

**Source:** TSG RAN WG1  
**To:** TSG-RAN WG4  
**Cc:** TSG-RAN WG2  
**Title:** LS on introduction of uplink power control at power control limits  
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During 3GPP TSG RAN#10 in Bangkok, it was agreed that the proposal of improved uplink power control at power control limits contained in [1] could be introduced in release 4 physical layer specifications under the work item “RAN small technical enhancements and improvements”.

This proposal consists in changing the UE behaviour when it operates in FDD mode close to its power control limits. It has been shown in different papers that the proposed behaviour improves the link quality in the upper power control limit case and reduces intra-cell interference in the lower power control limits case.

Until 3GPP TSG RAN WG1#18 in Boston, it was acknowledged that the introduction of this feature would only impact RAN WG1 specification 25.214 i.e. the proposed behaviour would replace the UE behaviour at power control limits standardised in release 99 (section 5.1.2.6 of 25.214 ).

During RAN WG1#18, it was discussed in [3] that simply replacing the release 99 UE behaviour at power control limits by the proposal contained in [2] might have some impact on the radio resource management. Indeed this would imply that release 4 UEs will have a different behaviour at power control limits than release 99 UEs. However from a release 99 UTRAN point-of-view it would not be possible to distinguish these behaviours at power control limits. As explained in [3], a release 99 UTRAN will know that certain UEs in a given cell are not release 99 UEs but it will not know what this implies in terms of behaviour at power control limits.

As it was acknowledged that the proposed feature improves the power control behaviour at power limits, RAN WG1 has decided to agree in principle the CR contained in [2]. Before proceeding further with the changes contained in [2], RAN WG1 kindly asks RAN WG4 to consider the proposed change in UE power control behaviour at power control limits and to answer the following questions :

1. Does RAN WG4 see any possible impact on the radio resource management if the UE behaviour at power control limits is replaced by the one described in [1] since this would imply that in some cases a Release 99 RNC is not aware of the UE (beyond Release 99) behaviour in terms of power control at power limits?
2. Does RAN WG4 have some release 99 performance requirements related to UE behaviour at power control limits? Would RAN WG4 consider tightening these requirements in release 4 considering the fact that with the proposal in [2], UE link level performance are improved?

#### **References**

[1] R1-00-1447, 3GPP TSG RAN WG1#17 Stockholm, improved uplink power control at power control limits, Siemens AG

[2] R1-01-0087, 3GPP TSG RAN WG1#18 Boston, CR for power control at power control limits, Siemens AG

[3] R1-01-0115, 3GPP TSG RAN WG1#18, Boston, impact of the introduction of uplink power control at power control limits, Nortel Networks)