TSG RAN Meeting #14 **RP-010786**

Kyoto, Japan, 11 - 14 December 2001

Title: **CRs (Rel-4) to TS 25.123**

Source: **TSG RAN WG4**

Agenda Item: **8.4.4**

RAN4 Tdoc	Spec	CR	Title	Cat	Phase	Curr Ver	New Ver
R4-011445	25.123	137	TFC selection at the UE maximum power	F	Rel-4	4.2.0	4.3.0
R4-011573	25.123	138	Clarification of CPICH measurement accuracy	F	Rel-4	4.2.0	4.3.0
R4-011574	25.123	139	Correction of Cell-Fach state requirements for 1.28Mcps TDD	F	Rel-4	4.2.0	4.3.0
R4-011575	25.123	140	Clarification of 1.28Mcps TDD/TDD handover	F	Rel-4	4.2.0	4.3.0

3GPP TSG RAN WG4 Meeting #20 **R4-011445**

East Brunswick, NJ, USA 12th - 16th November 2001

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CHANGE REQUEST

⌘ **25.123** **CR** **137** ⌘ ev **-** ⌘ Current version: **4.2.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Correction to requirements on TFC selection in UE for 1.28 Mcps UTRA TDD
Source:	⌘	RAN WG4
Work item code:	⌘	LCRTDD-RF
Date:	⌘	12/11/2001
Category:	⌘	**F**
Release:	⌘	Rel-4

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)

Reason for change:	⌘	Requirements for 1.28 Mcps UTRA TDD don't take into account the recently introduced concept of TFC states and the blocking requirement.
Summary of change:	⌘	Corrections to UE TFC selection for 1.28 Mcps UTRA TDD option: - Concept of TFC states introduced - Clarification of the blocking requirement - Recovery and Elimination criterion described together
Consequences if not approved:	⌘	Requirements on TFC selection in UE in contradiction with 25.321. Isolated Impact Analysis: Correction to a function, UE TFC selection at maximum power, where the specification, TS25.123 and TS25.321, contains contradictions. Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.

Clauses affected:	⌘	6A.2, 6A.3
Other specs affected:	⌘	- Other core specifications - Test specifications - O&M Specifications
Other comments:	⌘	Note that no final value has been agreed upon yet for T_{notify} = [15]ms in TS25.133, section 6.4.2 and in TS25.123, section 6A.2.2 that is needed for finalizing the current requirements on TFC selection in UE in both specifications.

6A.2 Transport format combination selection in UE for 1.28Mcps TDD option

6A.2.1 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.

6A.2.2 Requirements

The UE shall continuously evaluate based on the ~~*Limited TFC Set* *Elimination*~~, ~~and~~ ~~*Recovered* *TFC Set*~~ and *Blocking* criteria defined below, ~~which~~how TFCs ~~of the given TFC set it can support~~ can be used for the purpose of TFC selection. The evaluation shall be performed using the estimated UE transmit power of a ~~corresponding~~ given TFC. The UE transmit power estimation shall be made using the UE transmitted power measured over the measurement period and the gain factors of the corresponding TFC.

The UE shall consider the ~~*Limited TFC Set* *Eliminiation*~~ criterion for a given TFC to be fulfilled ~~if~~ the estimated UE transmit power needed ~~of a certain~~ for this TFC ~~has been evaluated as~~ is greater than the Maximum UE transmitter power for at least X ~~measurement periods~~ out of Y successive measurement periods. ~~If the *Limited TFC Set* criterion for a TFC is fulfilled, t~~The MAC in the UE shall consider that the TFC ~~cannot be supported in TFC selection~~ 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 [15 ms] from the moment the ~~*Limited TFC Set* *Elimination*~~ criterion ~~has been~~ was fulfilled.

The UE shall consider the *Recovery* criterion for a given TFC to be fulfilled if the estimated UE transmit power needed for this TFC has not been greater than the Maximum UE transmitter power for at least Y successive measurement periods. 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 fulfilled.

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}).

~~If the *Limited TFC Set* criterion is fulfilled for a TFC the UE shall:~~

- ~~at the latest, block that TFC from usage at the start of the longest uplink TTI after the period (T_{notify} + T_{modify}+ T_{L1_proc}) from the moment when the *Limited TFC Set* criterion was fulfilled.~~

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.

Table 6.1: T_{adapt}

Service	T_{adapt} [ms]
AMR	40

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 [5].

