

**TSG-RAN Working Group 1 meeting No. 19
February 27- March 2, Las Vegas, U.S.A.**

TSGR1-01-0199

TSG-RAN Working Group 4 (Radio) meeting #15
Boston, USA, 23-26 Jan, 2001

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Source: TSG RAN WG4
To: TSG RAN WG1
CC:
Title: LS to RAN WG1: Amendments to application of beam forming in release 4
Contact Person: Jukka Vikstedt (jukka.vikstedt@nokia.com)

RAN WG4 is currently studying and introducing requirements for UE when beam forming without S-CPICH. In this case UE needs to use dedicated pilots for a phase reference. RAN WG4 aims to have related tests included for release 4. While studying the requirements closer RAN WG4 has made the following observations, which have been discussed in R4-010050 in more detail, and which are summarized below:

- ?? As beam forming can be applied with S-CPICH or without, RAN WG1 specifications should clearly indicate which kind of beam forming can be applied on different downlink channels. At current RAN WG1 specification, this information is scattered in different section/chapters and specifications and there is a possibility for different interpretations.
- ?? RAN WG1 should specify downlink channels on which simultaneous application of Tx diversity and beam forming is possible. At the moment this information is missing from RAN WG1 specifications. However, something can be indirectly concluded from different RAN WG1 specifications, but there is as well possibility for different interpretations, which should be avoided.

RAN WG4 has also identified some aspects of beam forming that are allowed currently in RAN WG1 specification but are not feasible from UE performance point of view. These are listed below and RAN WG4 kindly asks RAN WG1 to take these into account while providing amendments to the observations mentioned above.

- ?? S-CCPCH carrying FACH can not be beam formed since according to RAN WG3 specifications FACH messages are RRC level messages. Hence Node B does not know to whom it is transmitting FACH messages.
- ?? It should be specified that associated DPCH shall be transmitted in a same beam as PDSCH, since PDSCH does not carry Layer 1 information. When transmitted in a same beam UE can apply phase reference derived from dedicated pilots of associated DPCH on PDSCH. Also it would enable the DSCH power control loop to work, since the control loop can be associated to DPCH.
- ?? Closed loop Tx diversity methods are not applicable to be used with beam forming without S-CPICH based on their usage of CPICH for the estimation on which to base the feedback commands in uplink.
- ?? STTD should not be used with beam forming if there is no S-CPICH available in the beam, since it has been specified that CPICH shall be transmitted from both antennas when open loop methods are applied.

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RAN WG4 kindly recommends that RAN WG1 provides needed amendments for release 4 versions of WG1 specifications so that beam forming concept using dedicated pilots can be finalized in all levels of RAN specifications for the release 4.