

TSG RAN Meeting #13
Beijing, China, 18-21 September 2001

RP-010621

Title: CRs (R'99 and Rel-4 Category A) to TS 25.133 (3)

Source TSG RAN WG4

Agenda item: 8.4.3

RAN4 Tdoc	Spec	CR	Title	Cat	Phase	Curr Ver	New Ver
R4-011307	25.133	166	Cell Re-selection in CELL_FACH test case	F	Rel99	3.6.0	3.7.0
R4-011308	25.133	167	Cell Re-selection in CELL_FACH test case	A	Rel-4	4.1.0	4.2.0
R4-011327	25.133	168	Correction for RRC re-establishment delay	F	Rel99	3.6.0	3.7.0
R4-011350	25.133	169	Correction for RRC re-establishment delay	A	Rel-4	4.1.0	4.2.0
R4-011328	25.133	170	Correction for section 5	F	Rel99	3.6.0	3.7.0
R4-011349	25.133	171	Correction for section 5	A	Rel-4	4.1.0	4.2.0
R4-011336	25.133	172	Section 4	F	Rel99	3.6.0	3.7.0
R4-011339	25.133	173	Section 4	A	Rel-4	4.1.0	4.2.0
R4-011337	25.133	174	Section 8	F	Rel99	3.6.0	3.7.0
R4-011340	25.133	175	Section 8	A	Rel-4	4.1.0	4.2.0
R4-011347	25.133	176	Cell reselection test cases in CELL_FACH state	F	Rel99	3.6.0	3.7.0
R4-011348	25.133	177	Cell reselection test cases in CELL_FACH state	A	Rel-4	4.1.0	4.2.0
R4-010883	25.133	178	Correction for FDD to TDD HO requirement	F	Rel99	3.6.0	3.7.0
R4-011067	25.133	179	Correction for FDD to TDD HO requirement	A	Rel-4	4.1.0	4.2.0
R4-011216	25.133	180	Correction of UE positioning measurements	F	Rel99	3.6.0	3.7.0
R4-011305	25.133	185	TFC state change description	F	Rel99	3.6.0	3.7.0
R4-011341	25.133	186	TFC state change description	A	Rel-4	4.1.0	4.2.0

CHANGE REQUEST

⌘ **25.133 CR 166** ⌘ ev **-** ⌘ Current version: **3.6.0** ⌘

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

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

Title:	⌘ Cell Reselection to GSM in Cell-FACH
Source:	⌘ RAN WG4
Work item code:	⌘ Date: ⌘ 2001-09-04
Category:	⌘ F
	Use <u>one</u> of the following categories:
	F (correction)
	A (corresponds to a correction in an earlier release)
	B (addition of feature),
	C (functional modification of feature)
	D (editorial modification)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .
Release:	⌘ Rel99
	Use <u>one</u> of the following releases:
	2 (GSM Phase 2)
	R96 (Release 1996)
	R97 (Release 1997)
	R98 (Release 1998)
	R99 (Release 1999)
	REL-4 (Release 4)
	REL-5 (Release 5)

Reason for change:	⌘ The cell reselection delay to GSM in Cell FACH must be tested. If we claim that TSG-T WG1 shall follow the annex in 25.133 when defining the tests this annex must be complete. T _{SI} shall not be used for the reading of the system information in GSM. Instead the requirement in GSM shall apply, here referred as TBCCH. Unclarity if the additional delay casued by the random access procedure is included in the cell re-selection delay or not.
Summary of change:	⌘ Correction of general requirement and addition of a testcases for Cell reselection delay to GSM in Cell FACH.
Consequences if not approved:	⌘ The capability of the UE to do a cell reselection to GSM in Cell FACH according the specification will not be tested.

Clauses affected:	⌘ 5.5.2.1.4, A.5.5
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications ⌘ <input checked="" type="checkbox"/> Test specifications ⌘ 34.121 <input type="checkbox"/> O&M Specifications
Other comments:	⌘

How to create CRs using this form:

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

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

5.5.2.1.4 UTRAN-GSM Cell Reselection

The cell re-selection delay in CELL_FACH state to a GSM cell shall be less than

$$T_{\text{reselection, GSM}} = T_{\text{identify, GSM}} + T_{\text{measurement, GSM}} + T_{\text{SI}} \text{ ms}$$

$$T_{\text{reselection, GSM}} = T_{\text{identify, GSM}} + T_{\text{measurement, GSM}} + T_{\text{BCCH}} + T_{\text{RA}} \text{ ms}$$

where

$T_{\text{identify, GSM}}$ is specified in 8.4.2.5.2.1

~~T_{SI} = The maximum repetition frequency of all relevant system information blocks that needs to be received by the UE to camp on a cell.~~

~~T_{BCCH} = the maximum time allowed to read BCCH data from GSM cell [21].~~

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

$$T_{\text{measurement, GSM}} = \text{Max} \left\{ 8 \cdot \frac{N_{\text{carriers}}}{N_{\text{GSM carrier RSSI}}} \cdot T_{\text{meas}}, 4 * T_{\text{meas}}, 480 \text{ms} \right\}$$

where:

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

$N_{\text{GSM carrier RSSI}}$ is specified in 8.4.2.5.1.

A.5.5.2.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the the CELL UPDATE message with cause value “cell reselection” in Cell 1.

The cell re-selection delay shall be less than 9 s.

NOTE: The cell re-selection delay is expressed as: $T_{\text{reselection, inter}} = T_{\text{identify, inter}} + T_{\text{SI}}$ ms,

where:

$T_{\text{identify, inter}}$ is specified in 8.4.2.3.1 as 7.12 s in this case..

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

This gives a total of 8.4 s, allow 9 s in the test case.

A.5.5.3 Cell Reselection to GSM

A.5.5.3.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_FACH state in section 5.5.2.1.4.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 6 GSM cells. Test parameters are given in Table, A.5.x1, A.5.x2, A.5.x3, A.5.x4, A.5.x5.

Table A.5.x1: General test parameters for UTRAN to GSM Cell Re-selection

	<u>Parameter</u>	<u>Unit</u>	<u>Value</u>	<u>Comment</u>
<u>Initial condition</u>	<u>Active cell</u>		<u>Cell1</u>	
	<u>Neighbour cell</u>		<u>Cell2</u>	
<u>Final condition</u>	<u>Active cell</u>		<u>Cell2</u>	
	<u>DRX cycle length</u>	<u>s</u>	<u>1.28</u>	
	<u>Neighbour cell list size</u>		<u>24 FDD neighbours on Channel 1</u> <u>6 GSM neighbours including ARFCN 1</u>	
	<u>T1</u>	<u>s</u>	<u>5</u>	
	<u>T2</u>	<u>s</u>	<u>10</u>	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.3A and Table A.5.3B.

Table A.5.x2: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	60
Channel symbol rate	ksps	30
Slot Format #1	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.x3: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	$\frac{1}{2}$
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Fixed

Table A.5.x4: Cell re-selection UTRAN to GSM cell case (cell 1)

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1 (UTRA)</u>	
		<u>T1</u>	<u>T2</u>
<u>UTRA RF Channel Number</u>		<u>Channel 1</u>	
<u>CPICH Ec/lor</u>	<u>dB</u>	<u>-10</u>	
<u>PCCPCH Ec/lor</u>	<u>dB</u>	<u>-12</u>	
<u>SCH Ec/lor</u>	<u>dB</u>	<u>-12</u>	
<u>PICH Ec/lor</u>	<u>dB</u>	<u>-15</u>	
<u>S-CCPCH Ec/lor</u>	<u>dB</u>	<u>-12</u>	
<u>OCNS Ec/lor</u>	<u>dB</u>	<u>-1.295</u>	
<u>\hat{I}_{or}/I_{oc}</u>	<u>dB</u>	<u>0</u>	<u>-5</u>
<u>I_{oc}</u>	<u>dBm/3.84 MHz</u>	<u>-70</u>	
<u>CPICH Ec/lo</u>	<u>dB</u>	<u>-13</u>	<u>-16.2</u>
<u>CPICH RSCP</u>	<u>dBm</u>	<u>-80</u>	<u>-85</u>
<u>Propagation Condition</u>		<u>AWGN</u>	
<u>Cell selection and reselection quality measure</u>		<u>CPICH Ec/lo</u>	
<u>Qqualmin</u>	<u>dB</u>	<u>-20</u>	
<u>Qrxlevmin</u>	<u>dBm</u>	<u>-115</u>	
<u>UE_TXPWR_MAX_RACH</u>	<u>dBm</u>	<u>21</u>	
<u>Qoffset1_{s,n}</u>	<u>dB</u>	<u>C1, C2: 0</u>	
<u>Qhyst1</u>	<u>dB</u>	<u>0</u>	
<u>PENALTY TIME</u>	<u>s</u>	<u>C2: 0</u>	
<u>TEMPORARY OFFSET1</u>	<u>dB</u>	<u>C2: 0</u>	
<u>Treselection</u>	<u>s</u>	<u>0</u>	
<u>Ssearch_{RAT}</u>	<u>dB</u>	<u>Not sent</u>	
<u>IE "FACH Measurement occasion info"</u>		<u>Sent</u>	
<u>FACH Measurement occasion cycle length coefficient</u>		<u>3</u>	
<u>Inter-frequency FDD measurement indicator</u>		<u>FALSE</u>	
<u>Inter-frequency TDD measurement indicator</u>		<u>FALSE</u>	
<u>Inter-RAT measurement indicators >RAT type</u>		<u>Included</u> <u>GSM</u>	

Table A.5.x5: Cell re-selection UTRAN to GSM cell case (cell 2)

<u>Parameter</u>	<u>Unit</u>	<u>Cell 2 (GSM)</u>	
		<u>T1</u>	<u>T2</u>
<u>Absolute RF Channel Number</u>		<u>ARFCN 1</u>	
<u>RXLEV</u>	<u>dBm</u>	<u>-90</u>	<u>-75</u>
<u>RXLEV ACCESS MIN</u>	<u>dBm</u>	<u>-104</u>	
<u>MS_TXPWR_MAX_CCH</u>	<u>dBm</u>	<u>33</u>	

A.5.5.3.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to transmit the random access in Cell 2 (the GSM cell).

The cell re-selection delay shall be less than 5.5 + T_{RA} s.

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

NOTE:

The cell re-selection delay can be expressed $T_{\text{reselection, GSM}} = T_{\text{identify, GSM}} + T_{\text{measurement, GSM}} + T_{\text{BCCH}} + T_{\text{RA}}$ ms

where:

T_{identify, GSM} Specified in 8.4.2.5.2.1, here it is 2880 ms

T_{measurement, GSM} Specified in 5.5.2.1.4, here it is 640 ms

T_{BCCH} According to [21], the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier, is 1.9 s.

T_{RA} The additional delay caused by the random access procedure in the GSM cell. Shall be defined by T1/RF when the test case is further detailed in TS 34.121.

This gives a total of 5.4 + T_{RA} s, allow 5.5 + T_{RA} s.

CHANGE REQUEST

⌘ **25.133 CR 167** ⌘ ev **-** ⌘ Current version: **4.1.0** ⌘

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

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

Title:	⌘ Cell Reselection to GSM in Cell-FACH
Source:	⌘ RAN WG4
Work item code:	⌘ <input type="text"/> Date: ⌘ 2001-09-04
Category:	⌘ A Release: ⌘ Rel-4
<p>Use <u>one</u> of the following categories:</p> <p>F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>	
<p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)</p>	

Reason for change:	⌘ The cell reselection delay to GSM in Cell FACH must be tested. If we claim that TSG-T WG1 shall follow the annex in 25.133 when defining the tests this annex must be complete. T _{SI} shall not be used for the reading of the system information in GSM. Instead the requirement in GSM shall apply, here referred as TBCCH. Unclarity if the additional delay casued by the random access procedure is included in the cell re-selection delay or not.
Summary of change:	⌘ Correction of general requirement and addition of a testcases for Cell reselection delay to GSM in Cell FACH.
Consequences if not approved:	⌘ The capability of the UE to do a cell reselection to GSM in Cell FACH according the specification will not be tested.

Clauses affected:	⌘ 5.5.2.1.4, A.5.5
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/> 34.121 <input checked="" type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications
Other comments:	⌘ Corresponding R99 CR in R4-011307

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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.

5.5.2.1.4 UTRAN-GSM Cell Reselection

The cell re-selection delay in CELL_FACH state to a GSM cell shall be less than

$$T_{\text{reselection, GSM}} = T_{\text{identify, GSM}} + T_{\text{measurement, GSM}} + T_{\text{SI}} \text{ ms}$$

$$T_{\text{reselection, GSM}} = T_{\text{identify, GSM}} + T_{\text{measurement, GSM}} + T_{\text{BCCH}} + T_{\text{RA}} \text{ ms}$$

where

$T_{\text{identify, GSM}}$ is specified in 8.4.2.5.2.1

~~T_{SI} = The maximum repetition frequency of all relevant system information blocks that needs to be received by the UE to camp on a cell.~~

T_{BCCH} = the maximum time allowed to read BCCH data from GSM cell [21].

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

$$T_{\text{measurement, GSM}} = \text{Max} \left\{ 8 \cdot \frac{N_{\text{carriers}}}{N_{\text{GSM carrier RSSI}}} \cdot T_{\text{meas}}, 4 * T_{\text{meas}}, 480\text{ms} \right\}$$

where:

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

$N_{\text{GSM carrier RSSI}}$ is specified in 8.4.2.5.1.

A.5.5.2.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the the CELL UPDATE message with cause value “cell reselection” in Cell 1.

The cell re-selection delay shall be less than 9 s.

NOTE: The cell re-selection delay is expressed as: $T_{\text{reselection, inter}} = T_{\text{identify, inter}} + T_{\text{SI}}$ ms,

where:

$T_{\text{identify, inter}}$ is specified in 8.4.2.3.1 as 7.12 s in this case..

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

This gives a total of 8.4 s, allow 9 s in the test case.

A.5.5.3 Cell Reselection to GSM

A.5.5.3.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL FACH state in section 5.5.2.1.4.

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 UMTS carrier and 6 GSM cells. Test parameters are given in Table, A.5.x1, A.5.x2, A.5.x3, A.5.x4, A.5.x5.

Table A.5.x1: General test parameters for UTRAN to GSM Cell Re-selection

	Parameter	Unit	Value	Comment
<u>Initial condition</u>	<u>Active cell</u>		<u>Cell1</u>	
	<u>Neighbour cell</u>		<u>Cell2</u>	
<u>Final condition</u>	<u>Active cell</u>		<u>Cell2</u>	
	<u>DRX cycle length</u>	<u>s</u>	<u>1.28</u>	
	<u>Neighbour cell list size</u>		<u>24 FDD neighbours on Channel 1</u> <u>6 GSM neighbours including ARFCN 1</u>	
	<u>T1</u>	<u>s</u>	<u>5</u>	
	<u>T2</u>	<u>s</u>	<u>10</u>	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.3A and Table A.5.3B.

Table A.5.x2: Physical channel parameters for S-CCPCH.