~~The UE shall consider the *Recovered TFC Set* criterion for a TFC to be fulfilled if the UE has evaluated for at least Y successive measurement periods that the estimated UE transmit power for that TFC has not been greater than the Maximum UE transmitter power.~~

~~It shall be considered that a TFC which fulfilled the *Recovered TFC Set* criterion can be supported for TFC selection. This TFC shall no longer be blocked.~~

~~MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within T_{notify} from the moment the *Recovered TFC Set* criterion has been fulfilled.~~

6A.3 Maximum allowed UL TX Power for 1.28Mcps TDD option

UTRAN may limit the power the UE is using on the uplink by setting the maximum allowed UL TX power IE defined in TS25.331.

For each measurement period, the UE shall with the use of the UE transmitted power measurement, estimate if it has reached the Maximum allowed UL TX Power or not. With tolerances as defined for the UE transmitted power measurement accuracy (section 9.1.2.1.2), the UE output power shall not exceed the Maximum allowed UL TX Power, as set by the UTRAN.

3GPP TSG RAN WG4 Meeting #20 R4-011573

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CHANGE REQUEST

⌘ **25.123** **CR** 138 ⌘ ev **-** ⌘ Current version: **4.2.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Clarification of CPICH measurement accuracy
Source:	⌘	RAN WG4
Work item code:	⌘	LCRTDD-RF
Date:	⌘	12 Nov. 2001
Category:	⌘	**F**
Release:	⌘	Rel-4

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)

Reason for change:	⌘	For the CPICH measurements, which are used for monitoritoring FDD cells in UTRA TDD Mode, CPICH RSCP absolute accuracy requirements are missing whereas relative accuracy requirements are given but are not applicable.
Summary of change:	⌘	CPICH RSCP relative accuracy requirements are replaced by absolute accuracy requirements. Isolated Impact Analysis: Clarification of a requirement. Would not affect implementations behaving like indicated in the CR, would affect implementations that do not behave like indicated in the CR.
Consequences if not approved:	⌘	Accuracy requirements for CPICH RSCP measurements would not be clear.

Clauses affected:	⌘	9.1.1.2
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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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.

9.1.1.2 CPICH measurements (FDD)

Note: This measurement is used for handover between UTRA TDD and UTRA FDD.

These measurements consider *CPICH RSCP* and *CPICH Ec/Io* measurements. The requirements in this section are valid for terminals supporting this capability.

The measurement period for CELL_DCH state and CELL_FACH state can be found in section 8.

9.1.1.2.1 CPICH RSCP

9.1.1.2.1.1 Inter frequency measurement absolute ~~relative~~ accuracy requirement

The accuracy requirements in table 9.5 are valid under the following conditions:

- CPICH_RSCP1$|_{dBm}$ ≥ -114 dBm.

$$\left|\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{CPICH\_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$$

Table 9.5: CPICH_RSCP Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_RSCP	dBm	± 6	± 9	-94...-70
	dBm	± 8	± 11	-94...-50

~~The relative accuracy of CPICH RSCP in the inter frequency case is defined as the CPICH RSCP measured from one cell compared to the CPICH RSCP measured from another cell on a different frequency.~~

~~The accuracy requirements in table 9.5 are valid under the following conditions:~~

- ~~CPICH_RSCP1,2 ≥ -114 dBm.~~

~~$$\left|\left|CPICH\_RSCP1\right|_{in\ dB} - \left|CPICH\_RSCP2\right|_{in\ dB}\right| \le 20dB$$~~

~~$$\left|\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{CPICH\_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$$~~

- ~~| Channel 1_Io - Channel 2_Io| ≤ 20 dB.~~

~~**Table 9.5: CPICH_RSCP Inter frequency relative accuracy**~~

~~Parameter~~	~~Unit~~	~~Accuracy [dB]~~		~~Conditions~~
		~~Normal condition~~	~~Extreme condition~~	~~Io [dBm]~~
~~CPICH_RSCP~~	~~dBm~~	~~± 6~~	~~± 6~~	~~-94...-50~~

9.1.1.2.1.2 Range/mapping

The reporting range for *CPICH RSCP* is from -115 ...-25 dBm.

