

# Mueller Exhibit 38

**View:** [Next in topic](#) | [Previous in topic](#)  
[Next by same author](#) | [Previous by same author](#)  
[Previous page \(August 2004\)](#) | [Back to main 3GPP\\_TSG\\_RAN\\_WG1 page](#)  
[Join or leave 3GPP\\_TSG\\_RAN\\_WG1](#)  
[Reply](#) | [Post a new message](#)  
[Search](#)  
[Log in](#)

**Options:** [Chronologically](#) | [Most recent first](#)  
[Proportional font](#) | [Non-proportional font](#)

**Date:** Thu, 12 Aug 2004 16:10:25 +0900  
**Reply-To:** Juho Lee <[\[log in to unmask\]](#)>  
**From:** Juho Lee <[\[log in to unmask\]](#)>  
**Subject:** Another set of Samsung contributions on enhanced uplink  
**Content-type:** multipart/mixed;

Dear all,

Attached please find another set of Samsung contributions on enhanced uplink.

R1-040850, EUL physical channel code mapping (AI 8.1)  
R1-040852, Selection of primary scheduling Node B in SHO (revised from R1-040691) (AI 8)  
R1-040853, System level performance with various scheduling schemes (AI 9.2)

R1-040857, System level performance with periodic TPS reporting (AI 8.5)  
R1-040858, System level performance with SHO scheduling (AI 9.2)  
R1-040859, Power control at the maximum power limit for EUL (AI 8.3)  
R1-040860, Overall RoT management strategy (AI 9.2)  
R1-040861, Autonomous transmission with TDM approach (AI 8)  
R1-040865, EUL scheduling: signalling support (AI 8.5)  
R1-040866, Error requirements of scheduling grants (AI 9.4)

See you in Prague next week.

Best Regards,  
Juho

-----  
Juho LEE, Ph. D.

Senior Engineer  
Global Standards and Research Team  
Telecommunication R&D Center  
Samsung Electronics Co., Korea  
E-mail: [\[log in to unmask\]](#)  
Tel/Fax: +82-31-279-5115/5130  
-----

.....  
[R1-040866.zip](#) [application/x-zip-compressed]

[R1-040850.zip](#) [application/x-zip-compressed]

[R1-040852.zip](#) [application/x-zip-compressed]

[R1-040853.zip](#) [application/x-zip-compressed]

[R1-040857.zip](#) [application/x-zip-compressed]

[R1-040858.zip](#) [application/x-zip-compressed]

[R1-040859.zip](#) [application/x-zip-compressed]

[R1-040860.zip](#) [application/x-zip-compressed]

[R1-040861.zip](#) [application/x-zip-compressed]

[R1-040865.zip](#) [application/x-zip-compressed]

---

Back to: [Top of message](#) | [Previous page](#) | [Main 3GPP\\_TSG\\_RAN\\_WG1 page](#)

**LIST.ETSI.ORG**





Title: Power control at the maximum power limit for E-DCH  
Source: Samsung  
Agenda Item: AI 8.3  
Document for: Discussion

---

## 1 Introduction

In previous Cannes meeting, it was agreed that the CCTrCH of E-DCH type and the CCTrCH of DCH type are mapped to different physical channels. Introduction of the additional physical channel could affect on operation in a UE side. One of the possible impacts may be power control at the maximum power limit where the total transmission power may exceed the maximum allowed power.

In this contribution, we analyze the deficiency of the transmission power and investigate the possible options to perform the power control at maximum power limit considering E-DCH.

## 2 Deficiency of the transmission power

There seems to be a couple of cases when the total transmission power would exceed the maximum allowed power after applying DPCCH power adjustments and gain factors. [1]

- **Closed loop power control:** consecutive power up commands might cause power limitation to the UE even though there is no problem in TF selection for DCH and E-DCH.
- **The TF for the retransmission would be the same as the initial transmission:** the UE would select the TF for the initial transmission considering the remaining transmission power by TF selection in MAC layer but it may not be true for the retransmission case. At retransmission timing, the UE could not have the sufficient power for the same TF as the initial transmission due to channel variation or DCH existence.
- **Minimum set of TFs for E-DCH:** if the UE supports the minimum set of TFs for E-DCH, the UE may transmit a minimum set TF even if the UE doesn't have a sufficient power to transmit.