<u>Parameter</u>	<u>Unit</u>	<u>Level</u>
<u>Channel bit rate</u>	<u>kbps</u>	<u>60</u>
<u>Channel symbol rate</u>	<u>ksps</u>	<u>30</u>
<u>Slot Format #1</u>	<u>-</u>	<u>4</u>
<u>TFCI</u>	<u>-</u>	<u>OFF</u>
<u>Power offsets of TFCI and Pilot fields relative to data field</u>	<u>dB</u>	<u>0</u>

Table A.5.x3: Transport channel parameters for S-CCPCH

<u>Parameter</u>	<u>FACH</u>
<u>Transport Channel Number</u>	<u>1</u>
<u>Transport Block Size</u>	<u>240</u>
<u>Transport Block Set Size</u>	<u>240</u>
<u>Transmission Time Interval</u>	<u>10 ms</u>
<u>Type of Error Protection</u>	<u>Convolution Coding</u>
<u>Coding Rate</u>	<u>1/2</u>
<u>Rate Matching attribute</u>	<u>256</u>
<u>Size of CRC</u>	<u>16</u>
<u>Position of TrCH in radio frame</u>	<u>Fixed</u>

Table A.5.x4: Cell re-selection UTRAN to GSM cell case (cell 1)

<u>Parameter</u>	<u>Unit</u>	<u>Cell 1 (UTRA)</u>	
		<u>T1</u>	<u>T2</u>
<u>UTRA RF Channel Number</u>		<u>Channel 1</u>	
<u>CPICH Ec/lor</u>	<u>dB</u>	<u>-10</u>	
<u>PCCPCH Ec/lor</u>	<u>dB</u>	<u>-12</u>	
<u>SCH Ec/lor</u>	<u>dB</u>	<u>-12</u>	
<u>PICH Ec/lor</u>	<u>dB</u>	<u>-15</u>	
<u>S-CCPCH Ec/lor</u>	<u>dB</u>	<u>-12</u>	
<u>OCNS Ec/lor</u>	<u>dB</u>	<u>-1.295</u>	
<u>\hat{I}_{or}/I_{oc}</u>	<u>dB</u>	<u>0</u>	<u>-5</u>
<u>I_{oc}</u>	<u>dBm/3.84 MHz</u>	<u>-70</u>	
<u>CPICH Ec/lo</u>	<u>dB</u>	<u>-13</u>	<u>-16.2</u>
<u>CPICH RSCP</u>	<u>dBm</u>	<u>-80</u>	<u>-85</u>
<u>Propagation Condition</u>		<u>AWGN</u>	
<u>Cell selection and reselection quality measure</u>		<u>CPICH Ec/lo</u>	
<u>Qqualmin</u>	<u>dB</u>	<u>-20</u>	
<u>Qrxlevmin</u>	<u>dBm</u>	<u>-115</u>	
<u>UE_TXPWR_MAX_RACH</u>	<u>dBm</u>	<u>21</u>	
<u>Qoffset1_{s,n}</u>	<u>dB</u>	<u>C1, C2: 0</u>	
<u>Qhyst1</u>	<u>dB</u>	<u>0</u>	
<u>PENALTY_TIME</u>	<u>s</u>	<u>C2: 0</u>	
<u>TEMPORARY OFFS ET1</u>	<u>dB</u>	<u>C2: 0</u>	
<u>Treselection</u>	<u>s</u>	<u>0</u>	
<u>Ssearch_{RAT}</u>	<u>dB</u>	<u>Not sent</u>	
<u>IE "FACH Measurement occasion info"</u>		<u>Sent</u>	
<u>FACH Measurement occasion cycle length coefficient</u>		<u>3</u>	
<u>Inter-frequency FDD measurement indicator</u>		<u>FALSE</u>	
<u>Inter-frequency TDD measurement indicator</u>		<u>FALSE</u>	
<u>Inter-RAT measurement indicators >RAT type</u>		<u>Included</u> <u>GSM</u>	

Table A.5.x5: Cell re-selection UTRAN to GSM cell case (cell 2)

<u>Parameter</u>	<u>Unit</u>	<u>Cell 2 (GSM)</u>	
		<u>T1</u>	<u>T2</u>
<u>Absolute RF Channel Number</u>		<u>ARFCN 1</u>	
<u>RXLEV</u>	<u>dBm</u>	<u>-90</u>	<u>-75</u>
<u>RXLEV ACCESS MIN</u>	<u>dBm</u>	<u>-104</u>	
<u>MS TXPWR MAX CCH</u>	<u>dBm</u>	<u>33</u>	

A.5.5.3.2 Test Requirements

The cell re-reselection delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to transmit the random access in Cell 2 (the GSM cell).

The cell re-selection delay shall be less than $5.5 + T_{RA}$ s.

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

NOTE:

The cell re-selection delay can be expressed $T_{\text{reselection, GSM}} = T_{\text{identify, GSM}} + T_{\text{measurement, GSM}} + T_{\text{BCCH}} + T_{\text{RA}}$ ms

where:

$T_{\text{identify, GSM}}$ Specified in 8.4.2.5.2.1, here it is 2880 ms

$T_{\text{measurement, GSM}}$ Specified in 5.5.2.1.4, here it is 640 ms

T_{BCCH} According to [21], the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier, is 1.9 s.

T_{RA} The additional delay caused by the random access procedure in the GSM cell. Shall be defined by T1/RF when the test case is further detailed in TS 34.121.

This gives a total of $5.4 + T_{\text{RA}}$ s, allow $5.5 + T_{\text{RA}}$ s.

CR-Form-v4	
CHANGE REQUEST	
⌘ 25.133 CR 168 ⌘ ev - ⌘ Current version: 3.6.0 ⌘	

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

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

Title:	⌘ Correction for RRC re-establishment delay		
Source:	⌘ RAN WG4		
Work item code:	⌘	Date:	⌘ 2001-09-05
Category:	⌘ F	Release:	⌘ Rel99
	Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ RRC re-establishment requirements are not fully correct and they do not follow the procedures defined in TS25.331. The assumptions of the requirement are also not clear.
Summary of change:	⌘ <ul style="list-style-type: none"> - The RRC re-establishment delay is defined more general way in order to take into account that N313 may have several different values. - The sentence related to SFN knowledge in the definition of a known cell is deleted- - The delay formulas for known and unknown target cell are split - The definition of T_{SI} is corrected to correspond the procedure defined in TS25.331 - The additional delay caused by the random access procedure is incorporated into the equations.
Consequences if not approved:	⌘ <ul style="list-style-type: none"> - The RRC re-establishment delay does not take into account that N313 may have several different values. - Incorrect formula for RRC re-establishment delay in case of a known target cell. - Unnecessary strict requirement for a cell to be regarded as known. - Incorrect definition of T_{SI}. - It is not clear whether additional delay caused by the random access procedure is included into the RRC re-establishment delay.

Clauses affected:	⌘ 6.1.2		
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications	⌘	
	<input type="checkbox"/> Test specifications		
	<input type="checkbox"/> O&M Specifications		
Other comments:	⌘		

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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.
- 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.

6.1 RRC Re-establishment

6.1.1 Introduction

RRC connection re-establishment is needed, when a UE in state CELL_DCH loses radio connection due to radio link failure. The procedure when a radio link failure occurs in CELL_DCH is specified in of TS 25.331.

6.1.2 Requirements

The requirements in this section are applicable when the UE performs a RRC Re-establishment to a cell belonging to any of the frequencies present in the previous (old) monitored set.

When the UE is in CELL_DCH state, the UE shall be capable of sending a CELL UPDATE message using the cause "radio link failure" within $T_{RE-ESTABLISH}$ seconds from when ~~the radio link failure occurred~~~~the CPHY Out Of Synch primitive indicates lost synchronisation.~~

The RRC Re-establishment delay requirement ($T_{RE-ESTABLISH-REQ}$) is defined as the time between the moment when the ~~radio link failure occurred~~~~CPHY Out Of Synch primitive indicates lost synchronisation~~, to when the UE starts to send preambles on the PRACH.

$T_{RE-ESTABLISH-REQ}$ is depending on whether the target cell is known by the UE or not. 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.~~

And the phase reference is the primary CPICH.

The RRC re-establishment delay shall be less than

$$50\text{ms} + T_{\text{search}} * NF + T_{\text{SI}} + T_{\text{RA}} \text{ ms}$$

in case that the target cell is known

and

$$50\text{ms} + T_{\text{search}} * NF + T_{\text{SI}} + T_{\text{RA}}$$

in case that the target cell is not known by the UE.

where T_{search} is the time it takes for the UE to search the cell.

$T_{\text{search}} = 100$ ms if the target cell is known by the UE, and

$T_{\text{search}} = 800$ ms if the target cell is not known by the UE.

where T_{SI} ~~is the maximum repetition period of all relevant system information blocks that needs to be received by the UE to camp on a cell~~ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell (ms).

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

NF is the number of different frequencies in the monitored set.

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

CHANGE REQUEST

⌘ **25.133 CR 169** ⌘ ev **-** ⌘ Current version: **4.1.0** ⌘

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

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

Title:	⌘ Correction for RRC re-establishment delay		
Source:	⌘ RAN WG4		
Work item code:	⌘	Date:	⌘ 2001-09-05
Category:	⌘ A	Release:	⌘ Rel-4
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)		2 (GSM Phase 2)
	A (corresponds to a correction in an earlier release)		R96 (Release 1996)
	B (addition of feature),		R97 (Release 1997)
	C (functional modification of feature)		R98 (Release 1998)
	D (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		REL-4 (Release 4)
			REL-5 (Release 5)

Reason for change:	⌘ RRC re-establishment requirements are not fully correct and they do not follow the procedures defined in TS25.331. The assumptions of the requirement are also not clear.
Summary of change:	⌘ <ul style="list-style-type: none"> - The RRC re-establishment delay is defined more general way in order to take into account that N313 may have several different values. - The sentence related to SFN knowledge in the definition of a known cell is deleted- - The delay formulas for known and unknown target cell are split - The definition of T_{SI} is corrected to correspond the procedure defined in TS25.331 - The additional delay caused by the random access procedure is incorporated into the equations.
Consequences if not approved:	⌘ <ul style="list-style-type: none"> - The RRC re-establishment delay does not take into account that N313 may have several different values. - Incorrect formula for RRC re-establishment delay in case of a known target cell. - Unnecessary strict requirement for a cell to be regarded as known. - Incorrect definition of T_{SI}. - It is not clear whether additional delay caused by the random access procedure is included into the RRC re-establishment delay.

Clauses affected:	⌘ 6.1.2
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/>
	<input type="checkbox"/> Test specifications
	<input type="checkbox"/> O&M Specifications

Other comments: ☹

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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.

6.1 RRC Re-establishment

6.1.1 Introduction

RRC connection re-establishment is needed, when a UE in state CELL_DCH loses radio connection due to radio link failure. The procedure when a radio link failure occurs in CELL_DCH is specified in of TS 25.331.

6.1.2 Requirements

The requirements in this section are applicable when the UE performs a RRC Re-establishment to a cell belonging to any of the frequencies present in the previous (old) monitored set.

When the UE is in CELL_DCH state, the UE shall be capable of sending a CELL UPDATE message using the cause “radio link failure” within $T_{RE-ESTABLISH}$ seconds from when ~~the radio link failure occurred~~~~the CPHY Out Of Synch primitive indicates lost synchronisation~~.

The RRC Re-establishment delay requirement ($T_{RE-ESTABLISH-REQ}$) is defined as the time between the moment when the ~~radio link failure occurred~~~~CPHY Out Of Synch primitive indicates lost synchronisation~~, to when the UE starts to send preambles on the PRACH.

$T_{RE-ESTABLISH-REQ}$ is depending on whether the target cell is known by the UE or not. 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~~.

And the phase reference is the primary CPICH.

The RRC re-establishment delay shall be less than

$$50\text{ms} + T_{\text{search}} * NF + T_{\text{SI}} + T_{\text{RA}} \text{ ms}$$

~~in case that the target cell is known~~

~~and~~

$$50\text{ms} + T_{\text{search}} * NF + T_{\text{SI}} + T_{\text{RA}}$$

~~in case that the target cell is not known by the UE.~~

where T_{search} is the time it takes for the UE to search the cell.

$T_{\text{search}} = 100$ ms if the target cell is known by the UE, and

$T_{\text{search}} = 800$ ms if the target cell is not known by the UE.

~~where T_{SI} is the maximum repetition period of all relevant system information blocks that needs to be received by the UE to camp on a cell is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell (ms).~~

~~$T_{\text{RA}} \equiv$ The additional delay caused by the random access procedure.~~

NF is the number of different frequencies in the monitored set.

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

CHANGE REQUEST

⌘ **25.133 CR 170** ⌘ ev **-** ⌘ Current version: **3.6.0** ⌘

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

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

Title:	⌘ Corrections for Section 5		
Source:	⌘ RAN WG4		
Work item code:	⌘	Date:	⌘ 06-09-2001
Category:	⌘ F	Release:	⌘ Rel99
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)		2 (GSM Phase 2)
	A (corresponds to a correction in an earlier release)		R96 (Release 1996)
	B (addition of feature),		R97 (Release 1997)
	C (functional modification of feature)		R98 (Release 1998)
	D (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		REL-4 (Release 4)
			REL-5 (Release 5)

Reason for change:	⌘	- The performance requirements of cell reselection delay in CELL_FACH state are looser than general measurement requirements defined in Section 8.
		- Detailed description of CELL_FACH state cell reselection requirements are not fully clear.
		- Currently there is no requirement on the RRC procedure Inter-RAT cell change order from UTRAN, which is used in CELL_DCH and CELL_FACH state to transfer a connection between the UE and UTRAN FDD to GSM.
Summary of change:	⌘	- It is clarified that the requirement of the interruption time of hard handover assumes only one insync.
		- Requirements for CELL_FACH state cell reselection delays are split into two cases and requirements are clarified.
		- Inter-RAT cell change order from UTRAN in CELL_DCH and CELL_FACH
Consequences if not approved:	⌘	Performance requirements in different sections of TS25.133 are not aligned with each other and we would not have requirements for inter-RAT cell change order from UTRAN.

Clauses affected:	⌘	5.5.2.2.2, 5.5.2.1, 5.5.2.1.1, 5.5.2.1.2, 5.5.2.1.3, 5.5.2.2, 5.5.2.2.1, 5.5.2.2.2, 5.5.2.2.3, 5.x, 5.x.1, 5.x.2, 5.x.2.1, 5.x.2.2
Other specs affected:	⌘	Other core specifications ⌘
	<input type="checkbox"/>	Test specifications
	<input type="checkbox"/>	O&M Specifications
Other comments:	⌘	

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 11.5.2].

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 $T_{\text{interrupt1}}$

$$T_{\text{interrupt1}} = T_{\text{IU}} + 40 + 20 * \text{KC} + 100 * \text{OC} \text{ ms}$$

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.

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 $T_{\text{interrupt1}}$ 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 $T_{\text{interrupt2}}$

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

In the interruption requirement $T_{\text{interrupt}2}$ 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 MODIFIED SECTIONS

5.5 Cell Re-selection in CELL_FACH

5.5.1 Introduction

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

5.5.2 Requirements

The Cell reselection delays specified below are applicable when the RRC parameter $T_{\text{reselection}}$ is set to 0. Otherwise the Cell reselection delay is increased $T_{\text{reselection S}}$.

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

5.5.2.1 Cell re-selection delay

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

[For UTRA TDD](#) the cell re-selection delay is defined as the time between the occurrence of an event which will trigger Cell Reselection process and the moment in time when the UE starts sending the RRC CELL UPDATE message to the UTRAN.

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

5.5.2.1.1 Intra frequency cell reselection

The cell re-selection delay in CELL_FACH state to a cell in the same frequency shall be less than

$$\underline{T_{\text{reselection, intra}}} = \underline{T_{\text{identify, intra}}} + \underline{T_{\text{SI}}} - \underline{T_{\text{reselection, intra}}} = \underline{T_{\text{identify, intra}}} + T_{\text{IU}} + 20 + T_{\text{SI}} + T_{\text{RA}} \text{ ms}$$

where

$T_{\text{identify, intra}}$ is specified in 8.4.2.2.1.

[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 \(10 ms\).](#)

T_{SI} = The maximum repetition period of all relevant system information blocks that needs to be received by the UE to camp on a cell. The time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.

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

If a cell has been detectable at least $T_{identify,intra}$, the cell reselection delay in CELL_FACH state to a cell in the same frequency shall be less than

$$T_{reselection, intra} = T_{Measurement_Period\ Intra} + T_{IU} + 20 + T_{SI} + T_{RA} \text{ ms}$$

where

$$T_{Measurement_Period\ Intra} = \text{Specified in 8.4.2.2.2.}$$

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

5.5.2.1.2 Inter frequency cell reselection

The cell re-selection delay in CELL_FACH state to a FDD cell on a different frequency shall be less than

$$T_{reselection, inter} = T_{identify, inter} + T_{SI} \quad T_{reselection, inter} = T_{identify, inter} + T_{IU} + 20 + T_{SI} + T_{RA} \text{ ms}$$

.where

$T_{identify, inter}$ is specified in 8.4.2.3.1.

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).

T_{SI} = The maximum repetition frequency of all relevant system information blocks that needs to be received by the UE to camp on a cell. The time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.

