3GPP TSG-RAN WG4 Meeting # 102-e R4-2203714

Electronic Meeting, February 21 – March 3, 2022

**Agenda item:** 10.9.3.1

**Source:** Qualcomm Incorporated

**Title:** TP to TR 38.854 on the Number of Rx beams

**Document for:** Endorsement

1. Introduction

TR 38.854 is used to capture the analysis on FR2 HST deployment scenarios, selection of parameters, potential issues, and expected performance.

At the RAN3#101-e meeting [1] it was agreed that RRM requirements shall be defined for the two sets of requirements in terms of the number of Rx beams:

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| --- |
| **GtW Agreements:**   * Define only two sets of enhanced RRM requirements in terms of number of Rx beams (i.e. Rx beam sweeping scaling factor) per UE   + Set 1: 2 Rx beams   + Set 2: 6 Rx beams * Introduce network signalling to configure UE to follow either Set 1 or Set 2 RRM requirements * Note: the applicability of Set 1/2 requirements to the FR2 HST scenarios will be captured in the TR |

In this contribution, we are providing our text proposal (TP) to TR 38.854 addressing the note in the current TR:

*- Note: the applicability of Set 1/2 requirements to the FR2 HST scenarios will be captured in the TR.*

The TP is based on the analysis from our discussion paper [2].

1. TP to TR 38.854 on the RRM requirement applicability rule

## 7.2 RRM requirements

<<<Start of Text Proposal>>>

Concerning the maximum supported speed for FR2 HST RAN4 agreed to use 350kmph as a reference maximum train speed and define RRM requirements to guarantee that.

It was agreed to add a flag to enable the UE to identify different/enhanced RRM requirements in HST FR2 deployments. FR2 HST UE has the capacity to support both unidirectional and bidirectional deployment scenarios. RAN4 agreed to introduce network assistance to inform UE on the FR2 HST deployment type (uni-directional or bi-directional).

RAN4 agreed to introduce dedicated new RRC based network signalling flag will be specified to enable/disable one shot large UL timing adjustment. Such RRC based network signalling is not limited to a particular FR2 HST deployment and/or scenarios, i.e., bi-directional scenario or uni-directional scenario.

In Scenario A, whether the RRH position on one side or both sides of railway tracks have no impact on RRM requirements under the assumption that FR2 HST UE boresight direction (or the beam direction if there is only one beam) is parallel to the track.

Under FR2 HST scenarios, the PSS/SSS detection is robust to deal with ISI and time differences.

Additional need for network signalling and CPE capabilities for HST FR2 deployments continued based on the deployment options and presence of non-CPE UEs. It was agreed that it is not necessary to introduce UE capability to indicate the support of FR2 HST.

It was also concluded that there is no need for CPE capability to change beam sweep number in uni-/bi-directional operation.

RAN4 agreed to introduce network signaling to configure UE to follow either Set 1 or Set 2 RRM requirements.

Concerning the number of Rx Beams from RRM perspective RAN4 agreed that related to the scope of the RRM requirements and the requirements for Scenario A and scenario B to only define two sets of enhanced RRM requirements in terms of number of RX beams (i.e. RX beam sweeping scaling factor) per UE:

- Set 1: 2 RX beams

- Set 1: 6 RX beams

RAN4 will introduce network signalling to configure UE to follow either Set 1 or Set 2 RRM requirements.

Set 1 requirements are developed based on the analysis with Dmin = 10m and Ds = 750m, and the recommended applicable range of Dmin for Set 1 requirement is Dmin <= [30] m. For the deployment with a larger Dmin, set 2 requirements are recommended to be configured by the network.

<<<End of Text Proposal 1>>>

References

1. R4-2120292, WF on FR2 HST RRM requirements (part 1), Nokia, Nokia Shanghai Bell, RAN4#101-e.