Source:　　　Ad hoc #16 chair

Title:　　　Ad hoc #16 report

1　　Introduction

This is the report of the RAN WG1 ad hoc #16, "Measurements", meeting on the evening of Tuesday, September 1, 1999. All the papers identified to within the scope of the ad hoc were treated.

2　　Contributions discussed

2.1　　TDD measurements

(99)a79　　Physical layer measurements in UTRA TDD mode (Siemens)
This contribution deals with definitions of measurements in the TDD mode. The paper was not presented, since it had already been discussed and endorsed in ad hoc #1.

2.2　　FDD measurements

(99)b22　　Required UTRAN measurements in UTRA/FDD (Ericsson)
The contribution proposes a number of measurements to be performed by UTRAN. The proposed measurements are RSSI, SIR, total transmitted power, and transmitted code power.

It was clarified that a reference point is specified, not a measurement point, i.e. UTRAN may derive the measurement value for the reference point in any way it wants as long as the accuracy requirements are fulfilled. It is understood that all accuracy requirements are given at the specified reference point. A lengthy debate followed on the topic of reference points. The problem seemed to be that R2 has specified an accuracy for the measurements, without an exact definition of the measurement and the reference point. It was stated that the accuracy that can be obtained is depending on if the reported value is a real measurement or a derived value. After some discussion it was agreed that the ad hoc should not consider the accuracy requirements listed by R2, but instead concentrating on defining the measurements, including a reference point. A liaison R1-99a60 was sent to R4 already at WG1#6 to check all accuracies defined in TS 25.302 by R2.

The ad hoc recommends that the text proposal is accepted with the clarification that the SIR measurement should be done after radio link combination in Node B

(99)b23　　Required UE measurements in UTRA/FDD (Ericsson)
The contribution proposes a number of measurements to be performed by UTRAN. The proposed measurements are RSCP, SIR, RSSI, and Ec/No.

In the text proposal it was proposed to mention SIR measurements on the CPICH with the note that those had not yet been agreed by R1. This was not accepted by all parties, instead it was proposed that no mentioning of this measurement should be done in the R1 documentation. A very long debate followed. Some companies thought that the measurement would add complexity in the terminal, while others expressed the view that it would not affect the complexity. It was also further discussed if the measurement would have any added value over measuring SIR only on the dedicated channels. Also here the views differed. In the light of the discussion no conclusion could be made on the SIR measurement on the CPICH, and hence the measurement should not be included in the specification.

It was agreed that a liaison statement should be sent to R2 informing them of the situation in R1. Further, it was clear that it would ease the discussion if there was some written contributions on the complexity issue and the need for the measurement. Discussion via email was encouraged.

The ad hoc recommends that the text proposal is accepted after removing the SIR measurement on CPICH.

(99)b24　Additional required measurements in UTRA/FDD (Ericsson)

The contribution proposes some additional measurements to be performed. The proposed measurements are transport channel BLER (UE & UTRAN), physical channel BER (UE & UTRAN), UE TX power (UE).

It was clarified that the BER measurement is based on the data, and hence would not deliver any useful indication of the link quality when the link is in DTX and no data is transmitted.

Some concerns on the complexity of generating BER estimates were raised. It was stated that the measurement should only be implemented if the accuracy requirement could be reached with reasonable complexity.

To clarify this with R4, a liaison will be written to indicate to WG4 that the complexity of the BER measurement and the UE TX power measurement should be taken into account when defining the required accuracy.

The ad hoc recommends that the text proposal is accepted after the following modifications:

- The note in section 8.1.8 should be deleted

- UTRAN transport channel BLER and physical channel BER should be measured after radio link combining in Node B

- The physical channel BER definition should read " The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding of the data."

(99)b25　Path delay measurement (Ericsson)

The contribution proposes two additional measurements to support roundtrip delay estimation. The UE shall be able to measure the difference between its TX and RX timing, and the same applies for UTRAN.

There was some discussion about the definition of "first significant path received", and it was concluded that this would need some further elaboration. It was further commented that the averaging time for the path delay profile was very implementation dependent.

