TSG-RAN Working Group 4 (Radio) meeting #3
Tokyo 29-31 March 1999

TSGR4#3(99)093

Agenda Item: 7.9

Source: Ericsson

Title: **Up-link ACIR simulation results**

Document for: Decision

---

1 Introduction

Previous adjacent channel and guard band studies in the UTRA system performed by Ericsson and others were summarised in [1]. Since then a common set of parameters for ACIR simulations have been determined in WG4, in order to get verification of simulations performed of different contributors and ease comparison of results.

In this contribution simulation results for the uplink, for both 8 kbps and 144 kbps, are provided.
Parameter settings and simulation environment is chosen according to what has been concluded within WG4 Ad Hoc group 2.

2 Models

2.1 Network model

Both operators use 36 cells where the base stations are placed in the middle of each cell. Since it is most likely that two operators do not co-locate their base stations, one operator's system is shifted versus the other.

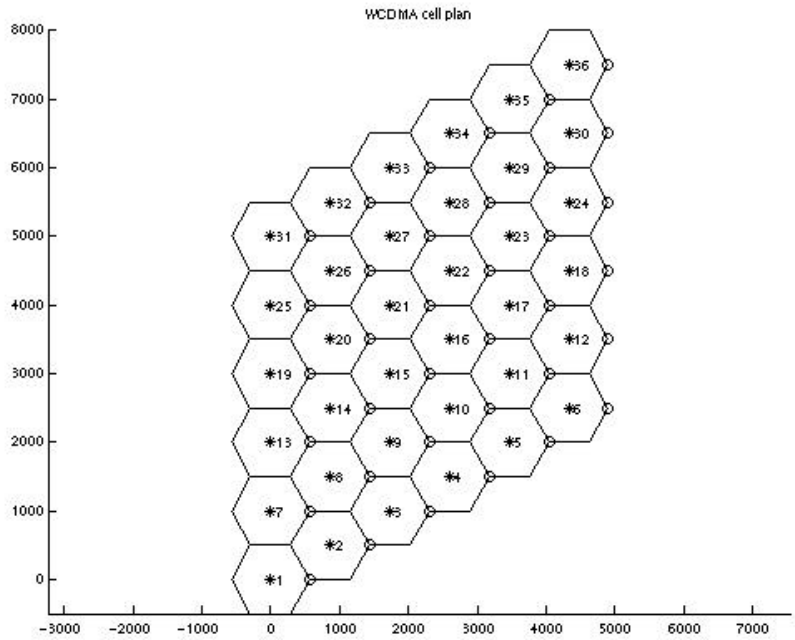

Figure 1. Cell deployment. Base stations are marked with stars and circles depending on system.

Since the shift between the two systems strongly effect the system capacity degradation, two different shifts are used. The first shift is a worst case scenario where the second systems base stations are located at the cell border of the first system. The second case is a half-cell radius shift, i.e. a case in-between the first case and site co-location.

3 Results

3.1 8 kbps

The decrease of system capacity in the uplink compared to a single operator system is shown below for different ACIR. The results cannot easily be compared to previous Ericsson simulations, since the outage criteria used is now quite different.

