3GPP RAN WG2 Meeting #131 R2-250XXXX

Bengaluru, India, Aug 25th – 29th, 2025

Agenda Item: 8.9.2

Source: Nokia

Title: Remaining Open issues for Idle mode IoT-NTN Operation

Document for: Discussion, Decision

# Introduction

The following document includes a list of open issues according to the following email discussion:

* [Post130][308][R19 IoT NTN] MAC CR (Nokia)

Scope: discuss the running TS 36.304 CR

Intended outcome: Endorsed CR and list of remaining open issues

**Deadline:** Long

Companies are invited to provide feedback on open issue list by: TBD

# Remaining open issues for specification 36.304

**Open issue 1: Acceptable cell operation for NB-IoT (For PWS reception only)**

**Issue description: PWS Reception in acceptable cell for NB-IoT.**

In RAN2-130 meetings many companies interested in introducing support for PWS reception for NB-IoT out-side the cells of registered PLMN. The motivation to have this support is to enable reception of emergency messages at NB-IoT devices from any network broadcasting the PWS not limited to its registered network.

There are two options to introduce the support in the specification.

1. Introduce the support for ‘acceptable cell’ concept for NB-IOT in Rel-19. However if the acceptable cell type is supported it also impacts the cell selection process for the NB-IoT devices. For this option further proposals /questions provided in open issue 1A.
2. Alternative option is to allow the UE only to monitor for PWS related system information outside the suitable cells cell without any other procedures related to camping and monitoring other SIBs.

Companies are invited to provide their views on introducing PWS reception for NB-IoT in acceptable cell. Indicate the prefered options from the above. If you have alternative solutions ,please indicate the same.

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| **Company** | **Preferred Option** | **Comments** |
| Mediatek | Option 1 | If we want to support this feature, we should use better model (i.e. reuse accetable cell concept). Option 2 is a little unclear to us on how to specify the UE behavior. Selection for an “acceptable” cell for PWS reception is anyway required. |
| CATT | Comments | Option 1 introduces significant spec impact. If there is really a need to support this feature, it is better to introduce acceptable cell concept for NB-IoT when both emergency call and PWS are supported.  We currently tend to support NB-IoT receiving PWS in a non-acceptable cell way. However, it is unclear how option 2 works if the UE is not camped on such cells. More clarification is needed before going towards this way.  In summary, since August is the last meeting of Rel-19, detailed and clear-enough solution need be proposed in order to support such an enhancement for NB-IoT in this Release. Otherwise, we don't think any enhancements in this direction can be supported in Rel-19. |
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**Open Issue 1A:**

Following are the specification changes related to acceptable cell in TS36.304.

1. Acceptable cell definition :

An "acceptable cell" is a cell on which the UE may camp to obtain limited service (originate emergency calls and receive ETWS and CMAS notifications), and it is not applicable to RRC\_INACTIVE state.

**Proposal 1:** As emergency calls not supported in Rel-19 we also change the definition for NB-IoT in this release to exclude the emergency call in the definition.

1. Section 5.1.2 have modified UE behaviour related to acceptable cell for emergency call handling.

**Proposal 2:** These changes should not be applicable for NB-IoT.

1. Section 5.2.7 includes UE behavior on cell selection on return to RRC-IDLE considering acceptable cell for camping.

**Question 1**: Companies to comment on Whether this cell selection changes needed for NB-IoT PWS Reception.

1. Section 5.2.8 Indicates any cell selection state support for camping to acceptable cell

**Question 2:** Companies to comment whether the NB-IoT need to support this functionality for PWS reception.

Companies are invited to provide their views on the above proposals /questions related to specification impact if acceptable cell category is considered for NB-IoT for PWS.

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| **Company** | **P1/P2** | **Q1/Q2** |
| Medaitek | P1: No need to change the definition of acceptable cell. In current SPEC, it is already clear that NB-IoT UE does NOT support emergency call. Even if accetable cell includes the definition of emergency call, it should be clear that NB-IoT UE does not trigger emergency call.  P2: Unclear. Which changes we are talking about ? Which part of 5.1.2 is impacted ? Any TP ? | Q1: Yes  Q2: Yes |
| CATT | OK with the statement in P1.  P2 is unclear. | If the "acceptable cell" concept is introduced for NB-IoT, the functionality in section 5.2.7 and 5.2.8 have to be supported. Otherwise, it is unclear under which conditions the NB-IoT UE start searching for acceptable cell.  Additionally, “Figure 5.2.2-2: RRC\_IDLE Cell Selection and Reselection for NB-IoT” also needs to be updated. |
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**Open issue 2: Working Assumption on SF mode operation indication for neighbour cells**

RAN2-130 has made the following working assumption.

Working Assumption:

1. In the neighbour cell list we introduce an indication whether the cell operates in S&F mode or not (FFS if we also include the transition time). This WA can only be confirmed if we converge on the corresponding UE behaviour.

The main FFS on this working assumption is related to whether UE behaviour related to cell reselection to be impacted with introduction of this parameter OR handling of this parameter should be left to UE implementation. Also for what cases /scenarios this information will be beneficial for UE ( For example whether the decision to select neighbour cell operating in SF mode is based on application layer trigger or status of pending paging reception for MO transmission).

Companies are invited to provide their views on introducing PWS reception for NB-IoT in acceptable cell. Indicate the prefered options from the above. If you have alternative solutions ,please indicate the same.

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| **Company** | **Scenario for usage of SF Mode of neighbour-cell** | **View on UE behaviour impact based on SF mode parameter of neighbour cell ( Impact to cell-reselection priority ..etc)** |
| Mediatek |  | If this new parameters are introduced, it should be up to UE implementation on how to handle the parameters. However, no significant benefit is foreseen by this new indication. We suggest not to do this in R19. |
| CATT | See right column | Rel-19 non-S&F capable UE may deprioritize the S&F cells during cell re-selection.  Rel-19 S&F capable UE may prioritize the S&F cells according to its current operating mode or urgency level of signalling/data. |
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Summary

# Other identified open issues

Companies are invited to describe any other identified open issues not currently included within this document

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| **Company** | **Other identified open issues? (please describe)** |
| Mediatek | If the acceptable cell is supported for NB-IoT, the Figure 5.2.2-2 should be impacted. |
| CATT | **Open Issue 3:** The FFS part below for S&F specific IDLE mode enhancements should be included in the open issue list:   * In a S&F network deployment which also exhibits discontinuous coverage, existing mechanisms to handle discontinuous coverage can be leveraged (e.g. satellite assistance information, UE not needing to perform idle mode tasks when the UE determines that is out of coverage, etc.). There is no need to modify existing discontinuous coverage features due to the addition of S&F Satellite operation. FFS if we clarify in discontinuous coverage procedure in idle mode that the UE also takes into account the information about NAS configured S&F monitoring list.   **Open Issue 4:** What/Whether impacts to cell reselection are needed due to the support of MME configured Satellite list:  Proposal 1: Enhance the definition of suitable cell in 36.304 so that a UE may consider a detected cell as unsuitable and not treating it as a candidate for reselection, if the detected cell is handled by a satellite operating in S&F mode for which conditions (A) and/or (B) are met.  [...]   * Can come back to this   Note that the above two open issues related to MME-Configured Satellite list anyway need be concluded in the August meeting, due to the need indicated by the satellite companies and support from a number of companies. We disagree with ignoring/depriortising these issues which are clearly open issues left from previous meetings on the table. |
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# Conclusions