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

If a cell has been detectable at least $T_{identify,inter}$, the cell reselection delay in CELL_FACH state to a FDD cell on a different frequency shall be less than

$$T_{reselection, inter} = T_{Measurement\ inter} + T_{IU} + 20 + T_{SI} + T_{RA} \text{ ms}$$

where

$$T_{Measurement\ inter} = \text{Specified in 8.4.2.3.2.}$$

These requirements assumes radio conditions to be sufficient, so that reading of system information can be done without errors.

5.5.2.1.3 FDD-TDD cell reselection

The cell re-selection delay in CELL_FACH state in FDD to a TDD cell shall be less than

$$T_{reselection, TDD} = T_{identify, TDD} + T_{SI} \quad T_{reselection, TDD} = T_{identify, TDD} + T_{SI} + T_{RA} \text{ ms}$$

where

$T_{identify, TDD}$ is specified in 8.4.2.4.1.

T_{SI} = The maximum repetition frequency of all relevant system information blocks that needs to be received by the UE to camp on a cell. The time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.

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

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

5.5.2.1.4 UTRAN-GSM Cell Reselection

The cell re-selection delay in CELL_FACH state to a GSM cell shall be less than

$$T_{\text{reselection, GSM}} = T_{\text{identify, GSM}} + T_{\text{measurement, GSM}} + T_{SI} \text{ ms}$$

where

$T_{\text{identify, GSM}}$ is specified in 8.4.2.5.2.1

T_{SI} = The maximum repetition frequency of all relevant system information blocks that needs to be received by the UE to camp on a cell.

$$T_{\text{measurement, GSM}} = \text{Max} \left\{ 8 \cdot \frac{N_{\text{carriers}}}{N_{\text{GSM carrier RSSI}}} \cdot T_{\text{meas}}, 4 * T_{\text{meas}}, 480\text{ms} \right\}$$

where:

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

$N_{\text{GSM carrier RSSI}}$ is specified in 8.4.2.5.1.

5.5.2.2 Interruption time

The requirements on interruption time below is valid when the signal quality of the serving cell is good enough to allow decoding of the FACH channel during the cell reselection.

5.5.2.2.1 FDD-FDD cell reselection

The interruption time, i.e. the time between the last TTI the UE monitors the FACH channel on the serving cell and the time the UE starts transmit the preambles on the PRACH for sending the RRC CELL UPDATE message in the target cell.

When intra-frequency cell reselection, or inter-frequency cell reselection when the UE does not need measurement occasion to perform inter-frequency measurements, occurs the interruption time shall be less than $T_{\text{interrupt1}}$

$$T_{\text{interrupt1}} = T_{IU} + 20 + T_{RA} \text{ ms}$$

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).

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

When inter-frequency cell reselection occurs and the UE needs measurement occasions to perform inter-frequency measurements, the interruption time shall be less than $T_{\text{interrupt2}}$

$$T_{\text{interrupt2}} = T_{IU} + 20 + T_{SI} + T_{RA} \text{ ms}$$

where

T_{SI} = the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331.

5.5.2.2.2 FDD-TDD cell reselection

The interruption time, i.e. the time between the last TTI the UE monitors the FACH channel on the serving cell and the time the UE starts transmit the RRC CELL UPDATE message in the target TDD cell.

When a FDD-TDD cell reselection occurs the interruption time shall be less than $T_{interrupt, TDD}$

$$T_{interrupt, TDD} = 100 + T_{SI} + T_{RA} \text{ ms}$$

where

T_{SI} = the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331.

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

5.5.2.2.3 FDD-GSM cell reselection

The interruption time, i.e. the time between the last TTI the UE monitors the FACH channel and the time the UE starts transmit a RACH in the target GSM cell.

When FDD-GSM cell reselection occurs the interruption time shall be less than $T_{interrupt, GSM}$

$$T_{interrupt, GSM} = 40 + T_{BCCH} + T_{RA} \text{ ms}$$

where

T_{BCCH} = the maximum time allowed to read BCCH data from the GSM cell [21].

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

NEXT MODIFIED SECTIONS

5.7 Cell Re-selection in URA_PCH

5.7.1 Introduction

The UE shall evaluate the cell re-selection criteria specified in TS 25.304, based on radio measurements, and if a better cell is found that cell is selected.

5.7.2 Requirements

Requirements for cell re-selection in CELL_PCH are the same as for cell re-selection in idle mode, see section 4.2. UE shall support all DRX cycle lengths in table 4.1, according to [16].

5.x Inter-RAT cell change order from UTRAN in CELL_DCH and CELL_FACH

5.x.1 Introduction

The purpose of inter-RAT cell change order from UTRAN FDD to GSM is to transfer a connection between the UE and UTRAN FDD to GSM. This procedure may be used in CELL_DCH and CELL_FACH state. The cell change order procedure is initiated from UTRAN with a RRC message (CELL CHANGE ORDER FROM UTRAN). The procedure is described in TS25.331 section 8.3.11.

5.x.2 Requirements

The requirements in this section shall apply to UE supporting FDD and GSM.

5.x.2.1 Delay

When the UE receives a RRC CELL CHANGE ORDER FROM UTRAN COMMAND with the activation time "now" or earlier than the value in table 5.y from the end of the last TTI containing the RRC command, the UE shall start transmit the random access in the target cell of the new RAT within the value in table 5.y from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than the value in table 5.y from the end of the last TTI containing the RRC command, the UE shall start transmit the random access in the target cell of the new RAT at the designated activation time.

The UE shall process the RRC procedures for the RRC CELL CHANGE ORDER FROM UTRAN COMMAND within 50 ms. If the activation time is used, it corresponds to the CFN of the UTRAN channel.

Table 5.y: Inter-RAT cell change order from UTRAN - delay

<u>UE synchronisation status</u>	<u>delay [ms]</u>
<u>The UE has synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received</u>	<u>$90 + T_{BCCH} + T_{RA}$</u>
<u>The UE has not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received</u>	<u>$190 + T_{BCCH} + T_{RA}$</u>

where

T_{BCCH} = the maximum time allowed to read BCCH data from the GSM cell [21].

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

5.x.2.2 Interruption time

The requirements on interruption time below is valid when the signal quality of the serving cell is good enough to allow decoding of the old channel during the inter-RAT cell change order from UTRAN delay.

The interruption time, i.e. the time between the end of the last TTI containing a transport block that the UE is able to receive on the old channel and the time the UE starts transmit the random access in the target cell, shall be less than the value in table 5.z. The requirement in table 5.z for the case, that UE is not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received, is valid when the signal quality of the GSM cell is good enough for successful synchronisation with one attempt.

Table 5.z: Inter-RAT cell change order from UTRAN - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received	$40 + T_{\text{BCCH}} + T_{\text{RA}}$
The UE has not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received	$140 + T_{\text{BCCH}} + T_{\text{RA}}$

where

T_{BCCH} = the maximum time allowed to read BCCH data from the GSM cell [21].

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

CHANGE REQUEST

⌘ **25.133 CR 171** ⌘ ev **-** ⌘ Current version: **4.1.0** ⌘

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

Title:	⌘ Corrections for Section 5
Source:	⌘ RAN WG4
Work item code:	⌘ Date: ⌘ 06-09-2001
Category:	⌘ A
	Use <u>one</u> of the following categories:
	F (correction)
	A (corresponds to a correction in an earlier release)
	B (addition of feature),
	C (functional modification of feature)
	D (editorial modification)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .
Release:	⌘ Rel-4
	Use <u>one</u> of the following releases:
	2 (GSM Phase 2)
	R96 (Release 1996)
	R97 (Release 1997)
	R98 (Release 1998)
	R99 (Release 1999)
	REL-4 (Release 4)
	REL-5 (Release 5)

Reason for change:	⌘ - The performance requirements of cell reselection delay in CELL_FACH state are looser than general measurement requirements defined in Section 8.
	- Detailed description of CELL_FACH state cell reselection requirements are not fully clear.
	- Currently there is no requirement on the RRC procedure Inter-RAT cell change order from UTRAN, which is used in CELL_DCH and CELL_FACH state to transfer a connection between the UE and UTRAN FDD to GSM.
Summary of change:	⌘ - It is clarified that the requirement of the interruption time of hard handover assumes only one insync.
	- Requirements for CELL_FACH state cell reselection delays are split into two cases and requirements are clarified.
	- Inter-RAT cell change order from UTRAN in CELL_DCH and CELL_FACH
Consequences if not approved:	⌘ Performance requirements in different sections of TS25.133 are not aligned with each other and we would not have requirements for inter-RAT cell change order from UTRAN.

Clauses affected:	⌘ 5.5.2.2.2, 5.5.2.1, 5.5.2.1.1, 5.5.2.1.2, 5.5.2.1.3, 5.5.2.2, 5.5.2.2.1, 5.5.2.2.2, 5.5.2.2.3, 5.x, 5.x.1, 5.x.2, 5.x.2.1, 5.x.2.2
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/>
	<input type="checkbox"/> Test specifications
	<input type="checkbox"/> O&M Specifications
Other comments:	⌘

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 11.5.2].

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 DPCH within D_{handover} seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than D_{handover} seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH at the designated activation time.

where:

D_{handover} equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.2.2.2.

5.2.2.2 Interruption time

The interruption time, i.e. the time between the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCH, 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 $T_{\text{interrupt1}}$

$$T_{\text{interrupt1}} = T_{\text{IU}} + 40 + 20 * \text{KC} + 100 * \text{OC} \text{ ms}$$

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.

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

In the interruption requirement $T_{\text{interrupt1}}$ 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 $T_{\text{interrupt2}}$

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

In the interruption requirement $T_{\text{interrupt}2}$ 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 MODIFIED SECTIONS

5.5 Cell Re-selection in CELL_FACH

5.5.1 Introduction

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

5.5.2 Requirements

The Cell reselection delays specified below are applicable when the RRC parameter $T_{\text{reselection}}$ is set to 0. Otherwise the Cell reselection delay is increased $T_{\text{reselection S}}$.

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

5.5.2.1 Cell re-selection delay

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

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

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

5.5.2.1.1 Intra frequency cell reselection

The cell re-selection delay in CELL_FACH state to a cell in the same frequency shall be less than

$$T_{\text{reselection, intra}} = T_{\text{identify, intra}} + T_{\text{SI}} + T_{\text{reselection, intra}} = T_{\text{identify, intra}} + T_{\text{IU}} + 20 + T_{\text{SI}} + T_{\text{RA}} \text{ ms}$$

where

$T_{\text{identify, intra}}$ is specified in 8.4.2.2.1.

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).

T_{SI} = The maximum repetition period of all relevant system information blocks that needs to be received by the UE to camp on a cell. The time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.

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

If a cell has been detectable at least $T_{identify,intra}$, the cell reselection delay in CELL_FACH state to a cell in the same frequency shall be less than

$$T_{reselection, intra} = T_{Measurement_Period\ Intra} + T_{IU} + 20 + T_{SI} + T_{RA} \text{ ms}$$

where

$$T_{Measurement_Period\ Intra} = \text{Specified in 8.4.2.2.2.}$$

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

5.5.2.1.2 Inter frequency cell reselection

The cell re-selection delay in CELL_FACH state to a FDD cell on a different frequency shall be less than

$$T_{reselection, inter} = T_{identify, inter} + T_{SI} \text{ } T_{reselection, inter} = T_{identify, inter} + T_{IU} + 20 + T_{SI} + T_{RA} \text{ -ms}$$

where

$T_{identify, ,inter}$ is specified in 8.4.2.3.1.

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).

T_{SI} = The maximum repetition frequency of all relevant system information blocks that needs to be received by the UE to camp on a cell. The time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.

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

If a cell has been detectable at least $T_{identify,inter}$, the cell reselection delay in CELL_FACH state to a FDD cell on a different frequency shall be less than

$$T_{reselection, inter} = T_{Measurement\ inter} + T_{IU} + 20 + T_{SI} + T_{RA} \text{ ms}$$

where

$$T_{Measurement\ inter} = \text{Specified in 8.4.2.3.2.}$$

These requirements assumes radio conditions to be sufficient, so that reading of system information can be done without errors.

5.5.2.1.3 FDD-TDD cell reselection

The cell re-selection delay in CELL_FACH state in FDD to a TDD cell shall be less than

$$T_{reselection, TDD} = T_{identify, TDD} + T_{SI} \text{ } T_{reselection, TDD} = T_{identify, TDD} + T_{SI} + T_{RA} \text{ -ms}$$

where

$T_{identify, TDD}$ is specified in 8.4.2.4.1.

T_{SI} = The maximum repetition frequency of all relevant system information blocks that needs to be received by the UE to camp on a cell. The time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.

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

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

5.5.2.1.4 UTRAN-GSM Cell Reselection

The cell re-selection delay in CELL_FACH state to a GSM cell shall be less than

$$T_{\text{reselection, GSM}} = T_{\text{identify, GSM}} + T_{\text{measurement, GSM}} + T_{SI} \text{ ms}$$

where

$T_{\text{identify, GSM}}$ is specified in 8.4.2.5.2.1

T_{SI} = The maximum repetition frequency of all relevant system information blocks that needs to be received by the UE to camp on a cell.

$$T_{\text{measurement, GSM}} = \text{Max} \left\{ 8 \cdot \frac{N_{\text{carriers}}}{N_{\text{GSM carrier RSSI}}} \cdot T_{\text{meas}}, 4 * T_{\text{meas}}, 480\text{ms} \right\}$$

where:

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

$N_{\text{GSM carrier RSSI}}$ is specified in 8.4.2.5.1.

5.5.2.2 Interruption time

The requirements on interruption time below is valid when the signal quality of the serving cell is good enough to allow decoding of the FACH channel during the cell reselection.

5.5.2.2.1 FDD-FDD cell reselection

The interruption time, i.e. the time between the last TTI the UE monitors the FACH channel on the serving cell and the time the UE starts transmit the preambles on the PRACH for sending the RRC CELL UPDATE message in the target cell.

When intra-frequency cell reselection, or inter-frequency cell reselection when the UE does not need measurement occasion to perform inter-frequency measurements, occurs the interruption time shall be less than $T_{\text{interrupt1}}$

$$\underline{T_{\text{interrupt1}} = T_{IU} + 20 + T_{RA} \text{ ms}}$$

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).

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

When inter-frequency cell reselection occurs and the UE needs measurement occasions to perform inter-frequency measurements, the interruption time shall be less than $T_{\text{interrupt2}}$

$$\underline{T_{\text{interrupt2}} = T_{IU} + 20 + T_{SI} + T_{RA} \text{ ms}}$$

where

T_{SI} = the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331.

5.5.2.2.2 FDD-TDD cell reselection

The interruption time, i.e. the time between the last TTI the UE monitors the FACH channel on the serving cell and the time the UE starts transmit the RRC CELL UPDATE message in the target TDD cell.

When a FDD-TDD cell reselection occurs the interruption time shall be less than T_{interrupt, TDD}

$$T_{\text{interrupt,TDD}} = 100 + T_{\text{SI}} + T_{\text{RA}} \text{ ms}$$

where

T_{SI} = the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331.

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

5.5.2.2.3 FDD-GSM cell reselection

The interruption time, i.e. the time between the last TTI the UE monitors the FACH channel and the time the UE starts transmit a RACH in the target GSM cell.

When FDD-GSM cell reselection occurs the interruption time shall be less than T_{interrupt, GSM}

$$T_{\text{interrupt,GSM}} = 40 + T_{\text{BCCH}} + T_{\text{RA}} \text{ ms}$$

where

T_{BCCH} = the maximum time allowed to read BCCH data from the GSM cell [21].

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

NEXT MODIFIED SECTIONS

5.7 Cell Re-selection in URA_PCH

5.7.1 Introduction

The UE shall evaluate the cell re-selection criteria specified in TS 25.304, based on radio measurements, and if a better cell is found that cell is selected.

5.7.2 Requirements

Requirements for cell re-selection in CELL_PCH are the same as for cell re-selection in idle mode, see section 4.2. UE shall support all DRX cycle lengths in table 4.1, according to [16].

5.x Inter-RAT cell change order from UTRAN in CELL_DCH and CELL_FACH

5.x.1 Introduction

The purpose of inter-RAT cell change order from UTRAN FDD to GSM is to transfer a connection between the UE and UTRAN FDD to GSM. This procedure may be used in CELL_DCH and CELL_FACH state. The cell change order procedure is initiated from UTRAN with a RRC message (CELL CHANGE ORDER FROM UTRAN). The procedure is described in TS25.331 section 8.3.11.

