TSG RAN Meeting #16 **RP-020285**
Marco Island, FL, USA, 4 - 7 June 2002

Title **CRs (R'99 and Rel-4/Rel-5 Category A) to TS 25.133 (2)**
Source **TSG RAN WG4**
Agenda Item **7.4.3**

RAN4 Tdoc	Spec	Curr Ver	New Ver	CR	R	Cat	Ph	Title	Acronym
R4-020633	25.133	3.9.0	3.10.0	367	1	F	R99	FDD-GSM cell reselection test correction - scenario 1	TEI
R4-020606	25.133	4.4.0	4.5.0	368		A	Rel-4	FDD-GSM cell reselection test correction - scenario 1	TEI
R4-020607	25.133	5.2.0	5.3.0	369		A	Rel-5	FDD-GSM cell reselection test correction - scenario 1	TEI
R4-020997	25.133	3.9.0	3.10.0	389	1	F	R99	TFC selection	TEI
R4-020998	25.133	4.4.0	4.5.0	390	1	A	Rel-4	TFC selection	TEI
R4-020999	25.133	5.2.0	5.3.0	391	1	A	Rel-5	TFC selection	TEI
R4-021001	25.133	3.9.0	3.10.0	392	1	F	R99	GSM re-selection	TEI
R4-020797	25.133	4.4.0	4.5.0	393		A	Rel-4	GSM re-selection	TEI
R4-020798	25.133	5.2.0	5.3.0	394		A	Rel-5	GSM re-selection	TEI
R4-020840	25.133	3.9.0	3.10.0	401		F	R99	Corrections to FDD-TDD requirements and test cases	TEI
R4-020914	25.133	4.4.0	4.5.0	414		A	Rel-4	Corrections to FDD-TDD requirements and test cases	TEI
R4-020915	25.133	5.2.0	5.3.0	415		A	Rel-5	Corrections to FDD-TDD requirements and test cases	TEI
R4-021045	25.133	3.9.0	3.10.0	422	1	F	R99	Definition of out of service	TEI
R4-021046	25.133	4.4.0	4.5.0	423	1	A	Rel-4	Definition of out of service	TEI
R4-021047	25.133	5.2.0	5.3.0	424	1	A	Rel-5	Definition of out of service	TEI

3GPP TSG RAN WG4 Meeting #22 **R4-020633**

Sophia Antipolis, France 3rd - 5th April 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.133** **CR** **367** ⌘ ev **1** ⌘ Current version: **3.9.0** ⌘

*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:	⌘	FDD-GSM cell reselection test correction - scenario 1
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	5/4/2002
Category:	⌘	**F**
Release:	⌘	R99

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

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	No value is given for T1 and T2 for the FDD-GSM cell reselection test case scenario 1. The following is proposed 1- The UE should have the time to perform all necessary procedures in order to rank the FDD cell above the GSM cell during T1. 2- T2 should be larger than the test requirement (27.6s). Those values were already proposed and agreed in Tdoc R4-011215 presented at the RAN4 meeting #19 in Edinburgh.
Summary of change:	⌘	1- T1 is set to 45s. 2- T2 is set to 35s.
Consequences if not approved:	⌘	Test description is not completed. Isolated impact: This is a correction of the test case. No impact on implementation. No impact on requirement.

Clauses affected:	⌘	A4.3.1.1		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications ☐ O&M Specifications	⌘	34.121
Other comments:	⌘			

	Equivalent CRs in other Releases: CR368 cat. A to 25.133 v4.4.0, CR369 cat. A to 25.133 v5.2.0

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/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.

A.4.3 UTRAN to GSM Cell Re-Selection

A.4.3.1 Scenario 1

A.4.3.1.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell re-selection delay reported in section 4.2.

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 12 GSM cells. Test parameters are given in Table, A.4.5, A.4.6, A.4.7. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.5: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1.28	
T1		s	45	
T2		s	35	

Table A.4.6: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	0	-5
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-13	-16.2
CPICH_RSCP	dBm	-80	-85
Propagation Condition		AWGN	
Cell_selection_and_ reselection_quality_measure		CPICH E_c/N_0	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
$Qoffset1_{s,n}$	dB	C1, C2: 0	
Qhyst1	dB	0	
PENALTY_TIME	s	C2: 0	
TEMPORARY_OFFSET1	dB	C2: 0	
Treselection	s	0	
$Ssearch_{RAT}$	dB	not sent	

Table A.4.7: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90	-75

RXLEV_ACCESS_MIN	dBm	-104
MS_TXPWR_MAX_CCH	dBm	33

A.4.3.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

The cell re-selection delay shall be less than 26 s + $T_{BCCH,}$ where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell [21].

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

NOTE: The cell re-selection delay can be expressed as: 4* $T_{measureGSM}$ + T_{BCCH}, where:

$T_{measureGSM}$ See Table 4.1 in section 4.2.2.

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

This gives a total of 25.6 s + T_{BCCH}, allow 26 s + T_{BCCH} in the test case.

3GPP TSG RAN WG4 Meeting #22 **R4-020606**

Sophia Antipolis, France 3rd - 5th April 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.133 CR 368** ⌘ ev **-** ⌘ Current version: **4.4.0** ⌘

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

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

Title:	⌘	FDD-GSM cell reselection test correction - scenario 1
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	5/4/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

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

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	No value is given for T1 and T2 for the FDD-GSM cell reselection test case scenario 1. The following is proposed 1- The UE should have the time to perform all necessary procedures in order to rank the FDD cell above the GSM cell during T1. 2- T2 should be larger than the test requirement (27.6s). Those values were already proposed and agreed in Tdoc R4-011215 presented at the RAN4 meeting #19 in Edinburgh.
Summary of change:	⌘	1- T1 is set to 45s. 2- T2 is set to 35s.
Consequences if not approved:	⌘	Test description is not completed. Isolated impact: This is a correction of the test case. No impact on implementation. No impact on requirement.

Clauses affected:	⌘	A4.3.1.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

	Equivalent CRs in other Releases: CR367r1 cat. F to 25.133 v3.9.0, CR369 cat. A to 25.133 v5.2.0

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

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

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

A.4.3 UTRAN to GSM Cell Re-Selection

A.4.3.1 Scenario 1

A.4.3.1.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell re-selection delay reported in section 4.2.

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 12 GSM cells. Test parameters are given in Table, A.4.5, A.4.6, A.4.7. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.5: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1.28	
T1		s	45	
T2		s	35	

Table A.4.6: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	0	-5
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-13	-16.2
CPICH_RSCP	dBm	-80	-85
Propagation Condition		AWGN	
Cell_selection_and_ reselection_quality_measure		CPICH E_c/N_0	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
$Qoffset1_{s,n}$	dB	C1, C2: 0	
Qhyst1	dB	0	
PENALTY_TIME	s	C2: 0	
TEMPORARY_OFFSET1	dB	C2: 0	
Treselection	s	0	
$Ssearch_{RAT}$	dB	not sent	

Table A.4.7: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90	-75

RXLEV_ACCESS_MIN	dBm	-104
MS_TXPWR_MAX_CCH	dBm	33

A.4.3.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

The cell re-selection delay shall be less than 26 s + $T_{BCCH,}$ where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell [21].

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

NOTE: The cell re-selection delay can be expressed as: 4* $T_{measureGSM}$ + T_{BCCH}, where:

$T_{measureGSM}$ See Table 4.1 in section 4.2.2.

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

This gives a total of 25.6 s + T_{BCCH}, allow 26 s + T_{BCCH} in the test case.

3GPP TSG RAN WG4 Meeting #22 **R4-020607**

Sophia Antipolis, France 3rd - 5th April 2002

CR-Form-v4

CHANGE REQUEST

⌘ **25.133 CR 369** ⌘ ev **-** ⌘ Current version: **5.2.0** ⌘

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

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

Title:	⌘	FDD-GSM cell reselection test correction - scenario 1
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	5/4/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

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

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	No value is given for T1 and T2 for the FDD-GSM cell reselection test case scenario 1. The following is proposed 1- The UE should have the time to perform all necessary procedures in order to rank the FDD cell above the GSM cell during T1. 2- T2 should be larger than the test requirement (27.6s). Those values were already proposed and agreed in Tdoc R4-011215 presented at the RAN4 meeting #19 in Edinburgh.
Summary of change:	⌘	1- T1 is set to 45s. 2- T2 is set to 35s.
Consequences if not approved:	⌘	Test description is not completed. Isolated impact: This is a correction of the test case. No impact on implementation. No impact on requirement.

