**3GPP TSG RAN WG1 #114bis R1-230xxxx**

**Xiamen, China, October 9th – October 13th, 2023**

**Source: moderator (vivo)**

**Title:** **Discussion on reply LS on power scaling and PHR**

**Agenda Item: 7.1**

**Document for:** **Discussion and decision**

1. Introduction

An LS from RAN4 [1] is received, where RAN4 asks RAN1 whether power scaling factor s has impact on PHR

 calculation in 38.213, text copied below.

RAN4 discussed the power scaling behaviour defined in the beginning of clause 7.1 of TS 38.213. In case the factor $s$ is not equal to 1, e.g. 2Tx UL MIMO when indicated TPMI is 0 or 1 for UE not indicating support of ULFPTx or operating in ULFPTx fullpowerMode 1, and applied to $\hat{P}\_{PUSCH,b,f,c}\left(i,j,q\_{d},l\right)$, RAN4identified that in such case the actually achievable maximum configured power would be different from the Pcmax,f,c value derived via reported power class. However, in the PHR calculation, i.e. in clause 7.7.1 in 38.213, this power scaling factor s is not considered.

RAN4 would like to check RAN1’s view whether the above understanding is correct and whether it is an issue from RAN1 perspective since ULFPTx introduced in Rel-16 is intentionally to address MIMO non-full power issue.

1. Discussion

To facilitate a potential draft reply LS to RAN4, please provide your views and comments below

Question: do you think current power scaling and PHR calculation has any issue with regards to the power scaling factor s in 38.213? If “yes” please provide details.

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| Company  | Yes or No | comments |
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Potential reply to RAN4

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1. Conclusions

1. Reference

[1] [R1-2308814](file:///C%3A%5CUsers%5Cyounsun%5CDocuments%5C3GPP%20documents%5CRAN1%20tdocs%5CTSGR1_114b%5CDocs%5CR1-2308814.zip) LS on power scaling and PHR in 38.213 RAN4, vivo

[2] [R1-2309026](file:///C%3A%5CUsers%5Cyounsun%5CDocuments%5C3GPP%20documents%5CRAN1%20tdocs%5CTSGR1_114b%5CDocs%5CR1-2309026.zip) Draft reply LS on power scaling and PHR in 38.213 ZTE

[3] [R1-2309044](file:///C%3A%5CUsers%5Cyounsun%5CDocuments%5C3GPP%20documents%5CRAN1%20tdocs%5CTSGR1_114b%5CDocs%5CR1-2309044.zip) Discussion on power scaling and PHR in 38.213 vivo

[4] [R1-2309045](file:///C%3A%5CUsers%5Cyounsun%5CDocuments%5C3GPP%20documents%5CRAN1%20tdocs%5CTSGR1_114b%5CDocs%5CR1-2309045.zip) Draft reply LS on power scaling and PHR in 38.213 vivo

[5] [R1-2309266](file:///C%3A%5CUsers%5Cyounsun%5CDocuments%5C3GPP%20documents%5CRAN1%20tdocs%5CTSGR1_114b%5CDocs%5CR1-2309266.zip) draft Reply LS on power scaling and PHR Google

[6] [R1-2309325](file:///C%3A%5CUsers%5Cyounsun%5CDocuments%5C3GPP%20documents%5CRAN1%20tdocs%5CTSGR1_114b%5CDocs%5CR1-2309325.zip) Draft reply LS on power scaling and PHR in 38.213 Lenovo

[7] [R1-2309348](file:///C%3A%5CUsers%5Cyounsun%5CDocuments%5C3GPP%20documents%5CRAN1%20tdocs%5CTSGR1_114b%5CDocs%5CR1-2309348.zip) Draft reply LS on power scaling and PHR in 38.213 Samsung

[8] [R1-2309471](file:///C%3A%5CUsers%5Cyounsun%5CDocuments%5C3GPP%20documents%5CRAN1%20tdocs%5CTSGR1_114b%5CDocs%5CR1-2309471.zip) Draft reply LS on power scaling and PHR in 38.213 CATT

[9] [R1-2309574](file:///C%3A%5CUsers%5Cyounsun%5CDocuments%5C3GPP%20documents%5CRAN1%20tdocs%5CTSGR1_114b%5CDocs%5CR1-2309574.zip) Discussion on LS on power scaling and PHR in 38.213 OPPO

[10] [R1-2309814](file:///C%3A%5CUsers%5Cyounsun%5CDocuments%5C3GPP%20documents%5CRAN1%20tdocs%5CTSGR1_114b%5CDocs%5CR1-2309814.zip) Draft Reply LS on power scaling and PHR in 38.213 Apple

[11] [R1-2310116](file:///C%3A%5CUsers%5Cyounsun%5CDocuments%5C3GPP%20documents%5CRAN1%20tdocs%5CTSGR1_114b%5CDocs%5CR1-2310116.zip) Discussion for reply LS on power scaling and PHR in 38.213 Qualcomm Incorporated

[12] [R1-2310246](file:///C%3A%5CUsers%5Cyounsun%5CDocuments%5C3GPP%20documents%5CRAN1%20tdocs%5CTSGR1_114b%5CDocs%5CR1-2310246.zip) Impact of MIMO power scaling on PHR in 38.213 Ericsson

[13] [R1-2310250](file:///C%3A%5CUsers%5Cyounsun%5CDocuments%5C3GPP%20documents%5CRAN1%20tdocs%5CTSGR1_114b%5CDocs%5CR1-2310250.zip) [Draft] Reply LS on power scaling and PHR in 38.213 Ericsson

[14] [R1-2310270](file:///C%3A%5CUsers%5Cyounsun%5CDocuments%5C3GPP%20documents%5CRAN1%20tdocs%5CTSGR1_114b%5CDocs%5CR1-2310270.zip) Discussion on power scaling and PHR in 38.213 Huawei, HiSilicon