5.x.2 Requirements

The requirements in this section shall apply to UE supporting FDD and GSM.

5.x.2.1 Delay

When the UE receives a RRC CELL CHANGE ORDER FROM UTRAN COMMAND with the activation time "now" or earlier than the value in table 5.y from the end of the last TTI containing the RRC command, the UE shall start transmit the random access in the target cell of the new RAT within the value in table 5.y from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than the value in table 5.y from the end of the last TTI containing the RRC command, the UE shall start transmit the random access in the target cell of the new RAT at the designated activation time.

The UE shall process the RRC procedures for the RRC CELL CHANGE ORDER FROM UTRAN COMMAND within 50 ms. If the activation time is used, it corresponds to the CFN of the UTRAN channel.

Table 5.y: Inter-RAT cell change order from UTRAN - delay

<u>UE synchronisation status</u>	<u>delay [ms]</u>
<u>The UE has synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received</u>	<u>$90 + T_{BCCH} + T_{RA}$</u>
<u>The UE has not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received</u>	<u>$190 + T_{BCCH} + T_{RA}$</u>

where

T_{BCCH} = the maximum time allowed to read BCCH data from the GSM cell [21].

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

5.x.2.2 Interruption time

The requirements on interruption time below is valid when the signal quality of the serving cell is good enough to allow decoding of the old channel during the inter-RAT cell change order from UTRAN delay.

The interruption time, i.e. the time between the end of the last TTI containing a transport block that the UE is able to receive on the old channel and the time the UE starts transmit the random access in the target cell, shall be less than the value in table 5.z. The requirement in table 5.z for the case, that UE is not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received, is valid when the signal quality of the GSM cell is good enough for successful synchronisation with one attempt.

Table 5.z: Inter-RAT cell change order from UTRAN - interruption time

Synchronisation status	Interruption time [ms]
<u>The UE has synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received</u>	<u>$40 + T_{\text{BCCH}} + T_{\text{RA}}$</u>
<u>The UE has not synchronised to the GSM cell before the CELL CHANGE ORDER FROM UTRAN COMMAND is received</u>	<u>$140 + T_{\text{BCCH}} + T_{\text{RA}}$</u>

where

T_{BCCH} = the maximum time allowed to read BCCH data from the GSM cell [21].

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

CHANGE REQUEST

⌘ **TS25.133 CR 172** ⌘ ev **-** ⌘ Current version: **3.6.0** ⌘

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

Title:	⌘ Section 4 changes		
Source:	⌘ RAN WG4		
Work item code:	⌘ Date: ⌘ 12 August 2001		
Category:	⌘ F		
	<table border="0"> <tr> <td style="vertical-align: top;"> <p>Use <u>one</u> of the following categories:</p> <p>F (correction)</p> <p>A (corresponds to a correction in an earlier release)</p> <p>B (addition of feature),</p> <p>C (functional modification of feature)</p> <p>D (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP <u>IR 21.900</u>.</p> </td> <td style="vertical-align: top;"> <p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2)</p> <p>R96 (Release 1996)</p> <p>R97 (Release 1997)</p> <p>R98 (Release 1998)</p> <p>R99 (Release 1999)</p> <p>REL-4 (Release 4)</p> <p>REL-5 (Release 5)</p> </td> </tr> </table>	<p>Use <u>one</u> of the following categories:</p> <p>F (correction)</p> <p>A (corresponds to a correction in an earlier release)</p> <p>B (addition of feature),</p> <p>C (functional modification of feature)</p> <p>D (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP <u>IR 21.900</u>.</p>	<p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2)</p> <p>R96 (Release 1996)</p> <p>R97 (Release 1997)</p> <p>R98 (Release 1998)</p> <p>R99 (Release 1999)</p> <p>REL-4 (Release 4)</p> <p>REL-5 (Release 5)</p>
<p>Use <u>one</u> of the following categories:</p> <p>F (correction)</p> <p>A (corresponds to a correction in an earlier release)</p> <p>B (addition of feature),</p> <p>C (functional modification of feature)</p> <p>D (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP <u>IR 21.900</u>.</p>	<p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2)</p> <p>R96 (Release 1996)</p> <p>R97 (Release 1997)</p> <p>R98 (Release 1998)</p> <p>R99 (Release 1999)</p> <p>REL-4 (Release 4)</p> <p>REL-5 (Release 5)</p>		

Reason for change:	⌘ The current text does not indicate what are the criteria for deriving the best-ranked GSM BCCH cell for cell re-selection. The following ambiguities in the text exists; <ul style="list-style-type: none"> - Ranking as per TS25.304 cannot be performed on a carrier, it can only be performed on a cell bases. Therefore the current text is incorrect and needs to be clarified what is intend - It is unclear if the ranking is based on signal level or if the measurement rules defined in TS25.304 - Duplication of Terminology - Aligment with other sections
Summary of change:	⌘ The text is corrected to indicated a staged procedure which is as follows <ul style="list-style-type: none"> - All the GSM BCCH carriers in the cell list shall be monitored - The 4 highest GSM BCCH carrier are identified - The BSIC of the GSM BCCH carrier are verified - The 4 verified GSM BCCH cells are ranked as per the measurement rules in TS25.304 <p>T_REP is replaced as Tsi Other aligment changes</p>
Consequences if not approved:	⌘ Non-uniform UE behaviour for measurements of inter-RAT GSM cells

Clauses affected:	⌘ Section 4
Other specs	⌘ <input type="checkbox"/> Other core specifications ⌘

affected:	<input checked="" type="checkbox"/>	Test specifications	TS34.121
	<input type="checkbox"/>	O&M Specifications	
Other comments:	⌘		

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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.
- 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.

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4.2.2.5 Measurements of inter-RAT GSM cells

The UE shall measure the signal level of the GSM BCCH carrier of each GSM neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in TS25.304, at least every $T_{\text{measureGSM}}$ (see table 4.1). The UE shall maintain a running average of 4 measurements for each GSM BCCH carrier. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

~~The UE shall attempt to verify the BSIC for each of the 4 best ranked GSM BCCH carriers (the best ranked according to the cell reselection criteria defined in TS25.304) at least every 30 seconds if GSM cells are measured according to the measurement rules. If GSM measurement are required by the measurement rules in TS25.304, the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers and rank the verified GSM BCCH cells according to the cell reselection criteria defined in TS25.304. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell~~

If the UE detects a BSIC, which is not indicated in the measurement control system information, the UE shall not consider that GSM BCCH carrier in cell reselection. The UE also shall not consider the GSM BCCH carrier in cell reselection, if the UE ~~can not~~ cannot demodulate the BSIC of that GSM BCCH carrier.

4.2.2.6 Evaluation of cell re-selection criteria

The UE shall evaluate the cell re-selection criteria defined in TS 25.304 for the cells, which have new measurement results available, at least every DRX cycle.

UE shall perform cell reselection immediately after the UE has found a higher ranked suitable cell, unless less than 1 second has elapsed from the moment the UE started camping on the ~~current serving~~ cell.

4.2.2.7 Maximum interruption in paging reception

UE shall perform the cell re-selection with minimum interruption in monitoring downlink channels for paging reception.

At intra-frequency cell re-selection, the UE shall monitor the downlink of ~~current~~ serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency cell for paging reception. The interruption time shall not exceed 50 ms.

At inter-frequency and inter-RAT cell re-selection, the UE shall monitor the downlink of ~~current~~ serving cell for paging reception until the UE is capable to start monitoring downlink channels for paging reception of the target inter-frequency cell. For inter-frequency cell re-selection the interruption time must not exceed $T_{\text{REP}} - T_{\text{SI}} + 50$ ms. ~~For inter-RAT cell re-selection the interruption time must not exceed $T_{\text{BCCH}} + 50$ ms. T_{REP} is the longest repetition period for the system information required to be read by the UE to camp on the cell.~~

T_{SI} is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.

T_{BCCH} is the maximum time allowed to read BCCH data from a GSM cell [21].

~~+ T_{REP} is the longest repetition period for the system information required to be read by the UE to camp on the cell. These requirements assume sufficient radio conditions, so that decoding of system information can be made without errors and does not take into account cell re-selection failure.~~

Table 4.1: $T_{\text{measureFDD}}$, $T_{\text{evaluateFDD}}$, $T_{\text{measureTDD}}$, $T_{\text{evaluateTDD}}$, and $T_{\text{measureGSM}}$

DRX cycle length [s]	N_{serv} [number of DRX cycles]	$T_{\text{measureFDD}}$ [s] (number of DRX cycles)	$T_{\text{evaluateFDD}}$ [s] (number of DRX cycles)	$T_{\text{measureTDD}}$ [s] (number of DRX cycles)	$T_{\text{evaluateTDD}}$ [s] (number of DRX cycles)	$T_{\text{measureGSM}}$ [s] (number of DRX cycles)
0.08	4	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	2.56 (32 DRX cycles)
0.16	4	0.64 (4)	2.56 (16)	0.64 (4)	2.56 (16)	2.56 (16)
0.32	4	1.28 (4)	5.12 (16)	1.28 (4)	5.12 (16)	5.12 (16)
0.64	4	1.28 (2)	5.12 (8)	1.28 (2)	5.12 (8)	5.12 (8)
1.28	2	1.28 (1)	6.4 (5)	1.28 (1)	6.4 (5)	6.4 (5)
2.56	2	2.56 (1)	7.68 (3)	2.56 (1)	7.68 (3)	7.68 (3)
5.12	1	5.12 (1)	10.24 (2)	5.12 (1)	10.24 (2)	10.24 (2)

In idle mode, UE shall support DRX cycles lengths 0.64, 1.28, 2.56 and 5.12 s, according to [16].

CHANGE REQUEST

⌘ **TS25.133 CR 173** ⌘ ev **-** ⌘ Current version: **4.1.0** ⌘

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

Title:	⌘ Section 4 changes
Source:	⌘ RAN WG4
Work item code:	⌘ Date: ⌘ 12 August 2001
Category: OKI	⌘ A Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP <u>IR 21.900</u> .
Release:	⌘ Rel-4 Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ The current text does not indicate what are the criteria for deriving the best-ranked GSM BCCH cell for cell re-selection. The following ambiguities in the text exists; <ul style="list-style-type: none"> - Ranking as per TS25.304 cannot be performed on a carrier, it can only be performed on a cell bases. Therefore the current text is incorrect and needs to be clarified what is intend - It is unclear if the ranking is based on signal level or if the measurement rules defined in TS25.304 - Duplication of Terminology - Aligment with other sections
Summary of change:	⌘ The text is corrected to indicated a staged procedure which is as follows <ul style="list-style-type: none"> - All the GSM BCCH carriers in the cell list shall be monitored - The 4 highest GSM BCCH carrier are identified - The BSIC of the GSM BCCH carrier are verified - The 4 verified GSM BCCH cells are ranked as per the measurement rules in TS25.304 <p>T_REP is replaced as Tsi Other aligment changes</p>
Consequences if not approved:	⌘ Non-uniform UE behaviour for measurements of inter-RAT GSM cells

Clauses affected:	⌘ Section 4
Other specs	⌘ <input type="checkbox"/> Other core specifications ⌘

affected:	<input checked="" type="checkbox"/>	Test specifications	TS34.121
	<input type="checkbox"/>	O&M Specifications	
Other comments:	⌘		

How to create CRs using this form:

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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.

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4.2.2.5 Measurements of inter-RAT GSM cells

The UE shall measure the signal level of the GSM BCCH carrier of each GSM neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in TS25.304, at least every $T_{\text{measureGSM}}$ (see table 4.1). The UE shall maintain a running average of 4 measurements for each GSM BCCH carrier. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

~~The UE shall attempt to verify the BSIC for each of the 4 best ranked GSM BCCH carriers (the best ranked according to the cell reselection criteria defined in TS25.304) at least every 30 seconds if GSM cells are measured according to the measurement rules. If GSM measurement are required by the measurement rules in TS25.304, the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers and rank the verified GSM BCCH cells according to the cell reselection criteria defined in TS25.304. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell~~

If the UE detects a BSIC, which is not indicated in the measurement control system information, the UE shall not consider that GSM BCCH carrier in cell reselection. The UE also shall not consider the GSM BCCH carrier in cell reselection, if the UE ~~can not~~ cannot demodulate the BSIC of that GSM BCCH carrier.

4.2.2.6 Evaluation of cell re-selection criteria

The UE shall evaluate the cell re-selection criteria defined in TS 25.304 for the cells, which have new measurement results available, at least every DRX cycle.

UE shall perform cell reselection immediately after the UE has found a higher ranked suitable cell, unless less than 1 second has elapsed from the moment the UE started camping on the ~~current serving~~ cell.

4.2.2.7 Maximum interruption in paging reception

UE shall perform the cell re-selection with minimum interruption in monitoring downlink channels for paging reception.

At intra-frequency cell re-selection, the UE shall monitor the downlink of ~~current~~ serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency cell for paging reception. The interruption time shall not exceed 50 ms.

At inter-frequency and inter-RAT cell re-selection, the UE shall monitor the downlink of ~~current~~ serving cell for paging reception until the UE is capable to start monitoring downlink channels for paging reception of the target inter-frequency cell. For inter-frequency cell re-selection the interruption time must not exceed $T_{\text{REP}} - T_{\text{SI}} + 50$ ms. ~~For inter-RAT cell re-selection the interruption time must not exceed $T_{\text{BCCH}} + 50$ ms. T_{REP} is the longest repetition period for the system information required to be read by the UE to camp on the cell.~~

T_{SI} is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks defined in 25.331 for a UTRAN cell.

T_{BCCH} is the maximum time allowed to read BCCH data from a GSM cell [21].

~~+ T_{REP} is the longest repetition period for the system information required to be read by the UE to camp on the cell. These requirements assume sufficient radio conditions, so that decoding of system information can be made without errors and does not take into account cell re-selection failure.~~

Table 4.1: $T_{\text{measureFDD}}$, $T_{\text{evaluateFDD}}$, $T_{\text{measureTDD}}$, $T_{\text{evaluateTDD}}$, and $T_{\text{measureGSM}}$

DRX cycle length [s]	N_{serv} [number of DRX cycles]	$T_{\text{measureFDD}}$ [s] (number of DRX cycles)	$T_{\text{evaluateFDD}}$ [s] (number of DRX cycles)	$T_{\text{measureTDD}}$ [s] (number of DRX cycles)	$T_{\text{evaluateTDD}}$ [s] (number of DRX cycles)	$T_{\text{measureGSM}}$ [s] (number of DRX cycles)
0.08	4	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	0.64 (8 DRX cycles)	2.56 (32 DRX cycles)	2.56 (32 DRX cycles)
0.16	4	0.64 (4)	2.56 (16)	0.64 (4)	2.56 (16)	2.56 (16)
0.32	4	1.28 (4)	5.12 (16)	1.28 (4)	5.12 (16)	5.12 (16)
0.64	4	1.28 (2)	5.12 (8)	1.28 (2)	5.12 (8)	5.12 (8)
1.28	2	1.28 (1)	6.4 (5)	1.28 (1)	6.4 (5)	6.4 (5)
2.56	2	2.56 (1)	7.68 (3)	2.56 (1)	7.68 (3)	7.68 (3)
5.12	1	5.12 (1)	10.24 (2)	5.12 (1)	10.24 (2)	10.24 (2)

In idle mode, UE shall support DRX cycles lengths 0.64, 1.28, 2.56 and 5.12 s, according to [16].

