TSG RAN Meeting #19 **RP-030040**
Birmingham, United Kingdom, 11 - 14 March, 2003

Title **CRs (Rel-5) to TS 25.133**
Source **TSG RAN WG4**
Agenda Item **8.4.5**

RAN4 Tdoc	Spec	CR	R	Cat	Rel	Curr Ver	Title	Work Item
R4-020073	25.133	519		F	Rel-5	5.5.0	Correction of measurement and reporting capability requirements in CELL_DCH state in case of parallel measurements	TEI5
R4-020074	25.133	520		A	Rel-6	6.0.0	Correction of measurement and reporting capability requirements in CELL_DCH state in case of parallel measurements	TEI5
R4-020187	25.133	532		F	Rel-5	5.5.0	Changes to TFC selection requirements for codec mode switch	TEI5
R4-020188	25.133	533		A	Rel-6	6.0.0	Changes to TFC selection requirements for codec mode switch	TEI5

3GPP TSG RAN WG4 (Radio) Meeting #26 **R4-030073**

Madrid, Spain 17 - 22 February, 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **519** ⌘ **rev** ⌘ Current version: **5.5.0** ⌘

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

Title:	⌘	Correction of measurement and reporting capability requirements in CELL_DCH state in case of parallel measurements
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	05/03/2003
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)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one 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 formulation of the requirements in section 8.3 for support of event triggering and reporting criteria in CELL_DCH state leads to ambiguous interpretation when parallel measurements are ordered to the mobile. When looking to parallel measurements, it is also not clear how the reporting criteria shall be intended in section 8.3. In section 8.2 some clarifications are needed about the concept of parallel physical measurements, which shall not be confused with the concept of parallel reporting criteria stated in section 8.3.
Summary of change:	⌘	A clarification is added to sections 8.2 and 8.3 about the performance requirements in case of parallel measurements. In section 8.2 it is clarified what is meant by parallel (physical) measurements. In section 8.3 it is clarified what is meant by parallel reporting criteria. Isolated Impact: would not affect implementation behaving like indicated in the CR, would affect implementations supported the corrected functionality otherwise.
Consequences if not approved:	⌘	The capability requirements for support of event triggering and reporting criteria in CELL_DCH state will be ambiguous.

Clauses affected:	⌘	8.2, 8.3

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

Other comments:	⌘	Equivalent CRs in other Releases: CR520 cat. A to 25.133 v6.0.0

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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.

8.2 Measurements in CELL_DCH State with special requirements

8.2.1 Introduction

This section contains specific requirements for certain measurements beyond those specified in section 8.1. The measurements are defined in TS 25.215, the measurement model is defined in TS 25.302 and measurement accuracies are specified in section 9. As long as the measurement configuration does not exceed the requirements stated in section 8.2.2, the UE shall meet the performance requirements defined in section 9.

Control of measurement reporting is specified in TS 25.331. Compressed mode is specified in TS 25.215.

8.2.2 Requirements

~~The requirements in section 9 are applicable for a UE performing measurements according to this section.~~

The UE shall be able to perform in parallel all physical layer measurements according to table 8.9. In this section one physical layer measurement corresponds to a measurement at the reference point B (i.e. measurement reported by layer 1 after layer 1 filtering) in the measurement model in TS 25.302 [15].

In addition to the requirements in table 8.9 the UE shall in parallel, in state CELL_DCH, also be able to measure and report the quantities according to section 8.1.

Table 8.9: Parallel physical layer measurement requirements

Measurement quantity	Number of parallel physical layer measurements possible to request from the UE
Transport channel BLER	1 per Transport Channel
UE transmitted power	1
UE Rx-Tx time difference	1 including timing to all radio links in active set
SFN-SFN observed time difference type 2	[]
UE GPS Timing of Cell Frames for LCS	[]

Editors Note: The presence of the measurements for location services needs to be revised.

8.3 Capabilities for Support of Event Triggering and Reporting Criteria in CELL_DCH state

8.3.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria. As long as the measurement configuration does not exceed the requirements stated in section 8.3.2, the UE shall meet the performance requirements defined in section 9.