Clauses affected:	⌘	A4.3.1.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

	Equivalent CRs in other Releases: CR367r1 cat. F to 25.133 v3.9.0, CR368 cat. A to 25.133 v4.4.0

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

A.4.3 UTRAN to GSM Cell Re-Selection

A.4.3.1 Scenario 1

A.4.3.1.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell re-selection delay reported in section 4.2.

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 12 GSM cells. Test parameters are given in Table, A.4.5, A.4.6, A.4.7. Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.5: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
DRX cycle length		s	1.28	
T1		s	45	
T2		s	35	

Table A.4.6: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	0	-5
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-13	-16.2
CPICH_RSCP	dBm	-80	-85
Propagation Condition		AWGN	
Cell_selection_and_ reselection_quality_measure		CPICH E_c/N_0	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
UE_TXPWR_MAX_RACH	dBm	21	
$Qoffset1_{s,n}$	dB	C1, C2: 0	
Qhyst1	dB	0	
PENALTY_TIME	s	C2: 0	
TEMPORARY_OFFSET1	dB	C2: 0	
Treselection	s	0	
$Ssearch_{RAT}$	dB	not sent	

Table A.4.7: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90	-75

RXLEV_ACCESS_MIN	dBm	-104
MS_TXPWR_MAX_CCH	dBm	33

A.4.3.1.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

The cell re-selection delay shall be less than 26 s + $T_{BCCH,}$ where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell [21].

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

NOTE: The cell re-selection delay can be expressed as: 4* $T_{measureGSM}$ + T_{BCCH}, where:

$T_{measureGSM}$ See Table 4.1 in section 4.2.2.

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

This gives a total of 25.6 s + T_{BCCH}, allow 26 s + T_{BCCH} in the test case.

3GPP TSG RAN WG4 Meeting #23 **R4-020997**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.133** **CR** **389** ⌘ **rev** **1** ⌘ Current version: **3.9.0** ⌘

*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 selection
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	R99

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

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Today the TFC selection requirement is based on the set of parameters X and Y, (also Z should be included for how fast the blocking is released but in the specification it has the same value as Y) for which the values are not agreed. Thereby there are no finalised requirements in 25.133.
Summary of change:	⌘	Set the parameters (X,Y,Z) to (15,30,30) and finalise the testcase based on these parameters.
Consequences if not approved:	⌘	No TFC selection requirement is agreed and the testcase must be removed. **Isolated Impact:** Minor impact on the TFC selection procedure. The impact is minor since the structure on the requirement has been well known and before the change the values of X, Y and Z were not defined.

Clauses affected:	⌘	6.4, A.6.4		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications ☐ O&M Specifications	⌘	34.121
Other comments:	⌘	Equivalent CRs in other Releases: CR390r1 cat. A to 25.133 v4.4.0, CR391r1 cat. A to 25.133 v5.2.0		

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/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.

6.4 Transport format combination selection in UE

6.4.1 Introduction

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

6.4.2 Requirements

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

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

MAC in the UE shall indicate the available bit rate for each logical channel to upper layers within T_{notify} ~~[15 ms]~~ from the moment the *Elimination* criterion was ~~fulfilled~~detected.

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

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

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

The definitions of the parameters X,Y and Z which shall be used when evaluating the *Elimination* and the *Recovery* criteria when no compressed mode patterns are activated are given in Table 6.x

Table 6.x: X, Y, Z parameters for TFC selection

X	Y	Z
15	30	30

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

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

where:

T_{notify} equals ~~[~~15~~]~~ ms, and

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

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

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

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

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

Table 6.1: T_{adapt}

Service	T_{adapt} [ms]
UMTS AMR	40
UMTS AMR2	60

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

The Maximum UE transmitter power is defined as follows

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

where

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

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

-New Section ----

A.6.4 Transport format combination selection in UE

A.6.4.1 Test Purpose and Environment

The purpose is to verify the UE blocks (stops using) a currently used TFC when the UE output power is not sufficient to support that TFC. This test will verify the general requirement on TFC selection in section 6.4.

A.6.4.1.1 Interactive or Background, PS, UL: 64 kbps

The test will verify the general requirement on TFC selection in section 6.4 for a RAB intended for packet data services, i.e. Interactive or Background, PS, UL: 64kbps as defined in TS 34.108.

The test parameters are given in Table A.6.8 , A.6.9 and Table A.6.10 below. The test consists of 2 successive time periods, with a time duration of T1 and T2 respectively.

Details on the UL reference RAB in table A.6.8 and A.6.9 can be found in TS 34.108 section “Interactive or background / UL:64 DL: 64 kbps / PS RAB + UL:3.4 DL:3.4 kbps SRBs for DCCH”.

Table A.6.8: UL reference RAB, Interactive or Background

	TFI	64 kbps RAB (20ms TTI)	DCCH 3.4kbps (40ms TTI)
TFS	TF0, bits	0x336	0x148
	TF1, bits	1x336	1x148
	TF2, bits	2x336	N/A
	TF3, bits	3x336	N/A
	TF4, bits	4x336	N/A

Table A.6.9: UL TFCI

TFCI	(64 kbps RAB, DCCH)
UL_TFC0	(TF0, TF0)
UL_TFC1	(TF0, TF1)
UL_TFC2	(TF1, TF0)
UL_TFC3	(TF1, TF1)
UL_TFC4	(TF2, TF0)
UL_TFC5	(TF2, TF1)
UL_TFC6	(TF3, TF0)
UL_TFC7	(TF3, TF1)
UL_TFC8	(TF4, TF0)
UL_TFC9	(TF4, TF1)

Table A.6.10: General test parameters

Parameter	Unit	Value	Comment
TFCS size		10	
TFCS		UL_TFC0, UL_TFC1, UL_TFC2, UL_TFC3, UL_TFC4, UL_TFC5, UL_TFC6, UL_TFC7, UL_TFC8, UL_TFC9	
Power Control		On	
Active cell		Cell 1	
Maximum allowed UL TX power	dBm	21	
T1	s	30	
T2	s	10	
Propagation condition		AWGN	

~~The test shall be performed in AWGN channel propagation conditions.~~

The radio conditions in the test shall be sufficient, so that decoding of the TPC commands can be made without errors.

The amount of available user data shall be sufficient to allow uplink transmission at the highest bit rate (UL_TFC8 or UL_TFC9) during the entire test and it shall be ensured that the UE is using UL_TFC8 or UL_TFC9 at the end of T1.

The test shall be performed in the following way:

Before time period T1:

The allowed TFCS according to table A.6~~x~~.10~~z~~ shall be signalled to the UE.

During time period T1:

The system simulator shall ensure that the UE output power is commanded to be between 14 to 15 dB below the UE Maximum allowed UL TX power.

During time period T2:

The system simulator shall continously send TPC_cmd=1 to the UE from the beginning of T2 until the end of T2.

NOTE: This will emulate that UL_TFC8 to UL_TFC9 can not be supported beacuse the UE reaches the maximum UL Tx power and still UTRAN is sending power-up commands. The time from the beginning of T2 until the UE blocks (stops using) UL_TFC8 and UL_TFC9 shall be measured.

A.6.4.2 Test Requirements

A.6.4.2.1 Interactive or Background, PS, UL: 64 kbps

The UE shall have stopped using UL_TFC8 and UL_TFC9 within 140~~[TBD]~~ ms from beginning of time period T2.

