TSG RAN Meeting #18 **RP-020780**
New Orleans, US, 3 - 6 December, 2002

Title **CRs (R'99 and Rel-4/Rel-5 Category A) to TS 25.133**
Source **TSG RAN WG4**
Agenda Item **7.4.3**

RAN4 Tdoc	Spec	CR	R	Cat	Rel	Curr Ver	Title	Work Item
R4-021403	25.133	437	1	F	R99	3.11.0	Correction of interruption time in FDD/FDD Hard Handover	TEI
R4-021404	25.133	438	1	A	Rel-4	4.6.0	Correction of interruption time in FDD/FDD Hard Handover	TEI
R4-021405	25.133	439	1	A	Rel-5	5.4.0	Correction of interruption time in FDD/FDD Hard Handover	TEI
R4-021443	25.133	476		F	R99	3.11.0	Correction of UE Transmitted Power requirements in case of Compressed Mode gaps	TEI
R4-021444	25.133	488		A	Rel-4	4.6.0	Correction of UE Transmitted Power requirements in case of Compressed Mode gaps	TEI
R4-021445	25.133	477		A	Rel-5	5.4.0	Correction of UE Transmitted Power requirements in case of Compressed Mode gaps	TEI
R4-021705	25.133	478	1	F	R99	3.11.0	Correction of Measurement Occasion Patterns for BSIC Reconfirmation	TEI
R4-021706	25.133	489	1	A	Rel-4	4.6.0	Correction of Measurement Occasion Patterns for BSIC Reconfirmation	TEI
R4-021707	25.133	479	1	A	Rel-5	5.4.0	Correcction of Measurement Occasion Patterns for BSIC Reconfirmation	TEI
R4-021741	25.133	480	2	F	R99	3.11.0	Required Window size for measurements using IPDL	TEI
R4-021742	25.133	490	2	A	Rel-4	4.6.0	Required Window size for measurements using IPDL	TEI
R4-021743	25.133	481	2	A	Rel-5	5.4.0	Required Window size for measurements using IPDL	TEI
R4-021713	25.133	482	1	F	R99	3.11.0	UE Timer accuracy	TEI
R4-021714	25.133	491	1	A	Rel-4	4.6.0	UE Timer accuracy	TEI
R4-021715	25.133	483	1	A	Rel-5	5.4.0	UE Timer accuracy	TEI
R4-021651	25.133	504		F	R99	3.11.0	Correction of UE parameters for Random Access Test	TEI

RAN4 Tdoc	Spec	CR	R	Cat	Rel	Curr Ver	Title	Work Item
R4-021652	25.133	505		A	Rel-4	4.6.0	Correction of UE parameters for Random Access Test	TEI
R4-021653	25.133	506		A	Rel-5	5.4.0	Correction of UE parameters for Random Access Test	TEI
R4-021717	25.133	507		F	R99	3.11.0	Corrections to cell reselection test cases	TEI
R4-021718	25.133	508		A	Rel-4	4.6.0	Corrections to cell reselection test cases	TEI
R4-021719	25.133	509		A	Rel-5	5.4.0	Corrections to cell reselection test cases	TEI

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021403**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **437** ⌘ **rev** **1** ⌘ Current version: **3.11.0** ⌘

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

Title:	⌘	Correction of interruption time in FDD/FDD Hard Handover
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	26/11/2002
Category:	⌘	**F**
Release:	⌘	R99

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: ⌘

In this test case, the delay uncertainty of the TTI of the uplink DCH is not taken into consideration. The timing of CFN between cell1 and cell2 is not always aligned in this test case described in TS25.133 A5.2. If the timing of CFN between cell1 and cell2 isn't aligned, uplink DPCCH may not be able to be transmitted within 70ms (A.5.2.1) or 100ms (A.5.2.2), which is test requirement. For example, when a PC preamble is specified with 0, uplink DPDCH and uplink DPCCH must be transmitted at the same time as to Synchronisation procedure A described in TS25.214 4.3.2.3. In this case, The transmission delay of a maximum TTI of the uplink DCH occurs to align the timing of uplink DPDCH and uplink DPCCH transmission with the maximum uplink TTI boundary of the target cell even if downlink DPCCH synchronisation procedure is completed within 70ms (A.5.2.1) or 100ms (A.5.2.2) from activation time. The transmission delay for a maximum uplink TTI occurs in the same way even if a PC preamble is except for 0. This delay isn't taken into consideration with the interruption time.

There are two ways of the following as an approach for this subject.

(a) The transmission delay to align the timing of uplink DPDCH and uplink DPCCH transmission with the maximum uplink TTI boundary of the target cell is added to the interruption time.
(b) The timing of CFN between cell1 and cell2 is aligned so that the UE can transmit uplink DPCCH after 70ms (A.5.2.1) or 100ms (A.5.2.2) from the activation time.

The approach (a) is reasonable for System Simulator used in Terminal Conformance test.

Summary of change: ⌘

To add the maximum TTI of the uplink DCH to the interruption time
To define DCH parameter as UL Reference Measurement Channel 12.2 kbps

Consequences if not approved:	⌘	Even “Good UE” may not pass the test. The UE may not transmit uplink DPDCH at the uplink TTI boundary.

Clauses affected:	⌘	5.2			
Other specs affected:	⌘	**Y** / **N** / **X**	Other core specifications	⌘	34.121 8.3.2
		X /	Test specifications		
		/ **X**	O&M Specifications		
Other comments:	⌘	The CR (T1R-020317) will be sent to T1-RF to add the maximum TTI of the uplink DCH to the interruption time. Equivalent CRs in other Releases: CR438r1 cat. A to 25.133 v4.6.0, CR439r1 cat. A to 25.133 v5.4.0			

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.

5.2 FDD/FDD Hard Handover

5.2.1 Introduction

The hard handover procedure is initiated from UTRAN with a RRC message that implies a hard handover, see TS 25.331 section 8.3.5.

5.2.2 Requirements

5.2.2.1 Hard handover delay

Procedure delay for all procedures, that can command a hard handover, are specified in TS25.331 section 13.5.2.

When the UE receives a RRC message implying hard handover with the activation time "now" or earlier than 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 DPCCH 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 DPCCH 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 5.2.2.2.

5.2.2.2 Interruption time

The interruption time, i.e. the time between the last TTI containing a transport block on the old DPDCH and the time the UE starts transmission of the new uplink DPCCH, is depending on whether the target cell is known for the UE or not.

If intra-frequency hard handover is commanded or inter-frequency hard handover is commanded when the UE does not need compressed mode to perform inter-frequency measurements, the interruption time shall be less than $T_{interrupt1}$

$$T_{interrupt1}=T_{IU}+40+20*KC+150*OC\underline{+ 10*F_{max}} \text{ ms}$$

where

T_{IU} is the interruption uncertainty when changing the timing from the old to the new cell. T_{IU} can be up to one frame (10 ms).

KC is the number of known target cells in the message, and

OC is the number of target cells that are not known in the message.

$\underline{F_{max}}$ <u>denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.</u>

NOTE: The figure 40 ms is the time required for measuring the downlink DPCCH channel as stated in TS 25.214 section 4.3.1.2.

In the interruption requirement $T_{interrupt1}$ a cell is known if either or both of the following conditions are true:

- the UE has had radio links connected to the cell in the previous (old) active set
- the cell has been measured by the UE during the last 5 seconds and the SFN of the cell has been decoded by the UE.

If inter-frequency hard handover is commanded and the UE needs compressed mode to perform inter-frequency measurements, the interruption time shall be less than $T_{interrupt2}$

$$T_{interrupt2} = T_{IU}+40+50*KC+150*OC+ 10*F_{max} ms$$

In the interruption requirement $T_{interrupt2}$ a cell is known if:

- the cell has been measured by the UE during the last 5 seconds.

The phase reference is the primary CPICH.

The requirements in this section assume that N312 has the smallest possible value i.e. only one insync is required.

NEXT CHANGED SECTION

A.5.2 FDD/FDD Hard Handover

A.5.2.1 Handover to intra-frequency cell

A.5.2.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the hard handover delay in CELL_DCH state in the single carrier case reported in section 5.2.2.1.

The test parameters are given in Table A.5.0 and A.5.0A below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 1B shall be used, and that CPICH Ec/Io and SFN-CFN observed timed difference shall be reported together with Event 1A. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration with activation time at the beginning of T3 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE so that the whole message is available at the UE the RRC procedure delay prior to the beginning of T3. The RRC procedure delay is defined [16].

Table A.5.0: General test parameters for Handover to intra-frequency cell

Parameter		Unit	Value	Comment
DCH parameters			Dl and Ul Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1 and A.2.1
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
Reporting range		dB	3	Applicable for event 1A and 1B
Hysteresis		dB	0	
W			1	Applicable for event 1A and 1B
Reporting deactivation threshold			0	Applicable for event 1A
Time to Trigger		ms	0	
Filter coefficient			0	
T1		s	5	
T2		s	5	
T3		s	5	

Table A.5.0A: Cell specific test parameters for Handover to intra-frequency cell

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
CPICH_Ec/Ior	dB	-10			-10		
PCCPCH_Ec/Ior	dB	-12			-12		
SCH_Ec/Ior	dB	-12			-12		
PICH_Ec/Ior	dB	-15			-15		
DPCH_Ec/Ior	dB	Note1	Note1	Note3	N/A	N/A	Note1
OCNS		Note2	Note2	Note2	-0.941	-0.941	Note2
$\hat{I}_{or}/I_{oc}$	dB	0	6.97		-Infinity	5.97	
I_{oc}	dBm/3.84 MHz	-70					
CPICH_Ec/Io	dB	-13			-Infinity	-14	
Propagation Condition		AWGN					
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: The DPCH may not be power controlled by the power control loop.							

A.5.2.1.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 110~~70~~ ms from the beginning of time period T3.

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

A.5.2.2 Handover to inter-frequency cell

A.5.2.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the inter frequency hard handover delay in CELL_DCH state as specified in section 5.2.2.1.

The test consists of three successive time periods, with a time duration T1, T2 and T3. The test parameters are given in tables A.5.0B and A.5.0C below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 2C shall be used. The CPICH Ec/I0 of the best cell on the unused frequency shall be reported together with Event 2C reporting. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration with activation time at beginning of T3 with one active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE so that the whole message is available at the UE the RRC procedure delay prior to the beginning of T3. The RRC procedure delay is defined [16].

Table A.5.0B: General test parameters for Handover to inter-frequency cell

Parameter		Unit	Value	Comment
DCH parameters			DL and UL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1 and A.2.1
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Compressed mode			A.22 set 1	As specified in TS 25.101 section A.5.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Threshold non used frequency		dB	-18	Absolute Ec/I0 threshold for event 2C
Reporting range		dB	4	Applicable for event 1A
Hysteresis		dB	0	
W			1	Applicable for event 1A
W non-used frequency			1	Applicable for event 2C
Reporting deactivation threshold			0	Applicable for event 1A
Time to Trigger		ms	0	
Filter coefficient			0	
T1		s	5	
T2		s	10	
T3		s	5	

TableA.5.0C: Cell Specific parameters for Handover to inter-frequency cell

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1			Channel 2		
CPICH_Ec/Ior	dB	-10			-10		
PCCPCH_Ec/Ior	dB	-12			-12		
SCH_Ec/Ior	dB	-12			-12		
PICH_Ec/Ior	dB	-15			-15		
DPCH_Ec/Ior	dB	Note1	Note 1	Note 3	N/A	N/A	Note1
OCNS		Note 2			-0.941	-0.941	Note 2
$\hat{I}_{or}/I_{oc}$	dB	0			Infinity	-1.8	-1.8
I_{oc}	dBm/3.84 MHz	-70					
CPICH_Ec/Io	dB	-13			Infinity	-14	
Propagation Condition		AWGN					
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: The DPCH may not be power controlled by the power control loop.							

A.5.2.2.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 140~~100~~ ms from the beginning of time period T3.

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

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021404**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **438** ⌘ **rev** **1** ⌘ Current version: **4.6.0** ⌘

*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:	⌘	Correction of interruption time in FDD/FDD Hard Handover
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	26/11/2002
Category:	⌘	**A**
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)*
Rel-6 *(Release 6)*

Reason for change: ⌘

In this test case, the delay uncertainty of the TTI of the uplink DCH is not taken into consideration. The timing of CFN between cell1 and cell2 is not always aligned in this test case described in TS25.133 A5.2. If the timing of CFN between cell1 and cell2 isn't aligned, uplink DPCCH may not be able to be transmitted within 70ms (A.5.2.1) or 100ms (A.5.2.2), which is test requirement. For example, when a PC preamble is specified with 0, uplink DPDCH and uplink DPCCH must be transmitted at the same time as to Synchronisation procedure A described in TS25.214 4.3.2.3. In this case, The transmission delay of a maximum TTI of the uplink DCH occurs to align the timing of uplink DPDCH and uplink DPCCH transmission with the maximum uplink TTI boundary of the target cell even if downlink DPCCH synchronisation procedure is completed within 70ms (A.5.2.1) or 100ms (A.5.2.2) from activation time. The transmission delay for a maximum uplink TTI occurs in the same way even if a PC preamble is except for 0. This delay isn't taken into consideration with the interruption time.

There are two ways of the following as an approach for this subject.

(a) The transmission delay to align the timing of uplink DPDCH and uplink DPCCH transmission with the maximum uplink TTI boundary of the target cell is added to the interruption time.
(b) The timing of CFN between cell1 and cell2 is aligned so that the UE can transmit uplink DPCCH after 70ms (A.5.2.1) or 100ms (A.5.2.2) from the activation time.

The approach (a) is reasonable for System Simulator used in Terminal Conformance test.

Summary of change: ⌘

To add the maximum TTI of the uplink DCH to the interruption time
To define DCH parameter as UL Reference Measurement Channel 12.2 kbps

Consequences if not approved:	⌘	Even “Good UE” may not pass this test. The UE may not transmit uplink DPDCH at the uplink TTI boundary.

Clauses affected:	⌘	5.2			
Other specs affected:	⌘	**Y** / **N** / **X**	Other core specifications	⌘	34.121 8.3.2
		X /	Test specifications		
		/ **X**	O&M Specifications		
Other comments:	⌘	Equivalent CRs in other Releases: CR437r1 cat. F to 25.133 v3.11.0, CR439r1 cat. A to 25.133 v5.4.0			

How to create CRs using this form:
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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.

5.2 FDD/FDD Hard Handover

5.2.1 Introduction

The hard handover procedure is initiated from UTRAN with a RRC message that implies a hard handover, see TS 25.331 section 8.3.5.

5.2.2 Requirements

5.2.2.1 Hard handover delay

Procedure delay for all procedures, that can command a hard handover, are specified in TS25.331 section 13.5.2.

When the UE receives a RRC message implying hard handover with the activation time "now" or earlier than 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 DPCCH 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 DPCCH 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 5.2.2.2.

5.2.2.2 Interruption time

The interruption time, i.e. the time between the last TTI containing a transport block on the old DPDCH and the time the UE starts transmission of the new uplink DPCCH, is depending on whether the target cell is known for the UE or not.

If intra-frequency hard handover is commanded or inter-frequency hard handover is commanded when the UE does not need compressed mode to perform inter-frequency measurements, the interruption time shall be less than $T_{interrupt1}$

$$T_{interrupt1}=T_{IU}+40+20*KC+150*OC\underline{+ 10*F_{max}} \text{ ms}$$

where

T_{IU} is the interruption uncertainty when changing the timing from the old to the new cell. T_{IU} can be up to one frame (10 ms).

KC is the number of known target cells in the message, and

OC is the number of target cells that are not known in the message.

$\underline{F_{max}}$ <u>denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.</u>

Note: The figure 40 ms is the time required for measuring the downlink DPCCH channel as stated in TS 25.214 section 4.3.1.2.

In the interruption requirement $T_{interrupt1}$ a cell is known if either or both of the following conditions are true:

- the UE has had radio links connected to the cell in the previous (old) active set
- the cell has been measured by the UE during the last 5 seconds and the SFN of the cell has been decoded by the UE.

If inter-frequency hard handover is commanded and the UE needs compressed mode to perform inter-frequency measurements, the interruption time shall be less than $T_{interrupt2}$

$$T_{interrupt2} = T_{IU}+40+50*KC+150*OC+ 10*F_{max} \text{ ms}$$

In the interruption requirement $T_{interrupt2}$ a cell is known if:

- the cell has been measured by the UE during the last 5 seconds.

The phase reference is the primary CPICH.

The requirements in this section assume that N312 has the smallest possible value i.e. only one insync is required.

NEXT CHANGED SECTION

A.5.2 FDD/FDD Hard Handover

A.5.2.1 Handover to intra-frequency cell

A.5.2.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the hard handover delay in CELL_DCH state in the single carrier case reported in section 5.2.2.1.

The test parameters are given in Table A.5.0 and A.5.0A below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 1B shall be used, and that CPICH Ec/Io and SFN-CFN observed timed difference shall be reported together with Event 1A. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration with activation time at the beginning of T3 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE so that the whole message is available at the UE the RRC procedure delay prior to the beginning of T3. The RRC procedure delay is defined [16].

Table A.5.0: General test parameters for Handover to intra-frequency cell

Parameter		Unit	Value	Comment
DCH parameters			DL and Ul Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1 and A.2.1
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
Reporting range		dB	3	Applicable for event 1A and 1B
Hysteresis		dB	0	
W			1	Applicable for event 1A and 1B
Reporting deactivation threshold			0	Applicable for event 1A
Time to Trigger		ms	0	
Filter coefficient			0	
T1		s	5	
T2		s	5	
T3		s	5	

Table A.5.0A: Cell specific test parameters for Handover to intra-frequency cell

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
CPICH_Ec/Ior	dB	-10			-10		
PCCPCH_Ec/Ior	dB	-12			-12		
SCH_Ec/Ior	dB	-12			-12		
PICH_Ec/Ior	dB	-15			-15		
DPCH_Ec/Ior	dB	Note1	Note1	Note3	N/A	N/A	Note1
OCNS		Note2	Note2	Note2	-0.941	-0.941	Note2
$\hat{I}_{or}/I_{oc}$	dB	0	6.97		-Infinity	5.97	
I_{oc}	dBm/ 3.84 MHz	-70					
CPICH_Ec/Io	dB	-13			-Infinity	-14	
Propagation Condition		AWGN					
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: The DPCH may not be power controlled by the power control loop.							