In table 9.6 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.6

Reported value	Measured quantity value	Unit
CPICH_RSCP_LEV _00	CPICH RSCP <–115	dBm
CPICH_RSCP_LEV _01	-115 ≤ CPICH RSCP < –114	dBm
CPICH_RSCP_LEV _02	-114 ≤ CPICH RSCP < –113	dBm
…	…	…
CPICH_RSCP_LEV _89	-27 ≤ CPICH RSCP < -26	dBm
CPICH_RSCP_LEV _90	-26 ≤ CPICH RSCP < -25	dBm
CPICH_RSCP_LEV _91	-25 ≤ CPICH RSCP	dBm

9.1.1.2.2 CPICH Ec/Io

9.1.1.2.2.1 Inter frequency measurement relative accuracy requirement

The relative accuracy of CPICH Ec/Io is defined as the CPICH Ec/Io measured from one cell compared to the CPICH Ec/Io measured from another cell on a different frequency.

The accuracy requirements in table 9.7 are valid under the following conditions:

CPICH_RSC1,2 ≥ -114 dBm.

$$\left| CPICH\_RSCP1\big|_{in\ dB} - CPICH\_RSCP2\big|_{in\ dB} \right| \le 20dB$$

$|\ Channel\ 1\_Io\ -Channel\ 2\_Io| \le 20$ dB.

$$\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{CPICH\_E_c}{I_{or}}\right)_{in\ dB} \le 20dB$$

Table 9.7: CPICH Ec/Io Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50

9.1.1.2.2.2 Range/mapping

The reporting range for *CPICH Ec/Io* is from -24 ...0 dB.

In table 9.8 mapping of the measured quantity is defined. Signalling range may be larger than the guaranteed accuracy range.

Table 9.8

Reported value	Measured quantity value	Unit
CPICH_Ec/Io _00	CPICH Ec/Io < –24	dB
CPICH_Ec/Io _01	-24 ≤ CPICH Ec/Io < –23.5	dB
CPICH_Ec/Io _02	-23.5 ≤ CPICH Ec/Io < –23	dB
…	…	…
CPICH_Ec/Io _47	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/Io _48	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/Io _49	0 ≤ CPICH Ec/Io	dB

3GPP TSG RAN WG4 Meeting #20 **R4-011574**

East Brunswick, NJ, USA 12th - 16th November 2001

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CHANGE REQUEST

⌘ **25.123** **CR** **139** ⌘ ev **-** ⌘ Current version: **4.2.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Clarification of Cell-FACH state requirements for 1.28Mcps TDD
Source:	⌘	RAN WG4
Work item code:	⌘	LCRTDD-RF
Date:	⌘	2001-011-13
Category:	⌘	**F**
Release:	⌘	Rel-4

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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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)

Reason for change:	⌘	Current requirements make no distinction between prior detected cells or non detected cells. This leads to too loose requirements in case of prior detected cells. In case of reselection towards FDD CPICH Ec/Io is missing. No distinction between GSM and UTRAN repetition period of relevant information to camp on a cell. RACH access procedure delay is currently not taken into account in the cell re-selection delay. Isolated Impact Analysis: Clarification of requirements. Does not affect implementations because added parts to the described behaviour is already part of the specification.
Summary of change:	⌘	Introduction of intra- and inter-frequency cell re-selection delay in case of prior identified cells. All re-selection delays are updated to take the delay of the access procedure into account. The related test cases are updated accordingly.
Consequences if not approved:	⌘	Missing requirements, incomplete and incorrect statements.

Clauses affected:	⌘	5, 5.4.3
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
	⌘	
Other comments:	⌘	

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5.4 Cell Re-selection in Cell_FACH

5.4.1 Introduction

When a Cell Re-selection process is triggered according to 25.331, the UE shall evaluate the cell re-selection criteria specified in TS 25.304, based on radio measurements, and if a better cell is found that cell is selected.

5.4.2 Requirements for 3.84Mcps TDD option

The cell re-selection delays specified below are applicable when the RRC parameter $T_{reselection}$ is set to 0. Otherwise the Cell reselection delay is increase by $T_{reselection}$ s.
P-CCPCH RSCP shall be used for cell reselection in Cell-FACH state to another TDD cell, CPICH RSCP shall be used for re-selection to a FDD cell and GSM carrier RSSI shall be used for cell re-selection to a GSM cell. The accuracies of the measurements used for a cell-reselection in an AWGN environment shall comply with the requirements in chapter 9.

5.4.2.1 Measurements

The UE measurement capability according to section 8.4.2.1 shall apply.