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

NOTE: The delay from the begining of T2 can be expressed as: $T_{ramp} + T_{detect\_block} + T_{notify} + T_{modify} + T_{L1\_proc} + T_{align\_TTI}$, where:

T_{ramp}	Margin added for the increase of UE output power to the UE maximum power. A margin of 1 frame (10ms) is used, i.e. 15 TPC commands.
T_{detect_block}	The time needed to detect that UL_TFC8 and UL_TFC9 can no longer be supported, i.e. defines the maximum time to detect that the *Elimination*~~*Limited TFC Set*~~ criterion is fulfilled for UL_TFC8 and UL_TFC9. According to X and Y values of 15 and 30 as defined in Section 6.4.2 and by assuming the maximum misalignment between the frame boundary, where the evaluation of the *Elimination* criterion is performed and the last slot needed for triggering the *Elimination* criterion on L1, T_{detect_block} becomes 15 slots +14 slots =19.33 ms.~~This figure is currently TBD as X and Y in the general requirement, see section 6.4.2, are not finalised yet.~~
T_{notify}	Equal to ~~[~~15~~]~~ ms, the time allowed for MAC to indicate to higher layers that UL_TFC8 and UL_TFC9 can no longer be supported.
T_{modify}	Equal to MAX(T_{adapt_max},T_{TTI}) = MAX(0, 40)=40ms
T_{adapt_max}	Equals to 0ms for the case without codec.
T_{L1_proc}	Equals 15ms.
T_{align_TTI}	Align with the longest uplink TTI where the new TFC can be selected. The worst case equals 40ms in this test case.
T_{TTI}	See section 6.4.2. Equals 40 ms in the test case.

This gives a maximum delay of (10 + 19.33~~T~~$_{detect\_block}$ + ~~[~~15~~]~~ + 40 + 15 + 40) ms = 139.33 ms from the beginning of T2, allow 140 ms in the test case.

3GPP TSG RAN WG4 Meeting #23 **R4-020998**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.133** **CR** **390** ⌘ **rev** **1** ⌘ Current version: **4.4.0** ⌘

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

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

Title:	⌘	TFC selection
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Today the TFC selection requirement is based on the set of parameters X and Y, (also Z should be included for how fast the blocking is released but in the specification it has the same value as Y) for which the values are not agreed. Thereby there are no finalised requirements in 25.133.
Summary of change:	⌘	Set the parameters (X,Y,Z) to (15,30,30) and finalise the testcase based on these parameters.
Consequences if not approved:	⌘	No TFC selection requirement is agreed and the testcase must be removed.

Clauses affected:	⌘	6.4, A.6.4		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications ☐ O&M Specifications	⌘	34.121
Other comments:	⌘	Equivalent CRs in other Releases: CR389r1 cat. F to 25.133 v3.9.0, CR391r1 cat. A to 25.133 v5.2.0		

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/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.

6.4 Transport format combination selection in UE

6.4.1 Introduction

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

6.4.2 Requirements

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

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

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within T_{notify} ~~[15 ms]~~ from the moment the *Elimination* criterion was ~~fulfilled~~detected.

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

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

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

The definitions of the parameters X,Y and Z which shall be used when evaluating the *Elimination* and the *Recovery* criteria when no compressed mode patterns are activated are given in Table 6.x

Table 6.x: X, Y, Z parameters for TFC selection

X	Y	Z
15	30	30

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

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

where:

T_{notify} equals ~~[~~15~~]~~ ms, and

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

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

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

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

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

Table 6.1: T_{adapt}

Service	T_{adapt} [ms]
UMTS_AMR	40
UMTS_AMR2	60

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

The Maximum UE transmitter power is defined as follows

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

where

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

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

-New Section ----

A.6.4 Transport format combination selection in UE

A.6.4.1 Test Purpose and Environment

The purpose is to verify the UE blocks (stops using) a currently used TFC when the UE output power is not sufficient to support that TFC. This test will verify the general requirement on TFC selection in section 6.4.

A.6.4.1.1 Interactive or Background, PS, UL: 64 kbps

The test will verify the general requirement on TFC selection in section 6.4 for a RAB intended for packet data services, i.e. Interactive or Background, PS, UL: 64kbps as defined in TS 34.108.

The test parameters are given in Table A.6.8 , A.6.9 and Table A.6.10 below. The test consists of 2 successive time periods, with a time duration of T1 and T2 respectively.

Details on the UL reference RAB in table A.6.8 and A.6.9 can be found in TS 34.108 section “Interactive or background / UL:64 DL: 64 kbps / PS RAB + UL:3.4 DL:3.4 kbps SRBs for DCCH”.

Table A.6.8: UL reference RAB, Interactive or Background

	TFI	64 kbps RAB (20ms TTI)	DCCH 3.4kbps (40ms TTI)
TFS	TF0, bits	0x336	0x148
	TF1, bits	1x336	1x148
	TF2, bits	2x336	N/A
	TF3, bits	3x336	N/A
	TF4, bits	4x336	N/A

Table A.6.9: UL TFCI

TFCI	(64 kbps RAB, DCCH)
UL_TFC0	(TF0, TF0)
UL_TFC1	(TF0, TF1)
UL_TFC2	(TF1, TF0)
UL_TFC3	(TF1, TF1)
UL_TFC4	(TF2, TF0)
UL_TFC5	(TF2, TF1)
UL_TFC6	(TF3, TF0)
UL_TFC7	(TF3, TF1)
UL_TFC8	(TF4, TF0)
UL_TFC9	(TF4, TF1)

Table A.6.10: General test parameters

Parameter	Unit	Value	Comment
TFCS size		10	
TFCS		UL_TFC0, UL_TFC1, UL_TFC2, UL_TFC3, UL_TFC4, UL_TFC5, UL_TFC6, UL_TFC7, UL_TFC8, UL_TFC9	
Power Control		On	
Active cell		Cell 1	
Maximum allowed UL TX power	dBm	21	
T1	s	30	
T2	s	10	
Propagation conditions		AWGN	

~~The test shall be performed in AWGN channel propagation conditions.~~

The radio conditions in the test shall be sufficient, so that decoding of the TPC commands can be made without errors.

The amount of available user data shall be sufficient to allow uplink transmission at the highest bit rate (UL_TFC8 or UL_TFC9) during the entire test and it shall be ensured that the UE is using UL_TFC8 or UL_TFC9 at the end of T1.

The test shall be performed in the following way:

Before time period T1:

The allowed TFCS according to table A.6.10~~x.z~~ shall be signalled to the UE.

During time period T1:

The system simulator shall ensure that the UE output power is commanded to be between 14 to 15 dB below the UE Maximum allowed UL TX power.

During time period T2:

The system simulator shall continously send TPC_cmd=1 to the UE from the beginning of T2 until the end of T2.

NOTE: This will emulate that UL_TFC8 to UL_TFC9 can not be supported beacuse the UE reaches the maximum UL Tx power and still UTRAN is sending power-up commands. The time from the beginning of T2 until the UE blocks (stops using) UL_TFC8 and UL_TFC9 shall be measured.

A.6.4.2 Test Requirements

A.6.4.2.1 Interactive or Background, PS, UL: 64 kbps

The UE shall have stopped using UL_TFC8 and UL_TFC9 within ~~[TBD]~~140 ms from beginning of time period T2.

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

NOTE: The delay from the begining of T2 can be expressed as:

$$T_{ramp} + T_{detect\_block} + T_{notify} + T_{modify} + T_{L1\_proc} + T_{align\_TTI}$$

where:

T_{ramp} Margin added for the increase of UE output power to the UE maximum power. A margin of 1 frame (10ms) is used, i.e. 15 TPC commands.

T_{detect_block} The time needed to detect that UL_TFC8 and UL_TFC9 can no longer be supported, i.e. defines the maximum time to detect that the *Elimination* ~~*Limited TFC Set*~~ criterion is fulfilled for UL_TFC8 and UL_TFC9. According to X and Y values of 15 and 30 as defined in Section 6.4.2 and by assuming the maximum misalignment between the frame boundary, where the evaluation of the *Elimination* criterion is performed and the last slot needed for triggering the *Elimination* criterion on L1, T_{detect_block} becomes 15 slots +14 slots =19.33 ms.~~This figure is currently TBD as X and Y in the general requirement, see section 6.4.2, are not finalised yet~~.

T_{notify} Equal to [15] ms, the time allowed for MAC to indicate to higher layers that UL_TFC8 and UL_TFC9 can no longer be supported.