A.5.2.1.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 110~~70~~ ms from the beginning of time period T3.

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

A.5.2.2 Handover to inter-frequency cell

A.5.2.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the inter frequency hard handover delay in CELL_DCH state as specified in section 5.2.2.1.

The test consists of three successive time periods, with a time duration T1, T2 and T3. The test parameters are given in tables A.5.0B and A.5.0C below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 2C shall be used. The CPICH Ec/I0 of the best cell on the unused frequency shall be reported together with Event 2C reporting. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration with activation time at beginning of T3 with one active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE so that the whole message is available at the UE the RRC procedure delay prior to the beginning of T3. The RRC procedure delay is defined [16].

Table A.5.0B: General test parameters for Handover to inter-frequency cell

Parameter		Unit	Value	Comment
DCH parameters			DL and UL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1 and A.2.1
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Compressed mode			A.22 set 1	As specified in TS 25.101 section A.5.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Threshold non used frequency		dB	-18	Absolute Ec/I0 threshold for event 2C
Reporting range		dB	4	Applicable for event 1A
Hysteresis		dB	0	
W			1	Applicable for event 1A
W non-used frequency			1	Applicable for event 2C
Reporting deactivation threshold			0	Applicable for event 1A
Time to Trigger		ms	0	
Filter coefficient			0	
T1		s	5	
T2		s	10	
T3		s	5	

TableA.5.0C: Cell Specific parameters for Handover to inter-frequency cell

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1			Channel 2		
CPICH_Ec/Ior	dB	-10			-10		
PCCPCH_Ec/Ior	dB	-12			-12		
SCH_Ec/Ior	dB	-12			-12		
PICH_Ec/Ior	dB	-15			-15		
DPCH_Ec/Ior	dB	Note 1	Note 1	Note3	N/A	N/A	Note 1
OCNS		Note 2			-0.941	-0.941	Note 2
$\hat{I}_{or}/I_{oc}$	dB	0			Infinity	-1.8	-1.8
I_{oc}	dBm/3.84 MHz	-70					
CPICH_Ec/Io	dB	-13			Infinity	-14	-14
Propagation Condition		AWGN					
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: The DPCH may not be power controlled by the power control loop.							

A.5.2.2.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 140~~100~~ ms from the beginning of time period T3.

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

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021405**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **439** ⌘ **rev** **1** ⌘ Current version: **5.4.0** ⌘

*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:	⌘	Correction of interruption time in FDD/FDD Hard Handover
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	26/11/2002
Category:	⌘	**A**
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: ⌘ In this test case, the delay uncertainty of the TTI of the uplink DCH is not taken into consideration. The timing of CFN between cell1 and cell2 is not always aligned in this test case described in TS25.133 A5.2. If the timing of CFN between cell1 and cell2 isn't aligned, uplink DPCCH may not be able to be transmitted within 70ms (A.5.2.1) or 100ms (A.5.2.2), which is test requirement. For example, when a PC preamble is specified with 0, uplink DPDCH and uplink DPCCH must be transmitted at the same time as to Synchronisation procedure A described in TS25.214 4.3.2.3. In this case, The transmission delay of a maximum TTI of the uplink DCH occurs to align the timing of uplink DPDCH and uplink DPCCH transmission with the maximum uplink TTI boundary of the target cell even if downlink DPCCH synchronisation procedure is completed within 70ms (A.5.2.1) or 100ms (A.5.2.2) from activation time. The transmission delay for a maximum uplink TTI occurs in the same way even if a PC preamble is except for 0. This delay isn't taken into consideration with the interruption time.

There are two ways of the following as an approach for this subject.

(a) The transmission delay to align the timing of uplink DPDCH and uplink DPCCH transmission with the maximum uplink TTI boundary of the target cell is added to the interruption time.
(b) The timing of CFN between cell1 and cell2 is aligned so that the UE can transmit uplink DPCCH after 70ms (A.5.2.1) or 100ms (A.5.2.2) from the activation time.

The approach (a) is reasonable for System Simulator used in Terminal Conformance test.

Summary of change: ⌘ To add the maximum TTI of the uplink DCH to the interruption time
To define DCH parameter as UL Reference Measurement Channel 12.2 kbps

Consequences if not approved:	⌘	Even “Good UE” may not pass this test. The UE may not transmit uplink DPDCH at the uplink TTI boundary.

Clauses affected:	⌘	5.2			
Other specs affected:	⌘	**Y** / **N** / **X**	Other core specifications	⌘	34.121 8.3.2
		X /	Test specifications		
		/ **X**	O&M Specifications		
Other comments:	⌘	Equivalent CRs in other Releases: CR437r1 cat. F to 25.133 v3.11.0, CR438r1 cat. A to 25.133 v4.6.0			

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.

5.2 FDD/FDD Hard Handover

5.2.1 Introduction

The hard handover procedure is initiated from UTRAN with a RRC message that implies a hard handover, see TS 25.331 section 8.3.5.

5.2.2 Requirements

5.2.2.1 Hard handover delay

Procedure delay for all procedures, that can command a hard handover, are specified in TS25.331 section 13.5.2.

When the UE receives a RRC message implying hard handover with the activation time "now" or earlier than 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 DPCCH 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 DPCCH 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 5.2.2.2.

5.2.2.2 Interruption time

The interruption time, i.e. the time between the last TTI containing a transport block on the old DPDCH and the time the UE starts transmission of the new uplink DPCCH, is depending on whether the target cell is known for the UE or not.

If intra-frequency hard handover is commanded or inter-frequency hard handover is commanded when the UE does not need compressed mode to perform inter-frequency measurements, the interruption time shall be less than $T_{interrupt1}$

$$T_{interrupt1}=T_{IU}+40+20*KC+150*OC\underline{+ 10*F_{max}} \text{ ms}$$

where

T_{IU} is the interruption uncertainty when changing the timing from the old to the new cell. T_{IU} can be up to one frame (10 ms).

KC is the number of known target cells in the message, and

OC is the number of target cells that are not known in the message.

$\underline{F_{max}}$ <u>denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.</u>

Note: The figure 40 ms is the time required for measuring the downlink DPCCH channel as stated in TS 25.214 section 4.3.1.2.

In the interruption requirement $T_{interrupt1}$ a cell is known if it has been measured by the UE during the last 5 seconds and the SFN of the cell has been decoded by the UE.

If inter-frequency hard handover is commanded and the UE needs compressed mode to perform inter-frequency measurements, the interruption time shall be less than $T_{interrupt2}$

$$T_{interrupt2} = T_{IU}+40+50*KC+150*OC\underline{+ 10*F_{max}} \text{ ms}$$

In the interruption requirement $T_{interrupt2}$ a cell is known if:

- the cell has been measured by the UE during the last 5 seconds.

The phase reference is the primary CPICH.

The requirements in this section assume that N312 has the smallest possible value i.e. only one insync is required.

NEXT CHANGED SECTION

A.5.2 FDD/FDD Hard Handover

A.5.2.1 Handover to intra-frequency cell

A.5.2.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the hard handover delay in CELL_DCH state in the single carrier case reported in section 5.2.2.1.

The test parameters are given in Table A.5.0 and A.5.0A below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 1B shall be used, and that CPICH Ec/Io and SFN-CFN observed timed difference shall be reported together with Event 1A. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration with activation time at the beginning of T3 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE so that the whole message is available at the UE the RRC procedure delay prior to the beginning of T3. The RRC procedure delay is defined [16].

Table A.5.0: General test parameters for Handover to intra-frequency cell

Parameter		Unit	Value	Comment
DCH parameters			DL and Ul Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1 and A.2.1
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
Reporting range		dB	3	Applicable for event 1A and 1B
Hysteresis		dB	0	
W			1	Applicable for event 1A and 1B
Reporting deactivation threshold			0	Applicable for event 1A
Time to Trigger		ms	0	
Filter coefficient			0	
T1		s	5	
T2		s	5	
T3		s	5	

Table A.5.0A: Cell specific test parameters for Handover to intra-frequency cell

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
CPICH_Ec/Ior	dB	-10			-10		
PCCPCH_Ec/Ior	dB	-12			-12		
SCH_Ec/Ior	dB	-12			-12		
PICH_Ec/Ior	dB	-15			-15		
DPCH_Ec/Ior	dB	Note1	Note1	Note3	N/A	N/A	Note1
OCNS		Note2	Note2	Note2	-0.941	-0.941	Note2
$\hat{I}_{or}/I_{oc}$	dB	0	6.97		-Infinity	5.97	
I_{oc}	dBm/3.84 MHz	-70					
CPICH_Ec/Io	dB	-13			-Infinity	-14	
Propagation Condition		AWGN					
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: The DPCH may not be power controlled by the power control loop.							

A.5.2.1.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 110~~70~~ ms from the beginning of time period T3.

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

A.5.2.2 Handover to inter-frequency cell

A.5.2.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the inter frequency hard handover delay in CELL_DCH state as specified in section 5.2.2.1.

The test consists of three successive time periods, with a time duration T1, T2 and T3. The test parameters are given in tables A.5.0B and A.5.0C below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1A and 2C shall be used. The CPICH Ec/I0 of the best cell on the unused frequency shall be reported together with Event 2C reporting. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration with activation time at beginning of T3 with one active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE so that the whole message is available at the UE the RRC procedure delay prior to the beginning of T3. The RRC procedure delay is defined [16].

Table A.5.0B: General test parameters for Handover to inter-frequency cell

Parameter		Unit	Value	Comment
DCH parameters			DL and UL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1 and A.2.1
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Compressed mode			A.22 set 1	As specified in TS 25.101 section A.5.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Threshold non used frequency		dB	-18	Absolute Ec/I0 threshold for event 2C
Reporting range		dB	4	Applicable for event 1A
Hysteresis		dB	0	
W			1	Applicable for event 1A
W non-used frequency			1	Applicable for event 2C
Reporting deactivation threshold			0	Applicable for event 1A
Time to Trigger		ms	0	
Filter coefficient			0	
T1		s	5	
T2		s	10	
T3		s	5	

TableA.5.0C: Cell Specific parameters for Handover to inter-frequency cell

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1			Channel 2		
CPICH_Ec/Ior	dB	-10			-10		
PCCPCH_Ec/Ior	dB	-12			-12		
SCH_Ec/Ior	dB	-12			-12		
PICH_Ec/Ior	dB	-15			-15		
DPCH_Ec/Ior	dB	Note 1	Note 1	Note3	N/A	N/A	Note 1
OCNS		Note 2			-0.941	-0.941	Note 2
$\hat{I}_{or}/I_{oc}$	dB	0			Infinity	-1.8	-1.8
I_{oc}	dBm/3.84 MHz	-70					
CPICH_Ec/Io	dB	-13			Intifinty	-14	-14
Propagation Condition		AWGN					
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: The DPCH may not be power controlled by the power control loop.							

A.5.2.2.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 140~~100~~ ms from the beginning of time period T3.

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

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021443**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **476** ⌘ **rev** ⌘ Current version: **3.11.0** ⌘

*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:	⌘	Correction of UE Transmitted Power requirements in case of Compressed Mode gaps
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	26/11/2002
Category:	⌘	**F**
Release:	⌘	R99

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:	⌘	In the current version of the specification, it is stated that in case of Compressed Mode gaps, the UE L1 shall report for the UE Transmitted Power a value of –50 dBm. This value will be then input to the L3 filter and will cause the drop of the averaged value at the output of L3 filter, which is wrong and can prevent the report of ordered events about the UE Tx Power (e.g. event 6a: the UE Tx power becomes larger than an absolute threshold).
Summary of change:	⌘	Correct the behaviour of UE L1 for empty slots created by compressed mode stating that, instead of responding with a value of –50 dBm, no value shall be reported for those slots. Isolated Impact: would not affect implementation behaving like indicated in the CR, would affect implementations supported the corrected functionality otherwise. The CR has a minor isolated impact on previous implementations, which still report the value of –50 dBm during compressed mode gaps. From a network point of view those mobile provides a lower averaged UE Tx power when in compressed mode. This may affect the network performance when both previous and new implementations are present together in the same network, depending on the use of the UE Tx power measurements.
Consequences if not approved:	⌘	The filtering of the UE Tx Power during Compressed Mode will lead to wrong lower values of the average after the L3 filter, which can prevent the correct reporting of ordered.

Clauses affected:	⌘	9.1.6.1
Other specs	⌘	Y: ☐ N: ☒ Other core specifications ⌘

affected:		X Test specifications X O&M Specifications
Other comments: ⌘	Equivalent CRs in other Releases: CR488 cat. A to 25.133 v4.6.0, CR477 cat. A to 25.133 v5.4.0	

How to create CRs using this form:
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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.

9.1.6 UE transmitted power

9.1.6.1 Accuracy requirement

The measurement period in CELL_DCH state is 1 slot.

Table 9.14 UE transmitted power absolute accuracy

Parameter	Unit	Accuracy [dB]	
		PUEMAX 24dBm	PUEMAX 21dBm
UE transmitted power=PUEMAX	dBm	+1/-3	±2
UE transmitted power=PUEMAX-1	dBm	+1.5/-3.5	±2.5
UE transmitted power=PUEMAX-2	dBm	+2/-4	±3
UE transmitted power=PUEMAX-3	dBm	+2.5/-4.5	±3.5
PUEMAX-10≤UE transmitted power<PUEMAX-3	dBm	+3/-5	±4

NOTE 1: User equipment maximum output power, PUEMAX, is the maximum output power level without tolerance defined for the power class of the UE in TS 25.101 [3] section 6.2.1.

NOTE 2: UE transmitted power is the reported value.

For each empty slot created by compressed mode, no value shall be reported by the UE L1 for those slots ~~shall respond with a value of -50 dBm~~.

9.1.6.2 UE transmitted power measurement report mapping

The reporting range for *UE transmitted power* is from -50 ...+33 dBm.

In table 9.15 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.15

Reported value	Measured quantity value	Unit
UE_TX_POWER _021	-50 ≤ UE transmitted power < -49	dBm
UE_TX_POWER _022	-49 ≤ UE transmitted power < -48	dBm
UE_TX_POWER _023	-48 ≤ UE transmitted power < -47	dBm
…	…	…
UE_TX_POWER _102	31 ≤ UE transmitted power < 32	dBm
UE_TX_POWER _103	32 ≤ UE transmitted power < 33	dBm
UE_TX_POWER _104	33 ≤ UE transmitted power < 34	dBm

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021445**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **477** ⌘ **rev** ⌘ Current version: **5.4.0** ⌘

*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:	⌘	Correction of UE Transmitted Power requirements in case of Compressed Mode gaps
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	26/11/2002
Category:	⌘	**A**
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:	⌘	In the current version of the specification, it is stated that in case of Compressed Mode gaps, the UE L1 shall report for the UE Transmitted Power a value of –50 dBm. This value will be then input to the L3 filter and will cause the drop of the averaged value at the output of L3 filter, which is wrong and can prevent the report of ordered events about the UE Tx Power (e.g. event 6a: the UE Tx power becomes larger than an absolute threshold).
Summary of change:	⌘	Correct the behaviour of UE L1 for empty slots created by compressed mode stating that, instead of responding with a value of –50 dBm, no value shall be reported for those slots. Isolated Impact: would not affect implementation behaving like indicated in the CR, would affect implementations supported the corrected functionality otherwise. The CR has a minor isolated impact on previous implementations, which still report the value of –50 dBm during compressed mode gaps. From a network point of view those mobile provides a lower averaged UE Tx power when in compressed mode. This may affect the network performance when both previous and new implementations are present together in the same network, depending on the use of the UE Tx power measurements.
Consequences if not approved:	⌘	The filtering of the UE Tx Power during Compressed Mode will lead to wrong lower values of the average after the L3 filter, which can prevent the correct reporting of ordered.

Clauses affected:	⌘	9.1.6.1
Other specs	⌘	Y ☐ N ☒ Other core specifications ⌘

affected:		X Test specifications X O&M Specifications
Other comments: ⌘	Equivalent CRs in other Releases: CR476 cat. F to 25.133 v3.11.0, CR488 cat. A to 25.133 v4.6.0	

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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.

9.1.6 UE transmitted power

9.1.6.1 Accuracy requirement

The measurement period in CELL_DCH state is 1 slot.

Table 9.14 UE transmitted power absolute accuracy

Parameter	Unit	Accuracy [dB]	
		PUEMAX 24dBm	PUEMAX 21dBm
UE transmitted power=PUEMAX	dBm	+1/-3	±2
UE transmitted power=PUEMAX-1	dBm	+1.5/-3.5	±2.5
UE transmitted power=PUEMAX-2	dBm	+2/-4	±3
UE transmitted power=PUEMAX-3	dBm	+2.5/-4.5	±3.5
PUEMAX-10≤UE transmitted power<PUEMAX-3	dBm	+3/-5	±4

NOTE 1: User equipment maximum output power, PUEMAX, is the maximum output power level without tolerance defined for the power class of the UE in TS 25.101 [3] section 6.2.1.

NOTE 2: UE transmitted power is the reported value.

For each empty slot created by compressed mode, no value shall be reported by the UE L1 for those slots ~~shall respond with a value of -50 dBm~~.

9.1.6.2 UE transmitted power measurement report mapping

The reporting range for *UE transmitted power* is from -50 ...+33 dBm.