CHANGE REQUEST

⌘ **TS25.133 CR 174** ⌘ ev **-** ⌘ Current version: **3.6.0** ⌘

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

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

Title:	⌘ Section 8 changes		
Source:	⌘ RAN WG4		
Work item code:	⌘	Date:	⌘ 30 August 2001
Category:	⌘ F	Release:	⌘ Rel99
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)		2 (GSM Phase 2)
	A (corresponds to a correction in an earlier release)		R96 (Release 1996)
	B (addition of feature),		R97 (Release 1997)
	C (functional modification of feature)		R98 (Release 1998)
	D (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <u>IR 21.900</u> .		REL-4 (Release 4)
			REL-5 (Release 5)

Reason for change:	⌘ The requirement in section 8.4 Measurements in CELL_FACH are incorrect. <ul style="list-style-type: none"> • There are no requirements for measurement reporting for intra and inter frequency measurement apart from volume measurements • No requirements for parallel measurement in CELL_FACH state • General editorial corrections
Summary of change:	⌘ <ul style="list-style-type: none"> • Delete reference to measurement reporting associated with intra and inter – frequency measurement occasions • Define the range of M_REP based on K is 0 to 6 (UE will lose timing information for k >6) • General editorial corrections
Consequences if not approved:	⌘ Non-uniform UE behaviour for cell re-selection in CELL_FACH state

Clauses affected:	⌘ Section 8		
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications	⌘	TS34.121
	<input checked="" type="checkbox"/> Test specifications		
	<input type="checkbox"/> O&M Specifications		
Other comments:	⌘		

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

8.3.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria.

The UE can be requested to make measurements under different measurement identity numbers. With each identity number there may be associated multiple number of events. The purpose of this section is to set some limits on the number of different reporting criteria the UE may be requested to track in parallel.

8.3.2 Requirements

In this section reporting criteria can be either event triggered reporting criteria or periodic reporting criteria.

The UE shall be able to support in parallel per category up to E_{cat} reporting criteria according to Table 8.10. For the measurement categories: Intra-frequency, Inter frequency, Inter frequency (virtual active set), and Inter-RAT the UE need not support more than 18 reporting criteria in total. For the measurement categories Traffic volume and Quality measurements the UE need not support more than 16 reporting criteria in total.

Table 8.10: Requirements for reporting criteria per measurement category

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

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 ~~and parallel measurements are specified in section 8.2.~~ Measurement occasions in CELL_FACH state are described in TS 25.331.

8.4.2 Requirements

8.4.2.1 UE Measurement Capability

The UE shall be able to monitor up to

32 intra frequency FDD cells and

32 inter frequency cells, including

- FDD mode cells distributed on up to 2 additional FDD carriers and
- Depending on UE Capability, TDD mode cells, distributed on up to 3 TDD carriers.

Depending on UE capability, the UE shall also in addition be able to monitor at least 32 GSM cells distributed on up to 32 GSM carriers.

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.

~~M_REP is the Measurement Occasion cycle length. The FACH Measurement Occasion of N_{TTI} frames will be repeated every $N_{TTI} \cdot M_REP$ 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.~~

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

$$T_{meas} = [(N_{FDD} + N_{TDD} + N_{GSM}) \cdot N_{TTI} \cdot M_REP \cdot 10] \text{ms}$$

where

- M_REP is the Measurement Occasion cycle length when K is 0... 6. 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 $N_{TTI} \cdot M_REP$ 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.

The UE is ~~required~~ 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 detected 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.

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

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

where

$T_{\text{basic identify FDD, intra}}$ is specified in section 8.1.2.2.2,

N_{TTI} and M_{REP} is specified in section 8.4.2.1.

and when CPICH Ec/Io \geq -20 dB, SCH_Ec/Io \geq -20 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

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 sequence~~ is activated, the UE shall be capable of performing CPICH measurements for 8 detected intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When ~~one a~~ measurement occasion ~~cycle sequence~~ is activated, the UE shall be capable of performing CPICH measurements for the $Y_{\text{measurement intra}}$ strongest cells, where $Y_{\text{measurement intra}}$ 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.

$$Y_{\text{measurement intra}} = \text{Floor} \left\{ X_{\text{basic measurement FDD}} \cdot \frac{T_{\text{Measurement_Period Intra}} - \text{Ceil} \left\{ \frac{T_{\text{Measurement_Period Intra}}}{N_{\text{TTI}} \cdot M_{\text{REP}} \cdot 10 \text{ ms}} \right\} \cdot N_{\text{TTI}} \cdot 10 \text{ ms}}{T_{\text{Measurement_Period Intra}}} \right\}$$

cells

where

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

$T_{\text{Measurement_Period Intra}}$ is specified in section 8.1.2.2.2,

M_{REP} and N_{TTI} is specified in section 8.4.2.1.

~~8.4.2.2.3 Periodic Reporting~~

~~Reported measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.~~

~~8.4.2.2.4 Event Triggered Reporting~~

~~Reported measurements contained in event triggered measurement reports shall meet the requirements in section 9.~~

~~In CELL_FACH event triggered reporting can only be set for Traffic Volume measurements defined in TS 25.331.~~

8.4.2.2.3 RACH reporting

Reporting measurements in the measurement reports sent on the RACH shall meet the requirements in section 9

8.4.2.3 FDD inter frequency measurements

In the CELL_FACH state when a measurement occasion ~~cycle sequence~~ is provided by the network the UE shall continuously measure detected inter frequency cells and search for new inter frequency cells indicated in the measurement control information.

8.4.2.3.1 Identification of a new cell

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

$$T_{\text{identify, inter}} = \text{Max} \left\{ 5000, \text{Ceil} \left\{ \frac{T_{\text{basic identify FDD inter}}}{T_{\text{Inter FACH}}} \right\} \cdot T_{\text{meas}} \cdot N_{\text{Freq, FDD}} \right\} \text{ ms}$$

where

$T_{\text{basic_identify_FDD,inter}}$ is specified in 8.1.2.3.2.

$N_{\text{Freq, FDD}}$: Number of FDD frequencies in the Inter-frequency cell info list

T_{Meas} and M_{REP} are specified in 8.4.2.1.

$T_{\text{Inter FACH}} = (N_{\text{TTI}} * 10 - 2 * 0.5) \text{ ms}$

and when $\text{CPICH } E_c/I_o \geq -20 \text{ dB}$, $\text{SCH } E_c/I_o \geq -17 \text{ dB}$ and $\text{SCH } E_c/I_o$ is equally divided between primary synchronisation code and secondary synchronisation code.

8.4.2.3.2 Measurement period

When a measurement occasion cycles are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.2 with measurement period is given by

$$T_{\text{measurement inter}} = \text{Max} \left\{ T_{\text{Measurement_Period Inter}}, 2 \cdot T_{\text{meas}}, \text{Ceil} \left\{ \frac{T_{\text{basic measurement FDD inter}}}{T_{\text{Inter FACH}}} \right\} \cdot T_{\text{meas}} \cdot N_{\text{Freq, FDD}} \right\} \text{ ms}$$

where

$T_{\text{basic_measurement_FDD,inter}}$ is specified in section 8.1.2.3.2.

$T_{\text{Measurement_Period Inter}}$ is specified in section 8.1.2.3.2.

T_{Meas} is specified in section 8.4.2.1.

$N_{\text{Freq, FDD}}$ and $T_{\text{Inter FACH}}$ are specified in section 8.4.2.3.1

If the UE does not need measurement occasions to perform inter-frequency measurements, the measurement period for inter frequency measurements is 480 ms.

~~8.4.2.3.3 Periodic Reporting~~

~~Reported measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.~~

~~8.4.2.3.4 Event Triggered Reporting~~

~~Reported measurements in event triggered measurement reports (Traffic Volume Measurement) shall meet the requirements in section 9.~~

8.4.2.4 TDD measurements

The requirements in this section apply only to UE supporting both TDD and FDD mode.

In the ~~CELL_DCH_FACH~~ state when a measurement occasion sequence cycle is provided by the network the UE shall continuously measure detected inter frequency TDD cells and search for new TDD cells indicated in the measurement control information.

The UE shall be capable of measuring the requested measurement quantity of at least 32 cells on a maximum of 3 frequencies, different from the frequency currently used by the UE.

8.4.2.4.1 Identification of a new cell

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

$$T_{\text{identify, TDD}} = \text{Max} \left\{ 5000, \text{Ceil} \left\{ \frac{T_{\text{basic identify TDD inter}}}{T_{\text{Inter FACH}}} \right\} \cdot T_{\text{meas}} \cdot N_{\text{Freq, TDD}} \right\} \text{ ms}$$

$T_{\text{basic_identify_TDD,inter}}$ is specified in 8.1.2.4.2.

$N_{\text{Freq, TDD}}$: Number of TDD frequencies in the Inter-frequency cell info list

T_{Meas} is specified in section 8.4.2.1.

$T_{\text{Inter FACH}}$ is specified in section 8.4.2.3.1

8.4.2.4.2 Measurement period

When a measurement occasion cycle as previously described are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.1 and 9.1.2 with measurement period is given by

$$T_{\text{measurement TDD}} = \text{Max} \left\{ T_{\text{Measurement_Period TDD inter}}, 2 \cdot T_{\text{meas}}, \text{Ceil} \left\{ \frac{T_{\text{basic measurement TDD inter}}}{T_{\text{Inter FACH}}} \right\} \cdot T_{\text{meas}} \cdot N_{\text{Freq, TDD}} \right\}$$

where

$T_{\text{basic_measurement_TDD inter}}$ is specified in section 8.1.2.4.2.

$T_{\text{Measurement_Period TDD inter}}$ is specified in section 8.1.2.4.2.

T_{Meas} is specified in section 8.4.2.1.

$T_{\text{Inter FACH}}$ is specified in section 8.4.2.3.1

$N_{\text{Freq, TDD}}$ is specified in section 8.4.2.4.1

If the UE does not need measurement occasions to perform inter-frequency measurements, the measurement period for inter frequency measurements is 480 ms.

8.4.2.5 GSM measurements

The requirements in this section apply only to UE supporting FDD and GSM.

In CELL_FACH state when measurement occasions are provided by the UTRAN the UE shall continuously measure GSM cells and search for new GSM cells given in the monitored set.

~~The reporting of measurements on a GSM cell can be requested with BSIC verified or BSIC non verified. However, to support cell reselection the UE shall always perform BSIC verification in Cell FACH state.~~

~~If BSIC verified is requested for a GSM cell the UE shall only report measurement quantities for that GSM cell with a BSIC "verified" according to section 8.4.2.5.2. If BSIC verification is not required for the reporting of a GSM cell the UE shall report measurement quantities for that GSM cell irrespectively if the BSIC has been verified or not verified according to section 8.4.2.5.2.~~

In section 8.4.2.1 the split of measurements between different modes and systems is defined. Every second measurement occasion scheduled for GSM measurements, as given by 8.4.2.1 shall be allocated for GSM initial BSIC identification.

The remaining measurements occasions scheduled for GSM measurements shall be used as follows. 3 occasions out of 4 shall be allocated for GSM carrier RSSI measurements and 1 out of 4 shall be allocated for GSM BSIC reconfirmation. The scheduling of measurement occasions between GSM carrier RSSI measurements and GSM BSIC reconfirmation is up to the UE.

If the UE does not need measurement occasions to perform GSM measurements, the requirements in GSM 05.08 shall apply.

8.4.2.5.1 GSM carrier RSSI

A UE supporting GSM measurements using measurement occasions shall meet the minimum number of GSM carrier RSSI measurements specified in Table 8.11. This measurement shall be based on measurement occasions allocated for GSM carrier RSSI measurements as described in 8.4.2.5. In the CELL_FACH state the measurement period for the GSM carrier RSSI measurement is 480 ms.

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 05.08, when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

Table 8.11

Length of measurement occasion (frames)	Number of GSM carrier RSSI samples in each measurement occasion, $N_{\text{GSM carrier RSSI}}$
1	16
2	32
4	64
8	128

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods. ~~This means that, in this particular case, the L1 reporting period to higher layers of a GSM neighbour can be a multiple of the measurement period.~~

8.4.2.5.2 BSIC verification

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

Initial BSIC identification

Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the FDD and GSM cell. The UE shall trigger the initial BSIC identification within 50% of the available measurement occasions used for GSM measurements as specified in 8.4.2.1. The requirements for Initial BSIC identification can be found in 8.4.2.5.2.1.

BSIC re-confirmation

Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement occasions used for GSM as specified in 8.4.2.1. The requirements for BSIC re-confirmation can be found in 8.4.2.5.2.2.

The BSIC of a GSM cell is considered to be "verified" if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification) and from that moment the BSIC shall be re-confirmed at least once every 6 times $T_{\text{re-confirm_GSM}}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified".

$T_{\text{re-confirm_GSM}}$ indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure according to section 8.4.2.5.2.2.

The UE shall be able to decode a BSIC within a measurement occasion when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the measurement occasion is within the limits specified in table 8.12.

Table 8.12: The measurement occasion length and maximum time difference for BSIC verification

Measurement occasion length [frames]	Maximum time difference [μ s]
1	± 4100
2	± 9100
4	± 19100
8	± 39100

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 05.05.

8.4.2.5.2.1 Initial BSIC identification

This measurement shall be based on the measurement occasions allocated for Initial BSIC identification as described in 8.4.2.5.

The UE shall continuously attempt to decode the BSIC of SCH on the BCCH carrier of the 6 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value.

When the UE attempts to decode the BSIC of one GSM BCCH carrier with unknown BSIC, the UE shall use all available measurements occasions allocated for GSM initial BSIC identification according section 8.4.2.5 to attempt to decode the BSIC from that GSM BCCH carrier.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{\text{identify, GSM}}$ ms, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 6 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

$T_{\text{identify, GSM}}$ is given for the combinations of T_{meas} and N_{TTI} that are given in table 8.13. The values given in table 8.13 represent the number of patterns required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Table 8.13: The worst-case time for identification of one previously not identified GSM cell

T_{meas} (ms)	$N_{\text{TTI}}=1$ frame $T_{\text{identify, GSM}}(\text{ms})$	$N_{\text{TTI}}=2$ frames $T_{\text{identify, GSM}}(\text{ms})$	$N_{\text{TTI}}=4$ frames $T_{\text{identify, GSM}}(\text{ms})$	$N_{\text{TTI}}=8$ frames $T_{\text{identify, GSM}}(\text{ms})$
20	1040	-	-	-
40	1600	800	-	-
60	2880	-	-	-
80	2880	1280	640	-
120	5280	2640	-	-
160	7680	2880	1280	640
240	29760	5280	1920	-
320	14080	6400	2560	1280
480	34560	12480	3840	1920
640	34560	12800	5120	2560
960		24960	5760	2840
1280		20480	10240	5120
1920			15360	5680
2560				10240
3840				15360

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.

$T_{re-confirm_GSM}$ 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 $T_{re-confirm_GSM}$ 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 $T_{re-confirm,GSM}$ (ms)	$N_{TTI}=2$ frames $T_{re-confirm,GSM}$ (ms)	$N_{TTI}=4$ frames $T_{re-confirm,GSM}$ (ms)	$N_{TTI}=8$ frames $T_{re-confirm,GSM}$ (ms)
20	800	-	-	-
40	1360	640	-	-
60	2640	-	-	-
80	2880	1280	1280	-
120	5040	2400	-	-
160	6400	2880	2560	2560
240	17280	4800	3840	-
320	10880	6400	5120	5120
480	22080	9600	7680	7680
640	26880	12800	10240	10240
960		17280	15360	15360
1280		20480	20480	20480
1920			30720	30720
2560				40960
3840				61440

8.5 Capabilities for Support of Event Triggering and Reporting Criteria in CELL_FACH state

8.5.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria.

8.5.2 Requirements

In this section reporting criteria can be either event triggered reporting criteria or periodic reporting criteria.

Table 8.11: Requirements for reporting criteria per measurement category

Measurement category	E_{cat}	Note
Traffic volume measurements	1	

CHANGE REQUEST

⌘ **TS25.133 CR 175** ⌘ ev **-** ⌘ Current version: **4.1.0** ⌘

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

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

Title:	⌘ Section 8 changes		
Source:	⌘ RAN WG4		
Work item code:	⌘	Date:	⌘ 30 August 2001
Category:	⌘ A	Release:	⌘ Rel-4
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	R96 (Release 1996)	2 (GSM Phase 2)
	A (corresponds to a correction in an earlier release)	R97 (Release 1997)	R96 (Release 1996)
	B (addition of feature),	R98 (Release 1998)	R97 (Release 1997)
	C (functional modification of feature)	R99 (Release 1999)	R98 (Release 1998)
	D (editorial modification)	REL-4 (Release 4)	R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <u>IR 21.900</u> .	REL-5 (Release 5)	

Reason for change:	⌘ The requirement in section 8.4 Measurements in CELL_FACH are incorrect. <ul style="list-style-type: none"> • There are no requirements for measurement reporting for intra and inter frequency measurement apart from volume measurements • No requirements for parallel measurement in CELL_FACH state • General editorial corrections
Summary of change:	⌘ <ul style="list-style-type: none"> • Delete reference to measurement reporting associated with intra and inter – frequency measurement occasions • Define the range of M_REP based on K is 0 to 6 (UE will lose timing information for k >6) • General editorial corrections
Consequences if not approved:	⌘ Non-uniform UE behaviour for cell re-selection in CELL_FACH state

Clauses affected:	⌘ Section 8		
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications	⌘	TS34.121
	<input checked="" type="checkbox"/> Test specifications		
	<input type="checkbox"/> O&M Specifications		
Other comments:	⌘		

How to create CRs using this form:

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

- 1) Fill out the above form. The symbols above marked # contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

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

8.3.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria.

