TSG-RAN Working Group 1 meeting #15 *TSGR1-00-1125*

Berlin, Germany, August 22nd – 25th, 2000

Agenda Item: **Plenary**

Source: **Siemens AG, Philips**

Title: **Proposal for work item on improved power control at maximum and minimum power**

Document for: **Discussion**

Work Item Description

Title

Improved power control behaviour at maximum and minimum power

Intended Output in RAN1 specification

Modification of the specification to include support of an improved scheme for power control at maximum and minimum power

TS 25.214 Physical layer procedures (FDD)

Impact on Other Technical Specifications and Technical Reports

Mainly there may be impacts on the following technical specifications:

TS 25.101 UE Radio transmission and Reception (FDD)
TS 25.331 RRC Protocol Specification

Technical Scope

In Release 1999 the behaviour of a UE operating at the power boundaries is in principle defined as follows:

- UEs are required to avoid exceeding the maximum allowed power by means of scaling the total transmit power after applying all adjustments to the DPCCH power and gain factors.

- UEs are not required to be capable of reducing their total transmit power below the minimum level described in TS 25.101. However, they may do so, provided that the power ratio between DPCCH and DPDCH remains.

Currently a rearrangement of gain factors e.g. by changing data rates is neglected in the power control algorithm during scaling applied at the UE. Therefore, to reduce especially the possibility of interference caused by UEs operating at the minimum power boundary suddenly increasing power levels, we propose to include the support of an advanced scheme for power control at minimum power. There may also be a related problem when the UE operates at maximum power, resulting from a too large decrease in power when scaling factors are changed.

The following benefits for the inclusion of support for advanced power control at maximum and minimum power can possibly be seen:

- Improvement of power control behaviour at the power limits

- Reduction of interference due to temporarily inconvenient power adjustments of UEs operating at the power limit

- Enhancement of link level performance

The expected area of required work seems to be considering mainly gain factor changes and their history during the UE operation at the power limits within the specification.

One solution already proposed in [1] includes tracing the power value without scaling and adopting the power level respectively after UE returns to the allowed output power range. Other solutions may also be feasible. Although it seems likely that only the UE specifications will need to be modified, there may possible some impact on the UTRAN, for example if new parameters need to signalled.

Impact on Other 3GPP work items

None

Schedule

Discussion of issue	08/2000
Drafting of CRs to existing specification	10/2000
Approval of CRs	11/2000 (latest)
RAN Plenary approval	RAN #10

References

[1] TSGR1#15(00)1056; Berlin, Germany; Siemens; Clarification of power control at maximum and minimum power