Further, the relation to the corresponding measurement defined by R2 (TOA) was discussed. It was clear that at the moment the measurement are not fully aligned, and that this would require further consideration.

Finally, the measurement unit and range of the reported values were questioned. It was agreed to discuss these further.

The ad hoc recommends that the text proposal is accepted after some modification according to the comments. After modification, sections 8.1.6 and 8.2.6 should read as follows:

8.1.6 UE RxTx timing

Definition	The difference in time between the UE uplink DPCCH/DPDCH frame transmission and the first significant path, of the downlink DPCH frame from the measured radio link. Measurement shall be made for each cell included in the active set. Note: The definition of "first significant path" needs further elaboration.
Purpose	Estimation of the path delay and the distance between and UTRAN access point and the UE.
Filtering	TBD.
Range/mapping	Always positive.

Physical channel(s) where the measurement shall be possible.	Idle mode/Connected mode (I/C)

	Intra-frequency	Inter-frequency
DPCH.	C	N.A.

8.2.6 Round Trip Delay (RTD)

Note: The relation between this measurement and the TOA measurement defined by WG2 needs clarification.

Definition	Round Trip Delay (RTD), is defined as $$RTD = T_{RX} - T_{TX}, \text{ where}$$ T_{TX} = The time of transmission of the beginning of a downlink DPCH frame to a UE. T_{RX} = The time of reception of the beginning (the first significant path) of the corresponding uplink DPCCH/DPDCH frame from the UE. Note: The definition of "first significant path" needs further elaboration.
Purpose	Estimation of the path delay and the distance between a UTRAN access point and the UE.
Filtering	TBD.
Range/mapping	TBD.

Physical channel(s) where the measurement shall be possible
DPCH for each RL transmitted from an UTRAN access point and DPDCH/DPCCH for each RL received in an UTRAN access point.

2.3   Structure and contents of measurement specification

(99)b26   Proposal for new measurement specification (Ericsson)
The contribution proposes to split the measurement specification 25.231 into one FDD and one TDD specification, and contains a new proposed document structure.

(99)c97   Proposal for restructuring the TDD parts of the measurement specification (Siemens)
The contribution propose a document structure for measurements relevant for TDD. The structure is very similar to the structure proposed for FDD in (99)b26.

Following the presentation of the two documents a discussion took place on the how the measurements would be specified in R1.

It was commented that filtering should not be specified by R1. The relation to reporting periods and the accuracy of those measurements was discussed. It was concluded to not include filtering in the L1 specification at the moment. However, it would be beneficial to continue the discussion on this issue via email.

It was clarified that there will be some duplication of information between the FDD and TDD specifications. It was further clarified that all measurements done in xDD connected mode are specified in the xDD specification. It was further clarified that measurements done in idle mode on xDD cells are documented in the xDD specification.

After some discussion, it was decided that:

- Two new specification documents should be generated.

- The scope of the specifications will follow the structure in (99)c97, with the exception that filtering is left out and that derived measurements like SIR are included.

- Before the end of this meeting, the new specifications should be progressed as much as possible, including creating a document with the correct structure, copy existing information to be kept from 25.231, and including text proposals agreed for 25.231.

- The goal for this meeting is to get some first versions of the new specifications approved by R1, and then improve and approve the documents using the email reflector in time for the next TSG RAN meeting.

2.4   Other measurement related contributions

(99)b57   Downlink interference measurement method using reserved code (Siemens)
The contribution describes an idea to use a reserved empty channelisation code to assist the UE in estimating cross-talk due to imperfect sampling times.

There was initial support for the proposal, and it was agreed that this is an area interesting to study further.

The group could not come to any conclusion on the questions if the code should be fixed or cell-specific and if the UE could rely on the existence of this empty code.

The contribution was noted, and it was agreed to recommend the inclusion of this study item into the technical report listing R1's study items.

3   Conclusion

Ad hoc #16 recommends the R1 plenary to accept the text proposals endorsed by the ad hoc. The text proposals are found in documents (99)b22, (99)b23, (99)b24, and (99)b25. Further, ad hoc #16 recommends R1 to adopt the proposed way forward on the measurement specifications. The new structure is based on the text in documents (99)b26 and (99)c97.