The UE can be requested to make measurements under different M~~m~~easurement I~~i~~dentities~~y~~ [11]~~numbers~~. Each Measurement Identity corresponds to either event based reporting, periodic reporting or no reporting. In case of event based reporting, ~~With~~ each Measurement I~~i~~dentity ~~number there~~ is~~may be~~ associated with one or more~~multiple number of~~ events, each identified with an Event Identity. In case of periodic reporting, a Measurement Identity is associated with one periodic reporting criterion. In case of no reporting, a Measurement Identity is associated with one no reporting criterion.

The purpose of this section is to set some limits on the number of different event, periodic and no reporting criteria the UE may be requested to track in parallel.

8.3.2 Requirements

In this section a reporting criterion~~a~~ corresponds to ~~can be~~ either one event (in the case of event based reporting), or one periodic ~~triggered~~ reporting criterion~~a~~ (in case of ~~or~~ periodic reporting) ~~criteria~~, or one no reporting criterion (in case of no reporting). For event based reporting, each instance of event, with the same or different Event Identities, is counted as separate reporting criterion in Table 8.10.

The UE shall be able to support in parallel per category up to E_{cat} reporting criteria according to Table 8.10. ~~The same type of events (e.g. events 1A) are counted as different events if either any of the parameters related to the events or their neighbour cell lists differ from each other.~~ For the measurement categories: Intra-frequency, Inter frequency, Inter frequency (virtual active set), and Inter-RAT the UE need not support more than 18 reporting criteria in total. For the measurement categories Traffic volume and Quality measurements the UE need not support more than 16 reporting criteria in total.

Table 8.10: Requirements for reporting criteria per measurement category

Measurement category	E_{cat}	Note
Intra-frequency	8	~~Applicable for periodic reporting or FDD events (1A-1F).~~
Inter-frequency	6	~~Applicable for periodic reporting or Event 2A-2F~~
Inter-frequency, virtual active set	4	~~Applicable for periodic reporting or Event 1A-1C~~
Inter-RAT	4	Only applicable for UE with this capability
UE internal measurements	8	
Traffic volume measurements	2 + (2 per Transport Channel)	
Quality measurements	2 per Transport Channel	
UP measurements	2	Only applicable for UE with this capability.

3GPP TSG RAN WG4 (Radio) Meeting #26 **R4-030074**

Madrid, Spain 17 - 22 February, 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **520** ⌘ **rev** ⌘ Current version: **6.0.0** ⌘

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

Title:	⌘	Correction of measurement and reporting capability requirements in CELL_DCH state in case of parallel measurements
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	05/03/2003
Category:	⌘	**A**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
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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 formulation of the requirements in section 8.3 for support of event triggering and reporting criteria in CELL_DCH state leads to ambiguous interpretation when parallel measurements are ordered to the mobile. When looking to parallel measurements, it is also not clear how the reporting criteria shall be intended in section 8.3. In section 8.2 some clarifications are needed about the concept of parallel physical measurements, which shall not be confused with the concept of parallel reporting criteria stated in section 8.3.
Summary of change:	⌘	A clarification is added to sections 8.2 and 8.3 about the performance requirements in case of parallel measurements. In section 8.2 it is clarified what is meant by parallel (physical) measurements. In section 8.3 it is clarified what is meant by parallel reporting criteria. Isolated Impact: would not affect implementation behaving like indicated in the CR, would affect implementations supported the corrected functionality otherwise.
Consequences if not approved:	⌘	The capability requirements for support of event triggering and reporting criteria in CELL_DCH state will be ambiguous.

Clauses affected:	⌘	8.2, 8.3			
Other specs affected:	⌘	**Y**	**N**		⌘
			X	Other core specifications	
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	Equivalent CRs in other Releases: CR519 cat. F to 25.133 v5.5.0

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Editors Note: The presence of the measurements for location services needs to be revised.

8.3 Capabilities for Support of Event Triggering and Reporting Criteria in CELL_DCH state

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The purpose of this section is to set some limits on the number of different event, periodic and no reporting criteria the UE may be requested to track in parallel.

8.3.2 Requirements

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The UE shall be able to support in parallel per category up to E_{cat} reporting criteria according to Table 8.10. ~~The same type of events (e.g. events 1A) are counted as different events if either any of the parameters related to the events or their neighbour cell lists differ from each other.~~ For the measurement categories: Intra-frequency, Inter frequency, Inter frequency (virtual active set), and Inter-RAT the UE need not support more than 18 reporting criteria in total. For the measurement categories Traffic volume and Quality measurements the UE need not support more than 16 reporting criteria in total.

