Stage 3 Corrections – phase 2**

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

**Document for: Decision**

# 1 Introduction

This document is the summary of the following email discussion

**[AT111e][104][PRN] Stage 3 Corrections (Nokia)**

Updated scope:

  Continue the discussion on change 2c in [R2-2006852](file:///C:\Data\3GPP\Extracts\R2-2006852-CR38304-NPN.docx)

  Discuss whether the flow chart can be modified or a note added to address the issue in [R2-2007841](file:///C:\Data\3GPP\Extracts\R2-2007841%20Correction%20to%2038.304%20on%20any%20cell%20seletion%20in%20NPN.doc)

  Continue the discussion on [R2-2006633](file:///C:\Data\3GPP\Extracts\38331_CR1722_(Rel-16)_R2-2006633%20Correction%20on%20First%20NPN-Identity%20Usage%20for%20SIB%20Validity.docx)

  Continue the discussion on [R2-2007842](file:///C:\Data\3GPP\Extracts\R2-2007842%20Correction%20to%2038.331%20on%20SIB%20validity%20and%20emergency%20services%20for%20NPN.doc)  (other aspects than emergency services)

  Discuss whether there is a selected CAG in automatic and manual selection mode (and then the need for changes in [R2-2006853](file:///C:\Data\3GPP\Extracts\R2-2006853-CR38331-NPN.docx))

  Continue the discussion on the need for the second change in [R2-2007411](file:///C:\Data\3GPP\Extracts\R2-2007411%20-%20ims-EmergencySupport%20interpretation%20and%20clarification%20for%20SNPN.docx)

Updated intended outcome: summary of the offline discussion and agreeable CRs:

Initial intermediate deadline (for companies' feedback): Monday 2020-08-24 12:00 UTC

Initial intermediate deadline (for rapporteur's summary in R2-2008209): Monday 2020-08-24 18:00 UTC

Proposals marked for agreement in R2-2008209 not challenged until Tuesday 2020-08-25 06:00 UTC will be declared as agreed by the session chair (further instructions/deadlines for providing actual CRs will follow).

# 2 Discussion

## 2.1 38.304 corrections

### 2.1.1 [R2-2006852](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_111-e/Docs/R2-2006852.zip) Cell selection and reselection corrections for NPNs (Nokia, Nokia Shanghai Bell)

Conclusions of previous discussions of the paper:

* Change 2d is endorsed
* Continue the discussion on 2c in a follow-up of offline 104

There are two places in the section that specify the UE behavior in SNPN AM with shared spectrum channel access when a SNPN cell that belongs to a SNPN that is not equal to the registered or selected SNPN:

------------ Text 1: ------------

- this cell is a SNPN cell that belongs to a SNPN that is not equal to the registered or selected SNPN of the UE in SNPN access mode,

the UE shall not consider this cell and, for operation in licensed spectrum, other cells on the same frequency as candidates for reselection for a maximum of 300 seconds.

For operation with shared spectrum channel access, when the highest ranked cell or best cell is not a candidate for reselection per the previous paragraph, the UE should continue to consider other cells on the same frequency for cell reselection, however if the second highest ranked cell on this frequency is also not suitable due to one or more of the above reasons, the UE may consider this frequency to be the lowest priority for a maximum of 300 seconds.

------------ Text 2: ------------

For a UE operating in SNPN AM and in shared spectrum channel access, 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 registered or selected SNPN ID, the UE shall not consider this cell as candidate for cell reselection but should continue to consider other cells on the same frequency for cell reselection.

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**Q1.1: Do you agree that "Text 2" above is redundant?**