The UE can be requested to make measurements under different measurement identity numbers. With each identity number there may be associated multiple number of events. The purpose of this section is to set some limits on the number of different reporting criteria the UE may be requested to track in parallel.

8.3.2 Requirements

In this section reporting criteria can be either event triggered reporting criteria or periodic reporting criteria.

The UE shall be able to support in parallel per category up to E_{cat} reporting criteria according to Table 8.10. For the measurement categories: Intra-frequency, Inter frequency, Inter frequency (virtual active set), and Inter-RAT the UE need not support more than 18 reporting criteria in total. For the measurement categories Traffic volume and Quality measurements the UE need not support more than 16 reporting criteria in total.

Table 8.10: Requirements for reporting criteria per measurement category

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

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 ~~and parallel measurements are specified in section 8.2.~~ Measurement occasions in CELL_FACH state are described in TS 25.331.

8.4.2 Requirements

8.4.2.1 UE Measurement Capability

The UE shall be able to monitor up to

32 intra frequency FDD cells and

32 inter frequency cells, including

- FDD mode cells distributed on up to 2 additional FDD carriers and
- Depending on UE Capability, TDD mode cells, distributed on up to 3 TDD carriers.

Depending on UE capability, the UE shall also in addition be able to monitor at least 32 GSM cells distributed on up to 32 GSM carriers.

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.

~~M_REP is the Measurement Occasion cycle length. The FACH Measurement Occasion of N_{TTI} frames will be repeated every $N_{TTI} \cdot M_REP$ 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.~~

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~~ 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

$$T_{meas} = [(N_{FDD} + N_{TDD} + N_{GSM}) \cdot N_{TTI} \cdot M_REP \cdot 10] \text{ms}$$

where

- M_REP is the Measurement Occasion cycle length when K is 0... 6. 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 $N_{TTI} \cdot M_REP$ 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.

The UE is ~~required~~ 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 detected 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.

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

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

where

$T_{\text{basic identify FDD, intra}}$ is specified in section 8.1.2.2.2,

N_{TTI} and M_{REP} is specified in section 8.4.2.1.

and when CPICH $E_c/I_o \geq -20$ dB, SCH $E_c/I_o \geq -20$ dB and SCH E_c/I_o is equally divided between primary synchronisation code and secondary synchronisation code.

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 sequence~~ is activated, the UE shall be capable of performing CPICH measurements for 8 detected intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When ~~one a~~ measurement occasion ~~cycle sequence~~ is activated, the UE shall be capable of performing CPICH measurements for the $Y_{\text{measurement intra}}$ strongest cells, where $Y_{\text{measurement intra}}$ 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.

$$Y_{\text{measurement intra}} = \text{Floor} \left\{ X_{\text{basic measurement FDD}} \cdot \frac{T_{\text{Measurement_Period Intra}} - \text{Ceil} \left\{ \frac{T_{\text{Measurement_Period Intra}}}{N_{\text{TTI}} \cdot M_{\text{REP}} \cdot 10 \text{ ms}} \right\} \cdot N_{\text{TTI}} \cdot 10 \text{ ms}}{T_{\text{Measurement_Period Intra}}} \right\}$$

cells

where

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

$T_{\text{Measurement_Period Intra}}$ is specified in section 8.1.2.2.2,

M_{REP} and N_{TTI} is specified in section 8.4.2.1.

~~8.4.2.2.3 Periodic Reporting~~

~~Reported measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.~~

~~8.4.2.2.4 Event Triggered Reporting~~

~~Reported measurements contained in event triggered measurement reports shall meet the requirements in section 9.~~

~~In CELL_FACH event triggered reporting can only be set for Traffic Volume measurements defined in TS 25.331.~~

8.4.2.2.3 RACH reporting

Reporting measurements in the measurement reports sent on the RACH shall meet the requirements in section 9

8.4.2.3 FDD inter frequency measurements

In the CELL_FACH state when a measurement occasion ~~cycle sequence~~ is provided by the network the UE shall continuously measure detected inter frequency cells and search for new inter frequency cells indicated in the measurement control information.

8.4.2.3.1 Identification of a new cell

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

$$T_{\text{identify, inter}} = \text{Max} \left\{ 5000, \text{Ceil} \left\{ \frac{T_{\text{basic identify FDD inter}}}{T_{\text{Inter FACH}}} \right\} \cdot T_{\text{meas}} \cdot N_{\text{Freq, FDD}} \right\} \text{ ms}$$

where

$T_{\text{basic_identify_FDD,inter}}$ is specified in 8.1.2.3.2.

$N_{\text{Freq, FDD}}$: Number of FDD frequencies in the Inter-frequency cell info list

T_{Meas} and M_{REP} are specified in 8.4.2.1.

$T_{\text{Inter FACH}} = (N_{\text{TTI}} * 10 - 2 * 0.5) \text{ ms}$

and when $\text{CPICH } E_c/I_o \geq -20 \text{ dB}$, $\text{SCH } E_c/I_o \geq -17 \text{ dB}$ and $\text{SCH } E_c/I_o$ is equally divided between primary synchronisation code and secondary synchronisation code.

8.4.2.3.2 Measurement period

When a measurement occasion cycles are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.2 with measurement period is given by

$$T_{\text{measurement inter}} = \text{Max} \left\{ T_{\text{Measurement_Period Inter}}, 2 \cdot T_{\text{meas}}, \text{Ceil} \left\{ \frac{T_{\text{basic measurement FDD inter}}}{T_{\text{Inter FACH}}} \right\} \cdot T_{\text{meas}} \cdot N_{\text{Freq, FDD}} \right\} \text{ ms}$$

where

$T_{\text{basic_measurement_FDD,inter}}$ is specified in section 8.1.2.3.2.

$T_{\text{Measurement_Period Inter}}$ is specified in section 8.1.2.3.2.

T_{Meas} is specified in section 8.4.2.1.

$N_{\text{Freq, FDD}}$ and $T_{\text{Inter FACH}}$ are specified in section 8.4.2.3.1

If the UE does not need measurement occasions to perform inter-frequency measurements, the measurement period for inter frequency measurements is 480 ms.

~~8.4.2.3.3 Periodic Reporting~~

~~Reported measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.~~

~~8.4.2.3.4 Event Triggered Reporting~~

~~Reported measurements in event triggered measurement reports (Traffic Volume Measurement) shall meet the requirements in section 9.~~

8.4.2.4 TDD measurements

The requirements in this section apply only to UE supporting both TDD and FDD mode.

In the ~~CELL_DCH_FACH~~ state when a measurement occasion sequence cycle is provided by the network the UE shall continuously measure detected inter frequency TDD cells and search for new TDD cells indicated in the measurement control information.

The UE shall be capable of measuring the requested measurement quantity of at least 32 cells on a maximum of 3 frequencies, different from the frequency currently used by the UE.

8.4.2.4.1 Identification of a new cell

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

$$T_{\text{identify, TDD}} = \text{Max} \left\{ 5000, \text{Ceil} \left\{ \frac{T_{\text{basic identify TDD inter}}}{T_{\text{Inter FACH}}} \right\} \cdot T_{\text{meas}} \cdot N_{\text{Freq, TDD}} \right\} \text{ ms}$$

$T_{\text{basic_identify_TDD,inter}}$ is specified in 8.1.2.4.2.

$N_{\text{Freq, TDD}}$: Number of TDD frequencies in the Inter-frequency cell info list

T_{Meas} is specified in section 8.4.2.1.

$T_{\text{Inter FACH}}$ is specified in section 8.4.2.3.1

8.4.2.4.2 Measurement period

When a measurement occasion cycle as previously described are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.1 and 9.1.2 with measurement period is given by

$$T_{\text{measurement TDD}} = \text{Max} \left\{ T_{\text{Measurement_Period TDD inter}}, 2 \cdot T_{\text{meas}}, \text{Ceil} \left\{ \frac{T_{\text{basic measurement TDD inter}}}{T_{\text{Inter FACH}}} \right\} \cdot T_{\text{meas}} \cdot N_{\text{Freq, TDD}} \right\}$$

where

$T_{\text{basic_measurement_TDD inter}}$ is specified in section 8.1.2.4.2.

$T_{\text{Measurement_Period TDD inter}}$ is specified in section 8.1.2.4.2.

T_{Meas} is specified in section 8.4.2.1.

$T_{\text{Inter FACH}}$ is specified in section 8.4.2.3.1

$N_{\text{Freq, TDD}}$ is specified in section 8.4.2.4.1

If the UE does not need measurement occasions to perform inter-frequency measurements, the measurement period for inter frequency measurements is 480 ms.

8.4.2.5 GSM measurements

The requirements in this section apply only to UE supporting FDD and GSM.

In CELL_FACH state when measurement occasions are provided by the UTRAN the UE shall continuously measure GSM cells and search for new GSM cells given in the monitored set.

~~The reporting of measurements on a GSM cell can be requested with BSIC verified or BSIC non verified. However, to support cell reselection the UE shall always perform BSIC verification in Cell FACH state.~~

~~If BSIC verified is requested for a GSM cell the UE shall only report measurement quantities for that GSM cell with a BSIC "verified" according to section 8.4.2.5.2. If BSIC verification is not required for the reporting of a GSM cell the UE shall report measurement quantities for that GSM cell irrespectively if the BSIC has been verified or not verified according to section 8.4.2.5.2.~~

In section 8.4.2.1 the split of measurements between different modes and systems is defined. Every second measurement occasion scheduled for GSM measurements, as given by 8.4.2.1 shall be allocated for GSM initial BSIC identification.

The remaining measurements occasions scheduled for GSM measurements shall be used as follows. 3 occasions out of 4 shall be allocated for GSM carrier RSSI measurements and 1 out of 4 shall be allocated for GSM BSIC reconfirmation. The scheduling of measurement occasions between GSM carrier RSSI measurements and GSM BSIC reconfirmation is up to the UE.

If the UE does not need measurement occasions to perform GSM measurements, the requirements in GSM 05.08 shall apply.

8.4.2.5.1 GSM carrier RSSI

A UE supporting GSM measurements using measurement occasions shall meet the minimum number of GSM carrier RSSI measurements specified in Table 8.11. This measurement shall be based on measurement occasions allocated for GSM carrier RSSI measurements as described in 8.4.2.5. In the CELL_FACH state the measurement period for the GSM carrier RSSI measurement is 480 ms.

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 05.08, when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

Table 8.11

Length of measurement occasion (frames)	Number of GSM carrier RSSI samples in each measurement occasion, $N_{\text{GSM carrier RSSI}}$
1	16
2	32
4	64
8	128

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods. ~~This means that, in this particular case, the L1 reporting period to higher layers of a GSM neighbour can be a multiple of the measurement period.~~

8.4.2.5.2 BSIC verification

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

Initial BSIC identification

Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the FDD and GSM cell. The UE shall trigger the initial BSIC identification within 50% of the available measurement occasions used for GSM measurements as specified in 8.4.2.1. The requirements for Initial BSIC identification can be found in 8.4.2.5.2.1.

BSIC re-confirmation

Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement occasions used for GSM as specified in 8.4.2.1. The requirements for BSIC re-confirmation can be found in 8.4.2.5.2.2.

The BSIC of a GSM cell is considered to be "verified" if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification) and from that moment the BSIC shall be re-confirmed at least once every 6 times $T_{\text{re-confirm_GSM}}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified".

$T_{\text{re-confirm_GSM}}$ indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure according to section 8.4.2.5.2.2.

The UE shall be able to decode a BSIC within a measurement occasion when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the measurement occasion is within the limits specified in table 8.12.

Table 8.12: The measurement occasion length and maximum time difference for BSIC verification

Measurement occasion length [frames]	Maximum time difference [μ s]
1	± 4100
2	± 9100
4	± 19100
8	± 39100

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 05.05.

8.4.2.5.2.1 Initial BSIC identification

This measurement shall be based on the measurement occasions allocated for Initial BSIC identification as described in 8.4.2.5.

The UE shall continuously attempt to decode the BSIC of SCH on the BCCH carrier of the 6 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value.

When the UE attempts to decode the BSIC of one GSM BCCH carrier with unknown BSIC, the UE shall use all available measurements occasions allocated for GSM initial BSIC identification according section 8.4.2.5 to attempt to decode the BSIC from that GSM BCCH carrier.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{\text{identify, GSM}}$ ms, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 6 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

$T_{\text{identify, GSM}}$ is given for the combinations of T_{meas} and N_{TTI} that are given in table 8.13. The values given in table 8.13 represent the number of patterns required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Table 8.13: The worst-case time for identification of one previously not identified GSM cell

T_{meas} (ms)	$N_{\text{TTI}}=1$ frame $T_{\text{identify, GSM}}(\text{ms})$	$N_{\text{TTI}}=2$ frames $T_{\text{identify, GSM}}(\text{ms})$	$N_{\text{TTI}}=4$ frames $T_{\text{identify, GSM}}(\text{ms})$	$N_{\text{TTI}}=8$ frames $T_{\text{identify, GSM}}(\text{ms})$
20	1040	-	-	-
40	1600	800	-	-
60	2880	-	-	-
80	2880	1280	640	-
120	5280	2640	-	-
160	7680	2880	1280	640
240	29760	5280	1920	-
320	14080	6400	2560	1280
480	34560	12480	3840	1920
640	34560	12800	5120	2560
960		24960	5760	2840
1280		20480	10240	5120
1920			15360	5680
2560				10240
3840				15360

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.

$T_{re-confirm_GSM}$ 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 $T_{re-confirm_GSM}$ 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 $T_{re-confirm,GSM}$ (ms)	$N_{TTI}=2$ frames $T_{re-confirm,GSM}$ (ms)	$N_{TTI}=4$ frames $T_{re-confirm,GSM}$ (ms)	$N_{TTI}=8$ frames $T_{re-confirm,GSM}$ (ms)
20	800	-	-	-
40	1360	640	-	-
60	2640	-	-	-
80	2880	1280	1280	-
120	5040	2400	-	-
160	6400	2880	2560	2560
240	17280	4800	3840	-
320	10880	6400	5120	5120
480	22080	9600	7680	7680
640	26880	12800	10240	10240
960		17280	15360	15360
1280		20480	20480	20480
1920			30720	30720
2560				40960
3840				61440

8.5 Capabilities for Support of Event Triggering and Reporting Criteria in CELL_FACH state

8.5.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria.

8.5.2 Requirements

In this section reporting criteria can be either event triggered reporting criteria or periodic reporting criteria.

