

**Agenda Item:**

**Source:** AH01 secretary

**Title:** Report AH01 meeting (30 September - 01 October 1999) – Rev. 2.0

**Document for:** Approval

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## **1 Introduction**

The AH01-DL chairman<sup>1</sup> opens the meeting on Thursday 30 September 1999, 13.10. The RAN WG4 chairman, Howard Benn, is not able to participate.

## **2 Approval of the agenda**

The chairman informs the meeting that Tdoc R4-99577 will be used as agenda for this AH01 meeting, which was agreed. The chairman also requests volunteers for secretary. Temporary secretary for this meeting is David Sandberg, Ericsson.

## **3 Link level simulations –Results and assumptions**

### **3.1 AdHoc01-Downlink (AH01-DL)**

Based on TS 25.101 v2.3.0

Tdocs: 578, 581, 584, 579, 582, 583

### **Simulation results**

#### **Tdoc R4-99578: Simulation Results for DL performance requirements**

Ericsson presents the document. The differences compared to earlier results presented by Nokia are less than 0.5 dB in all cases.

Nokia asked about puncturing of systematic tail bits and multiplexing of punctured bit streams for 144 kbps measurement channel. It is concluded that discussions on these topics are ongoing on the WG1 reflector, but no conclusions are found yet.

#### **Tdoc R4-99581: Simulation results for UE performance requirements**

NTT-DoCoMo presents the document. The results are almost the same as for Nokia. NTT-DoCoMo comments that the puncturing for the higher data rates is according to current status in WG1.

#### **Tdoc R4-99584: Simulation results for UE performance tests**

Nokia presents the document. It is questioned how the results match results from other companies. Some time will be given to compare the results.

Vodafone asks if anybody is going to present results for compressed mode. Nokia commented that we should first define the simulations case, then do the simulations. If we should have a test we need a proposal for a case.

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## Specification of performance requirements

### **Tdoc R4-99579: Proposal for the specification of performance requirements**

Ericsson presents the document. It contains 2 proposals: proposal for selection of BLER targets and editorial changes to the requirements in chapter 8 of TS 25.101. BLER targets will be discussed later. It is commented that the formula presented is not valid for multipath propagation. The answer is that other formulas exist for this case. It is agreed that the first line in table 23 should also be removed.

The proposed editorial changes are approved and it is said that the proposal should also be used when reviewing other paragraphs of chapter 8.

### **Tdoc R4-99582: Target BLER for UE performance requirement**

NTT-DoCoMo presents the document.

Ericsson means that 33 minutes is quite a long time for one test. Especially for slow-fading channels it will take too long to get a good confidence level.

Nokia suggests an offline discussion. We might have test cases which are not yet defined.

Lucent means that this is a tradeoff between test time and performance. Lucent also suggests two targets for different cases. If there is a need to test  $10^{-3}$ , not all of the cases have to be tested with that target. We can have different groups of test with different target BLER.

### **Tdoc R4-99583: Modifications to TX diversity testing assumptions**

Nokia presents the document.

Ericsson wonders if this should go into assumptions or specification.

Nokia comments that if it is approved we need to modify sections which have these TX diversity schemes. These modifications can be provided by Nokia if the assumptions are agreed.

A text proposal for this is very welcome. We should have some time to think this over and then give comments. After this it can be approved.

It is agreed to have one week for comments on the reflector before the document can be approved.

### **Tdoc R4-99591: Dynamic propagation conditions**

Ericsson presents the document. Nokia agrees that the current text in spec is not realistic. Nokia suggests just to reduce the numbers in the current text, ie  $\pm 6 \mu\text{s}$ . Nokia asks if ideal tracking should be used. Ericsson replies that for the reference simulations we should use ideal tracking. The chairman suggests further offline discussions.

Later in the meeting

Nokia added that the proposal gives a priori information on the position of taps which has not been verified or proved. This a priori information might be misused to pass conformance testing. Nokia therefore prefers just to reduce the window size and have the behaviour as it is. Ericsson prefers to have the proposal in R4-99591 as it is more realistic in terms of behaviour.