T_{modify} Equal to $MAX(T_{adapt\_max}, T_{TTI}) = MAX(0, 40)=40ms$

T_{adapt_max} Equals to 0ms for the case without codec.

T_{L1_proc} Equals 15ms.

T_{align_TTI} Align with the longest uplink TTI where the new TFC can be selected. The worst case equals 40ms in this test case.

T_{TTI} See section 6.4.2. Equals 40 ms in the test case.

This gives a maximum delay of (10 + 19.33~~T$_{detect_block}$~~ + ~~[~~15~~]~~ + 40 + 15 + 40) ms = 139.33 ms from the beginning of T2, allow 140 ms in the test case.

3GPP TSG RAN WG4 Meeting #23 **R4-020999**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.133** **CR** **391** ⌘ **rev** **1** ⌘ Current version: **5.2.0** ⌘

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

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

Title:	⌘	TFC selection
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

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

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Today the TFC selection requirement is based on the set of parameters X and Y, (also Z should be included for how fast the blocking is released but in the specification it has the same value as Y) for which the values are not agreed. Thereby there are no finalised requirements in 25.133.
Summary of change:	⌘	Set the parameters (X,Y,Z) to (15,30,30) and finalise the testcase based on these parameters.
Consequences if not approved:	⌘	No TFC selection requirement is agreed and the testcase must be removed.

Clauses affected:	⌘	6.4, A 6.4		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications ☐ O&M Specifications	⌘	34.121
Other comments:	⌘	Equivalent CRs in other Releases: CR389r1 cat. F to 25.133 v3.9.0, CR390r1 cat. A to 25.133 v4.4.0		

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/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.

6.4 Transport format combination selection in UE

6.4.1 Introduction

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

6.4.2 Requirements

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

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

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within T_{notify} ~~[15 ms]~~ from the moment the *Elimination* criterion was ~~fulfilled~~detected.

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

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

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

The definitions of the parameters X,Y and Z which shall be used when evaluating the *Elimination* and the *Recovery* criteria when no compressed mode patterns are activated are given in Table 6.x

Table 6.x: X, Y, Z parameters for TFC selection

X	Y	Z
15	30	30

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

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

where:

T_{notify} equals [15] ms, and

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

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

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

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

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

Table 6.1: T_{adapt}

Service	T_{adapt} [ms]
UMTS_AMR	40
UMTS_AMR2	60

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

The Maximum UE transmitter power is defined as follows

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

where

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

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

-New Section ----

A.6.4 Transport format combination selection in UE

A.6.4.1 Test Purpose and Environment

The purpose is to verify the UE blocks (stops using) a currently used TFC when the UE output power is not sufficient to support that TFC. This test will verify the general requirement on TFC selection in section 6.4.

A.6.4.1.1 Interactive or Background, PS, UL: 64 kbps

The test will verify the general requirement on TFC selection in section 6.4 for a RAB intended for packet data services, i.e. Interactive or Background, PS, UL: 64kbps as defined in TS 34.108.

The test parameters are given in Table A.6.8 , A.6.9 and Table A.6.10 below. The test consists of 2 successive time periods, with a time duration of T1 and T2 respectively.

Details on the UL reference RAB in table A.6.8 and A.6.9 can be found in TS 34.108 section “Interactive or background / UL:64 DL: 64 kbps / PS RAB + UL:3.4 DL:3.4 kbps SRBs for DCCH”.

Table A.6.8: UL reference RAB, Interactive or Background

	TFI	64 kbps RAB (20ms TTI)	DCCH 3.4kbps (40ms TTI)
TFS	TF0, bits	0x336	0x148
	TF1, bits	1x336	1x148
	TF2, bits	2x336	N/A
	TF3, bits	3x336	N/A
	TF4, bits	4x336	N/A

Table A.6.9: UL TFCI

TFCI	(64 kbps RAB, DCCH)
UL_TFC0	(TF0, TF0)
UL_TFC1	(TF0, TF1)
UL_TFC2	(TF1, TF0)
UL_TFC3	(TF1, TF1)
UL_TFC4	(TF2, TF0)
UL_TFC5	(TF2, TF1)
UL_TFC6	(TF3, TF0)
UL_TFC7	(TF3, TF1)
UL_TFC8	(TF4, TF0)
UL_TFC9	(TF4, TF1)

Table A.6.10: General test parameters

Parameter	Unit	Value	Comment
TFCS size		10	
TFCS		UL_TFC0, UL_TFC1, UL_TFC2, UL_TFC3, UL_TFC4, UL_TFC5, UL_TFC6, UL_TFC7, UL_TFC8, UL_TFC9	
Power Control		On	
Active cell		Cell 1	
Maximum allowed UL TX power	dBm	21	
T1	s	30	
T2	s	10	
Propagation condition		AWGN	

~~The test shall be performed in AWGN channel propagation conditions.~~

The radio conditions in the test shall be sufficient, so that decoding of the TPC commands can be made without errors.

The amount of available user data shall be sufficient to allow uplink transmission at the highest bit rate (UL_TFC8 or UL_TFC9) during the entire test and it shall be ensured that the UE is using UL_TFC8 or UL_TFC9 at the end of T1.

The test shall be performed in the following way:

Before time period T1:

The allowed TFCS according to table A.6~~x~~.10~~z~~ shall be signalled to the UE.

During time period T1:

The system simulator shall ensure that the UE output power is commanded to be between 14 to 15 dB below the UE Maximum allowed UL TX power.

During time period T2:

The system simulator shall continously send TPC_cmd=1 to the UE from the beginning of T2 until the end of T2.

NOTE: This will emulate that UL_TFC8 to UL_TFC9 can not be supported beacuse the UE reaches the maximum UL Tx power and still UTRAN is sending power-up commands. The time from the beginning of T2 until the UE blocks (stops using) UL_TFC8 and UL_TFC9 shall be measured.

A.6.4.2 Test Requirements

A.6.4.2.1 Interactive or Background, PS, UL: 64 kbps

The UE shall have stopped using UL_TFC8 and UL_TFC9 within ~~[TBD]~~ 140ms from beginning of time period T2.

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

NOTE: The delay from the begining of T2 can be expressed as:

$$T_{ramp} + T_{detect\_block} + T_{notify} + T_{modify} + T_{L1\_proc} + T_{align\_TTI}$$

where:

T_{ramp} Margin added for the increase of UE output power to the UE maximum power. A margin of 1 frame (10ms) is used, i.e. 15 TPC commands.

T_{detect_block} The time needed to detect that UL_TFC8 and UL_TFC9 can no longer be supported, i.e. defines the maximum time to detect that the *Elimination*~~*Limited TFC Set*~~ criterion is fulfilled for UL_TFC8 and UL_TFC9~~.~~ . According to X and Y values of 15 and 30 as defined in Section 6.4.2 and by assuming the maximum misalignment between the frame boundary, where the evaluation of the *Elimination* criterion is performed and the last slot needed for triggering the *Elimination* criterion on L1, T_{detect_block} becomes 15 slots +14 slots =19.33 ms.~~This figure is currently TBD as X and Y in the general requirement, see section 6.4.2, are not finalised yet~~.

T_{notify} Equal to [15] ms, the time allowed for MAC to indicate to higher layers that UL_TFC8 and UL_TFC9 can no longer be supported.

T_{modify} Equal to $MAX(T_{adapt\_max}, T_{TTI}) = MAX(0, 40)=40ms$

T_{adapt_max} Equals to 0ms for the case without codec.

T_{L1_proc} Equals 15ms.

T_{align_TTI} Align with the longest uplink TTI where the new TFC can be selected. The worst case equals 40ms in this test case.

T_{TTI} See section 6.4.2. Equals 40 ms in the test case.