In table 9.15 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.15

Reported value	Measured quantity value	Unit
UE_TX_POWER _021	-50 ≤ UE transmitted power < -49	dBm
UE_TX_POWER _022	-49 ≤ UE transmitted power < -48	dBm
UE_TX_POWER _023	-48 ≤ UE transmitted power < -47	dBm
…	…	…
UE_TX_POWER _102	31 ≤ UE transmitted power < 32	dBm
UE_TX_POWER _103	32 ≤ UE transmitted power < 33	dBm
UE_TX_POWER _104	33 ≤ UE transmitted power < 34	dBm

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021705**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **478** ⌘ **rev** **1** ⌘ Current version: **3.11.0** ⌘

*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:	⌘	Correction of Measurement Occasion Patterns for BSIC Reconfirmation
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	26/11/2002
Category:	⌘	**F**
Release:	⌘	R99

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:	⌘	Table 8.14 has some errors. Some of the cells in the table are not applicable after the change of the allowed measurement occasion patterns of Table 8.10A.
Summary of change:	⌘	Change the values in table 8.14. One note is added for N_TTI = 1 and Tmeas = 960 ms, 1280 and 1920 ms. These combinations of parameters result in long reconfirmation time, and for that reason are not specified. Isolated Impact: The CR has a minor isolated impact on the BSIC reconfirmation procedures because the time allowed to do a reselection is changed.
Consequences if not approved:	⌘	The specified values of $T_{re\text{-}confirm.\ GSM}$ for the measurement occasion patterns for BSIC Reconfirmation will be erroneous. - The correction is needed because the system cannot function correctly without this correction. - Some (N_TTI;T_meas) combinations are inconsistent with Table 8.10A The UE is not able to accept other (N_TTI;T_meas) combinations than included in the Table 8.10A. The behaviour of the UE is not specified when configured by other combinations and therefore can be different from one manufacturer to another. One possible situation is that UTRAN assumes that the UE accept the combination whereas the UE rejects it. The removal of these combinations will clear such situations. - When values in previous version were optimistic, UTRAN wrongly anticipated reconfirmation failure too soon. Then UTRAN concluded wrongly that the

	GSM cell was not detectable by the UE. - When values in previous version were pessimistic, UTRAN wrongly anticipated reconfirmation failure too late. One possible side effect was that UTRAN could slow down the re-selection time. These hereabove faults happen with 100 % probablility when UTRAN configures the UE with the previous (N_TTI;T_meas) combinations.

Clauses affected:	⌘	8.4.2.5.2.2			
Other specs affected:	⌘	**Y**	**N**		⌘
			X	Other core specifications	
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘	Equivalent CRs in other Releases: CR489r1 cat. A to 25.133 v4.6.0, CR479r1 cat. A to 25.133 v5.4.0			

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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.

8.4.2.5.2.2 BSIC re-confirmation

The requirements of this section are applicable for BSIC re-confirmation.

The UE shall maintain the timing information of 6 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For each measurement occasion allocated for GSM BSIC reconfirmation as described in 8.4.2.5, the UE shall attempt to decode the BSIC falling within the measurement occasion duration according to table 8.12. When the UE has to select one out of several possible GSM cells to reconfirm within the possible allocation of measurement occasions, according to 8.4.2.5, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see section 8.4.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the 6 strongest GSM cells in the monitored list.

$T_{re\text{-}confirm\_GSM}$ is given for the combinations of T_{meas} and N_{TTI} that are given in table 8.14. The values given in table 8.14 represent the number of patterns required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier. Different values for $T_{re\text{-}confirm\ GSM}$ might apply when more than one GSM cell is in the BSIC reconfirmation procedure at the same time.

Table 8.14: The worst-case time for reconfirmation of one previously identified GSM cell

T_meas (ms)	N_TTI=1 frame $T_{re\text{-}confirm,GSM}$ (ms)	N_TTI=2 frames $T_{re\text{-}confirm,GSM}$ (ms)	N_TTI=4 frames $T_{re\text{-}confirm,GSM}$ (ms)	N_TTI=8 frames $T_{re\text{-}confirm,GSM}$ (ms)
80	2880	~~1280~~1600	-	-
~~120~~	~~5040~~	~~2400~~	-	-
160	6400	~~2880~~3200	~~2560~~2240	~~2560~~1600
240	17280	4800	-~~3840~~	-
320	~~10880~~14080	6400	~~5120~~4480	~~5120~~3200
480	22080	9600	~~7680~~6720	~~7680~~4800
640	26880	12800	10240	~~10240~~6400
960	*	17280	~~1536~~13440	~~1536~~9600
1280	*	~~2048~~33280	~~2048~~17920	~~2048~~12800
1920	*	*	~~3072~~26880	~~3072~~19200
~~2560~~				~~40960~~
~~3840~~				~~61440~~

* Note: There are no performance requirements for these combinations of parameters because they result in long reconfirmation time.

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021707**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **479** ⌘ **rev** **1** ⌘ Current version: **5.4.0** ⌘

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

Title:	⌘	Correction of Measurement Occasion Patterns for BSIC Reconfirmation
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	26/11/2002
Category:	⌘	**A**
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:	⌘	Table 8.14 has some errors. Some of the cells in the table are not applicable after the change of the allowed measurement occasion patterns of Table 8.10A.
Summary of change:	⌘	Change the values in table 8.14. One note is added for N_TTI = 1 and Tmeas = 960 ms, 1280 and 1920 ms. These combinations of parameters result in long reconfirmation time, and for that reason are not specified. Isolated Impact: The CR has a minor isolated impact on the BSIC reconfirmation procedures because the time allowed to do a reselection is changed.
Consequences if not approved:	⌘	The specified values of $T_{re\text{-}confirm.\ GSM}$ for the measurement occasion patterns for BSIC Reconfirmation will be erroneous. - The correction is needed because the system cannot function correctly without this correction. - Some (N_TTI;T_meas) combinations are inconsistent with Table 8.10A The UE is not able to accept other (N_TTI;T_meas) combinations than included in the Table 8.10A. The behaviour of the UE is not specified when configured by other combinations and therefore can be different from one manufacturer to another. One possible situation is that UTRAN assumes that the UE accept the combination whereas the UE rejects it. The removal of these combinations will clear such situations. - When values in previous version were optimistic, UTRAN wrongly anticipated reconfirmation failure too soon. Then UTRAN concluded wrongly that the

	GSM cell was not detectable by the UE. - When values in previous version were pessimistic, UTRAN wrongly anticipated reconfirmation failure too late. One possible side effect was that UTRAN could slow down the re-selection time. These hereabove faults happen with 100 % probablility when UTRAN configures the UE with the previous (N_TTI;T_meas) combinations.

Clauses affected:	⌘	8.4.2.5.2.2			
Other specs affected:	⌘	**Y**	**N**		⌘
			X	Other core specifications	
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘	Equivalent CRs in other Releases: CR478r1 cat. F to 25.133 v3.11.0, CR489r1 cat. A to 25.133 v4.6.0			

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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.

8.4.2.5.2.2 BSIC re-confirmation

The requirements of this section are applicable for BSIC re-confirmation.

The UE shall maintain the timing information of 6 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For each measurement occasion allocated for GSM BSIC reconfirmation as described in 8.4.2.5, the UE shall attempt to decode the BSIC falling within the measurement occasion duration according to table 8.12. When the UE has to select one out of several possible GSM cells to reconfirm within the possible allocation of measurement occasions, according to 8.4.2.5, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see section 8.4.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the 6 strongest GSM cells in the monitored list.

$T_{re\text{-}confirm\_GSM}$ is given for the combinations of T_{meas} and N_{TTI} that are given in table 8.14. The values given in table 8.14 represent the number of patterns required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier. Different values for $T_{re\text{-}confirm\ GSM}$ might apply when more than one GSM cell is in the BSIC reconfirmation procedure at the same time.

Table 8.14: The worst-case time for reconfirmation of one previously identified GSM cell

T_meas (ms)	N_TTI=1 frame $T_{re\text{-}confirm,GSM}$ (ms)	N_TTI=2 frames $T_{re\text{-}confirm,GSM}$ (ms)	N_TTI=4 frames $T_{re\text{-}confirm,GSM}$ (ms)	N_TTI=8 frames $T_{re\text{-}confirm,GSM}$ (ms)
80	2880	~~1280~~1600	-	-
~~120~~	~~5040~~	~~2400~~	-	-
160	6400	~~2880~~3200	~~2560~~2240	~~2560~~1600
240	17280	4800	-~~3840~~	-
320	~~1088014080~~	6400	~~5120~~4480	~~5120~~3200
480	22080	9600	~~7680~~6720	~~7680~~4800
640	26880	12800	10240	~~10240~~6400
960	*	17280	~~15360~~13440	~~15360~~9600
1280	*	~~2048~~33280	~~2048~~17920	~~2048~~12800
1920	*	*	~~30720~~26880	~~30720~~19200
~~2560~~				~~40960~~
~~3840~~				~~61440~~

* Note: There are no performance requirements for these combinations of parameters because they result in long reconfirmation time.

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021741**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **480** ⌘ **rev** **2** ⌘ Current version: **3.11.0** ⌘

*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:	⌘	Required Window size for measurements using IPDL
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	26/11/2002
Category:	⌘	**F**
Release:	⌘	R99

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 performance requirements of SFN-SFN observed time difference type 2 measurements with IPDL are not finalised
Summary of change:	⌘	1) Time to detect a new cell through IPDL measurements and the corresponding measurement period is defined in CELL_DCH and Cell_FACH states when idle periods with a length of 1 slot are scheduled and based on Search Window Size 40 and 80 chips 2) Side conditions for accuracy requirements are defined. 3) The test case "A.9.1.5.2 SFN-SFN observed time difference type 2" is corrected. There are now tests both with and without IPDL. Isolated Impact Analysis: This CR has an isolated impact on the SFN-SFN type 2 measurement. Since, the CR only corrects the requirements of an optional feature, it does not have any impact on any other requirements or implementations.
Consequences if not approved:	⌘	There are no measurement requirements or a test case for UE measurements utilising IPDL. The performance of SFN-SFN type 2 measurements cannot be assessed.

Clauses affected:	⌘	8.1.2.2.2, 8.4.2.2.2, 9.1.8.2.2, A.9.1.5			
Other specs affected:	⌘	**Y** ☐	**N** ☒	Other core specifications	⌘
		Y ☒	**N** ☐	Test specifications	34.121

	N O&M Specifications	
Other comments: ⌘	Equivalent CRs in other Releases: CR490r2 cat. A to 25.133 v4.6.0, CR481r2 cat. A to 25.133 v5.4.0	

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:

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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 UE Measurements Procedures

8.1 General Measurement Requirements in CELL_DCH State

8.1.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL_DCH state. The requirements are split in FDD intra frequency, FDD inter frequency, TDD and GSM measurements. These measurements may be used by the UTRAN, e.g. for handover decisions. 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. Control of measurement reporting is specified in TS 25.331 and parallel measurements are specified in section 8.2. Compressed mode is specified in TS 25.215.

8.1.2 Requirements

8.1.2.1 UE Measurement Capability

In CELL_DCH state the UE shall be able to monitor up to

- 32 intra frequency FDD cells (including active set), and
- 32 inter frequency cells, including
  - FDD cells distributed on up to 2 additional FDD carriers and
  - Depending on UE Capability, TDD cells, distributed on up to 3 TDD carriers and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers.

Depending on UE capability, the UE shall be able to monitor up to 16 intra frequency cells during IPDL gaps.

If the UE utilises compressed mode for inter-frequency and/or inter-RAT measurements, in order for the requirements in the following subsections to apply the UTRAN must:

- provide transmission gap pattern sequences with TGPL1 > 1, and
- provide the patterns within a transmission gap pattern sequence that are identical (i.e., TGPL1 = TGPL2), and
- ensure that with the activation of one or more transmission gap pattern sequences, no more than two frames contain a transmission gap within any window of three consecutive frames, and
- ensure that there is a minimum of 8 slots between the end of the first transmission gap and the beginning of the second transmission gap in case of two successive compressed frames..

Performance requirements for different types of transmission gap pattern sequences and different number of cells is defined in the following sections.

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

The received CPICH E_c/I_o is defined as

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

and the received SCH E_c/I_o is defined as

$$\left(\frac{SCH\_E_c}{I_o}\right)_{in\ dB} = \left(\frac{SCH\_E_c}{I_{or}}\right)_{in\ dB} - \left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB}$$

8.1.2.2 FDD intra frequency measurements

During the CELL_DCH state the UE shall continuously measure identified intra frequency cells and search for new intra frequency cells in the monitoring set. In case the network requests the UE to report detected set cells, the UE shall also search for intra frequency cells outside the monitored and active set. Cells, which are neither included in the active set nor in the monitored set, and are identified by the UE belong to the detected set according to TS 25.331. If compressed mode pattern sequences are activated, intra frequency measurements can be performed between the transmission gaps simultaneously for data reception from the active set cell/s.

The performance of intra frequency measurements when IPDL is active has not been studied.

8.1.2.2.1 Identification of a new cell

The UE shall be able to identify and decode the SFN of a new detectable cell belonging to the monitored set within

$$T_{identify\ intra} = Max\left\{800, T_{basic\ identify\ FDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}\right\} ms$$

A cell shall be considered detectable when

- CPICH Ec/Io ≥ -20 dB,
- SCH_Ec/Io ≥ -20 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

When L3 filtering is used an additional delay can be expected.

In case of conflict when a compressed gap sequence is activated the UE may choose to prioritise the SFN decoding.

8.1.2.2.1.1 Identification of a new cell using IPDL gaps

When the UE is supporting IPDL measurements and when idle periods with a length of 1 slot are scheduled the UE physical layer shall be capable to identify a new cell and report SFN-SFN observed time difference type 2 measurement within

$$T_{identify,IPDL} = Max\{T_{Measerement\ Period\ Intra}, T_{IPDL}\}\ ms$$

where

$T_{Measurement\ Period\ Intra}$ = The measurement period for Intra frequency CPICH measurements defined in Section 8.1.2.2.2.

and

T_{IPDL} depends on the Search Window Size given in UE positioning OTDOA neighbour cell info as given in Table 8.X

Table 8.X: T_{IPDL}

Search Window Size	**T_{IPDL}**
less than or equal to +/- 40 chips	Time over which 4 consecutive IPDL gaps occur
+/- 80 chips	Time over which 8 consecutive IPDL gaps occur

8.1.2.2.2 UE CPICH measurement capability

In the CELL_DCH state the measurement period for intra frequency measurements is 200 ms. When no transmission gap pattern sequence is activated, the UE shall be capable of performing CPICH measurements for 8 identified intra-frequency cells of the monitored set and/or the active set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When one or more transmission gap pattern sequences are activated, the UE shall be capable of performing CPICH measurements for at least $Y_{measurement\ intra}$ cells , where $Y_{measurement\ intra}$ is defined in the following equation. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2. If the UE has identified more than $Y_{measurement\ intra}$ cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\ intra} = Floor\left\{ X_{basic\ measurement\ FDD} \cdot \frac{T_{Intra}}{T_{Measurement\ Period,\ Intra}} \right\} \text{ cells}$$

where

$X_{basic\ measurement\ FDD}$ = 8 (cells)

$T_{Measurement\_Period\ Intra}$ = 200 ms. The measurement period for Intra frequency CPICH measurements.

T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing.

$T_{basic\_identify\_FDD,\ intra}$ = 800 ms. This is the time period used in the intra frequency equation where the maximum allowed time for the UE to identify a new FDD cell is defined.

8.1.2.2.2.1 Capabilities for measurements during IPDL gaps

When idle periods with a length of 1 slot are scheduled, the UE physical layer shall be capable of reporting SFN-SFN observed time difference type 2 measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.8.2.2 with measurement period given by

$$T_{measurement\ IPDL} = Max\{T_{Measurement\_Period\ Intra}, T_{4\ IPDLs}\} ms$$

where

$T_{Measurement\_Period\ Intra}$ = The measurement period for Intra frequency CPICH measurements defined in Section 8.1.2.2.2.

$T_{4\ IPDLs}$ = Time period over which 4 consecutive idle periods occur.

***** NEW SECTION *****

8.4 Measurements in CELL_FACH State

8.4.1 Introduction

This section contains requirements on the UE regarding cell reselection and measurement reporting in CELL_FACH state. The requirements for cell re-selection are split in FDD intra frequency, FDD inter frequency, TDD and GSM measurements. 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. Control of measurement reporting is specified in TS 25.331. Measurement occasions in CELL_FACH state are described in TS 25.331.

8.4.2 Requirements

8.4.2.1 UE Measurement Capability

In CELL_FACH state, the UE shall be able to monitor up to

- 32 intra frequency FDD cells and
- 32 inter frequency cells, including
  - FDD cells distributed on up to 2 additional FDD carriers and
  - Depending on UE Capability, TDD mode cells, distributed on up to 3 TDD carriers, and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers.

Depending on UE capability, the UE shall be able to monitor up to 16 intra frequency cells during IPDL gaps.

The requirements in section 9 on CPICH Ec/Io and RSCP measurements are applicable for a UE performing measurements according to this section. For inter-frequency FDD, TDD and GSM cell re-selection, measurement occasions as specified in TS 25.331 are used to find and measure on other cells.

It is defined below how the measurements on different systems and modes are performed given the time allocated to that system. The requirements in this section are based on an assumption that the time during the measurement occasions that is allocated to each of the different modes and systems shall be equally shared by the modes which the UE has capability for and that are in the monitored set signalled by the network.

For this three parameters are defined:

N_{FDD} is 0 or 1. If there are inter-frequency FDD cells in the neighbour list N_{FDD}=1, otherwise N_{FDD}=0.

N_{TDD} is 0 or 1. If the UE is capable of TDD and there are TDD cells in the neighbour list N_{TDD}=*1* otherwise N_{TDD}=0.

N_{GSM} is 0 or 1. If the UE is capable of GSM and there are GSM cells in the neighbour list, N_{GSM}=*1*, otherwise N_{GSM}=0.