## 3 Possible options for power control at the maximum power limit

### 3.1 Equally scaling method

The UE performs additional scaling to the total transmit power so that it is equal to the maximum allowed power in case that the total UE transmit power exceeds the maximum allowed value. The additional scaling to the total transmit power should maintain the original gain factor ratio configured by higher layer. It may be simple to the UE because the UE doesn't have to distinguish newly included channels, E-DPDCH or E-DPCCH. However, this method could raise some concerns as follows.

- Impact on DCH performance: in this method, DPDCH and E-DPDCH power would be reduced equally at the maximum power limit. But if there is no E-DPDCH, the UE may not meet the power limit situation and hence will not experience the power scaling for DPDCH. It means that DCH performance could be degraded due to E-DCH even though DCH has a higher priority than E-DCH. In case of retransmission, this problem could be worse since MAC layer could not select the E-TF for retransmission considering power margin at retransmission timing.
- Shortage of the required power at the next TTI: the UE sets the required power of DCH or E-DCH with respect to DPCCH power. If the DPCCH power was scaled down due to E-DCH at previous timing, the UE cannot obtain the power required to guarantee E-DCH performance even though the required power margin is available. This kind of problem would be severe if data rate changes very abruptly.

### 3.2 E-DPDCH only scaling method

The UE reduces only the E-DPDCH power among uplink channels if the total transmission power is larger than the maximum allowed power. If the reduced gain factor is not a reasonable value, e.g., too small, the UE could decide if it will transmit the E-DPDCH. If after E-DPDCH scaling, the total transmission power is still larger than the maximum allowed power, the UE will apply the equal scaling for remain channel like as Rel-99 power control. It is noted that even though the E-DPDCH power is reduced, E-DPCCH would be better to maintain the given power ratio in order to enable for the Node-B to decode the E-DPDCH correctly. This method can guarantee for the UE to transmit the DPDCH and DPCCH with the required power. It would be a natural way to solve the deficiency of transmission power while keeping the principle that DCH is always prioritized over E-DCH.

There seems to be two possible options for E-DPDCH only scaling method depending on the operation boundary.

- E-DPDCH only scaling per TTI: the power scaling could happen at every TTI boundary. It is applicable to solve the power deficiency problem due to retransmission or minimum set TF transmission. In this method, the UE would scale E-DPDCH power by expecting the total transmission power per TTI. It is noted that if the amount of power reduction is very large so that the actual E-DPDCH power offset is smaller than a certain threshold value, it may be beneficial that the UE doesn't transmit E-DCH since the UE could try retransmission at next retransmission timing.
- E-DPDCH only scaling per slot: power scaling could happen at every slot. Impact of the slow-wise E-DPDCH only scaling on the UE implementation is FFS.

## 4 Conclusion

We discussed some issues about power control operation at the maximum power limit. We can see the E-DPDCH only scaling method at the maximum power limit would be a better method than the equally scaling method since this kind of prioritization between data channels could guarantee the performance of DCH, which has a higher priority than E-DCH as agreed in Cannes..

Regarding the power control at the maximum power limit, we propose to adopt the following as the working assumption.

- If the UE expects that the total transmit power would exceed the power limit during a TTI interval, the UE reduces only the E-DPDCH power offset per TTI.

Feasibility of reducing only the E-DPDCH power offset per slot upon occurrence of the power shortage problem is FFS.

Based on the discussions, we propose to agree on the following text proposal for RAN1 TR 25.808 and to capture them.

----- Start of text proposal for RAN1 TR 25.808 -----

### **11 Physical Layer Procedures**

Editor's note: This chapter is supposed to capture the changes to TS25.214

If the UE expects that the total transmit power would exceed the power limit during a TTI interval, the UE reduces only the E-DPDCH power offset per TTI.

----- End of text proposal -----

### References

- [1] R1-040697, "TFC selection across E-DCH and DCH", Samsung