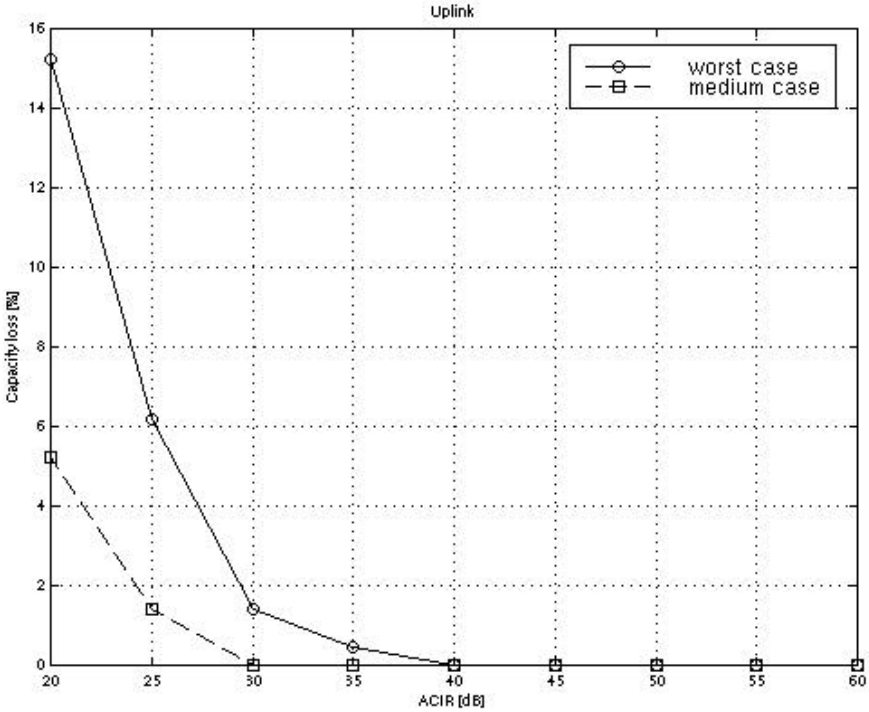

Figure 2. Capacity loss versus ACIR for 8 kbps in the uplink. Single operator capacity is 52.5 users per cell.

3.2 144 kbps

The decrease of system capacity in the uplink compared to a single operator system is shown below for different ACIR.

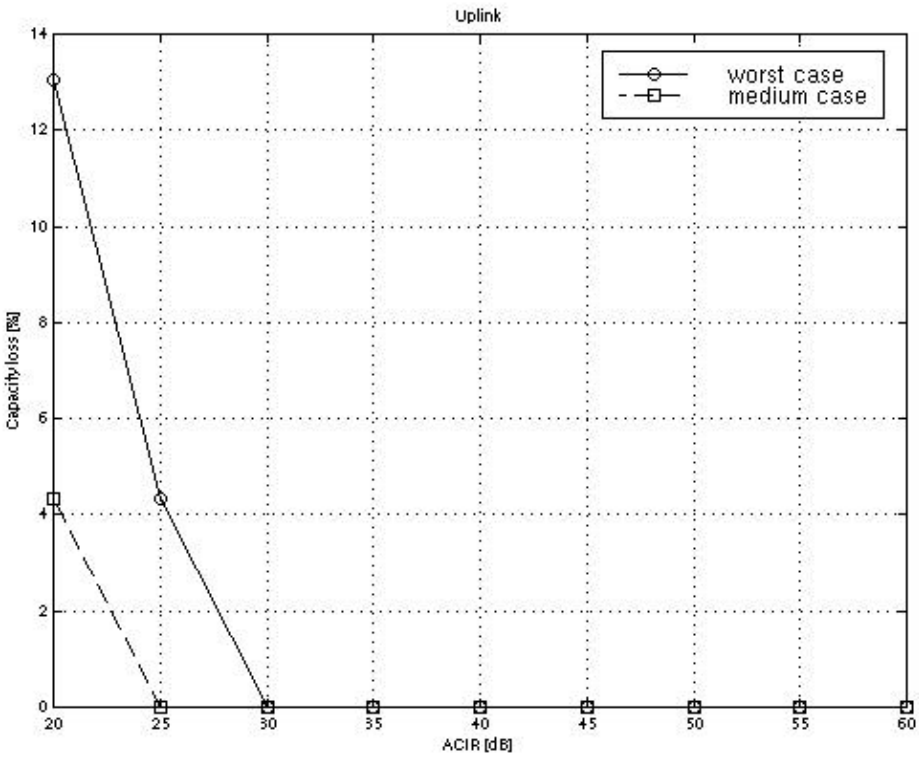

Figure 3. Capacity loss versus ACIR for 144 kbps in the uplink. Single operator capacity is 5.75 users per cell.

For the 144 kbps service the adjacent channel interference does not seem to affect system capacity severely, except for really low ACIR values. The reason for this difference in behaviour from the speech service simulations could be the fact that the system is much more limited by noise than interference limited for the 144 kbps scenario. This needs further investigation, since it is not clear how range limitation impacts ACIR performance.

4 Conclusions

The ACIR simulations for the uplink show very moderate worst case capacity losses (up to 1.5%) for ACIR values down to 30 dB. This shows that a reasonable choice of ACIR (combined receiver and transmitter effects) for uplink specification purposes is 30 dB.

5 References

[1] Tdoc TSGR4#2 (99)048, “Evaluation of up- and downlink adjacent channel performance”, Source: Ericsson.