5.4.2.2 Cell re-selection delay

The cell re-selection delay is defined as the time between the occurrence of an event which will trigger Cell Reselection process and the moment in time when the UE starts sending the RRC CELL UPDATE message to the UTRAN.

5.4.2.2.1 Intra-frequency cell re-selection

The cell re-selection delay in CELL_FACH state for intra frequency cells shall be less than:

$$T_{reselection,\,intra} = T_{identify,\,intra} + T_{SI}$$

where

$T_{identify\_intra}$ =Specified in 8.4.2.2.1.

T_{SI} =Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.

This requirement assumes radio conditions to be sufficient, so reading of system information can be done without errors.

5.4.2.2.2 Inter-frequency TDD cell re-selection

The cell re-selection delay in CELL_FACH state for inter-frequency TDD cells shall be less than:

$$T_{reselection,\,TDD,inter} = T_{identify,\,inter} + T_{SI}$$

where

$T_{identify\_inter}$ =Specified in 8.4.2.3.1.

T_{SI} =Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.

This requirement assumes radio conditions to be sufficient, so reading of system information can be done without errors.

5.4.2.2.3 Inter-frequency FDD cell re-selection

The cell re-selection delay in CELL_FACH state for inter-frequency FDD cells shall be less than:

$$T_{reselection,\,FDD} = T_{identify,\,FDD} + T_{SI}$$

where

$T_{identify, FDD}$ =Specified in 8.4.2.4.1T_{SI} =Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.

This requirement assumes radio conditions to be sufficient, so reading of system information can be done without errors.

5.4.2.2.4 Inter-RAT cell re-selection

The cell re-selection delay in CELL_FACH state for inter-RAT cells shall be less than:

$$T_{reselection, GSM} = T_{identify, GSM} + T_{Measurement\_GSM} + T_{SI}$$

where

$T_{identify, GSM}$ = Is the worst case time for identification of one previously not identified GSM cell and is specified in TS25.225 Annex A.

$T_{Measurement,GSM}$ = is the worst case time for measuring one previously identified GSM carrier

T_{SI} =Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.

$$T_{Measurement, GSM} = Max\left\{480ms,\ 8 \cdot \frac{N_{carriers}}{N_{GSM\ carrier\ RSSI}} \cdot T_{meas}\right\}$$

where

$N_{carriers}$ is the number of GSM carriers in the Inter-RAT cell info list

$N_{GSM\ carrier\ RSSI}$ can be derived from the values in table 8.7 section 8.4.2.5.1.

This requirement assumes radio conditions to be sufficient, so reading of system information can be done without errors.

5.4.2.3 Maximum interruption in FACH message reception

The UE shall perform the cell re-selection with minimum interruption in FACH message reception.
The UE shall not interrupt the FACH message reception during measurements required for cell re-selection
The UE shall not interrupt the FACH message reception during the evaluation process of a cell required for a cell re-selection.
In case the UE reselects a cell the interruption time shall not exceed T_{SI}+50ms. T_{SI} is the longest repetition period for the system information to be read by the UE to camp on the cell.

5.4.3 Requirements for 1.28Mcps TDD option

P-CCPCH RSCP shall be used for cell reselection in Cell-FACH state to another TDD cell, CPICH RSCP and if requested in addition CPICH Ec/Io shall be used for re-selection to a FDD cell and GSM carrier RSSI shall be used for cell re-selection to a GSM cell. The accuracies of the measurements used for a cell-reselection in an AWGN environment shall comply with the requirements in chapter 9.

5.4.3.1 Measurements

The UE measurement capability according to section 8.4A shall apply.

5.4.3.2 Cell re-selection delay

For TDD tThe cell re-selection delay is defined as the time between the occurrence of an event which will trigger Cell Reselection process and the moment in time when the UE starts to send SYNCH-UL sequence for sending the RRC CELL UPDATE message to the UTRAN.

For FDD the cell re-selection delay is defined as the time between the occurrence of an event which will trigger Cell Reselection process and the moment in time when the UE starts sending the preambles on the PRACH for sending RRC CELL UPDATE message to the UTRAN.

For GSM the cell re-selection delay is defined as the time between the occurrence of an event which will trigger Cell Reselection process and the moment in time when the UE starts sending the random access in the target cell of the new RAT.

