

TSG-RAN Working Group 1 meeting #12
Seoul, Korea
April 10 – 13, 2000

TSGR1#12(00)523

Agenda item:

Source: Ericsson

Title: CR 25.214-091: Clarification of TX diversity power setting

Document for: Decision

From the current specification it is not clear that the downlink power setting values from higher layers (TS 25.433, NBAP Specification) correspond to the total power for both antennas in case of transmit diversity.

To avoid misunderstandings, this is proposed to be clarified in the downlink power control section of TS 25.214.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.214 CR 091

Current Version: **3.2.0**

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **TSG-RAN #8**
list expected approval meeting # here ↑

for approval
for information

strategic (for SMG use only)
non-strategic

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects:
(at least one should be marked with an X)

(U)SIM ME UTRAN / Radio Core Network

Source: Ericsson

Date: 2000-04-07

Subject: Clarification of TX diversity power setting

Work item:

Category:

(only one category shall be marked with an X)

F Correction
A Corresponds to a correction in an earlier release
B Addition of feature
C Functional modification of feature
D Editorial modification

Release: Phase 2
Release 96
Release 97
Release 98
Release 99
Release 00

Reason for change:

Clarify that power setting corresponds to the total power for two antennas in case of transmit diversity.

Clauses affected: 5.2.1.1

Other specs affected:

Other 3G core specifications → List of CRs:
Other GSM core specifications → List of CRs:
MS test specifications → List of CRs:
BSS test specifications → List of CRs:
O&M specifications → List of CRs:

Other comments:

5.2 Downlink power control

The transmit power of the downlink channels is determined by the network. In general the ratio of the transmit power between different downlink channels is not specified and may change with time. However, regulations exist as described in the following subclauses.

5.2.1 DPCCH/DPDCH

5.2.1.1 General

The downlink transmit power control procedure controls simultaneously the power of a DPCCH and its corresponding DPDCHs. The power control loop adjusts the power of the DPCCH and DPDCHs with the same amount, i.e. the relative power difference between the DPCCH and DPDCHs is not changed.

The relative transmit power offset between DPCCH fields and DPDCHs is determined by the network. The TFCI, TPC and pilot fields of the DPCCH are offset relative to the DPDCHs power by PO1, PO2 and PO3 dB respectively. The power offsets may vary in time. Power setting shall be interpreted as setting of the total power from the two antennas in case of transmit diversity.

5.2.1.2 Ordinary transmit power control

The UE shall generate TPC commands to control the network transmit power and send them in the TPC field of the uplink DPCCH. An example on how to derive the TPC commands is given in Annex B.2.

When the UE is not in soft handover the TPC command generated is transmitted in the first available TPC field in the uplink DPCCH.

When the UE is in soft handover it should check the downlink power control mode (DPC_MODE) before generating the TPC command:

- if DPC_MODE = 0 : the UE sends a unique TPC command in each slot and the TPC command generated is transmitted in the first available TPC field in the uplink DPCCH;
- if DPC_MODE = 1 : the UE repeats the same TPC command over 3 slots and the new TPC command is transmitted such that there is a new command at the beginning of the frame.

The DPC_MODE parameter is a UE specific parameter controlled by the UTRAN.

As a response to the received TPC commands, UTRAN may adjust the downlink DPCCH/DPDCH power. The average power of transmitted DPDCH symbols over one timeslot shall not exceed Maximum_DL_Power(dBm), nor shall it be below Minimum_DL_Power (dBm). Transmitted DPDCH symbol means here a complex QPSK symbol before spreading which does not contain DTX. Maximum_DL_Power and Minimum_DL_Power are power limits for one spreading code.

Changes of power shall be a multiple of the minimum step size $\Delta_{\text{TPC,min}}$ dB. It is mandatory for UTRAN to support $\Delta_{\text{TPC,min}}$ of 1 dB, while support of 0.5 dB is optional.

UTRAN may further employ following method. If the value of *Limited Power Raise Used* parameter is 'Used', UTRAN shall not increase the DL power of the RL if it would exceed by more than *Power_Raise_Limit* dB the averaged DL power used in the last *DL_Power_Averaging_Window_Size* timeslots of the same RL. This shall only be applied after the first *DL_Power_Averaging_Window_Size* timeslots after the activation of this method.

Power_Raise_Limit and *DL_Power_Averaging_Window_Size* are parameters configured in the UTRAN.

When TPC commands cannot be generated in the UE due to downlink out-of-synchronisation, the TPC command transmitted shall be set as "1" during the period of out-of-synchronisation.