This gives a maximum delay of (10 + 19.33~~T~~$_{detect\_block}$~~-~~+ [15] + 40 + 15 + 40) ms ms = 139.33 ms from the beginning of T2~~-~~. allow 140 ms in the test case

3GPP TSG RAN WG4 Meeting #23 **R4-021001**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.133** **CR** **392** ⌘ **rev** **1** ⌘ Current version: **3.9.0** ⌘

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

Title:	⌘	Correction of Compressed Mode Patterns for BSIC identification and reconfirmation
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	R99

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

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change:	⌘	The tables 8.7 and 8.8 have some errors. Some of the patterns could not be used and others do not have the specified performance.
Summary of change:	⌘	Change the values in the table and replace three sequences that do not guarantee a BSIC reading at all.
Consequences if not approved:	⌘	The specified values of $N_{identifv.abort}$ and $T_{identifv.\ abort}$ for the reference patterns will be erroneous. **Isolated Impact:** The CR has no impact on the BSIC identification and reconfirmation procedures since the new reference patterns were already mandatory before the change in the set of reference patterns.

Clauses affected:	⌘	8.1.2.5.2, A.5.4		
Other specs affected:	⌘	☐ Other core specifications ☒ Test specifications ☐ O&M Specifications	⌘	34.121
Other comments:	⌘	Equivalent CRs in other Releases: CR393 cat. A to 25.133 v4.4.0, CR394 cat. A to 25.133 v5.2.0		

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

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

8.1.2.5.2.1 Initial BSIC identification

This measurement shall be based on a transmission gap pattern sequence with the purpose "GSM Initial BSIC identification"

For GSM cells that are requested with BSIC verified the UE shall attempt to decode the SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the measurement control information. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BSIC carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value after layer 3 filtering. The GSM signal strength levels used in BSIC identification for arranging GSM cells in signal strength order shall be based on the latest GSM carrier RSSI measurement results available.

When the UE attempts to decode the BSIC of one GSM BCCH carrier with unknown BSIC, the UE shall use all available transmission gaps, within the transmission gap pattern sequence with the purpose "GSM Initial BSIC identification", 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 $N_{identify\_abort}$ successive patterns, 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 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

$N_{identify\_abort}$ values are given for a set of reference patterns in table 8.7. $T_{identify\_abort}$ is the elapsed time during $N_{identify\_abort}$ transmission gap patterns (informative). The figures given in table 8.7 represent the number of patterns required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Table 8.7: The worst-case time for identification of one previously not identified GSM cell

	TGL1 [slots]	TGL2 [slots]	TGD [slots]	TGPL1 [frames]	TGPL2 [frames]	$T_{identify\ abort}$ [s]	$N_{identify\_abort}$ [patterns]
Pattern 1	7	-	undefined	3	TGPL1	1.561.53	5251
Pattern 2	7	-	undefined	8	TGPL1	5.285.20	6665
Pattern 3	7	7	47	8	TGPL1	2.882.00	3625
Pattern 4	7	7	38	12	TGPL1	2.88	24
Pattern 5	14	-	undefined	8	TGPL1	1.841.76	2322
Pattern 6	14	-	undefined	24	TGPL1	5.285.04	2221
Pattern 7	14	14	45	12	TGPL1	1.44	12
Pattern 8	10	-	undefined	812	TGPL1	2.882.76	3623
Pattern 9	10	10	75	12	TGPL1	2.881.56	2413

8.1.2.5.2.2 BSIC re-confirmation

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

The UE shall maintain the timing information of 8 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 transmission gap of a transmission gap pattern sequence with the measurement purpose "GSM BSIC re-confirmation", the UE shall attempt to decode the BSIC falling within the effective gap duration. If more than one BSIC can be decoded within the same gap, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within $T_{re\text{-}confirm\_abort}$ seconds, 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 8.1.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the 8 strongest GSM cells in the monitored list.

$N_{re\text{-}confirm\_abort}$ is the number of transmission gap patterns executed during $T_{re\text{-}confirm\_abort}$ (informative).

Table 8.8: The worst-case time for BSIC re-confirmation of one GSM cell

	TGL1 [slots]	TGL2 [slots]	TGD [slots]	TGPL1 [frames]	TGPL2 [frames]	$T_{re\text{-}confirm\_abort}$ [s]	$N_{re\text{-}confirm\_abort}$ [patterns]
Pattern 1	7	-	undefined	3	TGPL1	1.321.29	4443
Pattern 2	7	-	undefined	8	TGPL1	5.044.96	6362
Pattern 3	7	-	undefined	15	TGPL1	8.17.95	5453
Pattern 4	7	7	69	23	TGPL1	10.129.89	4443
Pattern 5	7	7	69	8	TGPL1	2.64	33
Pattern 6	14	-	undefined	8	TGPL1	1.61.52	2019
Pattern 7	14	14	60	8	TGPL1	0.80	10
Pattern 8	10	-	undefined	8	TGPL1	2.641.76	3322
Pattern 9	10	-	undefined	2324	TGPL1	8.054.80	3520
Pattern 10	7	7	47	8	TGPL1	2.641.76	3322
Pattern 11	7	7	38	12	TGPL1	2.64	22
Pattern 12	14	-	undefined	24	TGPL1	5.044.80	2120
Pattern 13	14	14	45	12	TGPL1	1.20	10
Pattern 14	10	-	undefined	1312	TGPL1	4.942.52	3821
Pattern 15	10	10	75	12	TGPL1	2.641.32	2211

----New Section ----

A.5.4 Inter-system Handover from UTRAN FDD to GSM

A.5.4.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell handover delay reported in section 5.4.2.1.

The test parameters are given in Table A.5.0D, A.5.0E and A.5.0F below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 3C shall be used.. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Handover from UTRAN command with activation time at beginning of T3 with a new active cell, cell 2. In GSM Handover command contained in that message, IE starting time shall not be included.

Table A.5.0D: General test parameters for Correct reporting of GSM neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Compressed mode patterns - GSM carrier RSSI measurement - GSM Initial BSIC identification - GSM BSIC re-confirmation		 DL Compressed mode reference pattern 2 in Set 2 Pattern 2 Pattern 2	 As specified in table A.22 TS 25.101 section A.5 As specified in section 8.1.2.5.2.1 table 8.7. As specified in section 8.1.2.5.2.2 table 8.8.
Active cell		Cell 1	
Inter-RAT measurement quantity		GSM Carrier RSSI	
BSIC verification required		Required	
Threshold other system	dBm	-80	Absolute GSM carrier RSSI threshold for event 3B and 3C.
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24 FDD neighbours on Channel 1 6 GSM neighbours including ARFCN 1	Measurement control information is sent before the compressed mode patterns starts.
N Identify abort		665	Taken from table 8.7.
T Reconfirm abort		5.50	Taken from table 8.8.
T1	s	20	
T2	s	5	
T3	s	5	

Table A.5.0E: Cell Specific Parameters for Handover UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)
		T1, T2, T3
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DCH_Ec/Ior	dB	Note 1
OCNS_Ec/Ior	dB	Note 2
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	-70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN
Note 1: The DPCH level is controlled by the power control loop Note 2 : The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}		

Table A.5.0F: Cell Specific Parameters for Handover UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2, T3
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-85	-75

A.5.4.2 Test Requirements

The UE shall begin to send access bursts on the new DCCH of the target cell less than 40 ms from the beginning of time period T3.

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

CR-Form-v5

CHANGE REQUEST

⌘ **25.133** **CR** **393** ⌘ **rev** **-** ⌘ Current version: **4.4.0** ⌘

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

Title:	⌘	Correction of Compressed Mode Patterns for BSIC identification and reconfirmation
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

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

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change:	⌘	The tables 8.7 and 8.8 have some errors. Some of the patterns could not be used and others do not have the specified performance.
Summary of change:	⌘	Change the values in the table and replace three sequences that do not guarantee a BSIC reading at all.
Consequences if not approved:	⌘	The specified values of $N_{identifv.abort}$ and $T_{identifv.\ abort}$ for the reference patterns will be erroneous.

Clauses affected:	⌘	8.1.2.5.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Equivalent CRs in other Releases: CR392r1 cat. F to 25.133 v3.9.0, CR394 cat. A to 25.133 v5.2.0

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

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

8.1.2.5.2.1 Initial BSIC identification

This measurement shall be based on a transmission gap pattern sequence with the purpose "GSM Initial BSIC identification"

For GSM cells that are requested with BSIC verified the UE shall attempt to decode the SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the measurement control information. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BSIC carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value after layer 3 filtering. The GSM signal strength levels used in BSIC identification for arranging GSM cells in signal strength order shall be based on the latest GSM carrier RSSI measurement results available.

