**3GPP TSG RAN WG2 Meeting #131bis R2-250xxxx
Prague, Czech Republic, October 13th – 17th, 2025**

**Agenda item: 8.8.1**

**Source: ZTE Corporation**

**Title: Open issues on Rel-19 NR NTN 38.304 CR**

**Document for: Discussion and Decision**

# 1 Introduction

This is to kick off below email discussion:

* [Post131][303][R19 NR NTN] 38.304 CR (ZTE)

 Scope: finalize the running 38.304 CR

 Intended outcome: Agreed CR

 Deadline:

1. Initial list of open issues by rapporteur, proposed resolutions for easy open issues or resolution options for other issues: sept. 19th
2. Input from other companies and final set of proposals and resolutions for identified issues that don’t require contribution input: Oct. 1st

NOTE: no contributions from other companies expected

Companies are invited to provide input on open issues and potential resolutions no later than **Monday September 22 10:00 UTC**.

Based on the input from companies in first round, Rapporteur will further collect companies’ comments for the proposed resolutions for identified open issues. The deadline for companies’ comments in second round will be on **Monday September 29 10:00 UTC** which gives some time for Rapporteur to prepare the summary.

Contact information:

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| Company | Delegate Name | Email |
| vivo | Yitao Mo (Stephen) | yitao.mo@vivo.com |
| Nokia | Jedrzej Stanczak |  |
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# Discussion

## 2.1 First round-open issue collection

So far there is one open issue included in the table, which was raised by Ericsson during post email discussion. Companies are invited to include any identified open issues and potential resolution in the table below. To ease the discussion in second round, please follow the template given in the table (e.g., open issue x, resolution:...), thanks!

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| **Company** | **Description of open issues and potential resolution** | **Rapporteur comment** |
| Ericsson | **Open issue 1:** The TAI/Cell list received in target service area in USD could be used by UE for service continuity purpose.**Resolution:** Remove the ‘(i.e., an area specified as a list of polygon or circle shapes)’ in below note.NOTE 0j: The ISA(s) can be ISA(s) provided in *SIBxx* and/or target service area (i.e., an area specified as a list of polygon or circle shapes) in USD. It is up to UE’s implementation to decide whether it is inside ISA(s) or not. | Seems to be a easy fix, companies are invited to provide comments in section 2.2 for this open issue vivo: We agree with Ericsson’s view. The content in USD is difined in 26.517, which falls outside of RAN2 scope. The current spec has already included the reference to that spec, so there is no need to add the explanatory description.Rapp2: Thanks for the instant feedback already, please also include comments in section 2.2 for resolutions of the open issues, thanks! |
| vivo | **Open issue 2:** With the support of common PDCCH repetition, the UE, the UE will nonitor the *pagingSearchSpace* and its linked CSS for paging reception. In the TS 38.304 spec, the PO concept should be applied to *SearchSpace* linked with *pagingSearchSpace*.**Solution:** **TS 38.304 sub-clause 7.1****…. <the related part is omitted>….**When *SearchSpaceId* other than 0 is configured for *pagingSearchSpace* or when *SearchSpaceId* other than 0 is configured for the *SearchSpace* linked with *pagingSearchSpace,* the UE monitors the (i\_s + 1)th PO. A PO is a set of 'S\*X ' consecutive PDCCH monitoring occasions where 'S' is the number of actual transmitted SSBs determined according to *ssb-PositionsInBurst* in *SIB1* and X is the *nrofPDCCH-MonitoringOccasionPerSSB-InPO* if configured or is equal to 1 otherwise. The [x\*S+K]th PDCCH monitoring occasion for paging in the PO corresponds to the Kth transmitted SSB, where x=0,1,…,X-1, K=1,2,…,S. The PDCCH monitoring occasions for paging which do not overlap with UL symbols (determined according to *tdd-UL-DL-ConfigurationCommon*) are sequentially numbered from zero starting from the first PDCCH monitoring occasion for paging in the PF. When *firstPDCCH-MonitoringOccasionOfPO* is present, the starting PDCCH monitoring occasion number of (i\_s + 1)th PO is the (i\_s + 1)th value of the *firstPDCCH-MonitoringOccasionOfPO* parameter; otherwise, it is equal to i\_s \* S\*X. If X > 1, when the UE detects a PDCCH transmission addressed to P-RNTI within its PO, the UE is not required to monitor the subsequent PDCCH monitoring occasions for this PO.**…. <the related part is omitted>….** | Rapp2: The issue is related to below RAN1 agreements:AgreementFor intra-slot PDCCH repetition of PDCCH CSS other than Type-0 CSS and other than Type-3 CSS for common search spaces other than *SearchSpaceZero*,:* Specify an explicit linkage of two SS for intra-slot PDCCH repetition. That is, a RRC parameter is introduced for SS linkage and enabling intra-slot PDCCH repetition. The starting symbol of monitoring occasion of the second SS is located right after the ending symbol of monitoring occasion of the first SS.

