Source:	**Ericsson, Nortel Networks, Panasonic, Qualcomm**
Title:	**Rel'5 HS-DPCCH performance**
Agenda Item:	**7.1.2**
Document for:	**Decision**

1. Introduction

The performance of HS-DPCCH has been discussed now in RAN1 for almost one year. While several methods to improve the performance of HS-DPCCH have been proposed, there is still no agreement in RAN1 that there actually is a problem for the system to operate with the current specification of HS-DPCCH. At RAN WG1#29, the situation in RAN1 seemed to be that an HS-pilot scheme would not be acceptable to a large number of companies, while the opposition to the introduction of the PRE/POST scheme originated mainly from the proponents of the HS-pilot scheme. Still, a number of companies believe that the performance requirements provided by RAN WG2 can be met with the current HS-DPCCH scheme. Therefore, the discussion was brought up to RAN#18, suggesting one of the following options as a way forward for Rel5:

1. do nothing

2. include the CRs provided (technically correct, not fully agreed, related also to WG2 discussions) (source by Individual companies)

3. include the CRs provided + investigate additional methods for the cases when requirements are not necessary met.

2. System options to improve the HS-DPCCH performance

Without adding anything to the current specification for HS-DPCCH, there are several options existing to improve the HS-DPCCH performance in difficult radio conditions:

- use of ACK/NACK repetition (1, 2, 3 or 4 times)

- adjustment of HS-DPCCH/UL DPCCH power offset (up to 6dB)

- adjustment of UL DPCCH SIR target.

With these tools, several ways are offered to increase the ACK/NACK energy, giving an operator a number of choices for the operation of HSDPA in the system. In addition, basestation implementation options, such as channel estimation or DTX/ACK threshold setting can be improved to optimise the performance.

It has been shown, e.g., in [1][2] that it is possible with these tools to meet the relaxed requirements provided by RAN2 under most conditions. RAN WG2 has pointed out again in [3], that "RAN2 would like to remind RAN1 that in bad radio conditions performance requirements are hard to meet, and RAN2 is aware of this limitation".

3. Conclusion

As a way forward for Rel5, considering the late state in the release, we recommend to keep the current HS-DPCCH specification as it is for Rel5. If it should be discovered later that there actually is a problem with the overall system performance, a modification (e.g. based on the PRE/POST scheme) of HS-DPCCH could be considered as a correction for Rel5. It is our view that without proper analysis of the overall system impact, it would be premature to introduce new features for HS-DPCCH into Rel5 at this stage. The

introduction of schemes with large impact on the current L1 specifications, e.g. HS-pilot schemes, should not be considered anymore for Rel5.

4. References

[1] R1-02-0925, "Performance of UL ACK/NACK transmission", RAN WG1#27
[2] R1-02-0948, "Performance of uplink HS-DPCCH in SHO with different error probability requirements", RAN WG1#27
[3] RP-020683, "Response to LS (R1-02-1457, R2-023025) on HS-DPCCH performance", RAN#18