When the UE attempts to decode the BSIC of one GSM BCCH carrier with unknown BSIC, the UE shall use all available transmission gaps, within the transmission gap pattern sequence with the purpose "GSM Initial BSIC identification", 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 $N_{identify\_abort}$ successive patterns, 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 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

$N_{identify\_abort}$ values are given for a set of reference patterns in table 8.7. $T_{identify\_abort}$ is the elapsed time during $N_{identify\_abort}$ transmission gap patterns (informative). The figures given in table 8.7 represent the number of patterns required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Table 8.7: The worst-case time for identification of one previously not identified GSM cell

	TGL1 [slots]	TGL2 [slots]	TGD [slots]	TGPL1 [frames]	TGPL2 [frames]	$T_{identify\ abort}$ [s]	$N_{identify\_abort}$ [patterns]
Pattern 1	7	-	undefined	3	TGPL1	1.561.53	5251
Pattern 2	7	-	undefined	8	TGPL1	5.285.20	6665
Pattern 3	7	7	47	8	TGPL1	2.882.00	3625
Pattern 4	7	7	38	12	TGPL1	2.88	24
Pattern 5	14	-	undefined	8	TGPL1	1.841.76	2322
Pattern 6	14	-	undefined	24	TGPL1	5.285.04	2221
Pattern 7	14	14	45	12	TGPL1	1.44	12
Pattern 8	10	-	undefined	812	TGPL1	2.882.76	3623
Pattern 9	10	10	75	12	TGPL1	2.881.56	2413

8.1.2.5.2.2 BSIC re-confirmation

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

The UE shall maintain the timing information of 8 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 transmission gap of a transmission gap pattern sequence with the measurement purpose "GSM BSIC re-confirmation", the UE shall attempt to decode the BSIC falling within the effective gap duration. If more than one BSIC can be decoded within the same gap, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within $T_{re\text{-}confirm\_abort}$ seconds, 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 8.1.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the 8 strongest GSM cells in the monitored list.

$N_{re\text{-}confirm\_abort}$ is the number of transmission gap patterns executed during $T_{re\text{-}confirm\_abort}$ (informative).

Table 8.8: The worst-case time for BSIC re-confirmation of one GSM cell

	TGL1 [slots]	TGL2 [slots]	TGD [slots]	TGPL1 [frames]	TGPL2 [frames]	$T_{re\text{-}confirm\_abort}$ [s]	$N_{re\text{-}confirm\_abort}$ [patterns]
Pattern 1	7	-	undefined	3	TGPL1	1.321.29	4443
Pattern 2	7	-	undefined	8	TGPL1	5.044.96	6362
Pattern 3	7	-	undefined	15	TGPL1	8.17.95	5453
Pattern 4	7	7	69	23	TGPL1	10.129.89	4443
Pattern 5	7	7	69	8	TGPL1	2.64	33
Pattern 6	14	-	undefined	8	TGPL1	1.61.52	2019
Pattern 7	14	14	60	8	TGPL1	0.80	10
Pattern 8	10	-	undefined	8	TGPL1	2.641.76	3322
Pattern 9	10	-	undefined	2324	TGPL1	8.054.80	3520
Pattern 10	7	7	47	8	TGPL1	2.641.76	3322
Pattern 11	7	7	38	12	TGPL1	2.64	22
Pattern 12	14	-	undefined	24	TGPL1	5.044.80	2120
Pattern 13	14	14	45	12	TGPL1	1.20	10
Pattern 14	10	-	undefined	1312	TGPL1	4.942.52	3821
Pattern 15	10	10	75	12	TGPL1	2.641.32	2211

----New Section ----

A.5.4 Inter-system Handover from UTRAN FDD to GSM

A.5.4.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell handover delay reported in section 5.4.2.1.

The test parameters are given in Table A.5.0D, A.5.0E and A.5.0F below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 3C shall be used.. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Handover from UTRAN command with activation time at beginning of T3 with a new active cell, cell 2. In GSM Handover command contained in that message, IE starting time shall not be included.

Table A.5.0D: General test parameters for Correct reporting of GSM neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Compressed mode patterns - GSM carrier RSSI measurement - GSM Initial BSIC identification - GSM BSIC re-confirmation		 DL Compressed mode reference pattern 2 in Set 2 Pattern 2 Pattern 2	 As specified in table A.22 TS 25.101 section A.5 As specified in section 8.1.2.5.2.1 table 8.7. As specified in section 8.1.2.5.2.2 table 8.8.
Active cell		Cell 1	
Inter-RAT measurement quantity		GSM Carrier RSSI	
BSIC verification required		Required	
Threshold other system	dBm	-80	Absolute GSM carrier RSSI threshold for event 3B and 3C.
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24 FDD neighbours on Channel 1 6 GSM neighbours including ARFCN 1	Measurement control information is sent before the compressed mode patterns starts.
N Identify abort		66~~5~~	Taken from table 8.7.
T Reconfirm abort		5.5~~0~~	Taken from table 8.8.
T1	s	20	
T2	s	5	
T3	s	5	

Table A.5.0E: Cell Specific Parameters for Handover UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)
		T1, T2, T3
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DCH_Ec/Ior	dB	Note 1
OCNS_Ec/Ior	dB	Note 2
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	-70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN
Note 1: The DPCH level is controlled by the power control loop Note 2 : The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}		

Table A.5.0F: Cell Specific Parameters for Handover UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2, T3
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-85	-75

A.5.4.2 Test Requirements

The UE shall begin to send access bursts on the new DCCH of the target cell less than 40 ms from the beginning of time period T3.

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

CR-Form-v5

CHANGE REQUEST

⌘ **25.133** **CR** **394** ⌘ **rev** **-** ⌘ Current version: **5.2.0** ⌘

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

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

Title:	⌘	Correction of Compressed Mode Patterns for BSIC identification and reconfirmation
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

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

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	The tables 8.7 and 8.8 have some errors. Some of the patterns could not be used and others do not have the specified performance.
Summary of change:	⌘	Change the values in the table and replace three sequences that do not guarantee a BSIC reading at all.
Consequences if not approved:	⌘	The specified values of $N_{identifv.abort}$ and $T_{identifv.\ abort}$ for the reference patterns will be erroneous. Isolated Impact: The CR has a minor isolated impact on the BSIC identification and reconfirmation procedures.

Clauses affected:	⌘	8.1.2.5.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Equivalent CRs in other Releases: CR392r1 cat. F to 25.133 v3.9.0, CR393 cat. A to 25.133 v4.4.0

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/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.

8.1.2.5.2.1 Initial BSIC identification

This measurement shall be based on a transmission gap pattern sequence with the purpose "GSM Initial BSIC identification"

For GSM cells that are requested with BSIC verified the UE shall attempt to decode the SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the measurement control information. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BSIC carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value after layer 3 filtering. The GSM signal strength levels used in BSIC identification for arranging GSM cells in signal strength order shall be based on the latest GSM carrier RSSI measurement results available.

When the UE attempts to decode the BSIC of one GSM BCCH carrier with unknown BSIC, the UE shall use all available transmission gaps, within the transmission gap pattern sequence with the purpose "GSM Initial BSIC identification", 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 $N_{identify\_abort}$ successive patterns, 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 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

$N_{identify\_abort}$ values are given for a set of reference patterns in table 8.7. $T_{identify\_abort}$ is the elapsed time during $N_{identify\_abort}$ transmission gap patterns (informative). The figures given in table 8.7 represent the number of patterns required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Table 8.7: The worst-case time for identification of one previously not identified GSM cell

	TGL1 [slots]	TGL2 [slots]	TGD [slots]	TGPL1 [frames]	TGPL2 [frames]	$T_{identify\ abort}$ [s]	$N_{identify\_abort}$ [patterns]
Pattern 1	7	-	undefined	3	TGPL1	1.561.53	**52**51
Pattern 2	7	-	undefined	8	TGPL1	5.285.20	6665
Pattern 3	7	7	47	8	TGPL1	2.882.00	3625
Pattern 4	7	7	38	12	TGPL1	2.88	24
Pattern 5	14	-	undefined	8	TGPL1	1.841.76	**23**22
Pattern 6	14	-	undefined	24	TGPL1	5.285.04	2221
Pattern 7	14	14	45	12	TGPL1	1.44	12
Pattern 8	10	-	undefined	812	TGPL1	2.882.76	3623
Pattern 9	10	10	75	12	TGPL1	2.881.56	2413

8.1.2.5.2.2 BSIC re-confirmation

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

The UE shall maintain the timing information of 8 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 transmission gap of a transmission gap pattern sequence with the measurement purpose "GSM BSIC re-confirmation", the UE shall attempt to decode the BSIC falling within the effective gap duration. If more than one BSIC can be decoded within the same gap, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within $T_{re\text{-}confirm\_abort}$ seconds, 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 8.1.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the 8 strongest GSM cells in the monitored list.