The measurement time T_{meas} is then defined as

$$T_{meas} = \left[\left(N_{FDD} + N_{TDD} + N_{GSM}\right) \cdot \mathrm{N}_{\mathrm{TTI}} \cdot \mathrm{M\_REP} \cdot 10\right]\mathrm{ms}$$

where

- M_REP is the Measurement Occasion cycle length where K is given in table 8.10A. K is the FACH measurement occasion length cofficient as specified in TS25.331
- The FACH Measurement Occasion of N_{TTI} frames will be repeated every N_{TTI} * M_REP frame.
- N_{TTI} is the number of frames in each measurement occasion, equal to the length of the largest TTI on the SCCPCH monitored by the UE.

Table 8.10A: K values for each N_{TTI} value

N_{TTI}	K
1	3,4,5,6
2	2,3,4,5
4	2,3,4
8	1,2,3

The UE is assumed to measure periodically once every time period T_{meas} on each of the modes and systems, FDD interfrequency cells, TDD interfrequency cells and GSM carriers for which the corresponding parameter N_{FDD}, N_{TDD} and N_{GSM} is set to 1.

8.4.2.2 FDD intra frequency measurements

During the CELL_FACH state the UE shall continuously measure identified intra frequency cells and search for new intra frequency cells in the monitoring set. If a measurement occasion is activated, intra frequency measurements can be performed between the measurement occasions.

The performance of intra frequency measurements when IPDL is active has not been studied.

8.4.2.2.1 Identification of a new cell

The UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,intra} = Max\left\{800, Ceil\left\{\frac{T_{basic\ identify\ FDD,intra}}{N_{TTI}\cdot(M\_REP-1)\cdot 10}\right\}\cdot N_{TTI}\cdot M\_REP\cdot 10\right\}\ ms$$

where

$T_{basic\_identify\_FDD,\ intra}$ is specified in section 8.1.2.2.2,

N_{TTI} and M_REP is specified in section 8.4.2.1.

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io $\geq$ -20 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

In case of conflict when a measurement occasion is activated the UE may choose to prioritise the SFN decoding

8.4.2.2.1.1 Identification of a new cell using IPDL gaps

When the UE is supporting IPDL measurements and when idle periods with a length of 1 slot are scheduled the UE physical layer shall be capable to identify a new cell and report SFN-SFN observed time difference type 2 measurement within

$T_{identify,IPDL}=Max\{T_{Measerement\_Period\ Intra}, T_{IPDL}\}$ ms

where

$T_{Measurement\_Period\ Intra}$ = The measurement period for Intra frequency CPICH measurements defined in Section 8.1.2.2.2.

and

T_{IPDL} depends on the Search Window Size given in UE positioning OTDOA neighbour cell info as given in Table 8.X

Table 8.X: T_{IPDL}

Search Window Size	**T_{IPDL}**
less than or equal to +/- 40 chips	Time over which 4 consecutive IPDL gaps occur
+/- 80 chips	Time over which 8 consecutive IPDL gaps occur

8.4.2.2.2 UE CPICH measurement capability

In the CELL_FACH state the measurement period for intra frequency measurements is 200 ms. When no measurement occasion cycle is activated, the UE shall be capable of performing CPICH measurements for 8 identified intra-frequency cells of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When a measurement occasion cycle is activated, the UE shall be capable of performing CPICH measurements for the $Y_{measurement\ intra}$ strongest cells , where $Y_{measurement\ intra}$ is defined in the following equation. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2. If the UE has identified more than $Y_{measurement\ intra}$ cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\ intra} = Floor\left\{ X_{basic\ measurement\ FDD} \cdot \frac{T_{Measurement\_Period\ Intra} - Ceil\left\{ \frac{T_{Measurement\_Period\ Intra}}{N_{TTI} \cdot M\_REP \cdot 10\ ms} \right\} \cdot N_{TTI} \cdot 10\ ms}{T_{Measurement\_Period\ Intra}} \right\} \text{ cells}$$

where

$X_{basic\ measurement\ FDD}$ is specified in section 8.1.2.2.2,

$T_{Measurement\_Period\ Intra}$ is specified in section 8.1.2.2.2,

M_REP and N_{TTI} is specified in section 8.4.2.1.

8.4.2.2.2.1 Capabilities for measurements during IPDL gaps.

When idle periods with a length of 1 slot are scheduled UE physical layer shall be capable of reporting SFN-SFN observed time difference type 2 measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.8.2.2 with measurement period given by

$$T_{measurement\ IPDL} = Max\{T_{Measurement\_Period\ Intra}, T_{4\ IPDLs}\} ms$$

where

$T_{Measurement\_Period\ Intra}$ = The measurement period for Intra frequency CPICH measurements defined in Section 8.1.2.2.2.

and

$T_{4\ IPDLs}$ = Time period over which 4 consecutive idle periods occur.

***** NEW SECTION *****

9.1.8.2 SFN-SFN observed time difference type 2

NOTE: This measurement is for location service purposes to identify time difference between two cells.

It is optional for terminal to support the use of IPDL periods together with SFN-SFN observed time difference type 2. The support of IPDL depends on the supported UE positioning methods.

NOTE: Requirement on the UE shall be reconsidered when the state of the art technology progress.

9.1.8.2.1 Intra frequency measurement requirement accuracy without IPDL period active

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.21 is valid under the following conditions:

CPICH_RSCP1,2|$_{dBm}$ ≥ -114 dBm.

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

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

~~$\left| \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left(\frac{P-CCPCH\_E_c}{I_{or}} \right)_{in\ dB}$~~ ~~is low enough to ensure successful SFN decoding.~~

Table 9.21

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm/3.84 MHz]
SFN-SFN observed time difference type2	chip	± 0.5	-94...-50

9.1.8.2.2 Intra frequency measurement requirement accuracy with IPDL period active

This requirement is valid only for UEs supporting IPDL measurements.

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.22 is valid under the following conditions:

CPICH_RSCP1,2|$_{dBm}$ ≥ -114 dBm.

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

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

~~$\left| \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left(\frac{P-CCPCH\_E_c}{I_{or}} \right)_{in\ dB}$~~ ~~is low enough to ensure successful SFN decoding~~.

Additionally the accuracy requirement in table 9.22 is also valid for neighbour cells for which the following conditions apply to during idle periods provided idle periods have a length of 1 slot:

CPICH_RSCPx,y|$_{dBm}$ ≥ -114 dBm.

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

where *x* and *y* represent cells measured using idle periods and $I_{o\_idle\text{-}period}$ is the total received power during the idle period.

NOTE: Additional general conditions are needed for the requirements in table 9.22 to be valid.

Table 9.22

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm/3.84 MHz]
SFN-SFN observed time difference type 2	chip	± 0.5	-94...-50

9.1.8.2.3 Inter frequency measurement requirement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

The accuracy requirement in table 9.23 is valid under the following conditions:

CPICH_RSCP1,2$|_{\text{dBm}}$ ≥ -114 dBm.

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

| Channel 1_Io$|_{\text{dBm/3.84 MHz}}$ -Channel 2_Io$|_{\text{dBm/3.84 MHz}}$ | ≤ 20 dB.

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

Table 9.23

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm/3.84 MHz]
SFN-SFN observed time difference type 2	chip	± 1	-94...-50

9.1.8.2.4 SFN-SFN observed time difference type 2 measurement report mapping

The reporting range is for *SFN-SFN observed time difference type 2* is from -1280 ... +1280 chip.

In table 9.24 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.24

Reported value	Measured quantity value	Unit
T2_SFN-SFN_TIME _00000	SFN-SFN observed time difference type 2 < -1280.0000	chip
T2_SFN-SFN_TIME _00001	-1280.0000 ≤ SFN-SFN observed time difference type 2 < -1279.9375	chip
T2_SFN-SFN_TIME _00002	-1279.9375 ≤ SFN-SFN observed time difference type 2 < -1279.8750	chip
…	…	…
T2_SFN-SFN_TIME _40959	1279.8750 ≤ SFN-SFN observed time difference type 2 < 1279.9375	chip
T2_SFN-SFN_TIME _40960	1279.9375 ≤ SFN-SFN observed time difference type 2 < 1280.0000	chip
T2_SFN-SFN_TIME _40961	1280.0000 ≤ SFN-SFN observed time difference type 2	chip

***** NEW SECTION *****

A.9.1.5.2 SFN-SFN observed time difference type 2 without IPDL period active

A.9.1.5.2.1 Test Purpose and Environment

The purpose of this test is to verify that the SFN-SFN observed time difference type 2 measurement accuracy without IPDL period active is within the specified limits. This test will verify the requirements in section 9.1.8.2.

During the test the time difference between Cell 1 and 2 can be set to value from -1279.75 to 1280 chips.

In this case all cells are in the same frequency. Table A.9.9 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.9: SFN-SFN observed time difference type 2 Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io -13.7 dB = Ioc,* Note 1	*Io -13.7 dB = Ioc,* Note 1
CPICH_Ec/Io, Note 2	dB	-13.2	-13.2
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density*Io* at receiver input and the geometry factor *Îor/Ioc*. NOTE 2: Io and CPICH Ec/Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.			

~~When verifying the SFN-SFN observed time difference type 2 intra frequency measurement accuracy with IPDL period active the idle period parameters in table A.9.10 shall be used.~~

~~Table A.9.10 SFN-SFN observed time difference type 2 idle period test parameters~~

~~Parameter~~	~~Unit~~	~~Cell 1~~	~~Cell 2~~
~~IP_Status~~	~~-~~	~~continuous~~	~~continuous~~
~~IP_Spacing~~	~~Frames~~	~~[10]~~	~~[10]~~
~~IP_Lenght~~	~~Symbols~~	~~10~~	~~10~~
~~IP_Offset~~	~~frame~~	~~NA~~	~~NA~~
~~Seed~~	~~integer~~	~~[13]~~	~~[4]~~
~~Burst_Start~~		~~NA~~	~~NA~~
~~Burst_Length~~		~~NA~~	~~NA~~
~~Burst_Freq~~		~~NA~~	~~NA~~

~~NOTE: The total signal power spectral density *Io* will change only downwards during BS transmission gap.~~

A.9.1.5.2.2 Test Requirements

The SFN-SFN observed time difference type 2 measurement accuracy shall meet the requirements in section 9.1.8.2

A.9.1.5.3 SFN-SFN observed time difference type 2 with IPDL period active

A.9.1.5.3.1 Test Purpose and Environment

This requirement is valid only for UEs supporting IPDL measurements.

The purpose of this test is to verify that the SFN-SFN observed time difference type 2 measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.8.2.

During the test the time difference between Cell 1 and 2 shall be set according to the assistance data defined in table A.9.Y.

In this case all cells are in the same frequency. Table A.9.X defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.X: SFN-SFN observed time difference type 2 Intra frequency test parameters

Parameter	Unit	Cell 1		Cell 2	
Time		No idle period	Idle period in Cell 1	No idle period	Idle period in Cell 1
UTRA RF Channel number		Channel 1	Channel 1	Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12	-12	-12
SCH_Ec/Ior	dB	-12	-12	-12	-12
PICH_Ec/Ior	dB	-15	-15	-15	-15
DPCH_Ec/Ior	dB	-15	-15	-	-
OCNS	dB	-1.11	-1.11	-0.94	-0.94
Îor/Ioc	dB	10.5	-24.5	-6	-6
Ioc	dBm/ 3.84 MHz	*-80*			
Io, Note 1	dBm/3.84 MHz	-69.04	-79.01	-69.04	-79.01
CPICH_Ec/Io, Note 1	dB	-10.46	-35.49	-26.96	-16.99
Propagation condition	-	AWGN			
NOTE 1: Io and CPICH Ec/Io levels have been calculated from other parameters for information purposes. They are is not settable parameters themselves.					

When verifying the SFN-SFN observed time difference type 2 intra frequency measurement accuracy with IPDL period active the idle period parameters in table A.9.10 shall be used.

Table A.9.Y SFN-SFN observed time difference type 2 assistance data test parameters

Parameter	Unit	Cell 1
Search Window Size	Chips	80
IP_Status	-	Continuous
IP_Spacing	Frames	10
IP_Lenght	Symbols	10
IP_Offset	frame	NA
Seed	integer	13
Burst_Start		NA
Burst_Length		NA
Burst_Freq		NA

NOTE: The total signal power spectral density *Io* will change only downwards during BS transmission gap.

A.9.1.5.3.2 Test Requirements

The SFN-SFN observed time difference type 2 measurement accuracy shall meet the requirements in section 9.1.8.2

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CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **481** ⌘ **rev** **2** ⌘ Current version: **5.4.0** ⌘

*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:	⌘	Required Window size for measurements using IPDL
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	26/11/2002
Category:	⌘	**A**
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 performance requirements of SFN-SFN observed time difference type 2 measurements with IPDL are not finalised
Summary of change:	⌘	1) Time to detect a new cell through IPDL measurements and the corresponding measurement period is defined in CELL_DCH and Cell_FACH states when idle periods with a length of 1 slot are scheduled and based on Search Window Size 40 and 80 chips 2) Side conditions for accuracy requirements are defined. 3) The test case "A.9.1.5.2 SFN-SFN observed time difference type 2" is corrected. There are now tests both with and without IPDL.
Consequences if not approved:	⌘	There are no measurement requirements or a test case for UE measurements utilising IPDL. The performance of SFN-SFN type 2 measurements cannot be assessed.

Clauses affected:	⌘	8.1.2.2.2, 8.4.2.2.2, 9.1.8.2.2, A.9.1.5			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	
		N / **N**			
		Y /	Test specifications		34.121
		/ **N**	O&M Specifications		
Other comments:	⌘	Equivalent CRs in other Releases: CR480r2 cat. F to 25.133 v3.11.0, CR490r2 cat. A to 25.133 v4.6.0			

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.

8 UE Measurements Procedures

8.1 General Measurement Requirements in CELL_DCH State

8.1.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL_DCH state. The requirements are split in FDD intra frequency, FDD inter frequency, TDD and GSM measurements. These measurements may be used by the UTRAN, e.g. for handover decisions. 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. Control of measurement reporting is specified in TS 25.331 and parallel measurements are specified in section 8.2. Compressed mode is specified in TS 25.215.

8.1.2 Requirements

8.1.2.1 UE Measurement Capability

In CELL_DCH state the UE shall be able to monitor up to

- 32 intra frequency FDD cells (including active set), and
- 32 inter frequency cells, including
  - FDD cells distributed on up to 2 additional FDD carriers and
  - Depending on UE Capability, TDD cells, distributed on up to 3 TDD carriers and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers.

Depending on UE capability, the UE shall be able to monitor up to 16 intra frequency cells during IPDL gaps.

If the UE utilises compressed mode for inter-frequency and/or inter-RAT measurements, in order for the requirements in the following subsections to apply the UTRAN must:

- provide transmission gap pattern sequences with TGPL1 > 1, and
- provide the patterns within a transmission gap pattern sequence are identical (i.e., TGPL1 = TGPL2), and
- ensure that with the activation of one or more transmission gap pattern sequences, no more than two frames contain a transmission gap within any window of three consecutive frames, and
- ensure that there is a minimum of 8 slots between the end of the first transmission gap and the beginning of the second transmission gap in case of two successive compressed frames.

Performance requirements for different types of transmission gap pattern sequences and different number of cells is defined in the following sections.

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

The received CPICH E_c/I_o is defined as

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

and the received SCH E_c/I_o is defined as

$$\left(\frac{SCH\_E_c}{I_o}\right)_{in\ dB} = \left(\frac{SCH\_E_c}{I_{or}}\right)_{in\ dB} - \left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB}$$

8.1.2.2 FDD intra frequency measurements

During the CELL_DCH state the UE shall continuously measure identified intra frequency cells and search for new intra frequency cells in the monitoring set. In case the network requests the UE to report detected set cells, the UE shall also search for intra frequency cells outside the monitored and active set. Cells, which are neither included in the active set nor in the monitored set, and are identified by the UE belong to the detected set according to TS 25.331. If compressed mode pattern sequences are activated, intra frequency measurements can be performed between the transmission gaps simultaneously for data reception from the active set cell/s.

The performance of intra frequency measurements when IPDL is active has not been studied.

8.1.2.2.1 Identification of a new cell

The UE shall be able to identify and decode the SFN of a new detectable cell belonging to the monitored set within

$$T_{identify\ intra} = Max\left\{800, T_{basic\ identify\ FDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}\right\} ms$$

A cell shall be considered detectable when

- CPICH Ec/Io ≥ -20 dB,
- SCH_Ec/Io ≥ -20 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

In case of conflict when a compressed gap sequence is activated the UE may choose to prioritise the SFN decoding

The UE shall be able to identify a new detectable cell not belonging to the monitored set within

$$T_{identify\ detected\ set} = 30s$$

when CPICH Ec/Io ≥ -20 dB, SCH_Ec/Io ≥ -17 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

8.1.2.2.1.1 Identification of a new cell using IPDL gaps

When the UE is supporting IPDL measurements and when idle periods with a length of 1 slot are scheduled the UE physical layer shall be capable to identify a new cell and report SFN-SFN observed time difference type 2 measurement within

$T_{identify,IPDL}=Max\{T_{Measerement\_Period\ Intra}, T_{IPDL}\}$ ms

where

$T_{Measurement\_Period\ Intra}$ = The measurement period for Intra frequency CPICH measurements defined in Section 8.1.2.2.2.

and

T_{IPDL} depends on the Search Window Size given in UE positioning OTDOA neighbour cell info as given in Table 8.X

Table 8.X: T_{IPDL}

Search Window Size	**T_{IPDL}**
less than or equal to +/- 40 chips	Time over which 4 consecutive IPDL gaps occur
+/- 80 chips	Time over which 8 consecutive IPDL gaps occur

8.1.2.2.2 UE CPICH measurement capability

In the CELL_DCH state the measurement period for intra frequency measurements is 200 ms. When no transmission gap pattern sequence is activated, the UE shall be capable of performing CPICH measurements for 8 identified-intra-frequency cells of the monitored set and/or the active set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When one or more transmission gap pattern sequences are activated, the UE shall be capable of performing CPICH measurements for at least $Y_{measurement\ intra}$ cells , where $Y_{measurement\ intra}$ is defined in the following equation. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2. If the UE has identified more than $Y_{measurement\ intra}$ cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\ intra} = Floor\left\{ X_{basic\ measurement\ FDD} \cdot \frac{T_{Intra}}{T_{Measurement\ Period,\ Intra}} \right\} \text{ cells}$$

where

$X_{basic\ measurement\ FDD}$ = 8 (cells)

$T_{Measurement\_Period\ Intra}$ = 200 ms. The measurement period for Intra frequency CPICH measurements.