5.4.3.2.1 Intra-frequency cell re-selection

The cell re-selection delay in CELL_FACH state for intra frequency cells shall be less than:

$$T_{reselection,intra} = T_{identify\ intra} + 40ms + T_{SI} + T_{RA}$$

~~$T_{reselection,intra} = T_{identify\ intra} + T_{SI}$~~

If a cell has been detectable at least for $T_{identify,intra}$, the cell re-selection delay in CELL_FACH state for intra frequency cells shall be less than:

$$T_{reselection,intra} = T_{Measurement\ Period\ Intra} + 40ms + T_{SI} + T_{RA}$$

where

$T_{identify\ intra}$ = Specified in 8.4A.2.2.1

$T_{Measurement\ Period\ Intra}$ = Specified in 8.4A.2.2.2

T_{SI} = Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.

T_{RA} = The additional delay caused by the random access procedure.

This requirement assumes radio conditions to be sufficient, so reading of system information can be done without errors.

5.4.2.3.2 Inter-frequency TDD cell re-selection

The cell re-selection delay in CELL_FACH state for inter-frequency TDD cells shall be less than:

$$T_{reselection,TDD,inter} = T_{identify\ inter} + 40ms + T_{SI} + T_{RA}$$

~~$T_{reselection,TDD,inter} = T_{identify\ inter} + T_{SI}$~~

If a cell has been detectable at least for $T_{identify,inter}$, the cell re-selection delay in CELL_FACH state for inter frequency cells shall be less than:

$$T_{reselection,TDD,inter} = T_{measurement\ inter} + 40ms + T_{SI} + T_{RA}$$

where

$T_{identify\_inter}$ = Specified in 8.4A.2.3.1

$T_{measurement\ inter}$ = Specified in 8.4A.2.3.2

T_{SI} = Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.

T_{RA} = The additional delay caused by the random access procedure.

This requirement assumes radio conditions to be sufficient, so reading of system information can be done without errors.

5.4.2.3.3 Inter-frequency FDD cell re-selection

The cell re-selection delay in CELL_FACH state for inter-frequency FDD cells shall be less than:

$$T_{reselection,FDD} = T_{identify\ FDD\ inter} + T_{SI} + T_{RA}$$

~~$T_{reselection,FDD} = T_{identify\ FDD\ inter} + T_{SI}$~~

where

$T_{identify\ FDD\ inter}$ = Specified in 8.4A.2.4.1

T_{SI} = Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.

T_{RA} = The additional delay caused by the random access procedure.

This requirement assumes radio conditions to be sufficient, so reading of system information can be done without errors.

5.4.2.3.4 Inter-RAT cell re-selection

The cell re-selection delay in CELL_FACH state for inter-RAT cells shall be less than:

$$T_{reselection,GSM} = T_{identify\ GSM} + T_{Measurement\ GSM} + T_{BCCH} + T_{RA}$$

where

$T_{identify\ GSM}$ = Is the worst case time for identification of one previously not identified GSM cell and is specified in TS25.225 Annex A.

$T_{Measurement\ GSM}$ is the worst case time for measuring one previously identified GSM carrier.

$$T_{Measurement\ GSM} = Max\left\{[480]ms, 8 \cdot \frac{N_{carriers}}{N_{GSM\ carrier\ RSSI}} \cdot T_{meas}\right\}$$

where

$N_{carriers}$ is the number of GSM carriers in the Inter-RAT cell info list

$N_{GSM\ carrier\ RSSI}$ can be derived from the values in table 8.7 section 8.4A.2.5.1.

~~T_{SI} = Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell.~~

T_{BCCH} = the maximum time allowed to read BCCH data from GSM cell [TS05.08].

This requirement assumes radio conditions to be sufficient, so reading of system information can be done without errors.

NEXT CHANGED SECTION

A.5.4 Cell Re-selection in CELL_FACH

A.5.4.1 3.84 Mcps TDD option

NOTE: The cell re-selection delay is sufficiently covered by the test cases proposed in section A.4. The requirements for interruption in FACH message reception in section 5.4 is not tested. If a suitable test is evaluated it may be included in this section.