$N_{re\text{-}confirm\_abort}$ is the number of transmission gap patterns executed during $T_{re\text{-}confirm\_abort}$ (informative).

Table 8.8: The worst-case time for BSIC re-confirmation of one GSM cell

	TGL1 [slots]	TGL2 [slots]	TGD [slots]	TGPL1 [frames]	TGPL2 [frames]	$T_{re\text{-}confirm\_abort}$ [s]	$N_{re\text{-}confirm\_abort}$ [patterns]
Pattern 1	7	-	undefined	3	TGPL1	1.321.29	4443
Pattern 2	7	-	undefined	8	TGPL1	5.044.96	6362
Pattern 3	7	-	undefined	15	TGPL1	8.17.95	5453
Pattern 4	7	7	69	23	TGPL1	10.129.89	4443
Pattern 5	7	7	69	8	TGPL1	2.64	33
Pattern 6	14	-	undefined	8	TGPL1	1.61.52	2019
Pattern 7	14	14	60	8	TGPL1	0.80	10
Pattern 8	10	-	undefined	8	TGPL1	2.641.76	3322
Pattern 9	10	-	undefined	2423	TGPL1	8.054.80	3520
Pattern 10	7	7	47	8	TGPL1	2.641.76	3322
Pattern 11	7	7	38	12	TGPL1	2.64	22
Pattern 12	14	-	undefined	24	TGPL1	5.044.80	2120
Pattern 13	14	14	45	12	TGPL1	1.20	10
Pattern 14	10	-	undefined	1312	TGPL1	4.942.52	3821
Pattern 15	10	10	75	12	TGPL1	2.641.32	2211

A.5.4 Inter-system Handover from UTRAN FDD to GSM

A.5.4.1 Test Purpose and Environment

This test is to verify the requirement for the UTRAN to GSM cell handover delay reported in section 5.4.2.1.

The test parameters are given in Table A.5.0D, A.5.0E and A.5.0F below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 3C shall be used.. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Handover from UTRAN command with activation time at beginning of T3 with a new active cell, cell 2. In GSM Handover command contained in that message, IE starting time shall not be included.

Table A.5.0D: General test parameters for Correct reporting of GSM neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Compressed mode patterns - GSM carrier RSSI measurement - GSM Initial BSIC identification - GSM BSIC re-confirmation		 DL Compressed mode reference pattern 2 in Set 2 Pattern 2 Pattern 2	 As specified in table A.22 TS 25.101 section A.5 As specified in section 8.1.2.5.2.1 table 8.7. As specified in section 8.1.2.5.2.2 table 8.8.
Active cell		Cell 1	
Inter-RAT measurement quantity		GSM Carrier RSSI	
BSIC verification required		Required	
Threshold other system	dBm	-80	Absolute GSM carrier RSSI threshold for event 3B and 3C.
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		24 FDD neighbours on Channel 1 6 GSM neighbours including ARFCN 1	Measurement control information is sent before the compressed mode patterns starts.
N Identify abort		66~~5~~	Taken from table 8.7.
T Reconfirm abort		5.5~~0~~	Taken from table 8.8.
T1	s	20	
T2	s	5	
T3	s	5	

Table A.5.0E: Cell Specific Parameters for Handover UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)
		T1, T2, T3
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DCH_Ec/Ior	dB	Note 1
OCNS_Ec/Ior	dB	Note 2
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	-70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN
Note 1: The DPCH level is controlled by the power control loop Note 2 : The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}		

Table A.5.0F: Cell Specific Parameters for Handover UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2, T3
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-85	-75

A.5.4.2 Test Requirements

The UE shall begin to send access bursts on the new DCCH of the target cell less than 40 ms from the beginning of time period T3.

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

3GPP TSG RAN WG4 Meeting #23 **R4-020840**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5.1

CHANGE REQUEST

⌘ **25.133** **CR** **401** ⌘ **rev** **-** ⌘ Current version: **3.9.0** ⌘

*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 to FDD-TDD requirements and test cases
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	R99

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

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change: ⌘

Completion of FDD-TDD handover interruption time requirements (5.3)

- Requirements on FDD-TDD HO interruption time still no finalized, i.e. in square brackets

Completion of FDD-TDD measurement requirements in CELL_DCH and CELL_FACH states (8.1.2.4 and 8.4.2.4)

- Correction needed for existing requirements on identification time Tidentify TDD inter and measurement period Tmeasurement TDD inter because not adapted to a TDD measurement approach when in compressed mode
- Requirements on number Xbasic measurement TDD inter of TDD cells to be measured during Tmeasurement TDD inter are missing
- Removal of FDD requirements that are not valid in a TDD context

Corrections to test case for FDD-TDD cell re-selection in Idle Mode (A.4.4)

- Corrections of incorrect signal level settings and clarification to test conditions and parameter settings

Completion of test case for TDD neighbor reporting in CELL_DCH state (A.8.3)

- Test settings still unfinalized, i.e. empty or in square brackets
- Test conditions and parameter settings partially missing.

Completion of P-CCPCH RSCP measurement accuracy test cases (A.9.8)

- Test settings still unfinalized, i.e. empty or in square brackets
- Test conditions and parameter settings completely missing.

Corrections to inter-frequency FDD-TDD cell re-selection requirements

	(4.2.2.4) - Correction to P-CCPCH RSCP cell re-selection hysteresis values based upon equivalent P-CPCCH RSCP accuracy requirements in CELL_DCH and CELL_FACH state **Corrections to FDD-TDD cell re-selection requirements and interruption time in CELL_FACH state (5.5.2.1.3 and 5.5.2.2.2)** - Correction needed because some key time delays for FDD-TDD cell re-selection delay in CELL_FACH are not taken into account **Introduction of FDD-TDD handover test case (A.5.3)** - FDD/TDD HO test case on requirements in section 5.3 still missing
Summary of change: ⌘	**Completion of FDD-TDD handover interruption time requirements (5.3)** - 40 ms for known and 200ms for unknown target cell case with additional 30ms when SFN decoding is required **Completion of FDD-TDD measurement requirements in CELL_DCH and CELL_FACH states (8.1.2.4 and 8.4.2.4)** - Correction to requirements on identification time Tidentify TDD inter and measurement period Tmeasurement TDD inter - Xbasic measurement TDD inter set to 6 (cells) - Removal of FDD requirements that are not valid in a TDD context **Corrections to test case for FDD-TDD cell re-selection in Idle Mode (A.4.4)** - Corrections to incorrect signal level settings and clarification to test conditions and parameter settings **Completion of test case for TDD neighbor reporting in CELL_DCH state (A.8.3)** - Completion of test conditions and parameter settings **Completion of P-CCPCH RSCP measurement accuracy test cases (A.9.8)** - Completion of test conditions and parameter settings **Corrections to inter-frequency FDD-TDD cell re-selection requirements (4.2.2.4)** - Cell re-selection when TDD neighbor cell P-CCPCH RSCP reception level 5dB higher than current serving cell - Evaluation of TDD neighbor cells dependent from the number of TDD carriers **Corrections to FDD-TDD cell re-selection requirements and interruption time in CELL_FACH state (5.5.2.1.3 and 5.5.2.2.2)** - Correction to FDD-TDD cell re-selection delays and interruption times **Introduction of FDD-TDD handover test case (A.5.3)** - New FDD/TDD HO test case on requirements in section 5.3
Consequences if not approved: ⌘	Critical FDD-TDD requirements in the ara of Connected Mode measurements, Handover interruption time, Cell Re-selection in Idle Mode and CELL_FACH state incomplete and corresponding test cases missing or not feasible. **Isolated impact analysis:** This CR contains corrections to FDD-TDD relevant parts of TS25.133 where this specification is incomplete and where parts of critical dual-mode FDD-TDD UE requirements and test cases are missing. Note that this CR does only impact requirement on FDD-TDD inter-working as set

	by WG4, i.e. there is no impact on Technical Specifications under the responsibility of other RAN WG's.