Later in the meeting it is agreed to change the numbers in the current specification for the birth/death propagation conditions to  $\pm 5 \mu\text{s}$ .

## **3.2 AdHoc01-Uplink (AH01-UL)**

Based on TS 25.104 v2.3.0

Tdocs: 580, 585, 586, 588

## Simulation results

### **Tdoc R4-99580: Link level simulation results for UL performance requirements (FDD)**

NTT-DoCoMo presents the document.

One important assumption that has to be considered is that antenna diversity is used.

A quite long discussion of whether antenna diversity should be used in our test or not follows.

Nokia wonders if it is safe to assume that most operators will use antenna diversity.

Lucent states that in the typical case antenna diversity is used. But, if we only specify tests with antenna diversity this will make it impossible for type approval of base stations without antenna diversity.

Nokia states that we risk to have to fill in the table twice. At least we will have to specify which scenario we will simulate first.

Another question is what cross correlation should be used between antenna branches. Lucent means that if diversity is chosen, cross correlation has to be zero. Otherwise it might be hard to find test equipment which generates two fading patterns with a specified cross correlation.

Chairman proposes an offline discussion on this topic.

### **Tdoc R4-99585: Link level simulation results for UL performance requirements (FDD)**

Nokia presents the document.

Simulations have been done using no antenna diversity, and can therefore not be compared with results from NTT-DoCoMo and Motorola.

### **Tdoc R4-99586: FDD uplink simulation results**

Motorola presents the document.

Curves include all overhead from DCCH and DPCCH.

Siemens asks about the implementation of the turbo decoder.

Nokia means that the turbo decoder algorithm used will probably not explain the differences in simulation result.

### **Tdoc R4-99588: Link level simulations for UL data channels (BS for FDD)**

Fujitsu presents the document.

Turbo decoder algorithm is Sub-LogMAP with 8 iterations.

It is commented that the result in figure 1 might be caused by slightly shorter turbo coding unit which degrades the result.

The results seem to show good correspondence with Tdoc R4-99502 from NTT-DoCoMo.

It is stated that  $E_b$  only includes energy for DPDCH.

Fujitsu will check why the BER curves seem to saturate at 30% for lower  $E_b/N_0$  values.

Chairman states that the open issues should be discussed during coffee break.

## Summary of simulation results

The Chairman proposes to specify requirement values for target BLER =  $10^{-1}$  and  $10^{-2}$  in general. Some tests should be selected where BLER= $10^{-3}$  is tested. These test should be with a fast fading channel to speed up testing of low BLER. This proposal was approved.

It is proposed to make a table where simulation results can be filled in. This is done, starting with DL and continuing with the UL: Tdoc R4-99596 and Tdoc R4-99597. Next a single value for the simulation results should be agreed and implementation margins need to be added. Further offline discussion is suggested.

On Friday morning discussion on the working Tdocs R4-99596 and Tdoc R4-99597 continues. The follow-up work is discussed:

#### **Uplink:**

Nokia states the simulation assumptions should be clear to everybody. The goal is to have full simulation results for the RAN4 October meeting. Vodafone asked why we are using DPCH\_Ec/Ior for the downlink and Eb/No for the downlink. Ericsson means that we have an idea on what requirements we need now and could therefore agree on improved text for the specifications to the TSG-RAN meeting. But the specifications will contain no values. This is agreed and work on the summary of results, R4-99597, is frozen for this meeting.

#### **Downlink:**

Offline discussion has resulted in proposals for single values and implementation margins. Single values as conclusion of simulations results are added to the tables of Tdoc R4-99596. No conclusion is reached for Case 1, as companies would like to study the difference between simulation results in this case. For larger datarates than 64 kbps, simulation results from several companies are not available yet.