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| **Company** | **Answer** | **Comment** |
| Huawei | Not exactly the same with Text 1 | The difference between Text 1 and Text 2 is that: Text2 does not consider the second best cell.  I tried to figure out why this discrepancy exists:  For SNPN in unlicensed spectrum, the intention is to follow NR-U behavior. But the NR-U behavior itself is evolving.  @RAN2 106, NR-U only agreed the behavior related to the highest ranked cell:   * If highest ranked or best cell is not suitable in an unlicensed frequency due to the fact that PLMN IDs is not the RPLMN (or EPLMN), only the highest ranked or best cell is considered not candidate for cell reselection for 300s or longer. Other cells in the frequency of the highest ranked or best cell should still be considered for cell reselection. FFS whether we have another limit in addition to Suitability criterion.   @RAN2 107, NR-U starts to consider the second highest ranked cell:   * The UE may consider the current NR-U frequency to be the lowest priority frequency for reselection for 300 seconds after at least < the N strongest cells > on that frequency were found not suitable due to belonging to a PLMN which is not indicated as being equivalent to the registered PLMN. N is UE implementation and the UE should check at least 2 if there is more than one.   When capturing the agreements for SNPN, we used the exact wording instead of only saying follow NR-U, and we only took the earliest agreement (on the highest ranked cell) into consideration:  @RAN2 109-e:  4.1 For unlicensed spectrum and a UE in SNPN AM, 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 registered or selected SNPN ID, the UE shall not consider this cell as candidate for cell reselection but should continue to consider other cells on the same frequency for cell reselection.  Therefore, the agreement for SNPN is not in line with the latest NR-U agreement.  Based on the above, our point is:  Text 1 and Text 2 are not the same meaning. But if most companies think the current misalignment is a mistake, and that the second highest cell should be taken into consideration (to match the latest NR-U agreement), it’s also ok for us to accept the change. |
| Nokia | Yes | At the moment the UE behaviour operating in SNPN AM in shared spectrum channel access is specified twice. The difference between the two specifications is that the 2nd text does not include the following:  *"If the second highest ranked cell on this frequency is also not suitable due to one or more of the above reasons, the UE may consider this frequency to be the lowest priority for a maximum of 300 seconds."*  As the 2nd occurrence of the specification does not invalidate the above optional UE behaviour in the 1st occurrence of the specification, a UE can still implement it and remains conform with the specification. Therefore, we think that the current text is redundant.  @Huawei: If the intention had been to exclude that behavior then a different text should have been added (an explicit statement excluding it). Our understanding is that the redundant text is just left over from the restructuring of the section happened at the previous meeting. |
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### 2.1.2 [R2-2007841](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_111-e/Docs/R2-2007841.zip) Correction to 38.304 on any cell seletion in NPN (Huawei, HiSilicon)

Conclusions of previous discussions of the paper:

* Discuss in a follow-up of offline 104 whether the flow chart can be modified or a note added

Figure 5.2.2-1 of TS 38.304 is copied below



**Q1.2: How to document the UE behavior in SNPN AM when "no suitable cell found" (arrows with red text in the figure)?**

* **Option a) Introduce a new state**
* **Option b) Add a clarification to section 5.2.6 and 5.2.7 ("… or suitable cell for any SNPN…")**
* **Option c) No need to document it**
* **Option d) Fix the flow chart**

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| **Company** | **Answer** | **Comment** |
| Huawei | Option b or d | We think Option b is the simplest. The flow chart does not prevent SNPN UE from entering *any cell selection* (as indicated in the arrows with red text). Also, there’s a sentence in 5.2.7, indicating *any cell selection* state does not exclude SNPN UE:   |  | | --- | | 5.2.7 Any Cell Selection state …  The UE, which is not camped on any cell, shall stay in this state. |   With Option b, the misalignment can be fixed:   |  | | --- | | 5.2.6 Selection of cell at transition to RRC\_IDLE or RRC\_INACTIVE state …  When returning to RRC\_IDLE state after UE moved to RRC\_CONNECTED state from *camped on any cell* state, UE shall attempt to camp on an acceptable cell according to *redirectedCarrierInfo*, if included in the *RRCRelease* message. If the UE cannot find an acceptable cell, the UE is allowed to camp on any acceptable cell of the indicated RAT. If the *RRCRelease* message does not contain *redirectedCarrierInfo* UE shall attempt to select an acceptable cell on an NR frequency. If no acceptable cell is found according to the above, the UE shall continue to search for an acceptable cell of any PLMN or a suitable cell of any SNPN in state *any cell selection*. 5.2.7 Any Cell Selection state This state is applicable for RRC\_IDLE and RRC\_INACTIVE state. In this state, the UE shall perform cell selection process to find a suitable cell. If the cell selection process fails to find a suitable cell after a complete scan of all RATs and all frequency bands supported by the UE, the UE shall attempt to find an acceptable cell of any PLMN or a suitable cell of any SNPN to camp on, trying all RATs that are supported by the UE and searching first for a high-quality cell, as defined in clause 5.1.1.2.  The UE, which is not camped on any cell, shall stay in this state. |   We are also glad to accept Option d if some easy change can fix the issue. |
| Nokia | Option b) or c) | We do not see a simple way to fix the flow chart. As a lot of details of the UE behavior in IDLE/INACTIVE mode is left for implementation, we are OK not to specify this. |
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## 2.2 38.331 (RRC) corrections