Rapporteur agrees with the intention, but also wonders if specs update is really needed in this case. It is understood the cited section is generic for any paging search space configured with searchSpaceId other than 0. Therefore from signalling perspective, if second set of SS is linked with pagingSearchSpace, it is also counted as pagingSearchSpace, the current specs is sufficient.But in any case, if majorities agree to reflect this also in 304 specs, then a slight rewording is needed, since current proposed change seems to imply UE only monitor one of the two SS configured, while UE shall monitor both. The proposed changes are shown in section 2.2.Companies are invited to provide feedback on down-selection of the two proposed resolutions. |
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## 2.2 Second round-resolution

This section will be used to collection companies’ views on the resolutions proposed for open issues identified.

For now, only open issue 1 was included, further updates maybe needed after first round discussion.

**Open issue 1**

**Open issue 1:** The TAI/Cell list received in target service area in USD could be used by UE for service continuity purpose.

**Resolution:** Remove the ‘(i.e., an area specified as a list of polygon or circle shapes)’ in below note.

NOTE 0j: The ISA(s) can be ISA(s) provided in *SIBxx* and/or target service area (i.e., an area specified as a list of polygon or circle shapes) in USD. It is up to UE’s implementation to decide whether it is inside ISA(s) or not.

**Q1: Do you agree on observation on issue 1 and the proposed resolution?**

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| **Company** | **Comments** |
| Nokia | Not entirely. We understand 38.304 should not say anything on the exact content of USD. However, this text in the brackets can stay in the note but might be moved to the part on “ISA provided in SIBxx”. Then it is correct as it says what SIBxx provides (and does not refer to USD).Rapp 3: I understand company are ok not to mention exact content about USD. Since the ISAs in SIBxx are well described in RRC specs, perhaps no need to duplicate here. Therefore I suggest to remove this part and make the note simpler. |
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**Conclusion:**

Based on above, below proposal is made:

**Proposal 1: Update NOTE0j as : ‘NOTE 0j: The ISA(s) can be ISA(s) provided in SIBxx and/or target service area in USD. It is up to UE’s implementation to decide whether it is inside ISA(s) or not.’**

**Open issue 2**

**Open issue 2:** With the support of common PDCCH repetition, the UE, the UE will monitor the *pagingSearchSpace* and its linked CSS for paging reception. In the TS 38.304 spec, the PO concept should be applied to *SearchSpace* linked with *pagingSearchSpace*.

**Resolution 1 :** The section 7.1 is generic for any searching space configured as pagingSearchSpace, and the search space linked with pagingSearchSpace is also considered as pagingSearchSpace. Therefore UE will apply the correct behavior as specified in this section to determine the PDCCH monitoring occasion. Existing 38.304 specs is sufficient, no specs update is needed.

**Resolution 2:** Update TS 38.304 sub-clause 7.1 as per below

**…. <the related part is omitted>….**

When *SearchSpaceId* other than 0 is configured for *pagingSearchSpace* and when *SearchSpaceId* other than 0 is configured for the *SearchSpace* linked with *pagingSearchSpace,* if configured*,* the UE monitors the (i\_s + 1)th PO. A PO is a set of 'S\*X ' consecutive PDCCH monitoring occasions where 'S' is the number of actual transmitted SSBs determined according to *ssb-PositionsInBurst* in *SIB1* and X is the *nrofPDCCH-MonitoringOccasionPerSSB-InPO* if configured or is equal to 1 otherwise. The [x\*S+K]th PDCCH monitoring occasion for paging in the PO corresponds to the Kth transmitted SSB, where x=0,1,…,X-1, K=1,2,…,S. The PDCCH monitoring occasions for paging which do not overlap with UL symbols (determined according to *tdd-UL-DL-ConfigurationCommon*) are sequentially numbered from zero starting from the first PDCCH monitoring occasion for paging in the PF. When *firstPDCCH-MonitoringOccasionOfPO* is present, the starting PDCCH monitoring occasion number of (i\_s + 1)th PO is the (i\_s + 1)th value of the *firstPDCCH-MonitoringOccasionOfPO* parameter; otherwise, it is equal to i\_s \* S\*X. If X > 1, when the UE detects a PDCCH transmission addressed to P-RNTI within its PO, the UE is not required to monitor the subsequent PDCCH monitoring occasions for this PO.