T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing.

$T_{basic\_identify\_FDD,\ intra}$ = 800 ms. This is the time period used in the intra frequency equation where the maximum allowed time for the UE to identify a new FDD cell is defined.

The UE shall furthermore be capable of performing CPICH measurements for at least 1 detected intra-frequency cell, in the detected set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 10 s. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2.

8.1.2.2.2.1 Capabilities for measurements during IPDL gaps

When idle periods with a length of 1 slot are scheduled, the UE physical layer shall be capable of reporting SFN-SFN observed time difference type 2 measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.8.2.2 with measurement period given by

$$T_{measurement\ IPDL} = Max\{T_{Measurement\_Period\ Intra}, T_{4\ IPDLs}\} ms$$

where

$T_{Measurement\_Period\ Intra}$ = The measurement period for Intra frequency CPICH measurements defined in Section 8.1.2.2.2.

$T_{4\ IPDLs}$ = Time period over which 4 consecutive idle periods occur.

***** NEW SECTION *****

8.4 Measurements in CELL_FACH State

8.4.1 Introduction

This section contains requirements on the UE regarding cell reselection and measurement reporting in CELL_FACH state. The requirements for cell re-selection are split in FDD intra frequency, FDD inter frequency, TDD and GSM measurements. 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. Control of measurement reporting is specified in TS 25.331. Measurement occasions in CELL_FACH state are described in TS 25.331.

8.4.2 Requirements

8.4.2.1 UE Measurement Capability

In CELL_FACH state, the UE shall be able to monitor up to

- 32 intra frequency FDD cells and
- 32 inter frequency cells, including
  - FDD cells distributed on up to 2 additional FDD carriers and
  - Depending on UE Capability, TDD mode cells, distributed on up to 3 TDD carriers, and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers.

Depending on UE capability, the UE shall be able to monitor up to 16 intra frequency cells during IPDL gaps.

The requirements in section 9 on CPICH Ec/Io and RSCP measurements are applicable for a UE performing measurements according to this section. For inter-frequency FDD, TDD and GSM cell re-selection, measurement occasions as specified in TS 25.331 are used to find and measure on other cells.

It is defined below how the measurements on different systems and modes are performed given the time allocated to that system. The requirements in this section are based on an assumption that the time during the measurement occasions that is allocated to each of the different modes and systems shall be equally shared by the modes which the UE has capability for and that are in the monitored set signalled by the network.

For this three parameters are defined:

N_{FDD} is 0 or 1. If there are inter-frequency FDD cells in the neighbour list N_{FDD}=1, otherwise N_{FDD}=0.

N_{TDD} is 0 or 1. If the UE is capable of TDD and there are TDD cells in the neighbour list N_{TDD}=*1* otherwise N_{TDD} =0.

N_{GSM} is 0 or 1. If the UE is capable of GSM and there are GSM cells in the neighbour list, N_{GSM}=*1*, otherwise N_{GSM} =0.

The measurement time T_{meas} is then defined as

$$T_{meas} = \left[\left(N_{FDD} + N_{TDD} + N_{GSM}\right) \cdot \mathrm{N_{TTI}} \cdot \mathrm{M\_REP} \cdot 10\right]\mathrm{ms}$$

where

- M_REP is the Measurement Occasion cycle length where K is given in Table X. K is the FACH measurement occasion length coefficient as specified in TS25.331
- The FACH Measurement Occasion of N_{TTI} frames will be repeated every N_{TTI} * M_REP frame.
- N_{TTI} is the number of frames in each measurement occasion, equal to the length of the largest TTI on the SCCPCH monitored by the UE.

Table 8.10A: K values for each N_{TTI} value

N_{TTI}	K
1	3,4,5,6
2	2,3,4,5
4	2,3,4
8	1,2,3

The UE is assumed to measure periodically once every time period T_{meas} on each of the modes and systems, FDD inter frequency cells, TDD inter frequency cells and GSM carriers for which the corresponding parameter N_{FDD}, N_{TDD} and N_{GSM} is set to 1.

8.4.2.2 FDD intra frequency measurements

During the CELL_FACH state the UE shall continuously measure identified intra frequency cells and search for new intra frequency cells in the monitoring set. If a measurement occasion is activated, intra frequency measurements can be performed between the measurement occasions.

The performance of intra frequency measurements when IPDL is active has not been studied.

8.4.2.2.1 Identification of a new cell

The UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,intra} = Max\left\{800, Ceil\left\{\frac{T_{basic\ identify\ FDD,intra}}{N_{TTI}\cdot(M\_REP-1)\cdot 10}\right\}\cdot N_{TTI}\cdot M\_REP\cdot 10\right\}\ ms$$

where

$T_{basic\_identify\_FDD,\ intra}$ is specified in section 8.1.2.2.2,

N_{TTI} and M_REP is specified in section 8.4.2.1.

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io $\geq$ -20 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

In case of conflict when a measurement occasion is activated the UE may choose to prioritise the SFN decoding

8.4.2.2.1.1 Identification of a new cell using IPDL gaps

When the UE is supporting IPDL measurements and when idle periods with a length of 1 slot are scheduled the UE physical layer shall be capable to identify a new cell and report SFN-SFN observed time difference type 2 measurement within

$T_{identify,IPDL}=Max\{T_{Measerement\_Period\ Intra},T_{IPDL}\}$ ms

where

$T_{Measurement\_Period\ Intra}$ = The measurement period for Intra frequency CPICH measurements defined in Section 8.1.2.2.2.

and

T_{IPDL} depends on the Search Window Size given in UE positioning OTDOA neighbour cell info as given in Table 8.X

Table 8.X: T_{IPDL}

Search Window Size	**T_{IPDL}**
less than or equal to +/- 40 chips	Time over which 4 consecutive IPDL gaps occur
+/- 80 chips	Time over which 8 consecutive IPDL gaps occur

8.4.2.2.2 UE CPICH measurement capability

In the CELL_FACH state the measurement period for intra frequency measurements is 200 ms. When no measurement occasion cycle is activated, the UE shall be capable of performing CPICH measurements for 8 identified intra-frequency cells of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When a measurement occasion cycle is activated, the UE shall be capable of performing CPICH measurements for the $Y_{measurement\ intra}$ strongest cells , where $Y_{measurement\ intra}$ is defined in the following equation. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2. If the UE has identified more than $Y_{measurement\ intra}$ cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\ intra} = Floor\left\{ X_{basic\ measurement\ FDD} \cdot \frac{T_{Measurement\_Period\ Intra} - Ceil\left\{ \frac{T_{Measurement\_Period\ Intra}}{N_{TTI} \cdot M\_REP \cdot 10\,\text{ms}} \right\} \cdot N_{TTI} \cdot 10\,\text{ms}}{T_{Measurement\_Period\ Intra}} \right\} \text{ cells}$$

where

$X_{basic\ measurement\ FDD}$ is specified in section 8.1.2.2.2,

$T_{Measurement\_Period\ Intra}$ is specified in section 8.1.2.2.2,

M_REP and N_{TTI} is specified in section 8.4.2.1.

8.4.2.2.2.1 Capabilities for measurements during IPDL gaps.

When idle periods with a length of 1 slot are scheduled UE physical layer shall be capable of reporting SFN-SFN observed time difference type 2 measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.8.2.2 with measurement period given by

$$T_{measurement\ IPDL} = Max\{T_{Measurement\_Period\ Intra}, T_{4\ IPDLs}\}\ ms$$

where

$T_{Measurement\_Period\ Intra}$ = The measurement period for Intra frequency CPICH measurements defined in Section 8.1.2.2.2.

and

$T_{4\ IPDLs}$ = Time period over which 4 consecutive idle periods occur.

***** NEW SECTION *****

9.1.8.2 SFN-SFN observed time difference type 2

NOTE: This measurement is for location service purposes to identify time difference between two cells.

It is optional for terminal to support the use of IPDL periods together with SFN-SFN observed time difference type 2. The support of IPDL depends on the supported UE positioning methods.

NOTE: Requirement on the UE shall be reconsidered when the state of the art technology progress.

9.1.8.2.1 Intra frequency measurement requirement accuracy without IPDL period active

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.21 is valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm for Band I,

CPICH_RSCP1,2$|_{dBm}$ ≥ -112 dBm for Band II,

CPICH_RSCP1,2$|_{dBm}$ ≥ -111 dBm for Band III..

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

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

~~$\left(\frac{I_o}{\hat{I}_{or}}\right)\Big|_{in\ dB} - \left(\frac{P-CCPCH\_E_c}{I_{or}}\right)_{in\ dB}$~~ ~~is low enough to ensure successful SFN decoding.~~

Table 9.21

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I	Band II	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
SFN-SFN observed time difference type2	chip	± 0.5	-94...-50	-92…-50	-91…-50

9.1.8.2.2 Intra frequency measurement requirement accuracy with IPDL period active

This requirement is valid only for UEs supporting IPDL measurements.

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.22 is valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm for Band I,

CPICH_RSCP1,2$|_{dBm}$ ≥ -112 dBm for Band II,

. CPICH_RSCP1,2$|_{dBm}$ ≥ -111 dBm for Band III.

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

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

~~$\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left(\frac{P-CCPCH\_E_c}{I_{or}}\right)_{in\ dB}$ is low enough to ensure successful SFN decoding.~~

Additionally the accuracy requirement in table 9.22 is also valid for neighbour cells for which the following conditions apply to during idle periods provided idle periods have a length of 1 slot:

CPICH_RSCPx,y$|_{dBm}$ ≥ -114 dBm.

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

where *x* and *y* represent cells measured using idle periods and $I_{o\_idle\text{-}period}$ is the total received power during the idle period.

NOTE: Additional general conditions are needed for the requirements in table 9.22 to be valid.

Table 9.22

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I	Band II	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
SFN-SFN observed time difference type 2	chip	± 0.5	-94...-50	-92…-50	-91…-50

9.1.8.2.3 Inter frequency measurement requirement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

The accuracy requirement in table 9.23 is valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm for Band I,

. CPICH_RSCP1,2$|_{dBm}$ ≥ -112 dBm for Band II,

CPICH_RSCP1,2$|_{dBm}$ ≥ -111 dBm for Band III.

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

| Channel 1_Io$|_{dBm}$ -Channel 2_Io$|_{dBm}$ | ≤ 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 9.23

Parameter	Unit	Accuracy [chip]	Conditions		
			Band I	Band II	Band III
			Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
SFN-SFN observed time difference type 2	chip	± 1	-94...-50	-92…-50	-91…-50

9.1.8.2.4 SFN-SFN observed time difference type 2 measurement report mapping

The reporting range is for *SFN-SFN observed time difference type 2* is from -1280 ... +1280 chip.

In table 9.24 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.24

Reported value	Measured quantity value	Unit
T2_SFN-SFN_TIME _00000	SFN-SFN observed time difference type 2 < -1280.0000	chip
T2_SFN-SFN_TIME _00001	-1280.0000 ≤ SFN-SFN observed time difference type 2 < -1279.9375	chip
T2_SFN-SFN_TIME _00002	-1279.9375 ≤ SFN-SFN observed time difference type 2 < -1279.8750	chip
…	…	…
T2_SFN-SFN_TIME _40959	1279.8750 ≤ SFN-SFN observed time difference type 2 < 1279.9375	chip
T2_SFN-SFN_TIME _40960	1279.9375 ≤ SFN-SFN observed time difference type 2 < 1280.0000	chip
T2_SFN-SFN_TIME _40961	1280.0000 ≤ SFN-SFN observed time difference type 2	chip

***** NEW SECTION *****

A.9.1.5.2 SFN-SFN observed time difference type 2 without IPDL period active

A.9.1.5.2.1 Test Purpose and Environment

The purpose of this test is to verify that the SFN-SFN observed time difference type 2 measurement accuracy without IPDL period active is within the specified limits. This test will verify the requirements in section 9.1.8.2.

During the test the time difference between Cell 1 and 2 can be set to value from -1279.75 to 1280 chips.

In this case all cells are in the same frequency. Table A.9.9 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.9: SFN-SFN observed time difference type 2 Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	DB	-10	-10
PCCPCH_Ec/Ior	DB	-12	-12
SCH_Ec/Ior	DB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io -13.7 dB = Ioc,* Note 1	*Io -13.7 dB = Ioc,* Note 1
CPICH_Ec/Io, Note 2	dB	-13.2	-13.2
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*. NOTE 2: Io and CPICH Ec/Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.			

~~When verifying the SFN-SFN observed time difference type 2 intra frequency measurement accuracy with IPDL period active the idle period parameters in table A.9.10 shall be used.~~

~~**Table A.9.10: SFN-SFN observed time difference type 2 idle period test parameters**~~

~~Parameter~~	~~Unit~~	~~Cell 1~~	~~Cell 2~~
~~IP_Status~~	~~-~~	~~continous~~	~~continous~~
~~IP_Spacing~~	~~Frames~~	~~[10]~~	~~[10]~~
~~IP_Lenght~~	~~Symbols~~	~~10~~	~~10~~
~~IP_Offset~~	~~frame~~	~~NA~~	~~NA~~
~~Seed~~	~~integer~~	~~[13]~~	~~[4]~~
~~Burst_Start~~		~~NA~~	~~NA~~
~~Burst_Length~~		~~NA~~	~~NA~~
~~Burst_Freq~~		~~NA~~	~~NA~~

~~NOTE: The total signal power spectral density *Io* will change only downwards during BS transmission gap.~~

A.9.1.5.2.2 Test Requirements

The SFN-SFN observed time difference type 2 measurement accuracy shall meet the requirements in section 9.1.8.2.

A.9.1.5.3 SFN-SFN observed time difference type 2 with IPDL period active

A.9.1.5.3.1 Test Purpose and Environment

This requirement is valid only for UEs supporting IPDL measurements.

The purpose of this test is to verify that the SFN-SFN observed time difference type 2 measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.8.2.

During the test the time difference between Cell 1 and 2 shall be set according to the assistance data defined in table A.9.Y.

In this case all cells are in the same frequency. Table A.9.X defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.X: SFN-SFN observed time difference type 2 Intra frequency test parameters

Parameter	Unit	Cell 1		Cell 2	
Time		No idle period	Idle period in Cell 1	No idle period	Idle period in Cell 1
UTRA RF Channel number		Channel 1	Channel 1	Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12	-12	-12
SCH_Ec/Ior	dB	-12	-12	-12	-12
PICH_Ec/Ior	dB	-15	-15	-15	-15
DPCH_Ec/Ior	dB	-15	-15	-	-
OCNS	dB	-1.11	-1.11	-0.94	-0.94
Îor/Ioc	dB	10.5	-24.5	-6	-6
Ioc	dBm/ 3.84 MHz	*-80*			
Io, Note 1	dBm/3.84 MHz	-69.04	-79.01	-69.04	-79.01
CPICH_Ec/Io, Note 1	dB	-10.46	-35.49	-26.96	-16.99
Propagation condition	-	AWGN			
NOTE 1: Io and CPICH Ec/Io levels have been calculated from other parameters for information purposes. They are is not settable parameters themselves.					

When verifying the SFN-SFN observed time difference type 2 intra frequency measurement accuracy with IPDL period active the idle period parameters in table A.9.10 shall be used.

Table A.9.Y SFN-SFN observed time difference type 2 assistance data test parameters

Parameter	Unit	Cell 1
Search Window Size	Chips	80
IP_Status	-	Continuous
IP_Spacing	Frames	10
IP_Lenght	Symbols	10
IP_Offset	frame	NA
Seed	integer	13
Burst_Start		NA
Burst_Length		NA
Burst_Freq		NA

NOTE: The total signal power spectral density *Io* will change only downwards during BS transmission gap.

A.9.1.5.3.2 Test Requirements

The SFN-SFN observed time difference type 2 measurement accuracy shall meet the requirements in section 9.1.8.2

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021713**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **482** ⌘ **rev** **1** ⌘ Current version: **3.11.0** ⌘

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

Title:	⌘	UE timer accuracy
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	26/11/2002
Category:	⌘	**F**
Release:	⌘	R99

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: ⌘ UE timers are used in different protocol entities to control the UE behaviour. Some examples are (TS 25.331):

- T305: Sets the time for UE periodic transmission of CELL UPDATE and URA UPDATE messages.
  Value range: 5, 10, 30, 60, 120, 360, 720, infinity [minutes]
- T314 and T315: Sets the time for how long UE shall attempt to re-establish the RRC Connection, in case of radio link failure.
  Value range T314: 0, 2, 4, 6, 8, 12, 16, 20 [seconds]
  Value range T315: 0,10, 30, 60, 180, 600, 1200, 1800 [seconds]
- T316 and T317: Sets the time for how long UE can be out-of-service in states Cell_PCH/URA_PCH and Cell_FACH.
  Value range T316: 0, 10, 20, 30, 40, 50, infinity [seconds]
  Value range T317: 0,10, 30, 60, 180, 600, 1200, 1800 [seconds]

It is assumed that in a typical UE implementation, the time measurement function is quite accurate, since most UE implementations are expected to provide e.g. a time of day clock feature. However, requirements on UE timer accuracy would facilitate the UTRAN setting of the corresponding timers on the network side. For this purpose, we expect that not so tight accuracy requirements are needed.