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Inter-RAT	4	Only applicable for UE with this capability
UE internal measurements	8	
Traffic volume measurements	2 + (2 per Transport Channel)	
Quality measurements	2 per Transport Channel	
UP measurements	2	Only applicable for UE with this capability.

3GPP TSG RAN WG4 (Radio) Meeting #26 **R4-030187**

Madrid, Spain 17 - 22 February, 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **532** ⌘ **rev** ⌘ Current version **5.5.0** ⌘

*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 ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	TFC selection requirements for step by step codec mode adaptation
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	05/03/2003
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)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one 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: ⌘ SA4 proposes to introduce a new recommendation for Rel-5 and onwards for the AMR rate adaptation. The proposal consists in recommending the UE to change the codec mode in a step-by-step fashion.
In order to enable this proposal to be approved, changes to the TFC selection have to be done.
The current maximum value (60ms) of Tadapt (i.e the time it takes for higher layers to provide data to MAC in a new supported bit rate) would be too low.
Here is a problematic example: say 4 UMTS_AMR2 codec modes are defined in the TFCS: 12.2, 10.2, 6.7 and 4.75 (in addition to the SID frames format). The current Tx power allows to use the 12.2 and indeed it is used. Then, at some point in time, the TFCs for 12.2, 10.2 and 6.7 are considered in Excess-Power. The higher layers (the codec) may need up to 60ms to switch to 10.2 and then 40ms to switch to 6.7 and another 40ms to switch to 4.75. This means 140ms to comply with the TFC selection mechanism. The requirement of 60ms is not met in that case.
A codec mode switch requires 40 ms wich is the codec mode change rate for UMTS_AMR2 and UMTS_AMR_WB and in addition 20 ms in order to take into account the time misalignment between the codec mode mode change request from MAC layer to to the codec.

Summary of change: ⌘ For services where a codec is used, Tadapt is modified so that the step by step adaptation is taken into account.

Consequences if not approved: ⌘ UE performing Step by Step adaptation will not comply with the TFC selection requirements

Isolated impact analysis:
This change does not change the performance requirements for codec mode

	switch. This change is backward compatible and addresses only the step by step UMTS_AMR2 and UMTS_AMR_WB codec adaptation which is not mandatory for the UE.

Clauses affected:	⌘	6.4.2			
Other specs affected:	⌘	**Y** / **N** **X** / ☐	Other core specifications	⌘	26.102
		☐ / **X**	Test specifications		
		☐ / **X**	O&M Specifications		
Other comments:	⌘	This change is necessary to introduce the step by step adaptation in the codec specifications. Equivalent CRs in other Releases: CR533 cat. A to 25.133 v6.0.0			

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6.4 Transport format combination selection in UE

6.4.1 Introduction

When the UE estimates that a certain TFC would require more power than the maximum transmit power, it shall limit the usage of transport format combinations for the assigned transport format set, according to the functionality specified in section 11.4 in TS25.321. This in order to make it possible for the network operator to maximise the coverage. Transport format combination selection is described in section 11.4 of TS 25.321.

6.4.2 Requirements

The UE shall continuously evaluate based on the *Elimination*, *Recovery* and *Blocking* criteria defined below, how TFCs on an uplink DPDCH can be used for the purpose of TFC selection. The evaluation shall be performed for every TFC in the TFCS using the estimated UE transmit power. The UE transmit power estimation for a given TFC shall be made using the UE transmitted power measured over the measurement period, defined in 9.1.6.1 as one slot, and the gain factors of the corresponding TFC.

The UE shall consider the *Elimination* criterion for a given TFC to be detected if the estimated UE transmit power needed for this TFC is greater than the Maximum UE transmitter power for at least X out of the last Y successive measurement periods immediately preceding evaluation. The MAC in the UE shall consider that the TFC is in Excess-Power state for the purpose of TFC selection.

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within T_{notify} from the moment the *Elimination* criterion was detected.

The UE shall consider the *Recovery* criterion for a given TFC to be detected if the estimated UE transmit power needed for this TFC has not been greater than the Maximum UE transmitter power for the last Z successive measurement periods immediately preceding evaluation. The MAC in the UE shall consider that the TFC is in Supported state for the purpose of TFC selection.

