**3GPP TSG-RAN WG4 Meeting # 111 R4-240xxxx**

**Fukuako, Japan, May. 20th – 24th, 2024**

**Agenda item:** 10.8.4

**Source:** Moderator (ZTE Corporation)

**Title:** Topic summary for [312] NR\_ATG\_enh

**Document for:** Information

# Introduction

In RAN #103 meeting, a new WID ‘RP-240839, “New WID on Enhancements for Air-to-ground network for NR”, was approved, where:

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| --- |
| * 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 |

In RAN4#110bis meeting, the WF R4-2406089 was approved.

For the thread [111][312] 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 10.8.3.

# Topic #1: ATG BS CA RF requirements (AI: 10.8.4)

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| **[R4-2407553](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407553.zip)** | CATT | Discussion on the remaining issues for ATG enhancement BS RF  **Observation: UE DEMOD performance requirement needs to be added if DL MIMO is supported in this WI. It’s a RAN plenary discussion.**  **Option 1: Remove the sentence “There is no TAE requirement for ATG BS” in 6.5.3.1 and 9.6.3, if WID is updated to include DL MIMO in the scope.**  **Option 2: Replace the sentence “There is no TAE requirement for ATG BS” with “The requirements for MIMO transmission are not applicable to ATG BS”.** |
| **[R4-2407949](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2407949.zip)** | CMCC | (NR\_ATG\_enh-Core) Discussion on BS RF requirements for ATG with CA  **Proposal 1: Remove the limitation for TAE, and** **no need to add other words to specify ATG TAE requirements.** |
| **[R4-2409600](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409600.zip)** | ZTE Corporation, Sanechips | Discussion on RF requirements for ATG BS in Rel-19  **Proposal 1**: to consider both option 2 and option 3 in order to cover all relevant RF requirement for Rel-19 ATG BS and leave DL MIMO as implementation. |
| **[R4-2409665](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_111/Docs/R4-2409665.zip)** | Ericsson | Discussion on remaining issues of ATG BS supporting CA   1. In Rel-18, the ATG BS does not have a designated core requirement, instead, it follows the existing NR BS requirement, the only exception is the TAE requirement. 2. Remove the sentence “There is no TAE requirement for ATG BS” in 6.5.3.1 and 9.6.3, and then refer to the existing NR BS TAE requirement for the ATG BS that supports CA operation. |

## 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 R4-2406089 last meeting, the open issue is how to handle CA TAE requirements for ATG BS in TS38.104. There are two options:*

* *Option 1: Remove the sentence “There is no TAE requirement for ATG BS” in 6.5.3.1 and 9.6.3*
* *Option 2: Remove the sentence “There is no TAE requirement for ATG BS” in 6.5.3.1 and 9.6.3, then add the following in 6.5.3.2 and 9.6.3.2,*
  + *For ATG BS, for intra-band contiguous carrier aggregation, without MIMO, TAE shall not exceed 260ns.*
  + *For ATG BS, inter-band carrier aggregation, without MIMO, TAE shall not exceed 3µs.*
* *Option 3: Find a place to add a general clarification that for ATG, intra-band contiguous CA and inter-band CA are supported but DL MIMO is not supported.*

*In moderator’s view, it was already agreed to reuse the* *existing NR BS TAE requirements and to reuse the same requirements other than TAE as the legacy NR BS RF CA for ATG BS supports CA operation. However, due to the descriptions for the existing NR BS TAE requirements includes ‘with or without MIMO’, and companies shared different understandings on MIMO for ATG BS supporting CA operation with regard to the current WID.* *It is the moderator’s view that the key point is to discuss whether to preclude MIMO for TAE requirements for ATG BS supports CA based on the current WID.*

**Issue 1-1: Whether to****preclude MIMO for TAE requirements for ATG BS supports CA based on the current WID?**

* Proposal:
  + Option 1: No. (R4-2407949, R4-2409665(?))
  + Option 2: Yes without WID upate. (R4-2407553)
  + Option 3: Leave DL-MIMO as implementation (R4-2409600)
  + Option 4: No with WID update to included DL MIMO feature. (R4-2407553)
* Recommended WF
  + Collect companies’ view.

**Issue 1-2: How to handle CA TAE requirements for ATG BS in TS38.104 based on the current WID?**

* Proposal:
  + Option 1: Remove the sentence “There is no TAE requirement for ATG BS” in 6.5.3.1 and 9.6.3
    - * Option 1-1: No need to add other words to specify ATG TAE requirements
      * Option 1-2: Some clarificaitons are needed, like refer to the existing NR BS TAE requirement and etc..
  + Option 2: Replace the sentence “There is no TAE requirement for ATG BS” with “The requirements for MIMO transmission are not applicable to ATG BS”.
  + Option 3: Remove the sentence “There is no TAE requirement for ATG BS” in 6.5.3.1 and 9.6.3 with WID updated to included DL MIMO feature.
* Recommended WF
  + Collect companies’ view