

Source: NEC
Title: Proposal for Unwanted Emission requirements and Scaling for AAS BS
Agenda item: 7.2.4.1 Unwanted emissions
Document for: Approval

Introduction

During RAN4#75AAS-AH, a number of contributions [1] to [6] were submitted on unwanted emission requirements and scaling for AAS BS. The proposals in these contributions were discussed and the differences were identified resulting in little progress. In this contribution we analyse commonality and differences between these proposals and make a compromised proposal for the unwanted emission requirements and scaling.

Discussion

A number of contributions [1] to [6] were submitted at RAN4#75AAS-AH on unwanted emission requirements. Three different approaches are identified from these proposals with some degree of commonality which led to the following agreements:

- Each AAS-ETAC contributes by a maximum of 1 time the unwanted emission limits specified in the non-AAS BS specifications (xx.104).
- Proposal 1 in [3] stating: As a reference for AAS equivalence discussions, Non-AAS systems should be assumed to have no more than the same number of radios as they have maximum layers - Endorsed

The proposals in [1] [2] [4] and [6] are driven by the desire to maintain same unwanted emission limits for AAS-BS as the non-AAS BS with the same MIMO (including transmit diversity and spatial multiplexing) transmission capabilities. This keeps the unwanted emission per AAS-ETAC power limits constant but requires total power limits and per transceiver power limits to vary with the number of AAS-ETAC.

On the other hand, contributions [3] and [5] propose the unwanted emission total power limits to be either fixed at the maximum configurable number of AAS-ETAC [5] or to be fixed at some number of AAS-ETAC below the maximum capability [3]. Both [3] and [5] argued against the proposal in [1], [2], [4] and [6] claiming there is no direct physical mapping between the AAS-ETAC and the physical transceiver groups.

The proposal for unwanted emission requirements, total power requirements, to vary with configured number of AAS-ETAC is a compromise between the proposals in [3] and [5]. Furthermore, to the contrary to the claim made in these proposals, a relationship between AAS-ETAC and corresponding physical transmitter groups in AAS BS exists in the same way as the relationship between antenna ports and transmitter antenna connectors exists in the non-AAS BS. For non-AAS BS, there is no

direct mapping between the layers/antenna ports and the physical transmitter antenna connectors at which the unwanted emission limits apply. In non AAS BS, layers are mapped to corresponding number of antenna ports which are permuted across a number of transmit antenna connectors. For AAS BS the same applies, with the transmit antenna connectors in the non-AAS BS are replaced with groups of transmitter units in the AAS BS. The difference between non-AAS BS and AAS BS is that for AAS BS the number of transmitter units per group is reconfigurable allowing greater flexibility and wider range of operation mode while for non-AAS BS the possible configuration modes is limited by the fixed number of transmit antenna connectors. Each of the transmitter groups in AAS BS becomes the reference at which the unwanted emission limit applies. These groups are physical and fixed during an operation mode until the AAS BS operating mode is changed.

For the purpose to achieve progress in AAS specifications, we accept the unwanted emission limit to be specified as a total power limit from all transceivers. We propose the unwanted emission limit to be specified per AAS-ETAC applicable at corresponding transmitters group with non-AAS BS per antenna connector limit or as a total power limit from all transmitters with the non-AAS BS per antenna connector limit scaled up by the total number of AAS-ETACs in the configuration.

Proposals:

We propose the following for unwanted emission requirements for AAS-BS:

- **The unwanted emission limit shall be specified either per AAS-ETAC applicable at corresponding transmitters group with non-AAS BS per antenna connector limit or total power limit from all transmitters with the non-AAS BS per antenna connector limit scaled up by the total number of AAS-ETACs in the configuration.**

References

- [1] R4-75AH-AAS-0011, Unwanted emission requirements for AAS BS, NTT DOCOMO INC.
- [2] R4-75AH-AAS-0012, Unwanted emission requirement, SEI
- [3] R4-75AH-AAS-0021, Setting the emissions requirement for AAS, Ericsson
- [4] R4-75AH-AAS-0052, Proposal for Unwanted Emission requirements for AAS BS, NEC
- [5] R4-75AH-AAS-0063, UEM scaling and number of AAS- ETAC, Huawei
- [6] R4-75AH-AAS-0071, Views on Unwanted Emission for AAS BS, Alcatel-Lucent