3GPP TSG-RAN WG3 Meeting #129-bis R3-25xxxx

**Prague, Czech Republic, 13 – 17 October 2025**

Agenda Item: 9.2.3

Source: ZTE Corporation (moderator)

Title: Summary of Offline Discussion for CB: # 9\_R19WAB

Document for: Discussion

# 1 Introduction

This contribution is to kick off the following CB:

**CB: # 9\_R19WAB**

**- NGAP corrections: check 6806 and 6890**

**- XnAP corrections: check 6951 and 7191**

**- 38.401 corrections: check CRs**

(ZTE -moderator)

# 2 For the Chair Notes

Editor’s Note: For Rel-20 study/work items, please consider that when agreements/FFSes are captured in a TP, additional inclusion in the Chair Notes may be unnecessary (particularly for stage 3 details).

**Propose the following:**

R3-25xxx1 – merged

R3-25xxx2 rev in R3-25xxx3 – agreed

R3-25xxx4 rev in R3-25xxx3 – endorsed

**Propose to capture the following in Chair Notes:**

Agreement: [carefully crafted text]

Agreement: [carefully crafted text]

WA: [carefully crafted text]

No consensus: [carefully crafted text]

To be continued: [carefully crafted text]

**Propose to further discuss the following online:**

[issue 1]

[issue 2]

# 3 Discussion

## 3.1 NGAP corrections

In R3-256806, it stated that

In Rel-19, SA2’s conclusion indicates that the Additional ULI can be used by the AMF as an implicit indication of WAB-gNB. Moreover, RAN3 discussed whether to introduce a explicit WAB indicator in the NGAP messages and agreed that “No need to introduce a new “WAB-gNB” indication in the NG SETUP REQUEST message.” The main reason is that the Additional ULI already added in the NG SETUP REQUEST message. Thus, it is worth to add description that the AMF can recognize the WAB-gNB based on the “Additional ULI” IE contained in the NG Setup Request message.

So it is suggested to add procedure text for the *Additional ULI* IE in NG SETUP REQUEST message, to describe that the AMF can be aware of the WAB-gNB based on such IE.

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| If the *Additional ULI* IE is included in the NG SETUP REQUEST message, the AMF shall, if supported, store this information, consider this transmitting NG-RAN node is a WAB-gNB, and take it into account for determining the location of UEs served by the NG-RAN node, as specified in TS 23.501 [9]. |

**Q1: Do companies agree the change in R3-256806?**

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| Company | Yes or No | Comments |
| Nokia | Yes |  |
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**Summary:**

In R3-256890,

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| Agreements in RAN3#126 meeting:  **For HO, the target WAB-gNB should reject HO preparation including the S-NSSAI used for Backhauling.**  Current specificaiton is inconsistent on the HO a WAB-MT to another WAB node. TS 23.501 defines  - To prevent handover of a MWAB-UE towards a target MWAB-gNB, the target MWAB-gNB (i.e. **during Xn handover or during N2 HO** after target AMF slice control as described in step 4 in clause 4.9.1.3.2 of TS 23.502 [3]) **fails the handover** as specified in TS 38.401 [42] because the dedicated slices for BH PDU sessions of the MWAB-UE are not supported by the target MWAB-gNB.  RAN3 agreed TP for Xn-HO in TS 38.423:  If the S-NSSAI dedicated to WAB-MT’s backhaul PDU session(s) is included in the *UE Context Information* IE in the HANDOVER REQUEST message, and the target NG-RAN node does not support serving the WAB-MT, the target NG-RAN node shall send the HANDOVER PREPARATION FAILURE message to the source NG-RAN node. The HANDOVER PREPARATION FAILURE message shall contain the *Cause* IE with an appropriate value.  However, it is missing in N2 HO.  In clause 8.4.2.3, clarify the HO a WAB-MT to a target WAB-gNB shall fail.  If the S-NSSAI dedicated to WAB-MT’s backhaul PDU session(s) is included in the *PDU Session Resource Setup List* IE in the HANDOVER REQUEST message, and the target NG-RAN node does not support serving the WAB-MT, the target NG-RAN node shall send the HANDOVER FAILURE message to the AMF with an appropriate cause value. |