A.5.4.2 1.28 Mcps TDD option

A.5.4.2.1 One frequency present in neighbour list

A.5.4.2.1.1 Test purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_FACH state in the single carrier case reported in section 5.4.3.2.1.
The test parameters are given in Table A.5.4A, A.5.4B, A.5.4C and A.5.4D

Table A.5.4A: General test parameters for Cell Re-selection in CELL_FACH

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-103	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1.28	The value shall be used for all cells in the test.
T1		s	5	
T2		s	5	

Table A.5.4B: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	35.2
Channel symbol rate	ksps	17.6
Slot Format #	-	0; 2
Frame allocation	-	Continuous frame allocation
Midamble allocation	-	Common Midamble

Table A.5.4C: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	20 ms
Type of Error Protection	Convolution Coding
Coding Rate	½
Rate Matching attribute	256
Size of CRC	16

Table A.5.4D: Cell specific test parameters for Cell Re-selection in CELL_FACH

Parameter	Unit	Cell 1				Cell 2				Cell 3			
Timeslot Number		0		DWPTS		0		DWPTS		0		DWPTS	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[9]	[7]	[9]	[7]	[7]	[9]	[7]	[9]	[-1]	[-1]	[-1]	[-1
PCCPCH RSCP	dBm	-64	-66			-66	-64			-74	-74		
Qoffset1$_{s,n}$	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1,C6:0				C2, C1: 0; C2, C3:0; C2,C4:0 C2, C5: 0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4 C3, C5: 0; C3, C6:0			
Qhyst1$_s$	dB	0				0				0			
Treselection		0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
FACH measurement occasion info		not sent				not sent				not sent			
		Cell 4				**Cell 5**				**Cell 6**			
Timeslot		**0**		**DWPTS**		**0**		**DWPTS**		**0**		**DWPTS**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T**
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1
PCCPCH RSCP	dBm	-74	-74			-74	-74			-74	-74		
Qoffset**1**$_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0 C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1$_s$	dB	0				0				0			
Treselection		0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
FACH measurement occasion info		not sent				not sent				not sent			
I_{oc}	dBm/1.28 MHz	-70											
Propagation Condition		AWGN											

Note: S-CCPCH is located in an other downlink TS than TS0.

A.5.4.2.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST to perform a CELL UPDATE message with cause cell reselection.

The cell re-selection delay shall be less than [1.6~~2.5~~] s.

The rate of correct tests observed during repeated tests shall be at least 90%.

NOTE:

The cell re-selection delay can be expressed as: ~~$T_{reselection,intra} = T_{identify\ intra} + T_{SI}$~~

$T_{reselection,\ intra} = T_{Measurement\ Period\ Intra} + 40ms + T_{SI} + T_{RA}$, where:

~~$T_{identify\ intra}$~~ ~~Specified in 8.4A.2.2.1 gives [800]ms for this test case.~~

$T_{Measurement\ Period\ Intra}$ Specified in 8.4A.2.2.2 gives [200]ms for this test case.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

T_{RA} = The additional delay caused by the random access procedure described in TS25.224. In this test case the persistence value is 1 thus T_{RA} is set to 35ms in the test case.

This gives a total of 1.552.08s, allow 1.62.5s in the test case.

A.5.4.2.2 Two frequency present in neighbour list

A.5.4.2.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_FACH state in section 5.4.2.1.2. The test parameters are given in Table A.5.4E and A.5.4H.

Table A.5.4E: General test parameters for Cell Re-selection in CELL_FACH

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3,Cell4, Cell5, Cell6	
final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-103	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}		s	1.28	The value shall be used for all cells in the test.
T1		s	10	
T2		s	15	

Table A.5.4F: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	35.2
Channel symbol rate	ksps	17.6
Slot Format #	-	0; 2
Frame allocation	-	Continuous frame allocation
Midamble allocation	-	Common Midamble

Table A.5.4G: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	20 ms
Type of Error Protection	Convolution Coding
Coding Rate	½
Rate Matching attribute	256
Size of CRC	16

Table A.5.4H: Cell specific test parameters for Cell re-selection in CELL_FACH state