Furthermore, for UE conformance test cases in TS 34.123, reference to core specification requirements on UE timer accuracy would facilitate setting of test requirements. Otherwise, the requirements would be implicitly specified by the conformance test cases, which is not a desired situation.

		Therefore if we do not add these requirements there will be: ▪ Problems in setting of UTRAN timers for supervising UE procedures Problems when setting test requirements in UE conformance tests
Summary of change:	⌘	Requirements on UE timer accuracy have been introduced.
Consequences if not approved:	⌘	Reqirements on UE timer accuracy would be missing.

Clauses affected:	⌘	8.1.2.2.2, 8.4.2.2.2, 9.1.8.2.2, A.9.1.5			
Other specs affected:	⌘	**Y** / **N**		⌘	
			N Other core specifications		
			N Test specifications		
			N O&M Specifications		
Other comments:	⌘	Equivalent CRs in other Releases: CR491r1 cat. A to 25.133 v4.6.0, CR483r1 cat. A to 25.133 v5.4.0			

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

7 Timing and Signalling characteristics

7.1 UE Transmit Timing

7.1.1 Introduction

The UE shall have capability to follow the frame timing change of the connected Node B. The uplink DPCCH/DPDCH frame transmission takes place approximately T_0 chips after the reception of the first detected path (in time) of the corresponding downlink DPCCH/DPDCH frame from the reference cell. T_0 is defined in [2]. UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are defined in the following requirements.

7.1.2 Requirements

The UE initial transmission timing error shall be less than or equal to ±1.5 Chip. The reference point for the UE initial transmit timing control requirement shall be the time when the first detected path (in time) of the corresponding downlink DPCCH/DPDCH frame is received from the reference cell plus T_0 chips. T_0 is defined in [2].

When the UE is not in soft handover, the reference cell shall be the one the UE has in the active set. The cell, which is selected as a reference cell, shall remain as a reference cell even if other cells are added to the active set. In case that the reference cell is removed from the active set the UE shall start adjusting its transmit timing no later than the time when the whole active set update message is available at the UE taking the RRC procedure delay into account.

The UE shall be capable of changing the transmission timing according the received downlink DPCCH/DPDCH frame. The maximum amount of the timing change in one adjustment shall be ¼ Chip.

The minimum adjustment rate shall be 233ns per second. The maximum adjustment rate shall be ¼ chip per 200ms. In particular, within any given 800*d ms period, the UE transmit timing shall not change in excess of +-1/4 chip from the timing at the beginning of this 800*d ms period, where $0 \leq d \leq 1/4$.

7.2 UE Receive - Transmit Time Difference

7.2.1 Introduction

The UE shall have the capability to be in soft handover with more than one cell. The downlink DPCH frame timing shall take place approximately T_0 chips before the transmission of the uplink DPDCH/DPCCH. The adjustment requirements for the uplink DPDCH/DPCCH timing are specified in 7.1.1. The valid range of the Receive to Transmit time difference at the UE is defined in the following requirements.

7.2.2 Requirements

A UE shall support reception, demodulation and combining of signals of a downlink DPCH when the receive timing is within a window of T_0 +/- 148 chip before the transmit timing where T_0 is defined in [2]. A UE is only required to react to TPC commands with a transmit power adjustment in the immediate next slot if the downlink receive timing of all cells in the active set is within a window of T_0 +/- 148 chip before the uplink transmit timing. If the downlink receive timing of one or more cells in the active set is outside the window of T_0 +/- 148 chip, the UE may also react with a power adjustment one slot later. The receive timing is defined as the first detected path in time.

7.3 UE timer accuracy

7.3.1 Introduction

UE timers are used in different protocol entities to control the UE behaviour.

7.3.2 Requirements

For UE timers T3xx, T_{barred}, Treselection, Penalty_time, T_{CRmax}, $T_{CrmaxHyst}$ [16], UE shall comply with the timer accuracies according to Table 7.x.

The requirements are only related to the actual timing measurements internally in the UE. They do not include the following:

- Inaccuracy in the start and stop conditions of a timer (e.g. UE reaction time to detect that start and stop conditions of a timer is fulfilled), or
- Inaccuracies due to restrictions in observability of start and stop conditions of a UE timer (e.g. TTI alignment when UE sends messages at timer expiry).

Timer value [s]	Accuracy
timer value <4	± 0.1 s
timer value ≥ 4	± 2.5 %

Table 7.x

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021715**

Secaucus, NJ, USA 11 - 15 November, 2002

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CHANGE REQUEST

⌘ **25.133** **CR** **483** ⌘ **rev** **1** ⌘ Current version: **5.4.0** ⌘

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

Title:	⌘	UE timer accuracy
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	26/11/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
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Reason for change: ⌘ UE timers are used in different protocol entities to control the UE behaviour. Some examples are (TS 25.331):

- T305: Sets the time for UE periodic transmission of CELL UPDATE and URA UPDATE messages.
  Value range: 5, 10, 30, 60, 120, 360, 720, infinity [minutes]
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  Value range T315: 0,10, 30, 60, 180, 600, 1200, 1800 [seconds]
- T316 and T317: Sets the time for how long UE can be out-of-service in states Cell_PCH/URA_PCH and Cell_FACH.
  Value range T316: 0, 10, 20, 30, 40, 50, infinity [seconds]
  Value range T317: 0,10, 30, 60, 180, 600, 1200, 1800 [seconds]

It is assumed that in a typical UE implementation, the time measurement function is quite accurate, since most UE implementations are expected to provide e.g. a time of day clock feature. However, requirements on UE timer accuracy would facilitate the UTRAN setting of the corresponding timers on the network side. For this purpose, we expect that not so tight accuracy requirements are needed.

Furthermore, for UE conformance test cases in TS 34.123, reference to core specification requirements on UE timer accuracy would facilitate setting of test requirements. Otherwise, the requirements would be implicitly specified by the conformance test cases, which is not a desired situation.

		Therefore if we do not add these requirements there will be: ▪ Problems in setting of UTRAN timers for supervising UE procedures Problems when setting test requirements in UE conformance tests
Summary of change:	⌘	Requirements on UE timer accuracy have been introduced.
Consequences if not approved:	⌘	Reqirements on UE timer accuracy would be missing.

Clauses affected:	⌘	8.1.2.2.2, 8.4.2.2.2, 9.1.8.2.2, A.9.1.5			
Other specs affected:	⌘	**Y**	**N**		
			N	Other core specifications	⌘
			N	Test specifications	
			N	O&M Specifications	
Other comments:	⌘	Equivalent CRs in other Releases: CR482r1 cat. F to 25.133 v3.11.0, CR491r1 cat. A to 25.133 v4.6.0			

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7 Timing and Signalling characteristics

7.1 UE Transmit Timing

7.1.1 Introduction

The UE shall have capability to follow the frame timing change of the connected Node B. The uplink DPCCH/DPDCH frame transmission takes place approximately T_0 chips after the reception of the first detected path (in time) of the corresponding downlink DPCCH/DPDCH frame from the reference cell T_0 is defined in [2]. UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are defined in the following requirements.

7.1.2 Requirements

The UE initial transmission timing error shall be less than or equal to ±1.5 Chip. The reference point for the UE initial transmit timing control requirement shall be the time when the first detected path (in time) of the corresponding downlink DPCCH/DPDCH frame is received from the reference cell plus T_0 chips. T_0 is defined in [2].

When the UE is not in soft handover, the reference cell shall be the one the UE has in the active set. The cell, which is selected as a reference cell, shall remain as a reference cell even if other cells are added to the active set. In case that the reference cell is removed from the active set the UE shall start adjusting its transmit timing no later than the time when the whole active set update message is available at the UE taking the RRC procedure delay into account.

The UE shall be capable of changing the transmission timing according the received downlink DPCCH/DPDCH frame. The maximum amount of the timing change in one adjustment shall be ¼ Chip.

The minimum adjustment rate shall be 233ns per second. The maximum adjustment rate shall be ¼ chip per 200ms. In particular, within any given 800*d ms period, the UE transmit timing shall not change in excess of ±d chip from the timing at the beginning of this 800*d ms period, where $0 \leq d \leq 1/4$.

7.2 UE Receive - Transmit Time Difference

7.2.1 Introduction

The UE shall have the capability to be in soft handover with more than one cell. The downlink DPCH frame timing shall take place approximately T_0 chips before the transmission of the uplink DPDCH/DPCCH. The adjustment requirements for the uplink DPDCH/DPCCH timing are specified in 7.1.1. The valid range of the Receive to Transmit time difference at the UE is defined in the following requirements.

7.2.2 Requirements

A UE shall support reception, demodulation and combining of signals of a downlink DPCH when the receive timing is within a window of T_0 +/- 148 chip before the transmit timing where T_0 is defined in [2]. A UE is only required to react to TPC commands with a transmit power adjustment in the immediate next slot if the downlink receive timing of all cells in the active set is within a window of T_0 +/- 148 chip before the uplink transmit timing. If the downlink receive timing of one or more cells in the active set is outside the window of T_0 +/- 148 chip, the UE may also react with a power adjustment one slot later. The receive timing is defined as the first detected path in time.

7.3 UE timer accuracy

7.3.1 Introduction

UE timers are used in different protocol entities to control the UE behaviour.

7.3.2 Requirements

For UE timers T3xx, T_{barred}, Treselection, Penalty_time, T_{CRmax}, $T_{CrmaxHyst}$ [16], UE shall comply with the timer accuracies according to Table 7.x.

The requirements are only related to the actual timing measurements internally in the UE. They do not include the following:

- Inaccuracy in the start and stop conditions of a timer (e.g. UE reaction time to detect that start and stop conditions of a timer is fulfilled), or
- Inaccuracies due to restrictions in observability of start and stop conditions of a UE timer (e.g. TTI alignment when UE sends messages at timer expiry).

Timer value [s]	Accuracy
timer value <4	± 0.1 s
timer value ≥4	± 2.5 %

Table 7.x

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021444**

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CHANGE REQUEST

⌘ **25.133** **CR** **488** ⌘ **rev** ⌘ Current version: **4.6.0** ⌘

*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:	⌘	Correction of UE Transmitted Power requirements in case of Compressed Mode gaps
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	26/11/2002
Category:	⌘	**A**
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)
Rel-6 (Release 6)

Reason for change:	⌘	In the current version of the specification, it is stated that in case of Compressed Mode gaps, the UE L1 shall report for the UE Transmitted Power a value of –50 dBm. This value will be then input to the L3 filter and will cause the drop of the averaged value at the output of L3 filter, which is wrong and can prevent the report of ordered events about the UE Tx Power (e.g. event 6a: the UE Tx power becomes larger than an absolute threshold).
Summary of change:	⌘	Correct the behaviour of UE L1 for empty slots created by compressed mode stating that, instead of responding with a value of –50 dBm, no value shall be reported for those slots. Isolated Impact: would not affect implementation behaving like indicated in the CR, would affect implementations supported the corrected functionality otherwise. The CR has a minor isolated impact on previous implementations, which still report the value of –50 dBm during compressed mode gaps. From a network point of view those mobile provides a lower averaged UE Tx power when in compressed mode. This may affect the network performance when both previous and new implementations are present together in the same network, depending on the use of the UE Tx power measurements.
Consequences if not approved:	⌘	The filtering of the UE Tx Power during Compressed Mode will lead to wrong lower values of the average after the L3 filter, which can prevent the correct reporting of ordered.

Clauses affected:	⌘	9.1.6.1
Other specs	⌘	Y: ☐ N: ☒ Other core specifications ⌘

affected:		Test specifications O&M Specifications
Other comments: ⌘	Equivalent CRs in other Releases: CR476 cat. F to 25.133 v3.11.0, CR477 cat. A to 25.133 v5.4.0	

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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.

9.1.6 UE transmitted power

9.1.6.1 Accuracy requirement

The measurement period in CELL_DCH state is 1 slot.

Table 9.14 UE transmitted power absolute accuracy

Parameter	Unit	Accuracy [dB]	
		PUEMAX 24dBm	PUEMAX 21dBm
UE transmitted power=PUEMAX	dBm	+1/-3	±2
UE transmitted power=PUEMAX-1	dBm	+1.5/-3.5	±2.5
UE transmitted power=PUEMAX-2	dBm	+2/-4	±3
UE transmitted power=PUEMAX-3	dBm	+2.5/-4.5	±3.5
PUEMAX-10≤UE transmitted power<PUEMAX-3	dBm	+3/-5	±4

NOTE 1: User equipment maximum output power, PUEMAX, is the maximum output power level without tolerance defined for the power class of the UE in TS 25.101 [3] section 6.2.1.

NOTE 2: UE transmitted power is the reported value.

For each empty slot created by compressed mode, no value shall be reported by the UE L1 for those slots ~~shall respond with a value of -50 dBm~~.

9.1.6.2 UE transmitted power measurement report mapping

The reporting range for *UE transmitted power* is from -50 ...+33 dBm.

In table 9.15 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.15

Reported value	Measured quantity value	Unit
UE_TX_POWER _021	-50 ≤ UE transmitted power < -49	dBm
UE_TX_POWER _022	-49 ≤ UE transmitted power < -48	dBm
UE_TX_POWER _023	-48 ≤ UE transmitted power < -47	dBm
…	…	…
UE_TX_POWER _102	31 ≤ UE transmitted power < 32	dBm
UE_TX_POWER _103	32 ≤ UE transmitted power < 33	dBm
UE_TX_POWER _104	33 ≤ UE transmitted power < 34	dBm

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⌘ **25.133** **CR** **489** ⌘ **rev** **1** ⌘ Current version: **4.6.0** ⌘

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

Title:	⌘	Correction of Measurement Occasion Patterns for BSIC Reconfirmation
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	26/11/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

Use one of the following categories:
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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:
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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:	⌘	Table 8.14 has some errors. Some of the cells in the table are not applicable after the change of the allowed measurement occasion patterns of Table 8.10A.
Summary of change:	⌘	Change the values in table 8.14. One note is added for N_TTI = 1 and Tmeas = 960 ms, 1280 and 1920 ms. These combinations of parameters result in long reconfirmation time, and for that reason are not specified. Isolated Impact: The CR has a minor isolated impact on the BSIC reconfirmation procedures because the time allowed to do a reselection is changed.
Consequences if not approved:	⌘	The specified values of $T_{re\text{-}confirm.\ GSM}$ for the measurement occasion patterns for BSIC Reconfirmation will be erroneous. - The correction is needed because the system cannot function correctly without this correction. - Some (N_TTI;T_meas) combinations are inconsistent with Table 8.10A The UE is not able to accept other (N_TTI;T_meas) combinations than included in the Table 8.10A. The behaviour of the UE is not specified when configured by other combinations and therefore can be different from one manufacturer to another. One possible situation is that UTRAN assumes that the UE accept the combination whereas the UE rejects it. The removal of these combinations will clear such situations. - When values in previous version were optimistic, UTRAN wrongly anticipated reconfirmation failure too soon. Then UTRAN concluded wrongly that the

	GSM cell was not detectable by the UE. - When values in previous version were pessimistic, UTRAN wrongly anticipated reconfirmation failure too late. One possible side effect was that UTRAN could slow down the re-selection time. These hereabove faults happen with 100 % probablility when UTRAN configures the UE with the previous (N_TTI;T_meas) combinations.

Clauses affected:	⌘	8.4.2.5.2.2			
Other specs affected:	⌘	**Y**	**N**		⌘
			X	Other core specifications	
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘	Equivalent CRs in other Releases: CR478r1 cat. F to 25.133 v3.11.0, CR479r1 cat. A to 25.133 v5.4.0			

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8.4.2.5.2.2 BSIC re-confirmation

The requirements of this section are applicable for BSIC re-confirmation.

The UE shall maintain the timing information of 6 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For each measurement occasion allocated for GSM BSIC reconfirmation as described in 8.4.2.5, the UE shall attempt to decode the BSIC falling within the measurement occasion duration according to table 8.12. When the UE has to select one out of several possible GSM cells to reconfirm within the possible allocation of measurement occasions, according to 8.4.2.5, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see section 8.4.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the 6 strongest GSM cells in the monitored list.

$T_{re\text{-}confirm\_GSM}$ is given for the combinations of T_{meas} and N_{TTI} that are given in table 8.14. The values given in table 8.14 represent the number of patterns required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier. Different values for $T_{re\text{-}confirm\ GSM}$ might apply when more than one GSM cell is in the BSIC reconfirmation procedure at the same time.

Table 8.14: The worst-case time for reconfirmation of one previously identified GSM cell

T_meas (ms)	N_TTI=1 frame $T_{re\text{-}confirm,GSM}$ (ms)	N_TTI=2 frames $T_{re\text{-}confirm,GSM}$ (ms)	N_TTI=4 frames $T_{re\text{-}confirm,GSM}$ (ms)	N_TTI=8 frames $T_{re\text{-}confirm,GSM}$ (ms)
80	2880	~~1280~~1600	-	-
~~120~~	~~5040~~	~~2400~~	-	-
160	6400	~~2880~~3200	~~2560~~2240	~~2560~~1600
240	17280	4800	-~~3840~~	-
320	~~10880~~14080	6400	~~5120~~4480	~~5120~~3200
480	22080	9600	~~7680~~6720	~~7680~~4800
640	26880	12800	10240	~~10240~~6400
960	*	17280	~~15360~~13440	~~15360~~9600
1280	*	~~20480~~33280	~~20480~~17920	~~20480~~12800
1920	*	*	~~30720~~26880	~~30720~~19200
~~2560~~				~~40960~~
~~3840~~				~~61440~~

* Note: There are no performance requirements for these combinations of parameters because they result in long reconfirmation time.