**Q2: Do companies agree the change in R3-256890?**

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| Company | Yes or No | Comments |
| Nokia | Yes | For Qualcomm’s comments that the HO Rejection is only for the target NG-RAN node that knows the dedicated S-NSSAI used for BH PDU Session, please find the update (the update means the target NG-RAN node know the dedicated S-NSSAI)  If the target NG-RAN node detects the S-NSSAI dedicated to WAB-MT’s backhaul PDU session(s) is included in the *PDU Session Resource Setup List* IE in the HANDOVER REQUEST message, and the target NG-RAN node does not support serving the WAB-MT, the target NG-RAN node shall send the HANDOVER FAILURE message to the AMF with an appropriate cause value.  If this is agreeable, XnAP changs is also needed. |
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## 3.2 XnAP corrections

In R3-256951, there are two changes, the second change “In the semantics description of WAB-MT Identifier, remove the “assigned by the WAB-MT’s BH-gNB”.” is the same as the endorsed CATT’s CR R3-256761. The first change is to capture the Xn setup failure case for WAB-gNBs in clause 8.4.1.3 to align with stage 2 specification TS 38.401.

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| 8.4.1.3 Unsuccessful Operation  If the *WAB-MT Identifier* IE is included in the XN SETUP REQUEST message, and the NG-RAN node2 is a WAB-gNB, the NG-RAN node2 may reject the Xn setup and send the XN SETUP FAILURE message to the NG-RAN node1 with an appropriate cause value. |

**Q3: Do companies agree the first change in R3-256951 as copied above?**

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| Company | Yes or No | Comments |
| Nokia |  | We understand the purpose, but current text is not appropriate for Section “Unsuccessful Operation” which uses “shall”, i.e. means the procedure “always” fail. But current text means “may” fail. |
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In [R3-257191](file:///C:\Users\q12059\Documents\3GPP%20RAN3\RAN3%20Meetings\RAN3_129b%20(Oct%202025,%20Prague)\Docs\R3-257191.zip), there are three changes as below. The second change is the same as the endorsed CATT’s CR R3-256761. As online discussion, the first change is not correct, the “if needed” should be kept. So we only need to focus on the third change.

-Removed the “if needed” from two statements, in clauses 8.4.1.2 and 8.4.2.2.

-Removed the “, assigned by the WAB-MT’s BH-gNB.” from the semantics descriptions of the *WAB-MT ID* IE in clauses 9.1.3.1, 9.1.3.2, 9.1.3.4 and 9.1.3.5.

-Replaced the second occurrence of “NG-RAN node” with “WAB-gNB” in both clauses

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| If the *WAB-MT Identifier* IE is included in the XN SETUP REQUEST message or in the XN SETUP RESPONSE message, the receiving NG-RAN node shall, if supported, consider that the transmitting NG-RAN node is a WAB-gNB, and conclude that the WAB-MT identified by the *WAB-MT Identifier* IE is co-located with the transmitting WAB-gNB, if needed. |

Note that the Rapporteur write back the “if needed”.

**Q4: Do companies agree the third change in R3-257191 as copied above (i.e. Replaced the second occurrence of “NG-RAN node” with “WAB-gNB” in clauses 8.4.1.2 and 8.4.2.2)?**

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| Company | Yes or No | Comments |
| Nokia |  | From the perspective of XnAP receiver, the transmitting node is a NG-RAN node. |
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## 3.3 Stage 2 (TS 38.401) corrections

### 3.3.1 R3-256714 and R3-256760

In R3-256714 and R3-256760, there are some overlapping changes. For the changes to clause 12.3, there are following two options:

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| Option 1: In R3-256760:  12.3 NG connection management  Based on the OAM configuration, the WAB-gNB can set up NG interface with an AMF. When disconnecting from an AMF is required, due to inter-AMF mobility of a WAB-gNB, or when the authorization status of the WAB-node changes from “authorized” to “not authorized”, the WAB-gNB may request the removal of the NG interface by triggering the NG Removal procedure toward the AMF.  Option 2: In R3-256714:  12.3 NG connection management  Based on the OAM configuration, the WAB-gNB can set up NG interface with an AMF. When disconnecting from an AMF is required, due to inter-AMF mobility of a WAB-gNB, or when the service authorization status of the WAB-gNB changes from “authorized” to “not authorized”, the WAB-gNB may request the removal of the NG interface by triggering the NG Removal procedure towards the AMF. |

