TSG-RAN Working Group 4 (Radio) meeting #5 *TSGW4#5(99)263*

Miami, Florida, 14 - 16 June 1999

TSG-RAN Working Group1 meeting #5 *TSGR1#5(99)774*

***Cheju (Korea),* June 1st – 4th 1999**

Agenda Item	:	
Source	:	3GPP RAN WG1
Title	:	Liaison statement to WG4 on power control minimum step sizes
To	:	3GPP RAN WG4
Document for	:	Approval

3GPP RAN WG1 would like to thank 3GPP RAN WG4 for their liaison statement received at our 4th meeting (April 18th – 20th), R4-99162 *LS to WG1 on clarification on PC step sizes in the closed loop power control*. Due to lack of available data, WG1 had unfortunately not been able to answer the questions from WG4 related to the benefit of using power control step sizes smaller than 1dB, considering link level performance and the impact of some imperfection. At its fourth meeting WG1 had not made further progress on the minimum power control step sizes. At its fifth meeting, discussion took place and the WG1 would like to communicate the following to 3GPP RAN WG4.

WG1 reviewed some contributions looking into the benefit of smaller step sizes than 1 dB, where such step is a "true" step meaning that the change of power between consecutive slots can be equal to that step or is an emulated one. A example of emulated step means that the average power change over a multiple number of slots corresponds to such a step. In practice it means that the UE can concatenate several TPC commands, where a TPC command is known to correspond to a small step. However the change between consecutive slots equals only the supported minimum power control step size.

Based on those contributions, 3GPP RAN WG1 recognises the possible benefit with small steps whether "true" one or "emulated" ones in some particular environments, in particular at high speed and very low speed. Based on these contributions 3GPP RANWG1 made the following conclusion.

Regarding the minimum PC step size for the UE

1) 1dB minimum power control step size is mandatory
2) some form of small step sizes below 1dB are either optional or mandatory in the way as defined below :
   a) it is still to be decided how such step sizes should be supported, whether these would be "true" small step sizes and/ or some emulated ones
   b) if a good emulation algorithm was to be found then
      i) this should be used as an example from which minimum performance requirements would be derived but flexibility of implementation should be left to the UE manufacturer.
      ii) there is no conclusion yet on whether such emulation functionality would be mandatory or optional
   c) if we were to go for true small steps, then these should be optional

Regarding the minimum power control step size for the BTS

1) 1dB minimum power control step size is mandatory and 0.5 dB should be optional.

3GPP RAN WG1 is continuing its work on the evaluation of emulated steps and true steps considering imperfection and will keep the 3GPP RAN WG4 informed of its progress. 3GPP RAN WG1 would like also to get indication from WG4 on how they intend to test the power control performance.