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021742**

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CHANGE REQUEST

⌘ **25.133** **CR** **490** ⌘ **rev** **2** ⌘ Current version: **4.6.0** ⌘

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

Title:	⌘	Required Window size for measurements using IPDL
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	26/11/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

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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 performance requirements of SFN-SFN observed time difference type 2 measurements with IPDL are not finalised
Summary of change:	⌘	1) Time to detect a new cell through IPDL measurements and the corresponding measurement period is defined in CELL_DCH and Cell_FACH states when idle periods with a length of 1 slot are scheduled and based on Search Window Size 40 and 80 chips 2) Side conditions for accuracy requirements are defined. 3) The test case "A.9.1.5.2 SFN-SFN observed time difference type 2" is corrected. There are now tests both with and without IPDL. Isolated Impact Analysis: This CR has an isolated impact on the SFN-SFN type 2 measurement. Since, the CR only corrects the requirements of an optional feature, it does not have any impact on any other requirements or implementations.
Consequences if not approved:	⌘	There are no measurement requirements or a test case for UE measurements utilising IPDL. The performance of SFN-SFN type 2 measurements cannot be assessed.

Clauses affected:	⌘	8.1.2.2.2, 8.4.2.2.2, 9.1.8.2.2, A.9.1.5

	Y	N		
Other specs affected: ⌘		**N**	Other core specifications	⌘
		N	Test specifications	

	N O&M Specifications	
Other comments: ⌘	Equivalent CRs in other Releases: CR480r2 cat. F to 25.133 v3.11.0, CR481r2 cat. A to 25.133 v5.4.0	

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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 UE Measurements Procedures

8.1 General Measurement Requirements in CELL_DCH State

8.1.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL_DCH state. The requirements are split in FDD intra frequency, FDD inter frequency, TDD and GSM measurements. These measurements may be used by the UTRAN, e.g. for handover decisions. 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. Control of measurement reporting is specified in TS 25.331 and parallel measurements are specified in section 8.2. Compressed mode is specified in TS 25.215.

8.1.2 Requirements

8.1.2.1 UE Measurement Capability

In CELL_DCH state the UE shall be able to monitor up to

- 32 intra frequency FDD cells (including active set), and
- 32 inter frequency cells, including
  - FDD cells distributed on up to 2 additional FDD carriers and
  - Depending on UE Capability, TDD cells, distributed on up to 3 TDD carriers and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers.

Depending on UE capability, the UE shall be able to monitor up to 16 intra frequency cells during IPDL gaps.

If the UE utilises compressed mode for inter-frequency and/or inter-RAT measurements, in order for the requirements in the following subsections to apply the UTRAN must:

- provide transmission gap pattern sequences with TGPL1 > 1, and
- provide the patterns within a transmission gap pattern sequence are identical (i.e., TGPL1 = TGPL2), and
- ensure that with the activation of one or more transmission gap pattern sequences, no more than two frames contain a transmission gap within any window of three consecutive frames, and
- ensure that there is a minimum of 8 slots between the end of the first transmission gap and the beginning of the second transmission gap in case of two successive compressed frames.

Performance requirements for different types of transmission gap pattern sequences and different number of cells is defined in the following sections.

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

The received CPICH E_c/I_o is defined as

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

and the received SCH E_c/I_o is defined as

$$\left(\frac{SCH\_E_c}{I_o}\right)_{in\ dB} = \left(\frac{SCH\_E_c}{I_{or}}\right)_{in\ dB} - \left(\frac{I_o}{\hat{I}_{or}}\right)_{in\ dB}$$

8.1.2.2 FDD intra frequency measurements

During the CELL_DCH state the UE shall continuously measure identified intra frequency cells and search for new intra frequency cells in the monitoring set. In case the network requests the UE to report detected set cells, the UE shall also search for intra frequency cells outside the monitored and active set. Cells, which are neither included in the active set nor in the monitored set, and are identified by the UE belong to the detected set according to TS 25.331. If compressed mode pattern sequences are activated, intra frequency measurements can be performed between the transmission gaps simultaneously for data reception from the active set cell/s.

The performance of intra frequency measurements when IPDL is active has not been studied.

8.1.2.2.1 Identification of a new cell

The UE shall be able to identify and decode the SFN of a new detectable cell belonging to the monitored set within

$$T_{identify\ \ intra} = Max\left\{800, T_{basic\ identify\ FDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}\right\} ms$$

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io $\geq$ -20 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

In case of conflict when a compressed gap sequence is activated the UE may choose to prioritise the SFN decoding

The UE shall be able to identify a new detectable cell not belonging to the monitored set within

$$T_{identify\ \ detected\ set} = 30s$$

when CPICH Ec/Io $\geq$ -20 dB, SCH_Ec/Io $\geq$ -17 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

8.1.2.2.1.1 Identification of a new cell using IPDL gaps

When the UE is supporting IPDL measurements and when idle periods with a length of 1 slot are scheduled the UE physical layer shall be capable to identify a new cell and report SFN-SFN observed time difference type 2 measurement within

$T_{identify,IPDL}$=Max{$T_{Measerement\_Period\ Intra}$,$T_{IPDL}$} ms

where

$T_{Measurement\_Period\ Intra}$ = The measurement period for Intra frequency CPICH measurements defined in Section 8.1.2.2.2.

and

T_{IPDL} depends on the Search Window Size given in UE positioning OTDOA neighbour cell info as given in Table 8.X

Table 8.X: T_{IPDL}

Search Window Size	**T_{IPDL}**
less than or equal to +/- 40 chips	Time over which 4 consecutive IPDL gaps occur
+/- 80 chips	Time over which 8 consecutive IPDL gaps occur

8.1.2.2.2 UE CPICH measurement capability

In the CELL_DCH state the measurement period for intra frequency measurements is 200 ms. When no transmission gap pattern sequence is activated, the UE shall be capable of performing CPICH measurements for 8 identified-intra-frequency cells of the monitored set and/or the active set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When one or more transmission gap pattern sequences are activated, the UE shall be capable of performing CPICH measurements for at least $Y_{measurement\ intra}$ cells , where $Y_{measurement\ intra}$ is defined in the following equation. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2. If the UE has identified more than $Y_{measurement\ intra}$ cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\ intra} = Floor\left\{ X_{basic\ measurement\ FDD} \cdot \frac{T_{Intra}}{T_{Measurement\ Period,\ Intra}} \right\} \text{ cells}$$

where

$X_{basic\ measurement\ FDD}$ = 8 (cells)

$T_{Measurement\_Period\ Intra}$ = 200 ms. The measurement period for Intra frequency CPICH measurements.

T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing.

$T_{basic\_identify\_FDD,\ intra}$ = 800 ms. This is the time period used in the intra frequency equation where the maximum allowed time for the UE to identify a new FDD cell is defined.

The UE shall furthermore be capable of performing CPICH measurements for at least 1 detected intra-frequency cell, in the detected set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 10 s. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2.

8.1.2.2.2.1 Capabilities for measurements during IPDL gaps

When idle periods with a length of 1 slot are scheduled, the UE physical layer shall be capable of reporting SFN-SFN observed time difference type 2 measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.8.2.2 with measurement period given by

$$T_{measurement\ IPDL} = Max\{T_{Measurement\_Period\ Intra}, T_{4\ IPDLs}\} ms$$

where

$T_{Measurement\_Period\ Intra}$ = The measurement period for Intra frequency CPICH measurements defined in Section 8.1.2.2.2.

$T_{4\ IPDLs}$ = Time period over which 4 consecutive idle periods occur.

***** NEW SECTION *****

8.4 Measurements in CELL_FACH State

8.4.1 Introduction

This section contains requirements on the UE regarding cell reselection and measurement reporting in CELL_FACH state. The requirements for cell re-selection are split in FDD intra frequency, FDD inter frequency, TDD and GSM measurements. 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. Control of measurement reporting is specified in TS 25.331. Measurement occasions in CELL_FACH state are described in TS 25.331.

8.4.2 Requirements

8.4.2.1 UE Measurement Capability

In CELL_FACH state, the UE shall be able to monitor up to

- 32 intra frequency FDD cells and
- 32 inter frequency cells, including
  - FDD cells distributed on up to 2 additional FDD carriers and
  - Depending on UE Capability, TDD mode cells, distributed on up to 3 TDD carriers, and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers.

Depending on UE capability, the UE shall be able to monitor up to 16 intra frequency cells during IPDL gaps.

The requirements in section 9 on CPICH Ec/Io and RSCP measurements are applicable for a UE performing measurements according to this section. For inter-frequency FDD, TDD and GSM cell re-selection, measurement occasions as specified in TS 25.331 are used to find and measure on other cells.

It is defined below how the measurements on different systems and modes are performed given the time allocated to that system. The requirements in this section are based on an assumption that the time during the measurement occasions that is allocated to each of the different modes and systems shall be equally shared by the modes which the UE has capability for and that are in the monitored set signalled by the network.

For this three parameters are defined:

N_{FDD} is 0 or 1. If there are inter-frequency FDD cells in the neighbour list N_{FDD}=1, otherwise N_{FDD}=0.

N_{TDD} is 0 or 1. If the UE is capable of TDD and there are TDD cells in the neighbour list N_{TDD}=*1* otherwise N_{TDD}=0.

N_{GSM} is 0 or 1. If the UE is capable of GSM and there are GSM cells in the neighbour list, N_{GSM}=*1*, otherwise N_{GSM}=0.

The measurement time T_{meas} is then defined as

$$T_{meas} = \left[\left(N_{FDD} + N_{TDD} + N_{GSM}\right) \cdot \mathrm{N}_{\mathrm{TTI}} \cdot \mathrm{M\_REP} \cdot 10\right]\mathrm{ms}$$

where

- M_REP is the Measurement Occasion cycle length where K is given in Table X. K is the FACH measurement occasion length coefficient as specified in TS25.331

- The FACH Measurement Occasion of N_{TTI} frames will be repeated every N_{TTI} * M_REP frame.
- N_{TTI} is the number of frames in each measurement occasion, equal to the length of the largest TTI on the SCCPCH monitored by the UE.

Table 8.10A: K values for each N_{TTI} value

N_{TTI}	K
1	3,4,5,6
2	2,3,4,5
4	2,3,4
8	1,2,3

The UE is assumed to measure periodically once every time period T_{meas} on each of the modes and systems, FDD inter-frequency cells, TDD inter-frequency cells and GSM carriers for which the corresponding parameter N_{FDD}, N_{TDD} and N_{GSM} is set to 1.

8.4.2.2 FDD intra frequency measurements

During the CELL_FACH state the UE shall continuously measure identified intra frequency cells and search for new intra frequency cells in the monitoring set. If a measurement occasion is activated, intra frequency measurements can be performed between the measurement occasions.

The performance of intra frequency measurements when IPDL is active has not been studied.

8.4.2.2.1 Identification of a new cell

The UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,intra} = Max\left\{800, Ceil\left\{\frac{T_{basic\ identify\ FDD,intra}}{N_{TTI}\cdot(M\_REP-1)\cdot 10}\right\}\cdot N_{TTI}\cdot M\_REP\cdot 10\right\}\ ms$$

where

$T_{basic\_identify\_FDD,intra}$ is specified in section 8.1.2.2.2,

N_{TTI} and M_REP is specified in section 8.4.2.1.

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io $\geq$ -20 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

In case of conflict when a measurement occasion is activated the UE may choose to prioritise the SFN decoding.

8.4.2.2.1.1 Identification of a new cell using IPDL gaps

When the UE is supporting IPDL measurements and when idle periods with a length of 1 slot are scheduled the UE physical layer shall be capable to identify a new cell and report SFN-SFN observed time difference type 2 measurement within

$T_{identify,IPDL}=Max\{T_{Measerement\_Period\ Intra}, T_{IPDL}\}$ ms

where

$T_{Measurement\_Period\ Intra}$ = The measurement period for Intra frequency CPICH measurements defined in Section 8.1.2.2.2.

and

T_{IPDL} depends on the Search Window Size given in UE positioning OTDOA neighbour cell info as given in Table 8.X

Table 8.X: T_{IPDL}

Search Window Size	**T_{IPDL}**
less than or equal to +/- 40 chips	Time over which 4 consecutive IPDL gaps occur
+/- 80 chips	Time over which 8 consecutive IPDL gaps occur

8.4.2.2.2 UE CPICH measurement capability

In the CELL_FACH state the measurement period for intra frequency measurements is 200 ms. When no measurement occasion cycle is activated, the UE shall be capable of performing CPICH measurements for 8 identified intra-frequency cells of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When a measurement occasion cycle is activated, the UE shall be capable of performing CPICH measurements for the $Y_{measurement\ intra}$ strongest cells , where $Y_{measurement\ intra}$ is defined in the following equation. The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.1 and 9.1.2. If the UE has identified more than $Y_{measurement\ intra}$ cells, the UE shall perform measurements of all identified cells but the reporting rate of CPICH measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\ intra} = Floor\left\{ X_{basic\ measurement\ FDD} \cdot \frac{T_{Measurement\_Period\ Intra} - Ceil\left\{ \frac{T_{Measurement\_Period\ Intra}}{N_{TTI} \cdot M\_REP \cdot 10\,\text{ms}} \right\} \cdot N_{TTI} \cdot 10\,\text{ms}}{T_{Measurement\_Period\ Intra}} \right\} \text{ cells}$$

where

$X_{basic\ measurement\ FDD}$ is specified in section 8.1.2.2.2,

$T_{Measurement\_Period\ Intra}$ is specified in section 8.1.2.2.2,

M_REP and N_{TTI} is specified in section 8.4.2.1.

8.4.2.2.2.1 Capabilities for measurements during IPDL gaps.

When idle periods with a length of 1 slot are scheduled UE physical layer shall be capable of reporting SFN-SFN observed time difference type 2 measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.8.2.2 with measurement period given by

$$T_{measurement\ IPDL} = Max\{T_{Measurement\_Period\ Intra}, T_{4\ IPDLs}\} ms$$

where

$T_{Measurement\_Period\ Intra}$ = The measurement period for Intra frequency CPICH measurements defined in Section 8.1.2.2.2.

and

$T_{4\ IPDLs}$ = Time period over which 4 consecutive idle periods occur.

***** NEW SECTION *****

9.1.8.2 SFN-SFN observed time difference type 2

NOTE: This measurement is for location service purposes to identify time difference between two cells.

It is optional for terminal to support the use of IPDL periods together with SFN-SFN observed time difference type 2. The support of IPDL depends on the supported UE positioning methods.

NOTE: Requirement on the UE shall be reconsidered when the state of the art technology progress.

9.1.8.2.1 Intra frequency measurement requirement accuracy without IPDL period active

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.21 is valid under the following conditions:

CPICH_RSCP1,2$|_{dBm} \geq$ -114 dBm.

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

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

~~$\left| \frac{I_o}{\hat{I}_{or}} \right|_{in\ dB} - \left(\frac{P-CCPCH\_E_c}{I_{or}} \right)_{in\ dB}$ is low enough to ensure successful SFN decoding.~~

Table 9.21

Parameter	Unit	Accuracy [chip]	Conditions Io [dBm/3.84 MHz]
SFN-SFN observed time difference type2	chip	± 0.5	-94...-50

9.1.8.2.2 Intra frequency measurement requirement accuracy with IPDL period active

This requirement is valid only for UEs supporting IPDL measurements.

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

The accuracy requirement in table 9.22 is valid under the following conditions:

CPICH_RSCP1,2$|_{dBm} \geq$ -114 dBm.

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

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

~~$\left| \frac{I_o}{\hat{I}_{or}} \right|_{in\ dB} - \left(\frac{P-CCPCH\_E_c}{I_{or}} \right)_{in\ dB}$ is low enough to ensure successful SFN decoding.~~

Additionally the accuracy requirement in table 9.22 is also valid for neighbour cells for which the following conditions apply to during idle periods provided idle periods have a length of 1 slot:

CPICH_RSCPx,y|$_{dBm}$ ≥ -114 dBm.

$$\left| \frac{I_{o\_idle\_period}}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left(\frac{CPICH\_E_c}{I_{or}} \right)_{in\ dB} \leq 20dB ,$$

where *x* and *y* represent cells measured using idle periods and $I_{o\ idle\text{-}period}$ is the total received power during the idle period.

NOTE: Additional general conditions are needed for the requirements in table 9.22 to be valid.

Table 9.22

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm/3.84 MHz]
SFN-SFN observed time difference type 2	chip	± 0.5	-94...-50

9.1.8.2.3 Inter frequency measurement requirement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

The accuracy requirement in table 9.23 is valid under the following conditions:

CPICH_RSCP1,2|$_{dBm}$ ≥ -114 dBm.

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

| Channel 1_Io|$_{dBm}$ -Channel 2_Io|$_{dBm}$ | ≤ 20 dB.

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

Table 9.23

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm/3.84 MHz]
SFN-SFN observed time difference type 2	chip	± 1	-94...-50

9.1.8.2.4 SFN-SFN observed time difference type 2 measurement report mapping

The reporting range is for *SFN-SFN observed time difference type 2* is from -1280 ... +1280 chip.

In table 9.24 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.24

Reported value	Measured quantity value	Unit
T2_SFN-SFN_TIME _00000	SFN-SFN observed time difference type 2 < -1280.0000	chip
T2_SFN-SFN_TIME _00001	-1280.0000 ≤ SFN-SFN observed time difference type 2 < -1279.9375	chip
T2_SFN-SFN_TIME _00002	-1279.9375 ≤ SFN-SFN observed time difference type 2 < -1279.8750	chip
…	…	…
T2_SFN-SFN_TIME _40959	1279.8750 ≤ SFN-SFN observed time difference type 2 < 1279.9375	chip
T2_SFN-SFN_TIME _40960	1279.9375 ≤ SFN-SFN observed time difference type 2 < 1280.0000	chip
T2_SFN-SFN_TIME _40961	1280.0000 ≤ SFN-SFN observed time difference type 2	chip

***** NEW SECTION *****

A.9.1.5.2 SFN-SFN observed time difference type 2 without IPDL period active

A.9.1.5.2.1 Test Purpose and Environment

The purpose of this test is to verify that the SFN-SFN observed time difference type 2 measurement accuracy without IPDL period active is within the specified limits. This test will verify the requirements in section 9.1.8.2.