### 2.2.1 [R2-2006633](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_111-e/Docs/R2-2006633.zip) Correction on First NPN-Identity Usage for SIB Validity (CATT)

* Initially discussed in offline 104
* Discuss the CR online together with [R2-2006853](file:///C:\Data\3GPP\Extracts\R2-2006853-CR38331-NPN.docx)
* Continue the discussion as part of the follow-up of offline 104

**Q2.1: Do you agree with the changes proposed in the CR:**

1. **Change “NPN-Identity” to “NPN identity” which is not an IE structure but only represents the first NPN ID in the list in section 5.2.2.2.1?**
2. **Remove “and reported by UE at establishment” from the description of the maxNPN definition?**
3. **Change the objects in the field description to really “field names” but not “IE names”. Remove the IE description of “NID” and “NPN-IdentityInfo”?**
4. **Other editorial changes proposed in the CR?**

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| **Company** | **Q2.1a** | **Q2.1b** | **Q2.1c** | **Q2.1d** | **Comment** |
| Huawei | Yes | No | No strong view | Yes | On Q2.1b, the correction to *maxNPN* is unnecessary because the original text is mimicking *maxPLMN* and NPN index is involved in *RRCSetupComplete*. |
| Nokia | Yes | No strong view | No | Yes |  |
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### 2.2.2 [R2-2007842](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_111-e/Docs/R2-2007842.zip) Correction to 38.331 on SIB validity and emergency services for NPN (Huawei, HiSilicon)

* Initially discussed in offline 104
* Discuss this CR online together with [R2-2007411](file:///C:\Data\3GPP\Extracts\R2-2007411%20-%20ims-EmergencySupport%20interpretation%20and%20clarification%20for%20SNPN.docx)
* Continue the discussion on other aspects than emergency services as part of the follow-up of offline 104

Conclusions of previous discussions of the paper:

* Continue the discussion on other aspects than emergency services as part of the follow-up of offline 104

**Q2.2a: Do you agree to Change “*NPN-Identity*” to “NPN identity” in clause 5.2.2.2.1?**

**Q2.2b: Do you agree to remove the reference to TS 23.501 for NPN identity in clause 5.2.2.2.1?**

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| **Company** | **Answer to Q1.2a** | **Answer to Q1.2b** | **Comment** |
| Huawei | Yes | Yes | Regarding Q1.2b, we would like to add some further explanation on why the reference should be removed:  There is no definition of “PNI-NPN identity” in SA2 spec. According to TS 23.501, a PNI-NPN can be deployed as a slice or a DNN, and CAG is an optional feature. In other words, PNI-NPN is not necessarily associated to CAG from SA2 perspective:   |  | | --- | | 5.30.3.1 General Public Network Integrated NPNs are NPNs made available via PLMNs e.g. by means of dedicated DNNs, or by one (or more) Network Slice instances allocated for the NPN. The existing network slicing functionalities apply as described in clause 5.15. When a PNI-NPN is made available via a PLMN, then the UE shall have a subscription for the PLMN in order to access PNI-NPN.  NOTE 1: Annex D provides additional consideration to consider when supporting Non-Public Network as a Network Slice of a PLMN.  As network slicing does not enable the possibility to prevent UEs from trying to access the network in areas where the UE is not allowed to use the Network Slice allocated for the NPN, Closed Access Groups may optionally be used to apply access control. |   From RAN2 point of view, the concept of “PNI-NPN identity” (consisting of PLMN ID + CAG ID) is needed to identify a PNI-NPN. If a PNI-NPN does not have CAG, it is invisible from RAN2’s viewpoint.  As a result, when describing PNI-NPN identity, the reference to SA2 spec should be removed. |
| Nokia | Yes | Yes |  |
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### 2.2.3 [R2-2006853](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_111-e/Docs/R2-2006853.zip) Corrections for PNI-NPN related parameter selection (Nokia, Nokia Shanghai Bell)