Parameter	Unit	Cell 1				Cell 2				Cell 3			
Timeslot Number		0		DWPTS		0		DWPTS		0		DWPTS	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T
UTRA RF Channel Number		Channel 1				Channel 2				Channel 1			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[9]	[7]	[9]	[7]	[7]	[9]	[7]	[9]	[-1]	[-1]	[-1]	[-1
PCCPCH RSCP	dBm	[-64]	[-66]			[-66]	[-64]			[-74]	[-74]		
$Qoffset1_{s,n}$	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1,C6:0				C2, C1: 0; C2, C3:0; C2,C4:0 C2, C5: 0; C2:C6:0				C3, C1: 0; C3, C2:0; C3,C4 C3, C5: 0; C3:C6:0			
$Qhyst1_s$	dBm	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
FACH measurement occasion info		not sent				not sent				not sent			
FACH measurement occasion cycle length		4				4				4			
Inter-frequency TDD measurement indicator		TRUE				TRUE				TRUE			
Inter-frequency FDD measurement indicator		FALSE				FALSE				FALSE			
		Cell 4				**Cell 5**				**Cell 6**			
Timeslot		**0**		**DWPTS**		**0**		**DWPTS**		**0**		**DWPTS**	
		T1	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**	**T1**	**T**
UTRA RF Channel Number		Channel				Channel 2				Channel			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3			-3	-3		
DwPCH_Ec/Ior	dB			0	0			0	0			0	0
$\hat{I}_{or}/I_{oc}$	dB	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1]	[-1
PCCPCH RSCP	dBm	[-74]	[-74]			[-74]	[-74]			[-74]	[-74]		
$Qoffset1_{s,n}$	dB	C4, C1: 0; C4, C2:0; C4,C3:0C4, C5:0; C4:C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5:C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6:C5:0			
$Qhyst1_s$	dB	0				0				0			
Treselection	s	0				0				0			
Qintrasearch	dB	not sent				not sent				not sent			
FACH measurement occasion info		not sent				not sent				not sent			
FACH measurement occasion cycle length		4				4				4			
Inter-frequency TDD measurement indicator		TRUE				TRUE				TRUE			
Inter-frequency FDD measurement indicator		FALSE				FALSE				FALSE			
I_{oc}	dBm/1.28 MHz	-70											
Propagation Condition		AWGN											

Note: S-CCPCH is located in an other downlink TS than TS0..

A.5.4.2.2.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST to perform a CELL UPDATE message with cause cell reselection.

The cell re-selection delay shall be less than [~~7~~2] s.

The rate of correct tests observed during repeated tests shall be at least 90%.

NOTE:

The cell re-selection delay can be expressed as: ~~$T_{reselection,inter} = T_{identify\ inter} + T_{SI}$~~
$T_{reselection,TDD,inter} = T_{measurement\ inter} + 40ms + T_{SI} + T_{RA}$, where:

~~$T_{identify\ inter}$~~ ~~Specified in 8.4A.2.3.1 gives [5]s for this test case.~~

$T_{measurement\ inter}$ Specified in 8.4A.2.3.2 gives [480]ms for this test case.

T_{SI} Maximum repetition rate of relevant system info blocks that needs to be received by the UE to camp on a cell. 1280 ms is assumed in this test case.

T_{RA} = The additional delay caused by the random access procedure described in TS25.224. In this test case the persistence value is 1 thus T_{RA} is set to 35ms in the test case.

This gives a total of ~~6.28~~1.84 s, allow 2~~7~~s in the test case.

3GPP TSG RAN WG4 Meeting #20 R4-011575

East Brunswick, NJ, USA 12th - 16th November 2001

CR-Form-v4

CHANGE REQUEST

⌘ **25.123 CR 140** ⌘ ev **-** ⌘ Current version: **4.2.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☒ Core Network ☐

Title:	⌘	Clarification of 1.28Mcps TDD/TDD handover
Source:	⌘	RAN WG4
Work item code:	⌘	LCRTDD-RF
Date:	⌘	2001-11-13
Category:	⌘	**F**
Release:	⌘	Rel-4

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)*

Reason for change:	⌘	Clarification of the explanation of the interruption time in case of a handover with SYNCH uplink exchange is recommended by the UTRAN.
Summary of change:	⌘	In case that a handover with SYNCH uplink exchange is recommended by the UTRAN SYNCH-UL sequence is transmitted in UpPTS. Isolated Impact Analysis: Clarification of a requirement. Would not affect implementations behaving like indicated in the CR, would affect implementations that do not behave like indicated in the CR.
Consequences if not approved:	⌘	Incomplete and incorrect statements.

Clauses affected:	⌘			
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ 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/3G_Specs/CRs.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.

