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Title: On UE Outer-loop PC behaviour with different transport formats
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Document for: Discussion

1 Introduction

In RAN4 #34, outer-loop TPC behaviour in 0 bit transport block (TB) reception was discussed [1]. Based on the discussion paper RAN4 identified that a straightforward implementation for outer-loop TPC in 0 bit TB reception (Method A in [1]) may lead to poor DCCH performance mapped to the associated DPCH in HSDPA as indicated in an LS [2]

In method A UE controls the target SIR based on the same quality target for both DCCH and 0 bit TB. In method B UE controls the target SIR based on the quality target, which is signalled through higher layers, in DCCH case, and based on approximately 1/10 of the quality target in 0 bit TB case. Method B is based on the idea that UE should adjust the target SIR for the downlink power control to meet the quality target received in the IE “DCH quality target” for all transport formats in the downlink TFS for a DCH.

It was felt by RAN4 that the correct UE behaviour follows the method B and therefore RAN4 sent an LS to RAN1 and RAN2 to get a confirmation for its understanding [2].

Discussion of this issue took place in the RAN1#40bis and RAN1#41 meetings. From RAN1’s understanding, the UE behaviour of method A in [1] (“straightforward implementation”) is the correct UE behaviour [3]. So the RAN1 conclusion was different than in RAN4.

Based on RAN1 decision CR (2606) to RAN2 specification is being proposed [4].

2 Discussion

In the RAN1 discussions only the use case, where DCCH is sent on associated DPCH channel together with HSDPA channel, was considered. Thereby also a solution to overcome undesired behaviour was only considered in the mentioned use case.

RAN1 did not analyse possible solutions with other use cases such as conversational speech and AMR but nevertheless the CR proposed in RP-050346 applies to all possible services where there are several transport formats per one transport channel.

It is unclear whether the solution in RP-050346 is also appropriate for other services like conversational speech and AMR in terms of capacity and quality. We would not like the outer-loop power control behaviour to be changed again due to limited analyses. We would like RAN to evaluate whether analyses on this area are good enough to conclude the solution in RP-050346 or whether further analyses in RAN1 are still needed.

From our point of view rejecting in the TSG RAN 1 the proposal which RAN4 stated “The UE behaviour of method B in R4-050118, where UE aims to fulfil the quality target on all transport formats ensures required link quality on transport format with DCCH data.” And taking method in use which was commented by RAN4 as “RAN4 identified that a straightforward implementation for outer-loop TPC in 0 bit TB reception (Method A in R4-050118) may lead to poor DCCH performance mapped to the associated DPCH in HSDPA”. If this has also the same impact for other services (as mentioned, not analysed) then UTRAN downlink capacity will be reduced for DCH operation.

Relative complexity between the proposals is seen a very minor issue, especially if we can then ensure good DL performance.

3 Conclusions

It is proposed that this issue is further considered in TSG RAN WG1 and WG4 so that we ensure good DL performance is reached not only with DCCH but also with other services as well and possible change in this direction is introduced only once we can see the impact to other services as well. Practically issues could be addressed in connection with the next co-located WGs meeting in August.

4 References

- [1] R4-050118 Outer loop TPC behaviour in 0-bit transport block reception for A-DPCH. NTT DoCoMo
- [2] R4-050267 RAN4 LS on Outer loop TPC behaviour in 0-bit transport block reception for A-DPCH.
- [3] R1-050563 RAN1 Reply LS on Outer loop TPC behaviour in 0-bit transport block reception for A-DPCH.
- [4] RP-050346 UE behaviour for DCH SIR target setting for Downlink power control, CR, TS 25.331 v5.12.0.