**…. <the related part is omitted>….**

**Q2: Companies are invited to provide feedback on the proposed resolutions.**

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| **Company** | **Comments** |
| Nokia | We agree with the Rapporteur’s understanding in Resolution 1. If RAN1 expect RAN2 to update the pagingSearchSpace because of the linked SearchSpace, RAN1 may inform us via LS. Therefore, we prefer Resolution 1 to avoid any update for now.  |
| Vivo | Specifically, the sentence uses two parallel "when" to establish conditions:    Condition 1: "When SearchSpaceId other than 0 is configured for pagingSearchSpace"    Condition 2: "When SearchSpaceId other than 0 is configured for the SearchSpace linked with (the configured) pagingSearchSpace"In our understanding, using "and" suggests that the UE monitors the corresponding PO only when both conditions are satisfied. This is not the intended behavior. We propose using "or" instead. |
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**Conclusion:**

Since the issue is newly raised, it can be further discussed next meeting to allow hearing more companies’ comments. Below proposal is made:

**Proposal 2: When common PDCCH repetition is configured for paging, down select between below two options for PO determination:**

* **Opt1: The search space linked with pagingSearchSpace is also considered as pagingSearchSpace. UE will apply behavior as specified in TS 38.304 section 7.1 to determine the PDCCH monitoring occasion, no specs change is needed for this purpose.**
* **Opt2: Update TS 38.304 sub-clause 7.1 as per below**

**…. <the related part is omitted>….**

When *SearchSpaceId* other than 0 is configured for *pagingSearchSpace* or when *SearchSpaceId* other than 0 is configured for the *SearchSpace* linked with *pagingSearchSpace,* if configured*,* the UE monitors the (i\_s + 1)th PO. A PO is a set of 'S\*X ' consecutive PDCCH monitoring occasions where 'S' is the number of actual transmitted SSBs determined according to *ssb-PositionsInBurst* in *SIB1* and X is the *nrofPDCCH-MonitoringOccasionPerSSB-InPO* if configured or is equal to 1 otherwise. The [x\*S+K]th PDCCH monitoring occasion for paging in the PO corresponds to the Kth transmitted SSB, where x=0,1,…,X-1, K=1,2,…,S. The PDCCH monitoring occasions for paging which do not overlap with UL symbols (determined according to *tdd-UL-DL-ConfigurationCommon*) are sequentially numbered from zero starting from the first PDCCH monitoring occasion for paging in the PF. When *firstPDCCH-MonitoringOccasionOfPO* is present, the starting PDCCH monitoring occasion number of (i\_s + 1)th PO is the (i\_s + 1)th value of the *firstPDCCH-MonitoringOccasionOfPO* parameter; otherwise, it is equal to i\_s \* S\*X. If X > 1, when the UE detects a PDCCH transmission addressed to P-RNTI within its PO, the UE is not required to monitor the subsequent PDCCH monitoring occasions for this PO.

# 3 Conclusion

Based on summary above, below proposals are made:

**Proposal 1: Update NOTE0j as : ‘NOTE 0j: The ISA(s) can be ISA(s) provided in SIBxx and/or target service area in USD. It is up to UE’s implementation to decide whether it is inside ISA(s) or not.’**

**Proposal 2: When common PDCCH repetition is configured for paging, down select between below two options for PO determination:**

* **Opt1: The search space linked with pagingSearchSpace is also considered as pagingSearchSpace. UE will apply behavior as specified in TS 38.304 section 7.1 to determine the PDCCH monitoring occasion, no specs change is needed for this purpose.**

**Opt2: Update TS 38.304 sub-clause 7.1 as per below**

**…. <the related part is omitted>….**

When *SearchSpaceId* other than 0 is configured for *pagingSearchSpace* or when *SearchSpaceId* other than 0 is configured for the *SearchSpace* linked with *pagingSearchSpace,* if configured*,* the UE monitors the (i\_s + 1)th PO. A PO is a set of 'S\*X ' consecutive PDCCH monitoring occasions where 'S' is the number of actual transmitted SSBs determined according to *ssb-PositionsInBurst* in *SIB1* and X is the *nrofPDCCH-MonitoringOccasionPerSSB-InPO* if configured or is equal to 1 otherwise. The [x\*S+K]th PDCCH monitoring occasion for paging in the PO corresponds to the Kth transmitted SSB, where x=0,1,…,X-1, K=1,2,…,S. The PDCCH monitoring occasions for paging which do not overlap with UL symbols (determined according to *tdd-UL-DL-ConfigurationCommon*) are sequentially numbered from zero starting from the first PDCCH monitoring occasion for paging in the PF. When *firstPDCCH-MonitoringOccasionOfPO* is present, the starting PDCCH monitoring occasion number of (i\_s + 1)th PO is the (i\_s + 1)th value of the *firstPDCCH-MonitoringOccasionOfPO* parameter; otherwise, it is equal to i\_s \* S\*X. If X > 1, when the UE detects a PDCCH transmission addressed to P-RNTI within its PO, the UE is not required to monitor the subsequent PDCCH monitoring occasions for this PO.