Table 8.11: Requirements for reporting criteria per measurement category

Measurement category	E_{cat}	Note
Traffic volume measurements	1	

CHANGE REQUEST

⌘ 25.133 CR 176 ⌘ ev r1 ⌘ Current version: 3.6.0 ⌘

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

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

Title:	⌘ Cell reselection test cases in CELL_FACH state		
Source:	⌘ RAN WG4		
Work item code:	⌘	Date:	⌘ 07-09-2001
Category:	⌘ F	Release:	⌘ Rel99
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)		2 (GSM Phase 2)
	A (corresponds to a correction in an earlier release)		R96 (Release 1996)
	B (addition of feature),		R97 (Release 1997)
	C (functional modification of feature)		R98 (Release 1998)
	D (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		REL-4 (Release 4)
			REL-5 (Release 5)

Reason for change:	⌘	<ul style="list-style-type: none"> - In the test case A.5.5.1 the UE should detect the neighbour cell1 already during T1 (T1>800 ms). This means that the UE should be able to find out within one measurement period (200 ms) that the cell1 is better than cell2. - In the test case A.5.5.2 the UE should detect the neighbour cell1 already during T1 (T1>7.12 s) and therefore the UE should be able to find out within T_{measurement inter} (480 ms in this case) that the cell1 is better than cell2. - The rate of correct cell reselection is not given either in the test case or in the start of Annex A. Section A.2.1 only says that a success rate of 90% is typically used.
Summary of change:	⌘	<ul style="list-style-type: none"> - The cell reselection delay requirement is corrected in the test case A5.5.1. - The cell reselection delay requirement is corrected in the test case A5.5.2. - The rate of correct cell reselections is included
Consequences if not approved:	⌘	<ul style="list-style-type: none"> - The test cases are not aligned with the general performance requirements. - The success rate of the test is derived based on the general requirements of TS25.133. If it is missing, it may cause confusion when T1 RF creates their test cases based on TS25.133

Clauses affected:	⌘	5.5.1.2 and 5.5.2.2	
Other specs affected:	⌘	<input type="checkbox"/> Other core specifications <input checked="" type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘ TS34.121
Other comments:	⌘		

A.5.5 Cell Re-selection in CELL_FACH

A.5.5.1 One frequency present in neighbour list

A.5.5.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_FACH state in the single carrier case reported in section 5.5.2.1.1.

The test parameters are given in Table A.5.1 and A.5.2. The UE is requested to monitor neighbouring cells on 1 carrier. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms

Table A.5.1 General test parameters for Cell Re-selection in CELL_FACH

	Parameter	Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3, Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
	Access Service Class (ASC#0) – Persistence value	-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
	T1	s	15	
	T2	s	15	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.1A and Table A.5.1B.

Table A.5.1A: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	60
Channel symbol rate	ksps	30
Slot Format #l	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.1B: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	$\frac{1}{2}$
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Fixed

Table A.5.2 Cell specific test parameters for Cell Re-selection in CELL_FACH

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
S-CCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
OCNS_Ec/Ior	dB	-1.295		-1.295		-1.295		-1.295		-1.295		-1.295	
\hat{I}_{or}/I_{oc}	dB	7.3	10.27	10.27	7.3	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
I_{oc}	dBm/3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-23	-23	-23	-23	-23	-23	-23	-23
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH E _c /N ₀		CPICH E _c /N ₀		CPICH E _c /N ₀		CPICH E _c /N ₀		CPICH E _c /N ₀		CPICH E _c /N ₀	
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_RACH	dBm	21		21		21		21		21		21	
Qoffset 2 _{s, n}	dB	C1, C2: 0 C1, C3: 0 C1, C4: 0 C1, C5: 0 C1, C6: 0		C2, C1: 0 C2, C3: 0 C2, C4: 0 C2, C5: 0 C2, C6: 0		C3, C1: 0 C3, C2: 0 C3, C4: 0 C3, C5: 0 C3, C6: 0		C4, C1: 0 C4, C2: 0 C4, C3: 0 C4, C5: 0 C4, C6: 0		C5, C1: 0 C5, C2: 0 C5, C3: 0 C5, C4: 0 C5, C6: 0		C6, C1: 0 C6, C2: 0 C6, C3: 0 C6, C4: 0 C6, C5: 0	
Qhyst	dB	0		0		0		0		0		0	
PENALTY_TIME	s	0		0		0		0		0		0	
TEMPORARY_OFF SET	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch IE "FACH Measurement occasion info"	dB	not sent		not sent		not sent		not sent		not sent		not sent	
		not sent		not sent		not sent		not sent		not sent		not sent	

A.5.5.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the the CELL UPDATE message with cause value “cell reselection” in Cell 1.

The cell re-selection delay shall be less than 1.62.5 s.

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

NOTE: The cell re-selection delay in this case is expressed as:
$$T_{\text{reselection, intra}} = T_{\text{identify, intra}} + T_{\text{SI}} + T_{\text{reselection, intra}} = T_{\text{Measurement_Period Intra}} + T_{\text{SI}} + T_{\text{RA}} \text{ ms,}$$

where:

$T_{\text{Measurement_Period Intra}}$ $T_{\text{identify, intra}}$ is specified in 8.4.2.2.24 as 2800 ms in this case.

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

T_{RA} : T_{RA} is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore T_{RA} in this test case is 40 ms.

This gives a total of 1.522.08 s, allow 1.62.5 s in the test case.

A.5.5.2 Two frequencies present in the neighbour list

A.5.5.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_FACH state in section 5.5.2.1.2.

The test parameters are given in tables A5.3 and A5.4. The UE is requested to monitor neighbouring cells on 2 carriers. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms.

Table A.5.3: General test parameters for Cell Re-selection in CELL_FACH

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3, Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
Access Service Class (ASC#0) – Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.3A and Table A.5.3B.

Table A.5.3A: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	60
Channel symbol rate	ksps	30
Slot Format #l	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.3B: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	1/2
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Fixed

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

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
S-CCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
OCNS_Ec/Ior	dB	-1.295		-1.295		-1.295		-1.295		-1.295		-1.295	
\hat{I}_{or}/I_{oc}	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
I_{oc}	dBm/3.8 4 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH E _c /N ₀		CPICH E _c /N ₀		CPICH E _c /N ₀		CPICH E _c /N ₀		CPICH E _c /N ₀		CPICH E _c /N ₀	
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_RACH	dBm	21		21		21		21		21		21	
Qoffset2 _{s, n}	dB	C1, C2: 0 C1, C3: 0 C1, C4: 0 C1, C5: 0 C1, C6: 0	C2, C1: 0 C2, C3: 0 C2, C4: 0 C2, C5: 0 C2, C6: 0	C3, C1: 0 C3, C2: 0 C3, C4: 0 C3, C5: 0 C3, C6: 0	C4, C1: 0 C4, C2: 0 C4, C3: 0 C4, C5: 0 C4, C6: 0	C5, C1: 0 C5, C2: 0 C5, C3: 0 C5, C4: 0 C5, C6: 0	C6, C1: 0 C6, C2: 0 C6, C3: 0 C6, C4: 0 C6, C5: 0						
Qhyst2	dB	0		0		0		0		0		0	
PENALTY_TIME	s	0		0		0		0		0		0	
TEMP_OFFSET	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	
Sintersearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	
IE "FACH Measurement occasion info"		sent		sent		sent		sent		sent		sent	

FACH Measurement occasion cycle length coefficient		3	3	3	3	3	3
Inter-frequency FDD measurement indicator		TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Inter-frequency TDD measurement indicator		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE

A.5.5.2.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the the CELL UPDATE message with cause value “cell reselection” in Cell 1.

The cell re-selection delay shall be less than 2.29 s.

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

NOTE: The cell re-selection delay in this case is expressed as: $T_{\text{reselection, inter}} = T_{\text{identify, inter}} + T_{\text{SI}} + T_{\text{reselection, inter}} = T_{\text{measurement inter}} + T_{\text{SI}} + T_{\text{RA}}$ ms,

where:

$T_{\text{measurement inter}}$ ~~$T_{\text{identify, inter}}$~~ is specified in 8.4.2.3.24 as 4807.12 ms in this case.:

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

T_{RA} : T_{RA} is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore T_{RA} in this test case is 40 ms.

This gives a total of 2.168.4 s, allow 2.29 s in the test case.

CHANGE REQUEST

⌘ 25.133 CR 177 ⌘ ev ⌘ Current version: 4.1.0 ⌘

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

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

Title:	⌘ Cell reselection test cases in CELL_FACH state		
Source:	⌘ RAN WG4		
Work item code:	⌘	Date:	⌘ 07-09-2001
Category:	⌘ A	Release:	⌘ Rel-4
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)		2 (GSM Phase 2)
	A (corresponds to a correction in an earlier release)		R96 (Release 1996)
	B (addition of feature),		R97 (Release 1997)
	C (functional modification of feature)		R98 (Release 1998)
	D (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		REL-4 (Release 4)
			REL-5 (Release 5)

Reason for change:	⌘	<ul style="list-style-type: none"> - In the test case A.5.5.1 the UE should detect the neighbour cell1 already during T1 (T1>800 ms). This means that the UE should be able to find out within one measurement period (200 ms) that the cell1 is better than cell2. - In the test case A.5.5.2 the UE should detect the neighbour cell1 already during T1 (T1>7.12 s) and therefore the UE should be able to find out within T_{measurement inter} (480 ms in this case) that the cell1 is better than cell2. - The rate of correct cell reselection is not given either in the test case or in the start of Annex A. Section A.2.1 only says that a success rate of 90% is typically used.
Summary of change:	⌘	<ul style="list-style-type: none"> - The cell reselection delay requirement is corrected in the test case A5.5.1. - The cell reselection delay requirement is corrected in the test case A5.5.2. - The rate of correct cell reselections is included
Consequences if not approved:	⌘	<ul style="list-style-type: none"> - The test cases are not aligned with the general performance requirements. - The success rate of the test is derived based on the general requirements of TS25.133. If it is missing, it may cause confusion when T1 RF creates their test cases based on TS25.133

Clauses affected:	⌘	5.5.1.2 and 5.5.2.2	
Other specs affected:	⌘	<input type="checkbox"/> Other core specifications <input checked="" type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘ TS34.121
Other comments:	⌘		

A.5.5 Cell Re-selection in CELL_FACH

A.5.5.1 One frequency present in neighbour list

A.5.5.1.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_FACH state in the single carrier case reported in section 5.5.2.1.1.

The test parameters are given in Table A.5.1 and A.5.2. The UE is requested to monitor neighbouring cells on 1 carrier. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms

Table A.5.1 General test parameters for Cell Re-selection in CELL_FACH

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3, Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
Access Service Class (ASC#0) – Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.1A and Table A.5.1B.

Table A.5.1A: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	60
Channel symbol rate	ksps	30
Slot Format #	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.1B: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	1/2
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Fixed

Table A.5.2 Cell specific test parameters for Cell Re-selection in CELL_FACH

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
CPICH Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
S-CCPCH Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
OCNS Ec/Ior	dB	-1.295		-1.295		-1.295		-1.295		-1.295		-1.295	
\hat{I}_{or}/I_{oc}	dB	7.3	10.27	10.27	7.3	0.27		0.27		0.27		0.27	
I_{oc}	dBm/3.84 MHz	-70											
CPICH Ec/Io	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH Ec/N0		CPICH Ec/N0		CPICH Ec/N0		CPICH Ec/N0		CPICH Ec/N0		CPICH Ec/N0	
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_RACH	dBm	21		21		21		21		21		21	
Qoffset 2s, n	dB	C1, C2: 0 C1, C3: 0 C1, C4: 0 C1, C5: 0 C1, C6: 0	C2, C1: 0 C2, C3: 0 C2, C4: 0 C2, C5: 0 C2, C6: 0	C3, C1: 0 C3, C2: 0 C3, C4: 0 C3, C5: 0 C3, C6: 0	C4, C1: 0 C4, C2: 0 C4, C3: 0 C4, C5: 0 C4, C6: 0	C5, C1: 0 C5, C2: 0 C5, C3: 0 C5, C4: 0 C5, C6: 0	C6, C1: 0 C6, C2: 0 C6, C3: 0 C6, C4: 0 C6, C5: 0						
Qhyst	dB	0		0		0		0		0		0	
PENALTY_TIME	s	0		0		0		0		0		0	
TEMPORARY_OFF SET	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch IE "FACH Measurement occasion info"	dB	not sent		not sent		not sent		not sent		not sent		not sent	

A.5.5.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the the CELL UPDATE message with cause value "cell reselection" in Cell 1.

The cell re-selection delay shall be less than 1.62-5 s.

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

NOTE: The cell re-selection delay in this case is expressed as:

$$T_{\text{reselection, intra}} = T_{\text{identify, intra}} + T_{\text{SI}} - T_{\text{reselection, intra}} = T_{\text{Measurement_Period Intra}} + T_{\text{SI}} + T_{\text{RA}} \text{ ms,}$$

where:

$T_{\text{Measurement_Period Intra}}$ $T_{\text{identify, intra}}$ is specified in 8.4.2.2.24 as 2800 ms in this case.

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

T_{RA} : T_{RA} is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore T_{RA} in this test case is 40 ms.

This gives a total of ~~1.522-08~~ s, allow ~~1.62-5~~ s in the test case.

A.5.5.2 Two frequencies present in the neighbour list

A.5.5.2.1 Test Purpose and Environment

The purpose of this test is to verify the requirement for the cell re-selection delay in CELL_FACH state in section 5.5.2.1.2.

The test parameters are given in tables A5.3 and A5.4. The UE is requested to monitor neighbouring cells on 2 carriers. The maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell shall be 1280 ms.

Table A.5.3: General test parameters for Cell Re-selection in CELL_FACH

Parameter		Unit	Value	Comment
initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3, Cell4, Cell5, Cell6	
final condition	Active cell		Cell1	
Access Service Class (ASC#0) – Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

The transport and physical parameters of the S-CCPCH carrying the FACH are defined in Table A.5.3A and Table A.5.3B.

Table A.5.3A: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	kbps	60
Channel symbol rate	ksps	30
Slot Format #1	-	4
TFCI	-	OFF
Power offsets of TFCI and Pilot fields relative to data field	dB	0

Table A.5.3B: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	10 ms
Type of Error Protection	Convolution Coding
Coding Rate	$\frac{1}{2}$
Rate Matching attribute	256
Size of CRC	16
Position of TrCH in radio frame	Fixed

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

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
S-CCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
OCNS_Ec/Ior	dB	-1.295		-1.295		-1.295		-1.295		-1.295		-1.295	
\hat{I}_{or}/I_{oc}	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
I_{oc}	dBm/3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH E _c /N ₀		CPICH E _c /N ₀		CPICH E _c /N ₀		CPICH E _c /N ₀		CPICH E _c /N ₀		CPICH E _c /N ₀	
Qqualmin	dB	-20		-20		-20		-20		-20		-20	
Qrxlevmin	dBm	-115		-115		-115		-115		-115		-115	
UE_TXPWR_MAX_RACH	dBm	21		21		21		21		21		21	
Qoffset2 _{s, n}	dB	C1, C2: 0 C1, C3: 0 C1, C4: 0 C1, C5: 0 C1, C6: 0		C2, C1: 0 C2, C3: 0 C2, C4: 0 C2, C5: 0 C2, C6: 0		C3, C1: 0 C3, C2: 0 C3, C4: 0 C3, C5: 0 C3, C6: 0		C4, C1: 0 C4, C2: 0 C4, C3: 0 C4, C5: 0 C4, C6: 0		C5, C1: 0 C5, C2: 0 C5, C3: 0 C5, C4: 0 C5, C6: 0		C6, C1: 0 C6, C2: 0 C6, C3: 0 C6, C4: 0 C6, C5: 0	
Qhyst2	dB	0		0		0		0		0		0	
PENALTY_TIME	s	0		0		0		0		0		0	
TEMP_OFFSET	dB	0		0		0		0		0		0	
Treselection	s	0		0		0		0		0		0	
Sintrasearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	
Sintersearch	dB	not sent		not sent		not sent		not sent		not sent		not sent	
IE "FACH Measurement occasion info"		sent		sent		sent		sent		sent		sent	
FACH Measurement occasion cycle length coefficient		3		3		3		3		3		3	
Inter-frequency FDD measurement indicator		TRUE		TRUE		TRUE		TRUE		TRUE		TRUE	
Inter-frequency TDD measurement indicator		FALSE		FALSE		FALSE		FALSE		FALSE		FALSE	

A.5.5.2.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the the CELL UPDATE message with cause value "cell reselection" in Cell 1.

The cell re-selection delay shall be less than [2.29](#) s.

[The rate of correct cell reselections observed during repeated tests shall be at least 90%.](#)

NOTE: The cell re-selection delay [in this](#) is expressed as:

$$T_{\text{reselection, inter}} = T_{\text{identify, inter}} + T_{\text{SI}} \quad T_{\text{reselection, inter}} = T_{\text{measurement inter}} + T_{\text{SI}} + T_{\text{RA}} \text{ ms,}$$

where:

[T_{measurement inter}](#) ~~T_{identify, inter}~~ is specified in 8.4.2.3.21 as ~~4807.42~~ [ms](#) in this case..

