3GPP TSG-RAN WG4 Meeting #76 **R4-154914**
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Source: **NEC**
Title: **Proposal on EIRP Level and Beam Declaration**
Agenda item: **7.2.2 EIRP accuracy and beam declaration**
Document for: **Approval**

Introduction

The current AAS TR [1] includes radiated transmit power requirements. The radiated transmit power requirements are placed on the accuracy of the declared EIRP that is presumed to correspond to an AAS BS beam. A beam is currently defined in the TR, however, for the purpose of declaration of the EIRP value, the current definition needs to be further clarified. In this contribution, we consider the options for which a beam could be defined for the purpose of EIRP declaration and make a proposal accordingly.

Discussion

RAN4 agreed radiated requirements to be placed on the accuracy of the declared EIRP value and the beams directions for which the EIRP accuracy is maintained shall be declared. The TR [1] already includes definition of a beam, however, this needs further clarification for the purpose of EIRP level declaration. In particular, there is a need to identify a beam when plural AAS-ETACs are used in an AAS BS..

In the current TR, AAS beam is defined as a beam created by means of a superposition of the signals radiated from different parts of the AAS antenna array. Beam is defined as the main lobe of the radiation pattern of an antenna array. AAS-ETAC is defined for AAS BS in [2] as the equivalent transmitter antenna connector for non AAS BS. However, there is no link of the AAS-ETAC to the beam definition or to the declared EIRP level. The current TR states that “the EIRP and its accuracy are defined for the declared beams when activated individually on all corresponding radiated elements and the requirements are placed per individual beam”. The “corresponding radiated elements” related to the beam is not clear in the TR. That is, the beam could be corresponded to a single AAS-ETAC or to all the AAS-ETAC associated with a TM.

Therefore, the options for further defining the beam for the purpose of EIRP declaration are as follows:

- Option 1: A beam is associated with a single AAS-ETAC. For this option, EIRP level is declared per beam with a single AAS-ETAC operating at its maximum intended/declared power rating.
- Option 2: A beam is associated with all AAS-ETACs which correspond to a TM. For this option, EIRP is declared for the beam with combined AAS-ETACs operating at their maximum intended/declared power rating intended for the same received signal and corresponding to the same transmission mode. In this case, there are two ways of verifying the declared EIRP level:
    - 2a: Measure the EIRP level for each AAS-ETAC and then sum them up for the total ETAC
    - 2b: Measure the EIRP level while all corresponding AAS-ETAC are active simultaneously.

NEC thinks a beam shall be defined per a single AAS-ETAC and EIRP level shall be declared per a single AAS-ETAC. This corresponds that non-AAS BS conducted requirements are adopted for AAS BS conducted requirements per AAS-ETAC.

Therefore NEC prefers option 1.

Proposals:

The current TR states that "the EIRP and its accuracy are defined for the declared beams when activated individually on all corresponding radiated elements…". The "corresponding radiated elements" related to the beam is not clear in the TR. Additional clarification on the beam definition is needed for the purpose of EIRP level declaration. AAS-ETAC is decided as a base for the conducted unwanted emission requirements but is not linked to the beam definition. NEC proposes the following as an additional clarification for the basis of beam definition for which EIRP level declaration is made:

Proposal-1: EIRP level is declared for a beam with a single AAS-ETAC operating at its maximum declared rated power.

References

[1] TR 37.842,

[2] R4-152471, Proposal for definition of "MIMO/Tx Diversity" Entity, Huawei, NEC.