**3GPP TSG-RAN WG4 Meeting #104-e R4-221xxxx**

**Electronic Meeting, 15 ‒ 26 Aug, 2022**

**Title:** WF on ATG BS RF requirements

**Agenda Item:** 11.12.5

**Source:** ZTE

**Document for:** Approval

# Topic #3 ATG BS RF requirements

## Issue 3-2-1: ATG BS class

4 companies support the following option 1 and one company say this need the coexistence study and WA BS might be reused, since the majority of view are fine with option 1, it’s proposed to agree on option 1 as baseline and further discuss the altitude value in 2nd round.

*Agreements:*

* + Option1: to follow the HAPS approach

- ATG Base Stations are characterized by requirements derived from ATG scenarios with a ground BS to air UE with typical vertical altitude range [TBD km].

- Further discuss the typical vertical altitude range

Agreement: follow the HAPS approach

## Issue 3-2-2: ATG BS type

2 companies clearly support the option 2 and one company support the option 1 and one company slight prefer option 1. It’s proposed to agree on BS type 1-H and BS type 1-O firstly and then further discuss BS type 1-C.

 *Agreements:*

 *Agree to support the BS type 1-H and BS type 1-O, FFS for BS type 1-C*

Huawei: based on the current BS spec, the baseline is 1-C, 1-O and 1-C.

ZTE: 1-C cannot have beam capability to serve the service in the air.

Ericsson: similar understanding is as 1-C. BS should use the beam rather than fixed antenna.

Agreement: Use BS type 1-H, 1-O as baseline. FFS for BS type I-C.

## Issue 3-2-3: ATG BS RF requirements

Discussion on ATG BS RF requirement is a bit high level, since this is first meeting. For ACLR, unwanted emission mask/ACS requirement, this should depend on the coexistence study outcome and it’s premature to agree on option 2 at current stage.

The following RF requirements highlighted in yellow, these requirements need more discussions in 2nd round.

*Potential Agreements for other RF requirements except for ACLR/ACS:*

|  |  |
| --- | --- |
| **Tx requirements** | **Proposal**  |
| **gNB output power**  | define a new BS-class which adopts the properties from the Wide area BS, similar to what have been done for HAPS and its maximum output power should be left up to the declaration.  |
| **Output power dynamics** |  |
| **RE power control dynamic range** | To reuse the existing requirement defined in TS 38.104 |
| **Total power dynamic range** | To reuse the total power dynamic range of TS 38.104 |
| **Transmit ON/OFF power** | To reuse the existing requirement defined in TS 38.104 |
| **Transmitted signal quality** |   |
| **Frequency error** | To reuse the same requirement defined in TS 38.104 |
| **Modulation quality** | To reuse the same requirement defined in TS 38.104FFS:256QAM |
| **Time alignment error** | This is not applicable for ATG BS  |
| **Unwanted emissions** |  |
| **Occupied bandwidth** | To reuse the same requirement defined in TS38.104 which is following ITU-R Recommendation SM.328 |
| **Adjacent Channel Leakage Power Ratio** | *Agreements for ACLR,unwanted emission mask and ACS:*for ACLR, UEM/ACS requirement, this should depend on the coexistence study outcome . |
| **Operating band unwanted emissions** | *Agreements for ACLR and ACS:*for ACLR, UEM/ACS requirement, this should depend on the coexistence study outcome .. |
| **Transmitter spurious emissions** | To reuse the same spurious emission requirement defined in TS 38.104 |
| **Transmitter intermodulation** | Not applicable since it’s supposed to have no surrounding interfering gNB next to gNB |
| **Rx requirement** |  |
| **Reference sensitivity level** | To reuse the same reference requirements for Wide Area BS defined in TS 38.104 |
| **Dynamic range**  | Since IoT of ATG BS is supposed to quite low compared with IoT level of the legacy TN BS, it’s sufficient to reuse the existing requirement for Wide Area BS defined in TS 38.104. |
| **ACS** | *Agreements for ACLR and ACS:*for ACLR, UEM/ACS requirement, this should depend on the coexistence study outcome . |
| **In-band blocking** | This depends on the outcome of coexistence study. |
| **Out of band blocking** | To reuse OOBB power level as -15dBm for ATG BS which should be sufficient enough. |
| **Receiver spurious emission** | To reuse the requirements defined in TS 38.104  |
| **Receiver intermodulation** | Similar as transmitter intermodulation requirements, not applicable since it’s supposed to have no surrounding interfering gNB next to gNB |
| **In-channel selectivity** | Similar as dynamic range requirements, the IoT of ATG BS is supposed to quite low compared with IoT level of the legacy TN BS, it’s sufficient to reuse the existing requirement for Wide Area BS defined in TS 38.104. |