TSG-RAN Working Group 1 meeting #7bis **TSGR1#7bis(99)f08**

Kyongju(Korea), Oct 4th- Oct 6th 99

Agenda Item : ad-hoc 9 physical meeting

Source : ad-hoc 9 Chairman[1]

Title : Report on ad-hoc 9 activities between WG1#7 and WG1#7bis

Document for : Approval

---

1. Introduction

This document reports on the discussions that have taken place on the RAN WG1 reflector in the framework of ad-hoc 9 (Closed loop power control for FDD) between 3GPP RAN WG1#7 and 3GPP RAN WG1#7bis meeting.

The discussion on the reflector dealt with the following topics :

1) Downlink power control in soft handover : Downlink power control rate reduction vs. Adjustment loop
2) Clean up of SSDT specification
3) Slow power control
4) Open loop power control

2. Summary of the discussions

2.1 Setting of gain factor

Ericsson submitted a contribution (R1-99e85) . NEC indicated support with some request for modifications.

2.2 Downlink power control in soft handover

A lot of discussion took place on this area. NEC introduce a new proposal “the adjustment loop”. This proposal is presented as an alternative to the downlink power control rate reduction that was agreed as a working assumption at the last meeting. However it appears that this proposal is effectively proposed as a replacement of the power resynchronisation + Dl PC rate reduction. The power resynchronisation is already included in the WG3 NBAP specification, by the support of PREF update after the soft handover and the reporting of the Tx power and quality indicators by the Node B to the RNC.

NEC introduces this proposal in order to 1) Avoid signalling over the Iub interface 2) To avoid problem if there are delays in the signalling from RNC to Node B leading to different time of application of the Pref. It appears also that the scheme could avoid problem for the dl inner loop power control when the change of Pref is high. Additionally NEC was concerned on the impact of the DL PC rate reduction, when there is shadowing. The position of NEC was to have the Dl PC rate reduction optional at the UE rather than mandatory.

Nokia expressed concerns about having a feature optional at the UE and indicated that the PC rate reduction was not a complicated task so was wiling to keep it as mandatory. Mitsubishi indicated support to the technical proposal from NEC. They are ready to remove the Dl CP rate reduction, but said it would not harm to keep it either.

---

[1] Evelyne Le Strat, Nortel Networks

Nortel Networks clarified that the proposal from Norte is not a resync proposal. It was evaluated considering that higher layers use a resync scheme, as currently allowed from the WG3 specs. The DL PC rate reduction reduces TPC errors and as such reduce the amount of signalling on the Iub interface. The scheme from NEC can well be combined with a Dl PC rate reduction. Nortel Networks also analysed the proposal from NEC and questioned the consistency of the algorithm with limited power control steps. Finally Nortel Networks questioned the validity of NEC simulation assumptions, in terms of TPC error rate, number of fingers in the Rake receiver.

Alcatel and NEC clarified what the adjustment loop algorithm may look like when considering limitations on the PC steps. Alcatel indicated that they had performed simulations showing that the adjustment loop outperform the resync scheme. However the results were not made available by Alcatel. It appears hence that no result is available for the suggested algorithm. Alcatel expressed the views that the power balancing scheme whether resync scheme or adjustment loop require some standardisation.

2.3 Slow power control

2.3.1. Slow power control and SSDT

It was asked by Ericsson how the slow power control worked with soft handover, in particular whether the UE needed to know the CPICH TX powers of the cells considered in the Slow TPC or whether there was an assumption that all powers were the same.

An answer was provided by NEC on this. NEC clarififed that it is assumed is that the portion of of CPICH TX power in the total TX power is almost the same for all cells. This means that interference power from a cell is proportional to the CPICH power as in the case where CPICH powers are the same for all cells.

2.3.2. Slow power control in general

Ericsson and Nortel Networks asked for some clarification on the slow power control. Nortel Networks expressed a number of concerns on the efficiency of the scheme and impact on downlink and uplink power control and optional support of the feature in both UE and UTRAN. Finally Nortel networks suggested to move slow power control to Release99. This view was supported by Samsung and Ericsson.

