

TSG-RANWG1#7

TSGR1#7(99)c00

August 30th –September 3rd

Hanover(Germany)

Agenda item:

Source : NEC

Title: Text modification for slow transmit power control in 25.211, 25.212 and 25.214

Document for: Approval

Introduction

Text modification for slow transmit power control is proposed for clarification and good consistency among 25.211, 25.212, and 25.214.

In 25.211, it is clarified that TPC bits can be used for carrying power control ratio.

In 25.212, coding of power control ratio is described.

In 25.214, the following points are clarified:

- Slow transmit power control is not used in soft handover mode.
- The E_c/I_o measured for handover preparation is utilized.
- DPCCH that includes two TPC bits per slot is used.
- Uplink transmit power control in slow transmit power control mode is the same as the ordinary transmit power control.
- When uplink transmission is suspended, TPC commands in the downlink are not used, and are dummy.
- When uplink transmission is resumed, dummy slots are transmitted prior to a frame that includes real data. In the dummy slots, TPC commands are dummy.

Text proposal in 25.211

5.2 Uplink physical channels

5.2.1 Dedicated uplink physical channels

The relationship between the TPC bit pattern and transmitter power control command is presented in Table 5.

In slow transmit power control, the relationship presented in Table 5 is not valid, and TPC bits are used to carry power control ratio (PCR) as described in 4.3.4 of TS 25.212 and in 5.2.3.3 of TS 25.214.

Table 5: TPC Bit Pattern

TPC Bit Pattern		Transmitter power control command
$N_{\text{TPC}} = 1$	$N_{\text{TPC}} = 2$	
1	11	1
0	00	0

Text proposal in 25.212

4.3 Coding for layer 1 control

4.3.4 Coding and Interleaving of power control ratio (PCR) for slow transmit power control

When slow transmit power control is used, there are two (encoded) TPC bits in every slot of the radio frame. One PCR is sent in a radio frame, i.e. 30 TPC bits are used. The PCR is firstly encoded using biorthogonal (32, 6) code. The mapping of PCR to the biorthogonal code words, $C_{32,m}$ and $\overline{C_{32,m}}$, is defined in TS 25.214.

The biorthogonal code words are generated in the same way as OVSF codes of level 32 defined in document TS 25.213. The biorthogonal code words are secondly encoded into PCR code words of 30 bits by puncturing the two least significant bits. Channel interleaving is not applied for the encoded bits, and the bits of the PCR code words are directly mapped to the slots of radio frames so that more significant bit is transmitted before the less significant bit within a radio frame.

Text proposal in 25.214

5.2.3.3 Slow transmit power control

Following an order from the network and acknowledgement by the UE, ordinary fast closed-loop transmit power control can be stopped and a slow transmit power control mode can be entered when the UE is not in soft handover. In this mode, downlink DPCCH/DPDCH transmit power is determined utilising power control ratios (PCR) reported from the UE. Uplink transmission is suspended when the

UE does not have any information to send, and the transmission is resumed to send ~~a power control ratio PCR~~ at least once in every T_{RINT} second. ~~The UE calculates power control ratios PCR in the following steps:~~

1. The UE measures ~~the Ec/Io of the CPICH power of received from~~ the cell in which the UE is located, and sets the value to Q_1 .
2. The UE measures ~~the Ec/Io of the CPICH powers received from neighbouring cells the cells belonging to the handover monitoring set~~, and sets the values greater than Q_1/R_{SEARCH} to Q_i , where $i = 2, 3, \dots, n$.
3. The UE sets the ~~power control ratio PCR~~ to $(Q_1 + Q_2 + \dots + Q_n)/Q_1$.

All TPC bits in the uplink DPCCH are used to send ~~power control ratios PCR. DPCCH that includes two TPC bits per slot is used. One power control ratio PCR is sent per frame, i.e. 30 TPC bits are used used to carry the power control ratio. The coding method is the same as that of default TFCI word described in 4.3.1.1. There are 64 code words. Biorthogonal code words, $C_{32,m}$ and $\overline{C_{32,m}}$, are used as defined in 4.3.4 of TS 25.212.~~ Code word $C_{32,m}$ corresponds to $0.5(m-1)$ dB and code word $\overline{C_{32,m}}$ corresponds to $\{0.5(m-1)+0.25\}$ dB where $m = 1, 2, \dots, 32$.

Following an order from the network, the slow transmit power control is stopped and ordinary fast closed-loop transmit power control is started. The parameters T_{RINT} and R_{SEARCH} are set using higher layer signaling.

~~While uplink transmission is suspended, the TPC commands in downlink DPCCH are all dummy, and are "1". When uplink transmission is resumed, the UE transmits dummy slots composed of only DPCCH prior to a radio frame composed of DPCCH and DPDCH. The number of the dummy slots is N_{DS} . The TPC commands in the dummy slots are dummy, and are all "1". When the UE transmits dummy slots, ordinary transmit power control described in 5.1.2.2 is started in uplink transmission.~~