Nokia summarises the manufacturers assumption for implementation margins: 2 dB for the static case, 3 dB for Multipath case 1 and case 2 (slow-fading), 3.5 dB for case 3 (fast-fading). Vodafone says that we have to be very clear on what the numbers in the tables mean and how they can be interpreted. It should be clear what they mean in Eb/Nt. DoCoMo expresses concerns with the implementation margins. Vodafone also thinks that implementation margins larger than 2 dB are too high.

After discussions, the meeting agrees to decide only on a requirement value for the static AWGN case and make further study on implementation margins and interpretation of simulation results until next meeting. Working document Tdoc R4-99596 is frozen.

### **3.3 TDD**

Tdocs: 587, 594

#### **Tdoc R4-99587: TDD common reference channels**

Interdigital presents the document.

Siemens comments that the first figure for RACH is not aligned with WG1 specs. The number of 110 bits in this proposal is correct, while in WG1 116 bits are stated, which needs to be corrected. Providing that the correction will be done in WG1 this proposal should be approved. .

#### **Tdoc R4-99594: TDD simulation assumptions**

Siemens presents the document.

It is commented that the same turbo decoder as for FDD (Max-LogMAP) is used.

Since simulations are set more by the standard than for the FDD mode, ideal channel estimation is not appropriate. Since there is a reference to the literature, some time is needed to think it over.

Time is given until the end of next week.

## **4 Work related to the specifications**

The meeting separates in a FDD UE an FDD BS group for drafting of text proposals for the specifications.

#### **4.1 Draft text for TS 25.101**

Based on results of the meeting, sections 8, annex A and B are updated on-line by the editor. The output of the drafting is Tdoc R4-99598: TS25.101 v2.4.0.

#### **Tdoc R4-99598: TS 25.101 v2.4.0**

The editor presents the document. The document is approved. It is clarified that agreed requirement values are only included for AWGN propagation conditions. It is noted that the agreed change for birth-death propagation condition still has to be incorporated.

The updated specification should be sent out on the reflector asap. It is agreed that editorial comments will be allowed to the updated specifications until Monday midnight CET.

#### **4.2 Draft text for TS 25.104**

The FDD BS group (see annex C) created a text proposal Tdoc R4-99599 with simulation assumptions and modifications for chapter 8 of TS 25.104.

#### **Tdoc R4-99599:**

The editor presents the document and it is approved.

For the UE it is agreed to remove the BLER target of 10<sup>-1</sup> for 12.2 kbps information data rates. This limit is only practical for data services and will probably not be used for 12.2 kbps.

The updated specifications should be sent out on the reflector asap. It is agreed that editorial comments will be allowed to the updated specifications until Monday midnight CET.

#### **4.3 Draft text for TDD specifications**

Based on Tdoc R4-99593-594.

Changes will be made according to the discussions during the meeting and will be sent out on the reflector. The structure of the TDD documents will be aligned with the structure of the FDD documents.

Interdigital comments on the multipath propagation condition and states that large delay spread is hard to handle in a TDD system. Large delay spread should not be tested since the system is not designed to operate in such environments. A reasonable delay spread may be around 4-5  $\mu$ s. Interdigital will start discussion on the reflector on this topic.

The updated specifications will be sent out on the reflector by Monday lunch CET, same deadline for comments as FDD specifications.

### **5 Output to other groups**

The updated specifications will be sent to TSG-RAN next week for approval.

The simulation results should only be used for internal RAN WG4 work, and proper interpretation of results is very important.

Vodafone commented that the simulation results and assumptions should be included in the RF system scenarios report. This should be addressed at the next RAN WG4 meeting.

### **6 Meeting closed.**

The chairman closed the meeting on Friday 1 October 1999, 14.50.