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

[T_{RA}: T_{RA} is a delay is caused by the physical random access procedure described in TS 25.214 section 6.1. A persistence value is assumed to be 1 in this test case and therefore T_{RA} in this test case is 40 ms.](#)

This gives a total of ~~2.168.4~~ [s](#), allow ~~2.29~~ [s](#) in the test case.

<i>CR-Form-v4</i>	
CHANGE REQUEST	
⌘	25.133 CR 178
⌘	ev -
⌘	Current version: 3.6.0

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

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

Title:	⌘ Correction for FDD to TDD HO requirement
Source:	⌘ RAN WG4
Work item code:	⌘
Date:	⌘ 2001-05-21
Category:	⌘ F
	Use <u>one</u> of the following categories:
	F (correction)
	A (corresponds to a correction in an earlier release)
	B (addition of feature),
	C (functional modification of feature)
	D (editorial modification)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .
Release:	⌘ Rel99
	Use <u>one</u> of the following releases:
	2 (GSM Phase 2)
	R96 (Release 1996)
	R97 (Release 1997)
	R98 (Release 1998)
	R99 (Release 1999)
	REL-4 (Release 4)
	REL-5 (Release 5)

Reason for change:	⌘ Currently the SFN decoding is not taken into account in the HO interruption times in cases where this is necessary for FDD/TDD HO. Clarification of the wording.
Summary of change:	⌘ SFN decoding is taken into account FDD to TDD HO interruption time.
Consequences if not approved:	⌘ Incorrect requirement for HO interruption time.

Clauses affected:	⌘ 5.3
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications
	<input type="checkbox"/> Test specifications
	<input type="checkbox"/> O&M Specifications
Other comments:	⌘

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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.

5.3 FDD/TDD Handover

5.3.1 Introduction

The purpose of FDD/TDD hard handover is to change the mode between FDD and TDD. The handover procedure is initiated from UTRAN with a RRC message that implies a hard handover, refer to TS25.331. Compressed mode according to the UE Capability may be used to be able to make any measurements on the other mode.

5.3.2 Requirements

These requirements shall apply only to FDD/TDD UE.

5.3.2.1 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 $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.3.2.2.

5.3.2.2 Interruption time

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old DPDCH and the time the UE starts transmission of the new uplink DPCH. The interruption time shall be less than the value in table 5-3. There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell needs to be decoded by the UE during the interruption time or not. The definition of known cell is specified in section 5.1.2.2.

In this interruption requirement a cell is known if:

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

Table 5.1: FDD/TDD interruption time

cell present in the handover command message	Interruption time [ms]		
	Known cell		Unknown cell
	<u>SFN not to be decoded</u>	<u>SFN needs to be decoded</u>	<u>SFN needs to be decoded</u>
1	[100]	[130]	[400 350]

The interruption time includes the time that can elapse till the appearance of the channel required for the synchronisation, which can be up to one frame (10ms). And the time that can elapse till the appearance of the slot in which the new uplink DPCH shall be transmitted, which can be up to one frame (10ms).

The requirement in Table 5.1 for the unknown cell shall apply if the signal quality of the unknown cell is good enough for successful synchronisation with one attempt.

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

Edinburgh, Great Britain, 3rd - 7th September 2001

CR-Form-v4

CHANGE REQUEST⌘ **25.133 CR 179** ⌘ ev **-** ⌘ Current version: **4.1.0** ⌘For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.Proposed change affects: ⌘ (U)SIM ME/UE Radio Access Network Core Network

Title:	⌘ Correction for FDD to TDD HO requirement		
Source:	⌘ RAN WG4		
Work item code:	⌘	Date:	⌘ 2001-05-21
Category:	⌘ A	Release:	⌘ Rel-4
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	2	(GSM Phase 2)
	A (corresponds to a correction in an earlier release)	R96	(Release 1996)
	B (addition of feature),	R97	(Release 1997)
	C (functional modification of feature)	R98	(Release 1998)
	D (editorial modification)	R99	(Release 1999)
	Detailed explanations of the above categories can be found in 3GPP IR 21.900 .		REL-4 (Release 4)
			REL-5 (Release 5)

Reason for change:	⌘ Corresponding REL-4 CR to document R4-010883. Currently the SFN decoding is not taken into account in the HO interruption times in cases where this is necessary for FDD/TDD HO. Clarification of the wording.
Summary of change:	⌘ SFN decoding is taken into account for FDD to TDD HO interruption time.
Consequences if not approved:	⌘ Incorrect requirement for HO interruption time.

Clauses affected:	⌘ 5.3
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/>
	<input type="checkbox"/> Test specifications
	<input type="checkbox"/> O&M Specifications
Other comments:	⌘

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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.

5.3 FDD/TDD Handover

5.3.1 Introduction

The purpose of FDD/TDD hard handover is to change the mode between FDD and TDD. The handover procedure is initiated from UTRAN with a RRC message that implies a hard handover, refer to TS25.331. Compressed mode according to the UE Capability may be used to be able to make any measurements on the other mode.

5.3.2 Requirements

These requirements shall apply only to FDD/TDD UE.

5.3.2.1 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 $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH at the designated activation time.

where:

$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.3.2.2.

5.3.2.2 Interruption time

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old DPDCH and the time the UE starts transmission of the new uplink DPCH. The interruption time shall be less than the value in table 5-3. There is different requirement on the interruption time depending on if the cell is known or not and if the SFN of the target cell needs to be decoded by the UE during the interruption time or not. The definition of known cell is specified in section 5.1.2.2.

In this interruption requirement a cell is known if:

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

Table 5.1: FDD/TDD interruption time

cell present in the handover command message	Interruption time [ms]		
	Known cell		Unknown cell
	<u>SFN not to be decoded</u>	<u>SFN needs to be decoded</u>	<u>SFN needs to be decoded</u>
1	[100]	[130]	[400 350]

The interruption time includes the time that can elapse till the appearance of the channel required for the synchronisation, which can be up to one frame (10ms). And the time that can elapse till the appearance of the slot in which the new uplink DPCH shall be transmitted, which can be up to one frame (10ms).

The requirement in Table 5.1 for the unknown cell shall apply if the signal quality of the unknown cell is good enough for successful synchronisation with one attempt.

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

CR-Form-v4	
CHANGE REQUEST	
⌘ 25.133 CR 180 ⌘ ev - ⌘ Current version: 3.6.0 ⌘	

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

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

Title:	⌘ Correction of UE positioning measurements		
Source:	⌘ RAN WG4		
Work item code:	⌘	Date:	⌘ 2001-08-21
Category:	⌘ F	Release:	⌘ Rel99
	<i>Use <u>one</u> of the following categories:</i> 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 .		<i>Use <u>one</u> of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ At WG4#17 R4-010777 was approved and later the CR was approved at RAN#12. In 25.133 version 3.6.0 the name LCS has not been replaced with UE positioning according to R4-010777.
Summary of change:	⌘ Aligning section 9.1.12 with the CR in R4-010777, i.e. replacing the name LCS with UE positioning.
Consequences if not approved:	⌘ Inconsistency will still exist in 25.133 section 9.1.12.

Clauses affected:	⌘ 9.1.12		
Other specs affected:	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	
Other comments:	⌘		

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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.

9.1.12 UE GPS Timing of Cell Frames for UE positioningLCS

The requirements in this section are valid for terminals supporting this capability:

Table 9.33

Parameter	Unit	Accuracy [chip]	Conditions
UE GPS Timing of Cell Frames for <u>UE positioning</u> LCS	chip	[]	

9.1.12.1 UE GPS timing of Cell Frames for UE positioning measurement report mapping

The reporting range is for UE GPS timing of Cell Frames for UE positioning is from 0 ... 2319360000000 chip.

In table 9.34 the mapping of measured quantity is defined.

Table 9.34

Reported value	Measured quantity value	Unit
GPS_TIME_0000000000000000	UE GPS timing of Cell Frames for UE positioning < 0.0625	chip
GPS_TIME_0000000000000001	$0.0625 \leq$ UE GPS timing of Cell Frames for UE positioning < 0.1250	chip
GPS_TIME_0000000000000002	$0.1250 \leq$ UE GPS timing of Cell Frames for UE positioning < 0.1875	chip
...
GPS_TIME_371097599999997	$2319359999999.8125 \leq$ UE GPS timing of Cell Frames for UE positioning < 2319359999999.8750	chip
GPS_TIME_371097599999998	$2319359999999.8750 \leq$ UE GPS timing of Cell Frames for UE positioning < 2319359999999.9375	chip
GPS_TIME_371097599999999	$2319359999999.9375 \leq$ UE GPS timing of Cell Frames for UE positioning < 2319360000000.0000	chip

CHANGE REQUEST

⌘ 25.133 CR 185 ⌘ ev - ⌘ Current version: 3.6.0 ⌘

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

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

Title:	⌘ TFC State Change Description		
Source:	⌘ RAN WG4		
Work item code:	⌘	Date:	⌘ 2001-09-05
Category:	⌘ F Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .	Release:	⌘ R99 Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ Inconsistency between TS 25.321 and TS 25.133 regarding UE TFC selection
Summary of change:	⌘ - Introduction of the concept of TFC states in line with 25.321 CR 092r2. - Description of Blocking as an additional criterion. Clarification that blocking was dependent on the TFC remaining unsupported for the entire Tblock period. - Functionality linked with Recovery & Elimination criterion described together. - Aligned the wording on all the sections describing state transition criteria.
Consequences if not approved:	⌘ The inconsistency between 25.321 and 25.133 regarding UE TFC selection requirement would remain.

Clauses affected:	⌘
Other specs affected:	⌘ <input checked="" type="checkbox"/> Other core specifications ⌘ 25.321 <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications
Other comments:	⌘

How to create CRs using this form:

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6.4 Transport format combination selection in UE

6.4.1 Introduction

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

6.4.2 Requirements

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

The UE shall consider the *Elimination Limited TFC Set* criterion for a given TFC to be fulfilled -if the estimated UE transmit power ~~needed of a certain for this~~ TFC ~~has been evaluated as is~~ greater than the Maximum UE transmitter power for at least X out of Y successive measurement periods, ~~out of Y successive measurement periods. If the Limited TFC Set criterion for a TFC is fulfilled, the MAC in the UE shall consider that the TFC is in Excess-Power state for the purpose of TFC selection. cannot be supported in TFC selection.~~

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within [15 ms] from the moment the *Elimination Limited TFC Set* criterion ~~has been was~~ fulfilled.

~~The UE shall consider the Recovery criterion for a given TFC to be fulfilled if the estimated UE transmit power needed for this TFC has not been greater than the Maximum UE transmitter power for at least Y successive measurement periods. The MAC in the UE shall consider that the TFC is in Supported state for the purpose of TFC selection.~~

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

~~The UE shall consider the Blocking criterion for a given TFC to be fulfilled at the latest at the start of the longest uplink TTI after the moment at which the TFC will have been in Excess-Power state for a duration of $(T_{\text{notify}} + T_{\text{modify}} + T_{\text{L1_proc}})$.~~

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

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

where:

T_{notify} equals [15] ms, and

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

$T_{\text{L1_proc}}$ equals 15 ms, and

$T_{\text{adapt_max}}$ equals $\text{MAX}(T_{\text{adapt_1}}, T_{\text{adapt_2}}, \dots, T_{\text{adapt_N}})$, and

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

$T_{\text{adapt_n}}$ equals the time it takes for higher layers to provide data to MAC in a new supported bitrate, for logical channel n. Table 6.1 defines T_{adapt} times for different services. For services where no codec is used T_{adapt} shall be considered to be equal to 0 ms.

Table 6.1: T_{adapt}

Service	T [ms]
AMR	40

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

The Maximum UE transmitter power is defined as follows

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

where

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

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

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

~~It shall be considered that a TFC, which fulfilled the *Limited Recovered TFC Set* criterion can be supported for TFC selection. This TFC shall no longer be blocked, shall not be considered in the TFC selection until the *Recovered TFC Set* criterion has been fulfilled.~~

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

6.5 Maximum allowed UL TX Power

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

For each measurement period, the UE shall with the use of the UE transmitted power measurement, estimate if it has reached the Maximum allowed UL TX Power or not. With tolerances as defined for the UE transmitted power measurement accuracy (section 9.1.6.1), the UE output power shall not exceed the Maximum allowed UL TX Power, as set by the UTRAN.

CHANGE REQUEST

⌘ **25.133 CR 186** ⌘ ev **-** ⌘ Current version: **4.1.0** ⌘

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

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

Title:	⌘ TFC State Change Description		
Source:	⌘ RAN WG4		
Work item code:	⌘	Date:	⌘ 2001-09-05
Category:	⌘ A	Release:	⌘ REL-4
	<i>Use one of the following categories:</i> 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 .		<i>Use one of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ Inconsistency between TS 25.321 and TS 25.133 regarding UE TFC selection		
Summary of change:	⌘ - Introduction of the concept of TFC states in line with 25.321 CR 093. ⌘ - Description of Blocking as an additional criterion. Clarification that blocking was dependent on the TFC remaining unsupported for the entire Tblock period. ⌘ - Functionality linked with Recovery & Elimination criterion described together. ⌘ - Aligned the wording on all the sections describing state transition criteria.		
Consequences if not approved:	⌘ The inconsistency between 25.321 and 25.133 regarding UE TFC selection requirement would remain.		

Clauses affected:	⌘ 6.4, 6.5		
Other specs affected:	⌘ <input checked="" type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	25.321
Other comments:	⌘		

How to create CRs using this form:

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

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under [ftp://ftp.3gpp.org/specs/](http://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.

6.4 Transport format combination selection in UE

6.4.1 Introduction

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

6.4.2 Requirements

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

The UE shall consider the *Elimination Limited TFC Set* criterion for a given TFC to be fulfilled -if the estimated UE transmit power ~~needed of a certain for this~~ TFC ~~has been evaluated as is~~ greater than the Maximum UE transmitter power for at least X out of Y successive measurement periods, ~~out of Y successive measurement periods. If the Limited TFC Set criterion for a TFC is fulfilled, the MAC in the UE shall consider that the TFC is in Excess-Power state for the purpose of TFC selection. cannot be supported in TFC selection.~~

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within [15 ms] from the moment the *Elimination Limited TFC Set* criterion ~~has been was~~ fulfilled.

~~The UE shall consider the Recovery criterion for a given TFC to be fulfilled if the estimated UE transmit power needed for this TFC has not been greater than the Maximum UE transmitter power for at least Y successive measurement periods. The MAC in the UE shall consider that the TFC is in Supported state for the purpose of TFC selection.~~

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

~~The UE shall consider the Blocking criterion for a given TFC to be fulfilled at the latest at the start of the longest uplink TTI after the moment at which the TFC will have been in Excess-Power state for a duration of $(T_{\text{notify}} + T_{\text{modify}} + T_{\text{L1_proc}})$.~~

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

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

where:

T_{notify} equals [15] ms, and

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

$T_{\text{L1_proc}}$ equals 15 ms, and

$T_{\text{adapt_max}}$ equals $\text{MAX}(T_{\text{adapt_1}}, T_{\text{adapt_2}}, \dots, T_{\text{adapt_N}})$, and

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

$T_{\text{adapt_n}}$ equals the time it takes for higher layers to provide data to MAC in a new supported bitrate, for logical channel n. Table 6.1 defines T_{adapt} times for different services. For services where no codec is used T_{adapt} shall be considered to be equal to 0 ms.

Table 6.1: T_{adapt}

Service	T [ms]
AMR	40

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

The Maximum UE transmitter power is defined as follows

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

where

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

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

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

~~It shall be considered that a TFC, which fulfilled the *Limited Recovered TFC Set* criterion can be supported for TFC selection. This TFC shall no longer be blocked, shall not be considered in the TFC selection until the *Recovered TFC Set* criterion has been fulfilled.~~

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

6.5 Maximum allowed UL TX Power

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

For each measurement period, the UE shall with the use of the UE transmitted power measurement, estimate if it has reached the Maximum allowed UL TX Power or not. With tolerances as defined for the UE transmitted power measurement accuracy (section 9.1.6.1), the UE output power shall not exceed the Maximum allowed UL TX Power, as set by the UTRAN.