Title: Proposal of a new study item "Performance Evaluation of the UE behaviour in high speed trains with speeds up to 350 kmph"

Source: Vodafone Group

Agenda Item: 9.11

Document for: Approval

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1. Introduction

The need for further investigations of the UE performance and behaviour in the area of high mobility environments was presented in TDoc R4-050171 from Vodafone in recent meeting RAN4 #34 in Scottsdale / USA. Due to the fact that HSDPA in its actual version is specified for mobility up to 120kph further investigations seem appropriate. It is assumed by operators that the need for high data rates in high speed environments like for example high speed trains at 350 kph will be a challenge for the near future.

2. Proposal

It is proposed to start a study item in RAN WG4 which investigates in detail the behaviour of the UE in high mobility environments like high speed trains with speeds higher than 250 kmph and 120 kmph for HSDPA. RAN4 should find realistic propagation conditions as well as multipath models for high speed environments up to 350 kmph as they exist in high speed trains. Based on this results RAN4 can decide whether or not simulations are needed to identify the achievable minimum performance in terms of data rates and throughput for the UE in an high speed train. Also the impact to the network e.g. handover, capacity effects and the other RAN working groups could be studied. This SI should give RAN4 the possibility to identify performance parameters in the current specifications which potentially could be improved in further releases.

Therefore RAN is kindly asked to agree on the study item proposal to start the work in RAN4. An TR should be drafted to collect the results. The end of the SI should be by September 2005.

References

[1] RAN WG4 #16 R4-010373   Performance specification at 250Kph (Vodafone, Ericsson)
[2] RAN WG4 #16 R4-0100461   CR, Nokia, Performance requirement for 250kph
[3] RAN WG4 #16 R4-010420   CR, Nokia, Performance requirement for 250kph
[4] RAN WG4 #17 R4-010560   Proposal of updates of TR 25.943 regarding UE speeds (Vodafone)
[5] RAN WG4 #31 R4-040252   HSDPA performance specification up to 350kph (Vodafone)
[6] RAN WG4 #34 R4-050171   Measurement results from high speed tests (Vodafone)

Study Item Description

Title: **Performance Evaluation of the UE behaviour in high speed trains with speeds up to 350 kmph**

1   3GPP Work Area

X	Radio Access
	Core Network
	Services

2   Linked work items

3   Justification

The behaviour of the UE in high mobility environments is described in the current specifications up to velocities of 250 kph and 120 kmph for HSDPA. In order to ensure a certain level of performance in terms of appropriate data rates (throughput) and QoS for the user in mobility environments with higher speeds, some work is necessary.

4   Objective

The aim of this study item is to

1. identify realistic propagation conditions and multipath models for high speed train environments
2. decide on the need to perform simulations of the UE behaviour for speeds up to 350 kph in high speed train environments including HSDPA
3. decide on the need to define minimum performance requirements for the UE and the network assuming high speed train environments with speeds up to 350 kmph
4. Identify impact to other groups

5   Service Aspects

   None

6   MMI-Aspects

   None

7   Charging Aspects

   None

8   Security Aspects

   None

9   Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

10   Expected Output and Time scale (to be updated at each plenary)

New specifications						
Spec No.	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
25.9XX	**Performance Evaluation of the UE behaviour in high speed trains with speeds up to 350 kmph**	RAN4	RAN1, RAN2, RAN3	RAN#29	RAN#30	
Affected existing specifications						
Spec No.	CR	Subject		Approved at plenary#		Comments

11   Study item rapporteurs

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12   Study item leadership

TSG-RAN WG4

13   Supporting companies

Vodafone Group, Nortel, T-Mobile, Nokia, Ericsson, Orange, Siemens

14   Classification of the SI (if known)

	Feature
X	Building Block
	Work Task

14a   The SI is a Feature: List of building blocks under this feature

n/a

14b   The SI is a Building Block: parent Feature

n/a

14c   The SI is a Work Task: parent Building Block