## Annex A: List of documents

Number	Title	Company
99577	Proposed agenda	Ericsson
99578	Simulation Results for DL performance requirements	Ericsson
99579	Proposal for the specification of performance requirements	Ericsson
99580	Link level simulation results for UL performance requirements (FDD)	NTT DoCoMo
99581	Simulation results for UE performance requirements	NTT DoCoMo
99582	Target BLER for UE performance requirement	NTT DoCoMo
99583	Modifications to TX diversity testing assumptions	Nokia
99584	Simulation results for UE performance tests	Nokia
99585	Link level simulation results for UL performance requirements (FDD)	Nokia
99586	FDD uplink simulation results	Motorola
99587	TDD common reference channels	Interdigital
99588	Link level simulations for UL data channels (BS for FDD)	Fujitsu
99589	TS25.101v2.3.0	Editor
99590	TS25.104v2.3.0	Editor
99591	Dynamic propagation conditions	Ericsson
99592	TS25.102v2.0.0	Editor
99593	TS25.105v2.0.0	Editor
99594	TDD simulation assumptions	Siemens
99595	Draft Meeting report for RAN4 AH01, 30 Sept-1 Oct	secretary AH01
99596	Summary of link level simulation results FDD UE rev.1.0	AH01
99597	Summary of link level simulation results FDD BS rev.1.0	AH01
99598	TS25.101v2.4.0	AH01
99599	Proposal for chapter 8 of TS 25.104	AH01

## Annex B: List of participants

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## Annex C: Drafting of text for TS 25.104

Chairman is the editor of 25.104 (Johan Sköld, Ericsson)

### Agenda:

1. Assumptions for simulations: Diversity on/off and more
2. Text proposal for Ch. 8.

### Diversity:

Chairman concludes earlier discussions by stating that the main assumption is that diversity will be used in the beginning. Later we will also have tests for the non-diversity case.

Lucent clarifies that if diversity includes polarisation diversity, the number of non-diversity base stations will be quite limited.

It is agreed to use antenna diversity with cross correlation 0 between antenna branches.

### Definitions:

$E_b/N_0$  should be defined as in Tdoc R4-99588 from Fujitsu.

Nokia clarifies that it was agreed to use CRC for BLER calculation at WG4#7.

It is also agreed to use values for DPCCH/DPDCH according to WG1 document TS 25.213. Values of 3 dB and 6 dB used in earlier simulations can easily be converted to be aligned with the values in the table since ideal channel estimation was used and hence only the overhead is altered.

Nokia asks if changes in WG1 should be reflected in our simulations. Ericsson means that the conformance testing of the BS will be done according to WG1 and therefore our simulations should be so too. Until later we have to state the assumptions for the simulations.

Information data rate	Power ratio [dB]	Amplitude ratio
12.2 kbps	-2.69 dB	0.7333
64 kbps	-5.46 dB	0.5333
144 and 384 kbps	-9.54 dB	0.3333

### Text in specification:

Tables in section 8 should be removed. We should insert new tables but we need to agree on what the tables should look like.

Tables in sections 8.2.1 and 8.2.2 should be removed.

Section 8.1 has been agreed but need to be restructured.

It is also agreed to remove column for data service.

Lucent states that it has to be defined how the power is applied to the antenna connector(s).

It is agreed that the  $E_b/N_0$  shall be applied separately at each antenna connector.

Chairman stated that we need to test other channels in the uplink, for example RACH. We therefore need contributions on how to test RACH.

Chairman also asks if we should have tests with power control. Lucent answers that this either could be done "for real" or by emulation. Emulation means that the fader doesn't fade the amplitude.

Some investigations have to be performed on how to test PC and the issue is left open until the October meeting.

### Further work on the UL simulations:

Nokia states the simulation assumptions should be clear to everybody. The goal is to have full simulation results for the October meeting.

Ericsson means that we have an idea on what number we need and could therefore agree on some text which are then sent to the RAN meeting. This will contain empty tables.



Assumption for implementation margin is 2 dB for the static case. Multipath case 1 and case 2 should have implementation margin of 3 dB. For case 3 the implementation margin should be 3.5 dB. Vodafone says that we have to be very clear on what the numbers in the tables mean and how they can be interpreted. Vodafone also thinks that implementation margins larger than 3 dB are too high.