TSG-RAN Working Group 1(Radio) meeting #8 ***TSGR1#7(99)e60***
New York, USA, 12-15 Oct., 1999

Agenda Item: **Ad Hoc 1**

Source: **Panasonic**

Title: **OL-TPC scheme in case of adoption of transmit diversity to BCH in TDD mode.**

Document for: **Decision**

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1. Introduction

Transmit diversity scheme for Broadcast Channel in TDD mode [1][2] was discussed in WG1#7 meeting, and it is still on going.

In document [3], we proposed open loop power control scheme in case that some kind of transmit diversity is introducing to PCCPCH. In Ad Hoc 1 meeting at Hanover, a concern was raised about an adoption of beamforming to PCCPCH.

But when an UE communicates via DCH, an UE already knows what kind of transmit diversity (no transmit diversity, transmit diversity, beamforming) is applied to PCCPCH. In case of application of transmit diversity to PCCPCH, an UE can combine received signal strength from several transmit antennas of an UTRAN access point to avoid excess interference of OL-TPC.

2. Text Proposal to TS25.224 V2.1.0

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4.2.2.2 Dedicated Physical Channel

The initial transmission power is decided in a similar manner as PRACH. After the synchronisation between UTRAN and UE is established, the UE transits into open-loop transmitter power control (TPC).

The transmitter power of UE shall be calculated by the following equation:

$$P_{UE} = \alpha L_{PCCPCH} + (1-\alpha)L_0 + I_{BTS} + SIR_{TARGET} + \text{Constant value}$$

where

P_{UE} :	Transmitter power level in dBm,
L_{PCCPCH}:	Measure representing path loss in dB (reference transmit power is broadcast on BCH).
L_0:	Long term average of path loss in dB
I_{BTS}:	Interference signal power level at cell's receiver in dBm, which is broadcast on BCH
α:	α is a weighting parameter which represents the quality of path loss measurements. α may be a function of the time delay between the uplink time slot and the most recent down link PCCPCH time slot. α is calculated at the UE. An example for calculating α as a function of the time delay is given in Annex 1.
SIR_{TARGET}:	Target SNR in dB. A higher layer outer loop adjusts the target SIR.
Constant value:	This value shall be set by higher Layer (operator matter).

without tx-div	P_{UE}, L_{PCCPCH} and L_0 can be calculated from the received signal strength transmitted from an antenna of UTRAN access poin
beamforming	P_{UE}, L_{PCCPCH} and L_0 can be calculated from the received signal strength transmitted from an antenna of UTRAN access point
with tx-div	P_{UE}, L_{PCCPCH} and L_0 can be calculated after confining the received signal strength transmitted from diversity antennas of UTRAN access point

------ end of text proposal -----

3. References

[1] Motorola, "Transmit diversity schemes for Broadcast channels of TDD mode", TSGR1#7(99)c08, Hannover, Germany, Aug. 30-Sep. 3, 1999.

[2] Texas Instruments, TSGR1#7(99)b45, Hannover, Germany, Aug. 30-Sep. 3, 1999.

[3] Panasonic, "Performance Analysis on OL-TPC based on parallel transmitted Midamble", TSGR1#7(99)c19, Hannover, Germany, Aug. 30-Sep. 3, 1999.