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within T_{notify} from the moment the *Recovery* criterion was detected.

The evaluation of the *Elimination* criterion and the *Recovery* criterion shall be performed at least once per radio frame.

The definitions of the parameters X,Y and Z which shall be used when evaluating the *Elimination* and the *Recovery* criteria when no compressed mode patterns are activated are given in Table 6.0.

Table 6.0: X, Y, Z parameters for TFC selection

X	Y	Z
15	30	30

The UE shall consider the *Blocking* criterion for a given TFC to be fulfilled at the latest at the start of the longest uplink TTI after the moment at which the TFC will have been in Excess-Power state for a duration of:

$$(T_{notify} + T_{modify} + T_{L1\_proc})$$

where:

T_{notify} equals [15] ms, and

T_{modify} equals MAX(T_{adapt_max},T_{TTI}), and

$T_{L1\ proc}$ equals 15 ms, and

T_{adapt_max} equals MAX(T_{adapt_1}, T_{adapt_2}, ..., T_{adapt_N}), and

N equals the number of logical channels that need to change rate, and

T_{adapt_n} equals the time it takes for higher layers to provide data to MAC in a new supported bitrate, for logical channel n. ~~Table 6.1 defines T_{adapt} times for different services.~~ For services where no codec is used T_{adapt} shall be

considered to be equal to 0 ms. For services where either UMTS_AMR2 or UMTS_AMR_WB is used, Tadapt shall be considered to be equal to the time required to switch from the current codec mode to a new supported codec mode. In that case Tadapt equals 20 ms + 40 ms per codec mode switch. E.g. Tadapt equals 60ms if one codec mode switch is necessary and Tadapt equals 140ms if 3 codec mode switches are necessary.

~~**Table 6.1: T_{adapt}**~~

~~**Service**~~	~~**T_{adapt} [ms]**~~
~~UMTS_AMR2~~	~~60~~
~~UMTS_AMR_WB~~	~~60~~

T_{TTI} equals the longest uplink TTI of the selected TFC (ms).

The Maximum UE transmitter power is defined as follows

Maximum UE transmitter power = MIN(Maximum allowed UL TX Power, UE maximum transmit power)

where

Maximum allowed UL TX Power is set by UTRAN and defined in [16], and

UE maximum transmit power is defined by the UE power class, and specified in [3].

3GPP TSG RAN WG4 (Radio) Meeting #26 **R4-030188**

Madrid, Spain 17 - 22 February, 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **533** ⌘ **rev** ⌘ Current version **6.0.0** ⌘

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

Title:	⌘	TFC selection requirements for step by step codec mode adaptation
Source:	⌘	RAN WG4
Work item code:	⌘	TEI5
Date:	⌘	05/03/2003
Category:	⌘	**A**
Release:	⌘	Rel-6

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)*
D *(editorial modification)*
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Use one 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:	⌘	SA4 proposes to introduce a new recommendation for Rel-5 and onwards for the AMR rate adaptation. The proposal consists in recommending the UE to change the codec mode in a step-by-step fashion. In order to enable this proposal to be approved, changes to the TFC selection have to be done. The current maximum value (60ms) of Tadapt (i.e the time it takes for higher layers to provide data to MAC in a new supported bit rate) would be too low. Here is a problematic example: say 4 UMTS_AMR2 codec modes are defined in the TFCS: 12.2, 10.2, 6.7 and 4.75 (in addition to the SID frames format). The current Tx power allows to use the 12.2 and indeed it is used. Then, at some point in time, the TFCs for 12.2, 10.2 and 6.7 are considered in Excess-Power. The higher layers (the codec) may need up to 60ms to switch to 10.2 and then 40ms to switch to 6.7 and another 40ms to switch to 4.75. This means 140ms to comply with the TFC selection mechanism. The requirement of 60ms is not met in that case. A codec mode switch requires 40 ms wich is the codec mode change rate for UMTS_AMR2 and UMTS_AMR_WB and in addition 20 ms in order to take into account the time misalignment between the codec mode mode change request from MAC layer to to the codec.
Summary of change:	⌘	For services where a codec is used, Tadapt is modified so that the step by step adaptation is taken into account.
Consequences if not approved:	⌘	UE performing Step by Step adaptation will not comply with the TFC selection requirements **Isolated impact analysis:** This change does not change the performance requirements for codec mode

	switch. This change is backward compatible and addresses only the step by step UMTS_AMR2 and UMTS_AMR_WB codec adaptation which is not mandatory for the UE.