During the test the time difference between Cell 1 and 2 can be set to value from -1279.75 to 1280 chips.

In this case all cells are in the same frequency. Table A.9.9 defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.9: SFN-SFN observed time difference type 2 Intra frequency test parameters

Parameter	Unit	Cell 1	Cell 2
UTRA RF Channel number		Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12
SCH_Ec/Ior	dB	-12	-12
PICH_Ec/Ior	dB	-15	-15
DPCH_Ec/Ior	dB	-15	-15
OCNS	dB	-1.11	-1.11
Îor/Ioc	dB	10.5	10.5
Ioc	dBm/ 3.84 MHz	*Io -13.7 dB = Ioc,* Note 1	*Io -13.7 dB = Ioc,* Note 1
CPICH_Ec/Io, Note 2	dB	-13.2	-13.2
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94…-70 -94…-50	-94…-70 -94…-50
Propagation condition	-	AWGN	
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*. NOTE 2: Io and CPICH Ec/Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.			

~~When verifying the SFN-SFN observed time difference type 2 intra frequency measurement accuracy with IPDL period active the idle period parameters in table A.9.10 shall be used.~~

~~**Table A.9.10: SFN-SFN observed time difference type 2 idle period test parameters**~~

~~Parameter~~	~~Unit~~	~~Cell 1~~	~~Cell 2~~
~~IP_Status~~	~~-~~	~~continous~~	~~continous~~
~~IP_Spacing~~	~~Frames~~	~~[10]~~	~~[10]~~
~~IP_Lenght~~	~~Symbols~~	~~10~~	~~10~~
~~IP_Offset~~	~~frame~~	~~NA~~	~~NA~~
~~Seed~~	~~integer~~	~~[13]~~	~~[4]~~
~~Burst_Start~~		~~NA~~	~~NA~~
~~Burst_Length~~		~~NA~~	~~NA~~
~~Burst_Freq~~		~~NA~~	~~NA~~

~~NOTE: The total signal power spectral density *Io* will change only downwards during BS transmission gap.~~

A.9.1.5.2.2 Test Requirements

The SFN-SFN observed time difference type 2 measurement accuracy shall meet the requirements in section 9.1.8.2

A.9.1.5.3 SFN-SFN observed time difference type 2 with IPDL period active

A.9.1.5.3.1 Test Purpose and Environment

This requirement is valid only for UEs supporting IPDL measurements.

The purpose of this test is to verify that the SFN-SFN observed time difference type 2 measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.8.2.

During the test the time difference between Cell 1 and 2 shall be set according to the assistance data defined in table A.9.Y.

In this case all cells are in the same frequency. Table A.9.X defines the limits of signal strengths and code powers, where the requirements are applicable.

Table A.9.X: SFN-SFN observed time difference type 2 Intra frequency test parameters

Parameter	Unit	Cell 1		Cell 2	
Time		No idle period	Idle period in Cell 1	No idle period	Idle period in Cell 1
UTRA RF Channel number		Channel 1	Channel 1	Channel 1	Channel 1
CPICH_Ec/Ior	dB	-10	-10	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12	-12	-12
SCH_Ec/Ior	dB	-12	-12	-12	-12
PICH_Ec/Ior	dB	-15	-15	-15	-15
DPCH_Ec/Ior	dB	-15	-15	-	-
OCNS	dB	-1.11	-1.11	-0.94	-0.94
Îor/Ioc	dB	10.5	-24.5	-6	-6
Ioc	dBm/ 3.84 MHz	*-80*			
Io, Note 1	dBm/3.84 MHz	-69.04	-79.01	-69.04	-79.01
CPICH_Ec/Io, Note 1	dB	-10.46	-35.49	-26.96	-16.99
Propagation condition	-	AWGN			
NOTE 1: Io and CPICH Ec/Io levels have been calculated from other parameters for information purposes. They are is not settable parameters themselves.					

When verifying the SFN-SFN observed time difference type 2 intra frequency measurement accuracy with IPDL period active the idle period parameters in table A.9.10 shall be used.

Table A.9.Y SFN-SFN observed time difference type 2 assistance data test parameters

Parameter	Unit	Cell 1
Search Window Size	Chips	80
IP_Status	-	Continuous
IP_Spacing	Frames	10
IP_Lenght	Symbols	10
IP_Offset	frame	NA
Seed	integer	13
Burst_Start		NA
Burst_Length		NA
Burst_Freq		NA

NOTE: The total signal power spectral density *Io* will change only downwards during BS transmission gap.

A.9.1.5.3.2 Test Requirements

The SFN-SFN observed time difference type 2 measurement accuracy shall meet the requirements in section 9.1.8.2

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021714**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **491** ⌘ **rev** **1** ⌘ Current version: **4.6.0** ⌘

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

Title:	⌘	UE timer accuracy	
Source:	⌘	RAN WG4	
Work item code:	⌘	TEI	***Date:*** ⌘ 26/11/2002
Category:	⌘	**A**	***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)*
Rel-6	*(Release 6)*

Reason for change: ⌘ UE timers are used in different protocol entities to control the UE behaviour. Some examples are (TS 25.331):

- T305: Sets the time for UE periodic transmission of CELL UPDATE and URA UPDATE messages.
  Value range: 5, 10, 30, 60, 120, 360, 720, infinity [minutes]
- T314 and T315: Sets the time for how long UE shall attempt to re-establish the RRC Connection, in case of radio link failure.
  Value range T314: 0, 2, 4, 6, 8, 12, 16, 20 [seconds]
  Value range T315: 0,10, 30, 60, 180, 600, 1200, 1800 [seconds]
- T316 and T317: Sets the time for how long UE can be out-of-service in states Cell_PCH/URA_PCH and Cell_FACH.
  Value range T316: 0, 10, 20, 30, 40, 50, infinity [seconds]
  Value range T317: 0,10, 30, 60, 180, 600, 1200, 1800 [seconds]

It is assumed that in a typical UE implementation, the time measurement function is quite accurate, since most UE implementations are expected to provide e.g. a time of day clock feature. However, requirements on UE timer accuracy would facilitate the UTRAN setting of the corresponding timers on the network side. For this purpose, we expect that not so tight accuracy requirements are needed.

Furthermore, for UE conformance test cases in TS 34.123, reference to core specification requirements on UE timer accuracy would facilitate setting of test requirements. Otherwise, the requirements would be implicitly specified by the conformance test cases, which is not a desired situation.

		Therefore if we do not add these requirements there will be: ▪ Problems in setting of UTRAN timers for supervising UE procedures Problems when setting test requirements in UE conformance tests
Summary of change:	⌘	Requirements on UE timer accuracy have been introduced.
Consequences if not approved:	⌘	Reqirements on UE timer accuracy would be missing.

Clauses affected:	⌘	8.1.2.2.2, 8.4.2.2.2, 9.1.8.2.2, A.9.1.5			
Other specs affected:	⌘	**Y**	**N**		
			N	Other core specifications	⌘
			N	Test specifications	
			N	O&M Specifications	
Other comments:	⌘	Equivalent CRs in other Releases: CR482r1 cat. F to 25.133 v3.11.0, CR483r1 cat. A to 25.133 v5.4.0			

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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

7 Timing and Signalling characteristics

7.1 UE Transmit Timing

7.1.1 Introduction

The UE shall have capability to follow the frame timing change of the connected Node B. The uplink DPCCH/DPDCH frame transmission takes place approximately T_0 chips after the reception of the first detected path (in time) of the corresponding downlink DPCCH/DPDCH frame from the reference cell T_0 is defined in [2]. UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are defined in the following requirements.

7.1.2 Requirements

The UE initial transmission timing error shall be less than or equal to ±1.5 Chip. The reference point for the UE initial transmit timing control requirement shall be the time when the first detected path (in time) of the corresponding downlink DPCCH/DPDCH frame is received from the reference cell plus T_0 chips. T_0 is defined in [2].

When the UE is not in soft handover, the reference cell shall be the one the UE has in the active set. The cell, which is selected as a reference cell, shall remain as a reference cell even if other cells are added to the active set. In case that the reference cell is removed from the active set the UE shall start adjusting its transmit timing no later than the time when the whole active set update message is available at the UE taking the RRC procedure delay into account.

The UE shall be capable of changing the transmission timing according the received downlink DPCCH/DPDCH frame. The maximum amount of the timing change in one adjustment shall be ¼ Chip.

The minimum adjustment rate shall be 233ns per second. The maximum adjustment rate shall be ¼ chip per 200ms. In particular, within any given 800*d ms period, the UE transmit timing shall not change in excess of ±d chip from the timing at the beginning of this 800*d ms period, where $0 \leq d \leq 1/4$.

7.2 UE Receive - Transmit Time Difference

7.2.1 Introduction

The UE shall have the capability to be in soft handover with more than one cell. The downlink DPCH frame timing shall take place approximately T_0 chips before the transmission of the uplink DPDCH/DPCCH. The adjustment requirements for the uplink DPDCH/DPCCH timing are specified in 7.1.1. The valid range of the Receive to Transmit time difference at the UE is defined in the following requirements.

7.2.2 Requirements

A UE shall support reception, demodulation and combining of signals of a downlink DPCH when the receive timing is within a window of T_0 +/- 148 chip before the transmit timing where T_0 is defined in [2]. A UE is only required to react to TPC commands with a transmit power adjustment in the immediate next slot if the downlink receive timing of all cells in the active set is within a window of T_0 +/- 148 chip before the uplink transmit timing. If the downlink receive timing of one or more cells in the active set is outside the window of T_0 +/- 148 chip, the UE may also react with a power adjustment one slot later. The receive timing is defined as the first detected path in time.

7.3 UE timer accuracy

7.3.1 Introduction

UE timers are used in different protocol entities to control the UE behaviour.

7.3.2 Requirements

For UE timers T3xx, T_{barred}, Treselection, Penalty_time, T_{CRmax}, $T_{CrmaxHyst}$ [16], UE shall comply with the timer accuracies according to Table 7.x.

The requirements are only related to the actual timing measurements internally in the UE. They do not include the following:

- Inaccuracy in the start and stop conditions of a timer (e.g. UE reaction time to detect that start and stop conditions of a timer is fulfilled), or
- Inaccuracies due to restrictions in observability of start and stop conditions of a UE timer (e.g. TTI alignment when UE sends messages at timer expiry).

Timer value [s]	Accuracy
timer value <4	± 0.1 s
timer value ≥4	± 2.5 %

Table 7.x

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021651**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **504** ⌘ **rev** ⌘ Current version: **3.11.0** ⌘

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

Title:	⌘	Correction of UE parameter for Randam Access test
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	26/11/2002
Category:	⌘	**F**
Release:	⌘	R99

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:	⌘	In the test of correct behaviour when Time-out, it is probable that UE transmit power may reach 0dBm limit defined by “Maximum allowed UL TX power” parameter before completing the preamble cycle. It would be very difficult to perform this test properly according to the current parameters.
Summary of change:	⌘	Maximum allowed UL TX power is changed from 0 dBm to 21dBm in table A.6.6. **Isolated Impact Analysis:** This CR only corrects the value of parameter for Random Access test. Therefore, it does not have any impact on any other requirements or implementations.
Consequences if not approved:	⌘	A good UE may fail the test when transmit power reaches the limit before sending prescribed number of preambles.

Clauses affected:	⌘	A.6.6

Other specs affected: ⌘	Y	N		⌘	
		X	Other core specifications		
	X		Test specifications		34.121
		X	O&M Specifications		

Other comments:	⌘	Equivalent CRs in other Releases: CR505 cat. A to 25.133 v4.6.0, CR506 cat. A to 25.133 v5.4.0

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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.

A.6.2 Random Access

A.6.2.1 Test Purpose and Environment

The purpose of these tests are to verify that the behaviour of the random access procedure is according to the requirements and that the PRACH power settings are within specified limits. This tests will verify the requirements in section 6.3.2.

Table A.6.5: RF Parameters for Random Access test

Parameter	Unit	Cell 1
UTRA RF Channel Number		Channel 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
Number of other transmitted Acquisition Indicators	-	0
AICH_Ec/Ior	dB	-10
PICH_Ec/Ior	dB	-15
OCNS_Ec/Ior when an AI is not transmitted	dB	-0.941
OCNS_Ec/Ior when an AI is transmitted	dB	-1.516
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	-70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN

The test parameters "System Information Block (SIB) type 5 (ASC #0)" defined in section 6.1 of TS34.108, shall be used in all random access tests. Crucial parameters for the test requirements are repeated in Table A.6.6 and A.6.7 and these overrule the parameters defined in SIB type 5.

Table A.6.6: UE parameters for Random Access test

Parameter	Unit	Value
Access Service Class (ASC#0) - Persistence value	0..1	1
Maximum number of preamble ramping cycles (M_{max}).		2
Maximum number of preambles in one preamble ramping cycle (Preamble Retrans Max)		12
The backoff time T_{B01} N_{B01min}=N_{B01max}	ms #TTI	N/A 10
Power step when no acquisition indicator is received (Power offset P0)	dB	3
Power offset between the last transmitted preamble and the control part of the message (Power offset P p-m)	dB	0
Maximum allowed UL TX power	dBm	~~0~~21

Table A.6.7: UTRAN parameters for Random Access test

Parameter	Unit	Value
Primary CPICH DL TX power	dBm	-8
UL interference	dBm	-102
SIR in open loop power control (Constant value)	dB	0
AICH Power Offset	dB	0

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021652**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **505** ⌘ **rev** ⌘ Current version: **4.6.0** ⌘

*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:	⌘	Correction of UE parameter for Randam Access test
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	26/11/2002
Category:	⌘	**A**
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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	In the test of correct behaviour when Time-out, it is probable that UE transmit power may reach 0dBm limit defined by “Maximum allowed UL TX power” parameter before completing the preamble cycle. It would be very difficult to perform this test properly according to the current parameters.
Summary of change:	⌘	Maximum allowed UL TX power is changed from 0 dBm to 21dBm in table A.6.6.
Consequences if not approved:	⌘	A good UE may fail the test when transmit power reaches the limit before sending prescribed number of preambles.
Clauses affected:	⌘	A.6.6

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	34.121
	X		Test specifications	
		X	O&M Specifications	

Other comments: ⌘ Equivalent CRs in other Releases: CR504 cat. F to 25.133 v3.11.0, CR506 cat. A to 25.133 v5.4.0

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.

A.6.2 Random Access

A.6.2.1 Test Purpose and Environment

The purpose of these tests are to verify that the behaviour of the random access procedure is according to the requirements and that the PRACH power settings are within specified limits. This tests will verify the requirements in section 6.3.2.

Table A.6.5: RF Parameters for Random Access test

Parameter	Unit	Cell 1
UTRA RF Channel Number		Channel 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
Number of other transmitted Acquisition Indicators	-	0
AICH_Ec/Ior	dB	-10
PICH_Ec/Ior	dB	-15
OCNS_Ec/Ior when an AI is not transmitted	dB	-0.941
OCNS_Ec/Ior when an AI is transmitted	dB	-1.516
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	-70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN

The test parameters "System Information Block (SIB) type 5 (ASC #0)" defined in section 6.1 of TS34.108, shall be used in all random access tests. Crucial parameters for the test requirements are repeated in Table A.6.6 and A.6.7 and these overrule the parameters defined in SIB type 5.

Table A.6.6: UE parameters for Random Access test

Parameter	Unit	Value
Access Service Class (ASC#0) - Persistence value	0..1	1
Maximum number of preamble ramping cycles (M_{max}).		2
Maximum number of preambles in one preamble ramping cycle (Preamble Retrans Max)		12
The backoff time T_{B01} N_{B01min}=N_{B01max}	ms #TTI	N/A 10
Power step when no acquisition indicator is received (Power offset P0)	dB	3
Power offset between the last transmitted preamble and the control part of the message (Power offset P p-m)	dB	0
Maximum allowed UL TX power	dBm	~~0~~21

Table A.6.7: UTRAN parameters for Random Access test

Parameter	Unit	Value
Primary CPICH DL TX power	dBm	-8
UL interference	dBm	-102
SIR in open loop power control (Constant value)	dB	0
AICH Power Offset	dB	0

3GPP TSG RAN WG4 (Radio) Meeting #25 **R4-021653**

Secaucus, NJ, USA 11 - 15 November, 2002

CR-Form-v7

CHANGE REQUEST

⌘ **25.133** **CR** **506** ⌘ **rev** ⌘ Current version: **5.4.0** ⌘

*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:	⌘	Correction of UE parameter for Randam Access test
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	26/11/2002
Category:	⌘	**A**
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:	⌘	In the test of correct behaviour when Time-out, it is probable that UE transmit power may reach 0dBm limit defined by “Maximum allowed UL TX power” parameter before completing the preamble cycle. It would be very difficult to perform this test properly according to the current parameters.
Summary of change:	⌘	Maximum allowed UL TX power is changed from 0 dBm to 21dBm in table A.6.6.
Consequences if not approved:	⌘	A good UE may fail the test when transmit power reaches the limit before sending prescribed number of preambles.
Clauses affected:	⌘	A.6.6

Other specs affected: ⌘	Y	N		⌘	
		X	Other core specifications		
	X		Test specifications		34.121
		X	O&M Specifications		

Other comments: ⌘ Equivalent CRs in other Releases: CR504 cat. F to 25.133 v3.11.0, CR505 cat. A to 25.133 v4.6.0

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A.6.2 Random Access

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PICH_Ec/Ior	dB	-15
OCNS_Ec/Ior when an AI is not transmitted	dB	-0.941
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I_{oc}	dBm/3.84 MHz	-70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN

The test parameters "System Information Block (SIB) type 5 (ASC #0)" defined in section 6.1 of TS34.108, shall be used in all random access tests. Crucial parameters for the test requirements are repeated in Table A.6.6 and A.6.7 and these overrule the parameters defined in SIB type 5.

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Table A.6.7: UTRAN parameters for Random Access test

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