**Q5: For the changes to clause 12.3, do companies think the change is needed and which option do you support if yes?**

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| --- | --- | --- |
| Company | Yes or No | Comments |
| Nokia |  | For the 1st change, it is not needed. The NG Removal procedure is related to WAB-gNB. Strictly speaking, it is related to WAB-gNB’s authorization status.  For the 2nd change, it is not needed. Better to align with SA2. |
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For the changes to clause 12.4,

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| Option 1: In R3-256760:  If the WAB-MT’s authorization status changes from “authorized” to “not authorized”, it is expected that WAB-MT’s PLMN/SNPN ensures that backhaul PDU sessions of the WAB-MT are maintained long enough for the WAB-gNB to perform UE handover/release and the removal of NG and Xn connections, as specified in TS 23.501 [3].  Option 2: In R3-256714:  Upon WAB-node service authorization status change from “authorized” to “not authorized”, the WAB-MT’s PLMN/SNPN should ensure that backhaul PDU sessions of the WAB-MT are maintained long enough for the WAB-gNB to perform UE handover/release and the removal of NG and Xn connections, as specified in TS 23.501 [3]. |

**Q6: For the changes to clause 12.4, do companies think the change is needed and which option do you support if yes?**

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| Company | Yes or No | Comments |
| Nokia |  | No big difference between the two options. Either one is fine. |
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There are two additional changes in R3-256760,

- In 12.1, clarify that WAB-gNB is configured by OAM after it is authorized.

- In 12.8, change “may reject” to “rejects”.

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| In clause 12.1:  **Phase 2-1: WAB-gNB initialization.** In this phase, the WAB-gNB is service-authorized by the SeGW or by the OAM, after which the WAB-gNB is configured by the OAM (e.g., with the information needed to establish NG connections towards one or more AMF(s)).  In clause 12.8:  Establishment of Xn connections between two WAB-gNBs can be avoided. To achieve this, the WAB-gNB rejects the Xn setup initiated by another WAB-gNB, e.g., based on the presence of the WAB-MT ID received in the XN SETUP REQUEST message. |

**Q7: Do companies agree the remaining changes (in clause 12.1 and 12.8) in R3-256760?**

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| Company | Yes or No | Comments |
| Nokia |  | For the 1st change, another simple option is just to add a “then”, i.e.  …. and the WAB-gNB is then service authorized ….  For the 2nd change, ok |
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There are some additional changes in R3-256714. Rapporteur think some changes can be agreeable, companies can review the CR after it available in the CB folder.

**Q8: Do companies agree the remaining changes (except changes in clause 12.3 and 12.4) in R3-256714? Please indicate which changes are supported or not supported if any.**

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| Company | Yes or No | Comments |
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### 3.3.2 R3-256950 and R3-257138

In R3-256950 and R3-257138, there is one overlapping change in clause 12.8:

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| Option 1 in R3-256950: 12.8 Xn connection management A WAB-gNB can establish an Xn connection with the BH-gNB serving the WAB-MT co-located with the WAB-gNB, and with the neighbouring gNBs. During the Xn setup or NG-RAN node configuration update, the WAB-gNB can include a WAB-MT identifier, to indicate that it is a WAB-gNB. In case the peer gNB is the WAB-MT’s BH-gNB, the WAB-MT ID makes the BH-gNB aware of the co-location of the WAB-MT and the WAB-gNB. The WAB-MT ID consists of the C-RNTI assigned to the WAB-MT by the BH-gNB, and the cell ID of BH-gNB´s cell serving the WAB-MT.  Option 2 in R3-257138:  12.8 Xn connection management  A WAB-gNB can establish an Xn connection with the BH-gNB serving the co-located WAB-MT, and with the neighbouring gNBs. During the setup or update of its Xn connections, the WAB-gNB can include an ID of the co-located WAB-MT, to indicate that it is a WAB-gNB. In case the peer gNB is the WAB-MT’s BH-gNB, the WAB-MT ID makes the BH-gNB aware of the co-location of the WAB-MT and the WAB-gNB. The WAB-MT ID consists of the C-RNTI assigned to the WAB-MT by the BH-gNB, and the cell ID of BH-gNB´s cell serving the WAB-MT. |