Clauses affected:	⌘	6.4.2			
Other specs affected:	⌘	**Y** / **N** **X** / ☐	Other core specifications	⌘	26.102
		☐ / **X**	Test specifications		
		☐ / **X**	O&M Specifications		
Other comments:	⌘	This change is necessary to introduce the step by step adaptation in the codec specifications. Equivalent CRs in other Releases: CR532 cat. F to 25.133 v5.5.0			

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6.4 Transport format combination selection in UE

6.4.1 Introduction

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6.4.2 Requirements

The UE shall continuously evaluate based on the *Elimination*, *Recovery* and *Blocking* criteria defined below, how TFCs on an uplink DPDCH can be used for the purpose of TFC selection. The evaluation shall be performed for every TFC in the TFCS using the estimated UE transmit power. The UE transmit power estimation for a given TFC shall be made using the UE transmitted power measured over the measurement period, defined in 9.1.6.1 as one slot, and the gain factors of the corresponding TFC.

The UE shall consider the *Elimination* criterion for a given TFC to be detected if the estimated UE transmit power needed for this TFC is greater than the Maximum UE transmitter power for at least X out of the last Y successive measurement periods immediately preceding evaluation. The MAC in the UE shall consider that the TFC is in Excess-Power state for the purpose of TFC selection.

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within T_{notify} from the moment the *Elimination* criterion was detected.

The UE shall consider the *Recovery* criterion for a given TFC to be detected if the estimated UE transmit power needed for this TFC has not been greater than the Maximum UE transmitter power for the last Z successive measurement periods immediately preceding evaluation. The MAC in the UE shall consider that the TFC is in Supported state for the purpose of TFC selection.

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within T_{notify} from the moment the *Recovery* criterion was detected.

The evaluation of the *Elimination* criterion and the *Recovery* criterion shall be performed at least once per radio frame.

The definitions of the parameters X,Y and Z which shall be used when evaluating the *Elimination* and the *Recovery* criteria when no compressed mode patterns are activated are given in Table 6.0.

Table 6.0: X, Y, Z parameters for TFC selection

X	Y	Z
15	30	30

The UE shall consider the *Blocking* criterion for a given TFC to be fulfilled at the latest at the start of the longest uplink TTI after the moment at which the TFC will have been in Excess-Power state for a duration of:

$$(T_{notify} + T_{modify} + T_{L1\_proc})$$

where:

T_{notify} equals [15] ms, and

T_{modify} equals MAX(T_{adapt_max},T_{TTI}), and

$T_{L1\ proc}$ equals 15 ms, and

T_{adapt_max} equals MAX(T_{adapt_1}, T_{adapt_2}, ..., T_{adapt_N}), and

N equals the number of logical channels that need to change rate, and

T_{adapt_n} equals the time it takes for higher layers to provide data to MAC in a new supported bitrate, for logical channel n. ~~Table 6.1 defines T_{adapt} times for different services.~~ For services where no codec is used T_{adapt} shall be

considered to be equal to 0 ms. For services where either UMTS_AMR2 or UMTS_AMR_WB is used, Tadapt shall be considered to be equal to the time required to switch from the current codec mode to a new supported codec mode. In that case Tadapt equals 20 ms + 40 ms per codec mode switch. E.g. Tadapt equals 60ms if one codec mode switch is necessary and Tadapt equals 140ms if 3 codec mode switches are necessary.

~~**Table 6.1: T_{adapt}**~~

~~**Service**~~	~~**T_{adapt} [ms]**~~
~~UMTS_AMR2~~	~~60~~
~~UMTS_AMR_WB~~	~~60~~

T_{TTI} equals the longest uplink TTI of the selected TFC (ms).

The Maximum UE transmitter power is defined as follows

Maximum UE transmitter power = MIN(Maximum allowed UL TX Power, UE maximum transmit power)

where

Maximum allowed UL TX Power is set by UTRAN and defined in [16], and

UE maximum transmit power is defined by the UE power class, and specified in [3].