* Initially discussed in offline 104
* Discuss the CR online focusing on: 1) how to handle the "selected PNI-NPN" 2) how UE should handle the case when a cell is shared between a PLMN and PNI-NPNs of that PLMN
* Huawei thinks that for SIB1 and UAC the current text is clear; on the selected CAG ID: this is always selected by NAS layer; current text is clear.
* ZTE thinks that most companies don't see the need for this CR and what is not clear can be left to UE implementation.
* Nokia would like to have some clarification on where the UE behaviour is clarified for the UAC case. Huawei thinks the current text says that the UE will select the UAC params corresponding to the selected PNI-NPN. Nokia thinks there is no selected PNI-NPN. Huawei thinks there is a selected CAG in automatic and manual selection mode.
* Discuss as part of the follow-up of offline 104 whether there is a selected CAG in automatic and manual selection mode

Conclusions of previous discussions of the paper:

* Discuss as part of the follow-up of offline 104 whether there is a selected CAG in automatic and manual selection mode

According to clause 3.8 of TS 23.122 CAG selection happens in the following way

"If a PLMN is selected as described in subclause 4.4.3.1.1 and there exists an entry in the "CAG information list" which includes a PLMN ID corresponding to the identity of the selected PLMN and an "Allowed CAG list" containing a CAG-ID broadcast by the cell on which the MS is camping, then the MS shall consider the CAG-ID as the selected CAG-ID. In this case, if the "Allowed CAG list" contains more than one CAG-IDs broadcast by the cell on which the MS is camping, the MS shall select one of those CAG-IDs based on MS implementation.

If a PLMN is selected as described in subclause 4.4.3.1.2, the selected CAG-ID is determined according to subclause 4.4.3.1.2.

The NAS shall provide the AS with a "CAG information list", if available. If the contents of the "CAG information list" have changed, the NAS shall provide an updated "CAG information list" to the AS."

**Q2.3a: How to use "selected PNI-NPN" term in 38.331?**

* **Option a): Avoid the use the "selected PNI-NPN" term except for manual CAG ID selection case**
* **Option b): Use the "selected PNI-NPN" term and assume that AS selects the CAG ID in similar way as NAS (*"Allowed CAG list" containing a CAG-ID broadcast by the cell on which the MS is camping, then the MS shall consider the CAG-ID as the selected CAG-ID. In this case, if the "Allowed CAG list" contains more than one CAG-IDs broadcast by the cell on which the MS is camping, the MS shall select one of those CAG-IDs based on MS implementation*)**

**Q2.3b: When the selected/registered PLMN ID is listed in the *plmn-IdentityList* and in the *npn-IdentityInfoList* (i.e. the cell is shared between a PLMN and PNI-NPNs of that PLMN) then which TA and Cell ID should be reported to upper layers by AS**

* **Option a): Up-to UE implementation**
* **Option b): If there is a selected CAG-ID (*"Allowed CAG list" containing one or more CAG-IDs broadcast by the cell*) then report the TA and Cell ID from the *npn-IdentityInfoList*.**
* **Option c): If CAG-only indication is not set then up-to UE implementation (Option a); if CAG-only indication is set then Option b).**

**Q2.3c: When the selected/registered PLMN ID is listed in the *plmn-IdentityList* and in the *npn-IdentityInfoList* (i.e. the cell is shared between a PLMN and PNI-NPNs of that PLMN) then which network ID the UE should refer to in *RRCSetupComplete* and in *RRCResumeComplete* messages?**

* **Option a): Up-to UE implementation**
* **Option b): If there is a selected CAG-ID (*"Allowed CAG list" containing one or more CAG-IDs broadcast by the cell*) then refer to network ID from the *npn-IdentityInfoList*.**
* **Option c): If CAG-only indication is not set then up-to UE implementation (Option a); if CAG-only indication is set then Option b).**

**Q2.3d: When the selected/registered PLMN ID is listed in the *plmn-IdentityList* and in the *npn-IdentityInfoList* (i.e. the cell is shared between a PLMN and PNI-NPNs of that PLMN) then which UAC parameters should AS apply?**

* **Option a): Up-to UE implementation**
* **Option b): If there is a selected CAG-ID ("*Allowed CAG list" containing one or more CAG-ID broadcast by the cell*) then use the UAC parameters broadcast for the PNI-NPNs of the selected/registered PLMN by the cell.**
* **Option c): If CAG-only indication is not set then up-to UE implementation (Option a); if CAG-only indication is set then Option b).**