**Q9: For the above two changes to clause 12.8, do companies think the change is needed and which option do you support if yes?**

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| Company | Yes or No | Comments |
| Nokia |  | Opion 1 is slightly better. |
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There are 3 additional changes in R3-256950:

1. Remove the definition of “BH-AMF”.
2. Modify the Figure 6.1.7-1:

- remove the line between “Neighbour NG-RAN node” and “UE’s 5GC”,

- add a line between “Neighbour NG-RAN node” and “BH-5GC”,

- change the sentence “Backhaul PDU Session(s) for transporting of NG-C/NG-U interface traffic of WAB-gNB” to “Backhaul PDU Session(s) for transporting of NG-C/NG-U/Xn-C/Xn-U interface traffic of WAB-gNB”.

1. In clause 12.5, change the title to “Additional User Location Information”, and capture that the WAB-gNB can indicate the Additional ULI to the core network by NG Setup and RAN Configuration Update procedures.

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| 1st change:  **BH-5GC:** The 5GC serving the WAB-MT.  **BH-gNB:** The gNB serving the WAB-MT.  **BH-UPF**: The UPF serving the WAB-MT for backhauling.  2nd change:  Figure 6.1.7-1 shows the WAB architecture for 5GS.  3rd change: 12.5 Additional User Location Information For UEs served by a WAB-gNB, in addition to the User Location Information (ULI), the WAB-gNB also provides the core network with Additional ULI, which includes a TAI and a NR CGI pertinent to the WAB-gNB’s broadcasted PLMN/SNPN.  If the PLMN/SNPN broadcasted by a WAB-gNB is the same as the PLMN/SNPN serving the WAB-MT, and the WAB-MT connects to the BH-gNB by means of a terrestrial link, the Additional ULI for UEs served by the WAB-gNB includes the TAI and the NR CGI of the cell serving the WAB-MT.  If the PLMN/SNPN serving the WAB-MT is different from the WAB-gNB’s broadcasted PLMN/SNPN, and the WAB-MT connects to the BH-gNB by means of a terrestrial link, the Additional ULI for UEs served by the WAB-gNB is determined by the WAB-gNB, based on the WAB-node’s geo-location.  If the WAB-MT connects to the BH-gNB by means of a non-terrestrial link, the Additional ULI for UEs served by WAB-gNB is determined by the WAB-gNB, based on WAB-node’s geo-location. This applies regardless of whether the PLMN/SNPN serving the WAB-MT is the same as, or different than, the WAB-gNB’s broadcasted PLMN/SNPN.  In case Additional ULI for UEs served by a WAB-gNB changes, e.g., due to WAB-node movement, the WAB-gNB derives the new Additional ULI and reports it via legacy procedures, if required by the core network.  The WAB-gNB can indicate the Additional ULI to the core network by NG Setup and RAN Configuration Update procedures. |

**Q10: Do companies agree the above 3 changes in R3-256950? Please indicate which changes are supported or not supported if any.**

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| Company | Yes or No | Comments |
| Nokia |  | For the update to the figure, we are not sure why the change is needed. The “Xn-C/U…” is dotted line. |
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There are some additional changes in R3-257138:

* Revise the description of ‘the NG connection(s) between the WAB-node and the old AMF(s)’ as ‘the NG connection(s) between the old logical WAB-gNB and the old AMF(s)’.
* Other minor changes.

