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1. Introduction

In this document we suggest possible solutions to handle abnormal situations for CPCH. Especially the proposal can be effectively used for emergency stop [1]. Node B can use this method to relieve overload condition by either off-loading some of the capacity or uniformly reducing the data rate of all UEs. This tool can also be used to manage short-time CPCH capacity and interference variation at the base node level.

2. Discussion

In current CPCH, in order for Node B to handle temporary capacity overloads, Node B can implement an emergency stop [1]. This mechanism is that if Node B disconnects DPCCH on the DL associated with CPCH, then UE PHY detects loss of the DPCCH on the DL and aborts CPCH transmission on the UL.

According to the example in TS 25.214, when an UE cannot get any reliable TPC command, the UE raises the UL power. In this case, until an UE detects the loss of DPCCH on the DL, the UE raises the UL power continuously, which produce interference. As we think, to solve this problem, another different emergency stop scheme should be used or another power control scheme might be needed. Possible schemes are as follows:

- To transmit specific bit pattern on DL DPDCH when emergency stop is needed.
- To transmit specific bits pattern on pilot field of DL DPCCH when emergency stop is needed. One example is to invert the pilot bits.
- To transmit emergency stop command on TFCI field of DL DPCCH
- To transmit TPC of down command with above methods.

First two methods transmit emergency stop command slot by slot. On the other hand, the method that uses TFCI field on DL-DPCCH transmits emergency stop command frame by frame. Emergency stop should be done with reasonable delay and little interference. And the reliability of emergency stop command should be high. Above three methods can be used without significant impacts on complexity or delay.

We prefer the method with little impact on current specification. It is the method that Node B transmits emergency stop command through TFCI field on DL-DPCCH. This method has the following advantages:

- Related useful information (e.g. the cause of emergency stop) can be transmitted to UE through TFCI field.
- There is no significant change in the current scheme.

In the case that TFCI field on DL-DPCCH is used for emergency stop, in addition to handle temporary capacity overloads at a cell, we can consider other purposes for Node B to make UE to stop CPCH transmission on the UL. For example, if Node B detects abnormal operation of an UE transmitting CPCH

(e.g. power control error, CRC error, …etc.), Node B can give STOP command to the UE through TFCI on DL-DPCCH in order to minimize interference produced by the UE. Besides, Node B can issue the cause of stopping the CPCH to UE and make the UE operating some subsequent functions according to the cause. In that sense, the method that uses TFCI field on DL-DPCCH is preferable.

3. Recommendation

As we mentioned before, it is useful to use TFCI field on DL-DPCCH associated with CPCH in order for Node B to handle abnormal situations. Consequently, we recommend the DPCCH on the DL to include TFCI field for UL-CPCH.

Reference
[1] GBT, "CPCH Access Procedures", R2-99F44