

**Agenda Item:** 5, 8.2

**Source:** Ericsson

**Title:** Plan for Link Level simulations of UTRA-FDD

**Document for:** Discussion & Approval

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## 1 Introduction

This document proposes a more detailed planning of the work on link level simulations based on [1][2] for downlink UTRA-FDD performance requirements, as specified in TS 25.101 v2.1.0, section 8.

It could also be used as a basis for the simulation work required for uplink UTRA-FDD performance requirements, as specified in TS25.104v2.1.0, section 8.

## 2 Plan for link level simulations

### 2.1 Time schedule

The table below shows the time plan for the link level simulations (for downlink) [1].

Table 1: Time schedule for link level simulations

Step	Goal	Timing
0	Agree on definitions and assumptions to enable start of simulations of benchmark test cases. Create simulation plan. Calibration simulations can be done based on 4096 Mcps.	By RAN4#5, 6/99
1	Validate the simulation model based on a few benchmark test cases. Agree on all assumptions and final simulation plan.	By RAN4#6, 7/99
2	First set of simulation results available. Update assumptions.	By RAN4#7, 9/99
3	All simulation results available to approve values for the specification.	By RAN4#8, 10/99

Note that this time schedule cannot fulfil the requirements for the RAN 4 Work Plan (30.504 V1.0.0), which requires specification to be complete by RAN4#7.

The simulation plan should contain more detailed assumptions for the simulations of the test cases. The feasibility of the simulations (and testing) should also be reviewed. Following sections provide more details for steps 1-3. This assumes that step 0 has been completed.

### 2.2 Step 1 – Validation

Benchmark simulations results are used to verify and align simulations chains used to perform the simulations. Results from several companies should be available and compared to complete the validation.

### 2.3 Step 1 – Additional assumptions for simulations

Following items have to be agreed to start the link level simulations for the specifications, in RAN4#6

1. New slot structure due to harmonisation (RAN WG1)  
WG1 slot structure has to be sufficiently stable. Benchmark simulations have been done based on 4.096 Mcps (before Harmonisation). Additional work will be needed for changing the simulation chain, which can take some time. Simulations results should now be based on 3.84 Mcps with the new slot structure. Alternatively simulations can be performed with the old slot structure, but then results have to be translated.
2. Measurement channels (Annex A) has to be updated and completed for data services according to the WG1 specifications.

3. Propagation conditions/channel models  
Annex B2.2 has to be agreed.
4. Definition of performance (BER/FER)  
Performance definition for DCH has to be agreed.
5. Performance requirements for different services  
Performance limits for the test environments (Annex B1) have to be agreed.
6. Assumptions for simulations  
Detailed assumptions for simulation runs should be defined if needed (see [2]).

## 2.4 Activity plan for simulations

Link level simulations can take considerable time to perform. Considering the required simulation time for the test cases specified in section 8 of 25.101v2.1.0, most of the simulations need to be performed in August 1999, before RAN4#7.

The table below proposes a detailed planning of simulation activities for UTRA-FDD downlink. The planning for UTRA-FDD uplink could be based on this.

Table 2: Activity plan to complete performance requirements for UTRA-FDD downlink

	RAN4#6 7/99	RAN4#7 9/99	RAN#5	RAN4#8 10/99	Comments
8 performance requirements	X				Definition of requirements
Annex A: Measurement channels	X				Required for simulations
Annex B: Propagation conditions	X				Required for simulations
8.2 Static propagation conditions		1		2	
8.3 Multi-path propagation conditions		1		2	
8.4 Moving propagation conditions		1		2	
8.5 Birth-death propagation conditions		1		2	
8.6 Handover performance				1,2	

1=First simulation run, 2=2<sup>nd</sup> simulation run if needed, values agreed for specification.

## 3 Organisation

Large amounts of simulations and evaluation of the results have to be completed within the next few months, as specified in the previous section for downlink UTRA-FDD.

AH01 in RAN WG4 is responsible for this work and should be organised in an effective way to achieve its goals. As downlink (UE) and uplink (BS) performance specifications are separated and simulations chains are different, the RAN4 discussions can also be separated.

It is proposed to split AH01 in a downlink and uplink adhoc, and appoint a separate chairman and secretary. Several physical adhoc meetings will be needed to complete the work on time.

## 4 Conclusions

The Link level simulations are still depending on the agreement of several issues and will be difficult to perform within the time schedule of the current workplan.

An activity plan for the link level simulations of UTRA-FDD is proposed. It is proposed to split AH01 in up- and downlink adhoc.

## References

- [1] R4-9930, Starting link level simulations, Ericsson.
- [2] R4-99341, Simulation assumptions for benchmarking simulation platforms, Nokia, Ericsson.