5.1 TDD/TDD Handover

5.1.1 Introduction

The purpose of TDD/TDD handover is to change the cell of the connection between UE and UTRAN. The handover procedure is initiated from UTRAN with a RRC message that implies a handover, refer to TS25.331.The handover procedure may cause the UE to change its frequency.
For 1.28 Mcps TDD, at the beginning of the measurement process the UE shall find synchronisation to the cell to measure using the synchronisation channel (DwPCH). This is described under 'cell search' in 3GPP RAN TS25.201, TS25.221 TS25.222, TS25.223, TS25.224, TS25.225' if the monitored cell is a 1.28 Mcps TDD cell. For a TDD cell to monitor after this procedure the exact timing of the midamble of the P-CCPCH is known and the measurements can be performed. Depending on the UE implementation and if timing information about the cell to monitor is available, the UE may perform the measurements on the P-CCPCH directly without prior DwPCH synchronisation.

5.1.2 Requirements

5.1.2.1 TDD/TDD Handover delay

5.1.2.1.1 3.84 Mcps TDD option

Procedure delay for all procedures, that can command a handover, are specified in TS25.331 section 13.5.2.
When the UE receives a RRC message implying handover with the activation time "now" or earlier than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.
If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH at the designated activation time.
where:
$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.1.2.2.1.

5.1.2.1.2 1.28 Mcps TDD option

Procedure delay for all procedures, that can command a handover, are specified in TS25.331.
When the UE receives a RRC message that implies a handover, with the activation time "now" or earlier than $D_{handover}$ seconds from the end of the last TTI containing the RRC command,,the UE shall start transmission $D_{handover}$ seconds from the end of the last TTI containing the RRC command.
If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH at the designated activation time.
where:
$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.1.2.2.2.

5.1.2.2 Interruption time

5.1.2.2.1 3.84 Mcps TDD option

The interruption time i.e. the time between the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCH, shall be less than the value in table 5.1 for intra-frequency handover and TDD/TDD inter-frequency handover. There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell has to be decoded by the UE or not.
A cell shall be regarded as known by the UE if either or both of the following conditions are true:

- it has been measured during the last 5 seconds or
- a dedicated connection existed between the UE and the cell during the last 5 seconds.

The SFN of the target cell needs not to be decoded by the UE if either or both of the following conditions are true:

- a handover with timing maintain is commanded by the UTRAN or
- the SFN of the target cell is known by the UE or

Table 5.1 TDD/TDD handover – interruption time

TDD/TDD handover case	Maximum delay [ms]			
	Known Cell		Unknown Cell	
	SFN not to be decoded	SFN needs to be decoded	SFN not to be decoded	SFN needs to be decoded
Intra-frequency	40	70	350	400
Inter-frequency	40	70	350	400

The interruption time includes the time that can elapse till the appearance of the channel required for the synchronisation, which can be up to one frame (10ms). And the time that can elapse till the appearance of the slot in which the new uplink DPCH shall be transmitted , which can be up to one frame (10ms).
The requirement in Table 5.1 for the unknown cell shall apply if the signal quality of the unknown cell is good enough for successful synchronisation with one attempt.

NOTE: One synchronisation attempt can consist of coherent averaging using several frames.

5.1.2.2.2 1.28 Mcps TDD option

The interruption time i.e. the time between the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCH or the SYNC-UL in case that a handover with SYNCH uplink exchange is recommended, shall be less than the value in table 5.1A. There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell has to be decoded by the UE or not..
A cell shall be regarded as known by the UE if either or both of the following conditions are true:

- it has been measured during the last 5 seconds or
- a dedicated connection existed between the UE and the cell during the last 5 seconds.

The SFN of the target cell needs not to be decoded by the UE if either or both of the following conditions are true:

- a handover with timing maintain is commanded by the UTRAN or
- the SFN of the target cell is known by the UE or

Table 5.1A: TDD/ TDD handover – interruption time

cell in the handover command message	Maximum delay [ms]			
	Known Cell		Unknown Cell	
	SFN not to be decoded	SFN needs to be decoded	SFN not to be decoded	SFN needs to be decoded
Intra-frequency	[40]	[70]	[350]	[400]
Inter-frequency	[40]	[70]	[350]	[400]

The interruption time includes the time that can elapse till the appearance of the channel required for the synchronisation. And the time that can elapse till the appearance of the new uplink DPCH or the Up~~Dw~~PTS in which the ~~new uplink~~ SYNC-UL~~1~~ shall be transmitted ~~,or in case of high chip rate TDD the new uplink DPCH, shall be transmitted~~ , which can be up to one frame (10ms).
The requirement in Table 5.1A for the cell shall apply if the signal quality of the unknown cell is good enough for successful synchronisation with one attempt.

NOTE: One synchronisation attempt can consist of coherent averaging using several frames.