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| 1st change: // move the sentence “The WAB-MT may connect to a public PLMN or an SNPN.” to a new line/paragraph.  In in-band scenarios, backhaul and access of the WAB-node use terrestrial radio links. In out-of-band scenarios, the backhaul can use a terrestrial or a non-terrestrial radio link, while the access uses terrestrial radio link.  The WAB-MT may connect to a public PLMN or an SNPN.  The WAB-gNB may connect to a public PLMN or an SNPN.  2nd change:  After all the UEs in RRC\_CONNECTED state are handed over, the NG connection(s) between the old logical WAB-gNB and the old AMF(s) are removed via NG Removal procedure and the old logical WAB-gNB’s cell(s) are removed from service.  3rd change:  A WAB-gNB should be configurable with respect to whether it should accept or reject Xn setup requests received from other WAB-gNBs. |

**Q11: Do companies agree the above 3 changes in R3-257138? Please indicate which changes are supported or not supported if any.**

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| Company | Yes or No | Comments |
| Nokia | Yes |  |
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### 3.3.3 [R3-256727](file:///C:\Users\q12059\Documents\3GPP%20RAN3\RAN3%20Meetings\RAN3_129b%20(Oct%202025,%20Prague)\Docs\R3-256727.zip)

In R3-256727, there are 5 changes:

* Add description for access and backhaul link in clause 6.1.7.
* Add “for WAB” in the title of protocol stack figures in clause 6.1.7.
* Update the description for the report of updated additional ULI to CN in clause 12.5.
* Remove the last sentence in clause 12.7.1.
* Change “should” to be “can” in the last sentence of clause 12.8.

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| A WAB-node consists of a WAB-gNB and a WAB-MT. The WAB-gNB is based on the gNB functionality specified in TS 38.300 [2] and serves UEs by means of a terrestrial NR Uu access radio link.  The WAB-MT is served by a BH-gNB via backhaul radio link. The WAB-gNB’s traffic, including NG, Xn and OAM traffic is transported via backhaul PDU session(s) of the WAB-MT.  Figure 6.1.7-2: Protocol stacks for NG Control plane and NG User plane transport of WAB  Figure 6.1.7-3: Protocol stacks for Xn Control plane and Xn User plane transport of WAB  In case Additional ULI for UEs served by a WAB-gNB changes, e.g., due to WAB-node movement, the WAB-gNB derives the new Additional ULI and reports it to the core network. 12.7.1 WAB-MT mobility The WAB-MT reuses legacy mobility procedures defined for the UE. During the WAB-node’s movement, when the BH PDU session(s) of WAB-MT are re-established, the co-located WAB-gNB may need to update the IP address(es) used for its traffic. In case IPsec tunnel mode is used to protect the WAB-gNB’s traffic, MOBIKE (IETF RFC 4555 [29]) can be used to avoid the change of inner IP address(es) used for this traffic. Otherwise, following procedures can be used for handling the IP address change of the WAB-gNB’s traffic:  - NG-C and Xn-C can be migrated to the new IP address(es) via legacy procedures defined in TS 38.412 [37] and TS 38.422 [38], respectively.  - NG-U GTP-U tunnels can be migrated via the legacy NGAP PDU Session Resource Modify Indication procedure.  *Next Change*  12.8 Xn connection management  A WAB-gNB canbe configurable with respect to whether it should accept or reject Xn setup requests received from WAB-gNBs. |

**Q12: Do companies agree the above changes in R3-256727? Please indicate which changes are supported or not supported if any.**

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| Company | Yes or No | Comments |
| Nokia |  | Ok except the deletion of “via legacy procedure, …” it is not needed. The previous agreement is this can be done by the legacy procedure and does not require Stage-3 change. So the existing text is correct. |
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### 3.3.4 [R3-256889](file:///C:\Users\q12059\Documents\3GPP%20RAN3\RAN3%20Meetings\RAN3_129b%20(Oct%202025,%20Prague)\Docs\R3-256889.zip)

In R3-256889, it states that:

Current TS 38.301 states:

For UEs served by a WAB-gNB, in addition to the User Location Information (ULI), the WAB-gNB also provides the core network with Additional ULI, which includes a TAI and a NR CGI **pertinent to the WAB-gNB’s broadcasted PLMN/SNPN**.

