3GPP TSG RAN Meeting #17
Biarritz, France, 3 – 6, September 2002

RP-020590

Title: **Agreed CRs (Rel-5) to TS 25.211 and TS 25.331 on "TX diversity on radio links in the active set"**

Source: **TSG-RAN WG1**

Agenda item: **7.1.5**

No.	Spec	CR	Rev	R1 T-doc	Subject	Phase	Cat	Workitem	V_old	V_new
1	25.211	169	-	R1-02-1075	TX diversity on radio links in the active set	Rel-5	F	TEI5	5.1.0	5.2.0
2	25.331	1683	-	R2-022437	TX diversity on radio links in the active set	Rel-5	F	TEI5	5.1.0	5.2.0

CR-Form-v7

CHANGE REQUEST

⌘ **25.211** CR **169** ⌘**rev** **-** ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME **X** Radio Access Network **X** Core Network ☐

Title: ⌘	TX diversity on radio links in the active set	
Source: ⌘	TSG RAN WG1	
Work item code: ⌘	TEI5	***Date:*** ⌘ 2002-08-14
Category: ⌘	**F**	***Release:*** ⌘ Rel-5

Use <u>one</u> of the following categories:
F (correction)
A (corresponds to a correction in an earlier release)
B (addition of feature),
C (functional modification of feature)
D (editorial modification)
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use <u>one</u> of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change: ⌘	The current specification leaves the UE implementation freedom in handling of different TX diversity usage on radio links in the active set. A UE might, e.g. use TX diversity on a radio link, although the radio link is not transmitted with TX diversity from the cell. The current specification text is a compromise that was made in order not to impact existing R99 UE implementations. This is however not relevant for later releases of the standard. In order to operate the network correctly, it is desirable that the UTRAN knows exactly how the UE behaves for different combinations.
Summary of change: ⌘	Define that the UE uses TX diversity only on radio links in the active set that actually use TX diversity, i.e. the UE follows the signaling from RRC.
Consequences if not approved: ⌘	Inefficient UTRAN operation when using TX diversity in soft handover.

Clauses affected: ⌘	5.3.1

Other specs affected: ⌘	Y	N		
	X		Other core specifications ⌘	25.331
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

# 5.3	Downlink physical channels

## 5.3.1	Downlink transmit diversity

Table 11 summariszes the possible application of open and closed loop transmit diversity modes on different downlink physical channel types. Simultaneous use of STTD and closed loop modes on the same physical channel is not allowed. In addition, if Tx diversity is applied on any of the downlink physical channels it shall also be applied on P-CCPCH and SCH. Regarding CPICH transmission in case of transmit diversity, see subclause 5.3.3.1.

With respect to the usage of Tx diversity on different radio links within an active set, the following rules apply:

- Different Tx diversity modes (STTD and closed loop) shall not be used on the radio links within one active set.

- No Tx diversity on one or more radio links shall not prevent UTRAN to use Tx diversity on other radio links within the same active set.

- If STTD is activated on one or several radio links in the active set, the UE shall operate STTD either on only those radio links where STTD has been activated or on all radio links in the active set. Higher layers inform the UE about the usage of STTD on the individual radio links in the active set.

- If closed loop TX diversity is activated on one or several radio links in the active set, the UE shall operate closed loop TX diversity either on only those radio links where closed loop TX diversity has been activated or on all radio links in the active set. Higher layers inform the UE about the usage of closed loop TX diversity on the individual radio links in the active set.

Furthermore, the transmit diversity mode used for a PDSCH frame shall be the same as the transmit diversity mode used for the DPCH associated with this PDSCH frame. The transmit diversity mode on the associated DPCH may not change during a PDSCH frame and within the slot prior to the PDSCH frame. This includes any change between no Tx diversity, open loop, closed loop mode 1 or closed loop mode 2.

Also, the transmit diversity mode used for a HS-SCCH and or a HS-PDSCH subframe shall be the same as the transmit diversity mode used for the DPCH associated with this HS-SCCH and or HS-PDSCH subframe. The transmit diversity mode on the associated DPCH may not change during a HS-SCCH and or HS-PDSCH subframe and within the slot prior to the HS-SCCH subframe. This includes any change between no Tx diversity, open loop, closed loop mode 1 or closed loop mode 2.

Table 11: Application of Tx diversity modes on downlink physical channel types
"X" – can be applied, "–" – not applied, "FFS" – for further study

Physical channel type	Open loop mode		Closed loop Mode
	TSTD	STTD	
P-CCPCH	–	X	–
SCH	X	–	–
S-CCPCH	–	X	–
DPCH	–	X	X
PICH	–	X	–
PDSCH	–	X	X
HS-PDSCH	–	X	FFS
HS-SCCH	–	X	FFS
AICH	–	X	–
CSICH	–	X	–
AP-AICH	-	X	-
CD/CA-ICH	-	X	-
DL-DPCCH for CPCH	-	X	X

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CHANGE REQUEST

⌘	**25.331** CR **1683**	⌘**rev**	**-**	⌘	Current version:	**5.1.0**	⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐   ME **X** Radio Access Network **X** Core Network ☐

Title: ⌘	TX diversity on radio links in the active set	
Source: ⌘	TSG-RAN WG2	
Work item code: ⌘	TEI5	***Date:*** ⌘ 19 August 2002
Category: ⌘ **F**		***Release:*** ⌘ Rel-5

Use *one* of the following categories:
F (correction)
A (corresponds to a correction in an earlier release)
B (addition of feature),
C (functional modification of feature)
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Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change: ⌘	Capture RAN1 decision. RAN1 specifications have so far allowed the UE two ways of handling TX diversity on radio links in the active set, when TX diversity is not used by UTRAN on all radio links in the active set. The UE may currently either operate TX diversity on all radio links in the active set or only on those radio links where TX diversity is actually used. Since RAN2 now provides signaling indicating the actual configuration of TX diversity on a per radio link basis, it is no longer necessary to allow the UE to operate differently.
Summary of change: ⌘	The UE can not chose to apply the same Tx diversity on all radio links if some radio links are using Tx diversity and some are not.
Consequences if not approved: ⌘	Conflicting RAN1 and RAN2 specifications on Tx diversity. The UE performance may be affected if the active set has some radio links with Tx diversity and some radio links without Tx diversity.

Clauses affected: ⌘	8.6.6.24	

		Y	N		
Other specs affected: ⌘			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments: ⌘	

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[…]

8.6.6.24   Tx Diversity Mode

If the IE "Tx Diversity Mode" is included the UE shall:

> 1> if the value of the IE "Tx Diversity Mode" is closed loop mode1, closed loop mode 2 or STTD:
>
> > 2> configure the Layer 1 to use the Tx diversity mode indicated in the IE "Tx Diversity Mode" for the radio links for which the IE "Closed loop timing adjustment mode" is included, ignoring the actual value of IE "Closed loop timing adjustment mode". ~~The UE may apply the Tx diversity mode indicated in IE "Tx Diversity Mode" to all radio links in the active set, as specified in [26]~~;
>
> 1> if the value of the IE "Tx Diversity Mode" is "none":
>
> > 2> configure the Layer 1 not to use Tx diversity.
>
> 1> if the IE "Tx Diversity Mode" is not included:
>
> > 2> continue to use the already configured Tx diversity mode;
> >
> > 2> in case no Tx diversity mode has been configured:
> >
> > > 3> do not apply Tx diversity.

[…]