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| **Company** | **Q2.3a** | **Q2.3b** | **Q2.3c** | **Q2.3d** | **Comment** |
| Huawei |  |  |  |  | Thank you Gyuri for providing further information ☺  And the CR raised a good question that’s not been fully discussed in RAN2.  We also checked 38.304 and 23.122 and would like to confirm whether we’re on the same page.  1) Selected PLMN -> The term is valid for both auto and manual selection, and the selection is performed by NAS.  38.304 Table 4.2-1, NAS column:  ***For a UE not operating in SNPN access mode, perform the following:***  *Maintain a list of PLMNs in priority order according to TS 23.122 [9]. Select a PLMN using automatic or manual mode as specified in TS 23.122 [9] and request AS to select a cell belonging to this PLMN. For each PLMN, associated RAT(s) may be set.*  2) Selected CAG -> The term is valid for both auto and manual selection, the question is, who to select? NAS or AS? (For the PLMN of this CAG, it is clear that NAS will do the job, see the highlighted sentence in “1)”).  2.1) From 38.304 Table 4.2-1, it is not clearly written, and AS only “reports”, not “selects”.  Table 4.2-1, AS column:  *Report available PLMNs and any associated CAG-IDs with associated RAT(s) to NAS on request from NAS or autonomously.*  *For a UE operating in SNPN access mode, report available SNPNs to NAS autonomously.*  ***To support manual CAG selection, perform the following:***  *Search for cells broadcasting a CAG-ID.*  …  Note that the highlighted sentence is out of the manual selection specific paragraph, which means it is common for auto and manual modes.  2.2) However, according to CT1 spec 23.122, it seems that in the chapter of manual selection (4.4.3.1.2), NAS will select both PLMN and CAG (which is also indicated by Gyuri in the problem statement); whereas in the chapter of automatic selection (4.4.3.1.1), NAS only selects PLMN, and the corresponding CAG is up to AS to select (based on the rules of cell selection defined in 38.304).  With the above understanding, we still think “selected CAG” is a valid description. Maybe “selected CAG by upper layers” is not so appropriate because in automatic mode it is selected by AS.  But as we said, that’s inferred from CT1 spec, not from RAN2 spec.  So our suggestion would be:  **RAN2 to clarify that selected PLMN is chosen by NAS. Selected CAG is chosen by NAS in manual mode and chosen by AS in automatic mode.**  And to minimize the spec impact, we may only need to fix descriptions like “by upper layers” and keep “selected CAG” (FFS on details). |
| Nokia | B) | B) | B) | B) | We think that CAG-ID selection is in the scope of NAS, and NAS specification specifies it. According to NAS specification a CAG-ID is selected when the cell supports a CAG-ID that is in the allowed CAG-ID list. (It is left for implementation is which CAG-ID is selected when a cell broadcasts multiple CAG IDs from the allowed CAG-ID list, but as all CAG-IDs of a PLMN belong to single logical cell, this has no AS impact). (We can assume that AS selects the CAG-ID in the same way as NAS, a reference to 23.122 may be added.)  Therefore, our view is that the AS should consider the parameters (TA, Cell ID, UAC parameters) belonging to the PNI-NPNs of the PLMN when the cell supports a CAG-ID that is in the allowed CAG-ID list.  Problem examples if we leave everything to UE implementation:   1. Reporting the TA and Cell ID from the *plmn-IdentityList* to NAS when CAG-only indication is set will create a mismatch between the network and the UE, as the network will assume that the UE is in the cell that is advertised in the *npn-IdentityInfoList.*   A network may intend to prioritize or deprioritize PNI-NPN traffic over PLMN traffic with different UAC parameters. This can only work if all UEs having subscription to the advertised CAGs use the UAC parameters for PNI-NPNs. |
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### 2.2.4 [R2-2007411](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_111-e/Docs/R2-2007411.zip) ims-EmergencySupport interpretation and clarification for SNPN (Ericsson)

Conclusions of previous discussions of the paper:

* Continue the discussion on the need for the second change (to be merged in a WI CR for 38.331 if agreed)

**Q2.4: Do you agree that it should be documented in 38.331 that the UE in SNPN AM ignores *ims-EmergencySupport* in SIB1 in Rel-16?**

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| **Company** | **Answer** | **Comment** |
| Huawei | Yes | OK to have. |
| Nokia | Maybe | As it is already clearly specified in NAS, this is not essential. Note that the only UE action with that flag is that it is forwarded to upper layers, and upper layers know that an emergency session cannot be started in SNPN AM. |
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# 3 Conclusions

## 3.1 Proposed agreements without further discussion

## 3.2 Issues that require further discussion