The WAB-gNB has same functionality as the gNB defined in TS 38.300, which can suppprt network sharing. When the WAB-gNB is shared, it can broadcast multiple PLMNs/SNPNs (e.g. PLMN A and B). For a specific UE from PLMN A, it is unclear which PLMN/SNPN is used in AULI.

In case the WAB-gNB sends the AULI related to PLMN B, the UE’s CN (PLMN A) cannot use the AULI since it does not have the information of PLMN B.

- Clarify the PLMN/SNPN in AULI is the UE’s serving PLMN/SNPN.

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| 12.5 User Location Information for UEs served by a WAB-gNB For UEs served by a WAB-gNB, in addition to the User Location Information (ULI), the WAB-gNB also provides the core network with Additional ULI, which includes a TAI and a NR CGI pertinent to the UE’s serving PLMN/SNPN.  If the PLMN/SNPN broadcasted by a WAB-gNB is the same as the PLMN/SNPN serving the WAB-MT, and the WAB-MT connects to the BH-gNB by means of a terrestrial link, the Additional ULI for UEs served by the WAB-gNB includes the TAI and the NR CGI of the cell serving the WAB-MT.  If the PLMN/SNPN serving the WAB-MT is different from the WAB-gNB’s broadcasted PLMN/SNPN, and the WAB-MT connects to the BH-gNB by means of a terrestrial link, the Additional ULI for UEs served by the WAB-gNB is determined by the WAB-gNB, based on the WAB-node’s geo-location.  If the WAB-MT connects to the BH-gNB by means of a non-terrestrial link, the Additional ULI for UEs served by WAB-gNB is determined by the WAB-gNB, based on WAB-node’s geo-location. This applies regardless of whether the PLMN/SNPN serving the WAB-MT is the same as, or different than, the WAB-gNB’s broadcasted PLMN/SNPN.  In case Additional ULI for UEs served by a WAB-gNB changes, e.g., due to WAB-node movement, the WAB-gNB derives the new Additional ULI and reports it via legacy procedures, if required by the core network. |

**Q13: Do companies agree the above change in R3-256889?**

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| Company | Yes or No | Comments |
| Nokia | Yes | WAB-gNB has the gNB functionality as defined in 38.300, which supports network sharing. The WAB-gNB may broadcast multiple PLMN/SNPN (e.g. PLMN A and B). For a specific UE of PLMN A, the AULI shall only include the UE’s serving PLMN A, rather any other PLMN (e.g. PLMN B) of the WAB-gNB’s broadcasted PLMN/SNPN. |
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# 4 Conclusion

# 5 References

1. R3-256806 Correction on WAB NG management (Huawei, CANON Research Centre France, Lenovo) CR1340r, TS 38.413 v19.0.0, Rel-19, Cat. F
2. R3-256890 Correction on handover a WAB-MT to a target WAB-gNB (Nokia, Nokia Shanghai Bell) CR1348r, TS 38.413 v19.0.0, Rel-19, Cat. F
3. R3-256951 Corrections for WAB (ZTE Corporation) CR1560r, TS 38.423 v19.0.0, Rel-19, Cat. F
4. R3-257191 Corrections of WAB (Ericsson) CR1600r, TS 38.423 v19.0.0, Rel-19, Cat. F
5. R3-256714 Corrections of WAB (Ericsson, Jio Platforms) CR0486r, TS 38.401 v19.0.0, Rel-19, Cat. F
6. R3-256727 Correction on WAB (Huawei) CR0487r, TS 38.401 v19.0.0, Rel-19, Cat. F
7. R3-256760 Corrections to WAB stage-2 (CATT, Ericsson) CR0489r, TS 38.401 v19.0.0, Rel-19, Cat. F
8. R3-256889 Correction on AULI (Nokia, Nokia Shanghai Bell) CR0491r, TS 38.401 v19.0.0, Rel-19, Cat. F
9. R3-256950 Corrections for WAB (ZTE Corporation) CR0493r, TS 38.401 v19.0.0, Rel-19, Cat. F
10. R3-257138 Correction to TS 38.401 for WAB (Samsung) CR0501r, TS 38.401 v19.0.0, Rel-19, Cat. F