2.4 Open loop power control

Ericsson proposed to move the responsibility of the open loop to WG2. The transmit power for the first preamble transmission would hence be passed from higher layers to the physical layer.

2.5 SSDT spec clean up

Ericsson initiated the discussion on the need to clean up the section of 25.214 dealing with SSDT. Some modification is needed since some aspects such as the selection of the primary cell are in the scope of WG2. Ericsson also indicated that there should be some consistency in all sections of the power control specification in terms of level of specification. For the SSDT the text effectively specifies the behaviour of the network whereas for other parts of the specification the behaviour of the network in response to UE's command is described as an example.

Philips supported this views although they agreed that the UE may benefit from some restrictions imposed on the network behaviour such as the maximum power difference. Philips recommended to move section "5.2.3.5.7.1 Management of multiple transmission power levels" and section 5.2.3.5.7.2 Power setting of the downlink Dedicated Physical Channel to an informative annex.

NEC answered the questions/concerns as follows :

- The selection of the primary cell is done by the physical layer based on measurements of the CPICH
- In terms of responsibility of the network, NEC clarified that SSDT is not only about the setting of power

but about deciding each cell transmits. The power of the primary cell is controlled in the normal manner.

- Some alignment of the measurements used for SSDT and other tasks such as cell selection/reselection may be needed.
- NEC would like to postpone the clean up until RAN WG1#8

Ericsson further indicated that they would like to see as much cleaning as possible at WG1#7bis since the specifications will be under change control after the RAN plenary in October. Ericsson further detailed the inconsistency between WG1 and WG2 specification on SSDT.

3. List of contributions for the WG1#7 ad-hoc 9 physical meeting

3.1 Liaisons from other groups

- R2-99d17, LS on Slow TPC
- R2-99d14, LS on Outer loop power control

3.2 DPCC/DPDCH power difference

- R1-99e85, Setting of uplink DPCCH and DPDCH power difference, Ericsson

3.3 Uplink Power control in normal mode

1) Uplink power control not in SHO

- R1-99e54, Text Proposal of Uplink Power Control with 0dB Command, Panasonic
- R1-99xxx, power control overshooting, Nortel Networks

2) Uplink power control not in SHO

- R1-99c27, On the Reliability of the Emulated Small Step Size During Soft Handover, Nortel Network
- R1-99c47 Emulated Small Step Size during Soft Handover, Nortel Networks
- R1-99d65, Text proposal for power control in soft handover, Philips, Nortel Networks
- R1-99e72 ???
- R1-99e73, Algorithm 2 power control in soft handover, Philips
- R1--99f03, Modified text for power control in soft handover, Philips

3.4 On power control in compressed mode

- R1-99c24, Comparison between algorithms with fixed and adaptive recovery period for fast power control in compressed mode, Alcatel
- R1-99c25, Initial Transmit Power Level after Transmission Gap in Compressed Mode
- R1-99e74, Proposal for initial transmit power level after transmission gap in compressed mode, Philips
- R1-99e75, Proposal for power control in compressed mode, Philips
- R1-99c58, Simulation results for compressed mode impacts on non compressed mode voice terminal, Mitsubishi
- R1-99e55, Pre-Wake up Power Control (PWPC) for Compressed Mode, Panasonic

- R1-99e56, Text Proposal of Pre-Wake up Power Control (PWPC) for Compressed Mode

3.5 Downlink Power control in soft handover (no SSDT case)

- R1-99e69, adjustment Loop in downlink power control during soft handover, NEC
- R1-99f10, Downlink power control in soft handover, summary of issues and way forward, Nortel networks

3.6 On open loop power control

- R1-99c14 RACH open loop power control, Ericsson
- R1-99e57, Open loop power control, Ericsson
- R1-99xxx, Open loop power control, Nortel Networks

3.7 Slow power control

- R1-99c00, Text modification for slow transmit power control in 25.211, 25.212 and 25.214, NEC
- R1-99c01, Benefits of slow transmit power control, NEC
- R1-99c16, A New Power Control Ratio Measurement for Slow Transmit Power Control
- R1-99f09, On Slow Power control, Nortel Networks