**3GPP TSG-RAN WG4 Meeting # 112-bis R4-2416526**

**Hefei, China, Oct.14th – 18th, 2024**

**Agenda item:** 6.10.5

**Source:** Moderator (ZTE Corporation)

**Title:** Topic summary for [305] NR\_ATG\_enh

**Document for:** Information

# Introduction

In RAN #105 meeting, the objectives for the revised WID RP-242381 are:

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| **The core part of this work item includes*** Specify the RF and RRM core requirements for intra-band co-located and inter-band co-located DL CA [RAN4]:
	+ FR1 intra-band contiguous CA
		- Example band combination: n79
	+ FR1+FR1 inter-band CA
		- Example band combination: n3+n39
* Specify the RF requirements for support of UL MIMO with 2TX for single CC for UE. [RAN4]
* Specify signaling and UE capabilities if necessary [RAN2].

**The performance part of the work item includes:*** Specify corresponding RRM performance and demodulation requirements for intra-band co-located and inter-band co-located DL CA.
* Specify corresponding demodulation requirements for support of UL MIMO with 2TX for single CC for UE with dual-polarization antenna.
* Specify conformance testing and conformance requirements for BS.
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In RAN4#110bis meeting, the WF R4-2406089 was approved, and the work plan can be found in R4-2404692.

In RAN4#111 meeting, the WF R4-2409957 was approved.

In RAN4#112 meeting, the WF R4-2413510 was approved.

For the thread [112bis][305] NR\_ATG\_enh, the main issues are to handle with issues for ATG BS RF supporting CA (intra-band contiguous CA and inter-band CA) feature under agenda item 6.10.3.

# Topic #1: ATG BS CA RF requirements (AI: 6.10.3)

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

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| **TDoc** | **Company** | **Title** |
| **[R4-2414976](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2414976.zip)** | Huawei, HiSilicon | discussion on BS requirements for ATG enhancements**Proposal 1**: Preclude DL MIMO for TAE requirements for ATG BS, since DL MIMO is not included in the updated WID. **Proposal 2**: Revise the sentences “There is no TAE requirement for ATG BS” in 6.5.3.1 and 9.6.3 to “There is no TAE requirement related to MIMO transmission for ATG BS”, i.e.There is no TAE requirement of MIMO transmission for ATG BS. |
| **[R4-2415013](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415013.zip)** | CMCC | Discussion on BS RF requirements for ATG with CA**Proposal 1: Wait for the conclusion of December plenary meeting to revise the wording on the TAE requirements.** |
| **[R4-2415104](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415104.zip)** | CATT | Discussion on the remaining issues for ATG enhancement BS RF**Proposal:** **If there’s no plan to add DL MIMO in future WID revision, consider the following wording for TS 38.04:****Replace the sentence “There is no TAE requirement for ATG BS” with “The requirements for MIMO transmission are not applicable to ATG BS”.** |
| **[R4-2415105](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415105.zip)** | CATT | Draft CR for 38.104: Introduction of R19 ATG enhancement BS RF requirements1. Remove the sentence “There is no TAE requirement for ATG BS.”
2. Add the sentence “The requirements for MIMO transmission are not applicable to ATG BS.”
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| **[R4-2415869](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415869.zip)** | Huawei, HiSilicon | Draft CR for TS 38.104 to add ATG enhancement BS RF requirementsRemove the sentence “There is no TAE requirement for ATG BS.”Add the sentence “The requirements for MIMO transmission are not applicable to ATG BS.” |
| **[R4-2415915](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415915.zip)** | ZTE Corporation, Sanechips | draft CR to TS 38.104: the introduction of Rel-19 ATG BS supporting CATo remove the following sentence for ATG BS:There are no CA requirements for ATG BS in the present specification.There is no TAE requirement for ATG BS in Rel-19. |
| **[R4-2415988](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415988.zip)** | Ericsson | Discussion on remaining issues of ATG BS supporting CA1. Replace “There is no TAE requirement for ATG BS” with “The TAE requirements for NR BS are applicable for ATG BS, except for MIMO which is not supported for ATG BS.”
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| **[R4-2415989](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415989.zip)** | Ericsson | Draft CR for 38.104 Introduction of Rel-19 ATG enhancement BS RFReplace “There is no TAE requirement for ATG BS” with “The TAE requirements for NR BS are applicable for ATG BS, except for MIMO which is not supported for ATG BS.” |

## Open issues summary

*Both intra-band contiguous CA and inter-band CA are supported for R19 ATG BS. The RF requirements for ATG BS supporting intra-band contiguous CA and inter-band CA are discussed in this section.*

*In the WF R4-2413510 last meeting, the open issue is how to handle CA TAE requirements for ATG BS in TS38.104. The WF are:*

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| ***Issue 1-1: Whether to preclude DL MIMO for TAE requirements for ATG BS supports CA?*** *Way Forward：** *DL MIMO is not included for ATG BS supports CA based on the current WID.*
	+ *RAN4 can re-visit it if there are revised WID to include DL MIMO.*

***Issue 1-2: How to handle CA TAE requirements for ATG BS in TS38.104 based on the current WID?****Way Forward：** *FFS on the wordings on the TAE requirements for ATG BS CA in the TS38.104.*
	+ *Only focus on TS38.104 in RAN4 #112-bis meeting.*
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*In last RAN meeting in September, the WID was revised to RP-242381. However, the revised objectives about the DL MIMO was NOT approved. In other words, DL MIMO is not included for ATG BS supports CA based on the current WID.*

**Issue 1-1: How to handle CA TAE requirements for ATG BS in TS38.104?**

* Proposal:
	+ Option 1: Wait for the conclusion of December plenary meeting to revise the wording on the TAE requirements. (CMCC)
	+ Option 2: Revise the wording in this meeting as proposed by other companies. (Huawei, Ericsson, CATT, ZTE)
* Recommended WF
	+ To check if Option 2 can be acceptable?

**Issue 1-2: Draft CRs to TS38.104 to revise the wording on the TAE requirements**

*There are several draft CRs proposed in this meeting, which are [R4-2415915](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415915.zip) (ZTE), [R4-2415105](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415105.zip) (CATT), [R4-2415869](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415869.zip) (Huawei), [R4-2415989](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415989.zip)(Ericsson). For each draft CR, different wordings for TAE requirements are proposed.*

* Proposal:
	+ Option 1: Remove “There is no TAE requirement for ATG BS.” (ZTE)
	+ Option 2: Replace “There is no TAE requirement for ATG BS” with “The requirements for MIMO transmission are not applicable to ATG BS” (CATT)
	+ Option 3: Replace “There is no TAE requirement for ATG BS” with “The TAE requirements for NR BS are applicable for ATG BS, except for MIMO which is not supported for ATG BS.” (Ericsson)
	+ Option 4: Update “There is no TAE requirement of MIMO transmission for ATG BS.” (Huawei)
* Recommended WF
	+ To check if the following wordings can be acceptable?:
		- Replace “There is no TAE requirement for ATG BS” with ‘The TAE requirements except for MIMO are applicable for ATG BS’

Note: RAN4 can re-visit it if there are revised WID to include DL MIMO.

* + Handheld the draft CR (to revise [R4-2415915](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_112bis/Docs/R4-2415915.zip) to merge all the draft CRs) if possibe.