Clauses affected:	⌘	2; 4.2.2.4; 5.3; 5.5.2.1; 5.5.2.1.3; 5.5.2.2.2; 8.1.2.4; 8.4.2.4; A.4.4; A.5.3; A.8.3; A.9.1.8		
Other specs affected:	⌘	[ ] Other core specifications [X] Test specifications [ ] O&M Specifications	⌘	TS25.101, TS34.121
Other comments:	⌘	Accompanying CR165 to 25.101 R99 and corresponding cat-A's. No test cases covering A.5.3, A.8.3 and A.9.1.8 currently exist in TS34.121. Equivalent CRs in other Releases: CR414 cat. A to 25.133 v4.4.0, CR415 cat. A to 25.133 v5.2.0		

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] (void)

[2] 3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".

[3] 3GPP TS 25.101: "UE Radio transmission and reception (FDD)".

[4] 3GPP TS 25.104: "UTRA (BS) FDD; Radio transmission and reception ".

[5] 3GPP TS 25.102: "UTRA (UE) TDD; Radio transmission and reception ".

[6] 3GPP TS 25.105: "UTRA (BS); Radio transmission and reception".

[7] ~~void.~~3GPP TS 25.212: "Multiplexing and channel coding (FDD)".

[8] 3GPP TS 25.141: "Base station conformance testing (FDD)".

[9] 3GPP TS 25.142: "Base station conformance testing (TDD)".

[10] 3GPP TS 25.113: "Base station EMC".

[11] 3GPP TR 25.942: "RF System scenarios".

[12] 3GPP TR 25.922: "Radio Resource Management Strategies".

[13] 3GPP TS 25.215: "Physical Layer Measurements (FDD)".

[14] 3GPP TS 25.225: "Physical Layer Measurements (TDD)".

[15] 3GPP TS 25.302: "Services provided by Physical Layer".

[16] 3GPP TS 25.331: "Radio Resource Control (RRC) Protocol Specification".

[17] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes"

[18] 3GPP TS 25.214: "Physical layer procedures (FDD)"

[19] 3GPP TS 25.321: " Medium Access Control (MAC) protocol specification"

[20] 3GPP TS 25.303: "Interlayer procedures in Connected Mode"

[21] 3GPP TS 05.08: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control"

[22] 3GPP TS 05.05: "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception"

< Next changed section >

4.2.2.4 Measurements of inter-frequency TDD cells

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

The UE shall measure ~~the~~ P-CCPCH RSCP at least every $N_{carrierTDD}$ * $T_{measureTDD}$ (see table 4.1) ~~of~~ for ~~each~~ inter-frequency TDD ~~neighbour~~ cells that are identified and measured according to the measurement rules~~indicated in the measurement control system information of the serving cell, according to the measurement rules defined in TS25.304, at least every $T_{measureTDD}$ (see table 4.1)~~. The parameter $N_{carrierTDD}$ is the number of carriers used for inter-frequency TDD cells. The UE shall filter P-CCPCH RSCP measurements of each measured inter-frequency TDD cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$.

The filtering of P-CCPCH RSCP shall be such that the UE shall be capable of evaluating that an already ~~detected~~ identified inter-frequency TDD cell has become better ranked than the serving cell within $N_{carrierTDD}$* $T_{evaluateTDD}$ from the moment the inter-frequency TDD cell became at least ~~3~~5 dB better ranked than the current serving cell provided that Treselection timer is set to zero. For non-~~detected~~ identified inter-frequency TDD cells, the filtering shall be such that the UE shall be capable of evaluating that an inter-frequency TDD cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency TDD cell became at least ~~3~~5 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency TDD cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency TDD cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.~~ The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.~~

< Next changed section >

5.3 FDD/TDD Handover

5.3.1 Introduction

The purpose of FDD/TDD ~~hard~~ handover is to change the radio access mode ~~between~~ from FDD ~~and~~ to TDD. The FDD/TDD handover procedure is initiated from UTRAN with a RRC message that implies a hard handover~~, refer to TS25.331~~ as described in [16].

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

5.3.2.1 ~~Hard~~ FDD/TDD handover delay

RRC ~~P~~procedure ~~delay~~ performance values for all RRC procedures~~,~~ that can command a hard handover~~,~~ are specified in ~~TS25.331 section 13.5.2~~[16].

When the UE receives a RRC message implying ~~hard~~ FDD/TDD 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~~ performance value as defined in ~~TS25.331 Section 13.5.2~~[16] 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, is dependent on whether the target cell is known for the UE or not. ~~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.~~

If FDD/TDD handover is commanded, the interruption time shall be less than,

$$T_{interrupt} = T_{offset} + T_{UL} + 30*F_{SFN} + 20*KC + 180*UC \text{ ms}$$

where,

T_{offset}	Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel
T_{UL}	Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell
F_{SFN}	Equal to 1 if SFN decoding is required and equal to 0 otherwise
KC	Equal to 1 if a known target cell is indicated in the RRC message implying FDD/TDD handover and equal to 0 otherwise
UC	Equal to 1 if an unknown target cell is indicated in the RRC message implying FDD/TDD handover and equal to 0 otherwise

~~In this interruption requirement a~~ An inter-frequency TDD target cell shall be considered known by the UE, if ~~is known if~~ the target 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~~
	~~SFN not to be decoded~~	~~SFN needs to be decoded~~	~~SFN needs to be decoded~~
~~1~~	~~[100]~~	~~[130]~~	~~[400]~~

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

The interruption time requirements ~~in Table 5.1~~ for ~~the~~ an unknown target cell shall apply only if the signal quality of the unknown target cell is ~~good enough~~ sufficient for successful synchronisation with one attempt.

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

< Next changed section >

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 $T_{reselection}$ is set to 0. Otherwise the Cell reselection delay is increased $T_{reselection}$ 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 cell 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 section 9. The measurements used for S-criteria and cell re-selection evaluation in CELL_FACH shall be performed according to section 8.4.

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 the preambles on the PRACH for sending 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 the ~~C~~cell ~~R~~re-selection process and the moment in time when the UE starts sending the RRC CELL UPDATE message to the UTRAN on the RACH.

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.

< Next changed section >

5.5.2.1.3 FDD-TDD cell reselection

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

The cell re-selection delay in CELL_FACH state in FDD to an inter-frequency TDD cell shall be less than,

~~$T_{reselection,TDD} = T_{identify,TDD} + 100 + T_{SI} + T_{RA}$ ms~~

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

where

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

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} ~~= T~~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~~[16] for a UTRAN cell.

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

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

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

where

$T_{Measurement\ TDD\ inter}$ is specified in 8.4.2.4.1.

Th~~is~~ese requirements assume~~s~~ radio conditions to be sufficient, so that reading of system information can be done without errors.

< Next changed section >

5.5.2.2.2 FDD-TDD cell reselection

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

The interruption time, ~~i.e.~~ is defined as the time period between the last TTI the UE monitors the FACH ~~channel~~ on the serving cell and the time instant the UE starts to transmit the RRC CELL UPDATE message in the target inter-frequency TDD cell on the RACH.

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

~~$T_{interrupt,TDD} = 100 + T_{si} + T_{RA}$ 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.~~

In case of inter-frequency cell reselection to a TDD cell and when the UE needs measurement occasions to perform inter-frequency TDD measurements, the interruption time shall be less than

$T_{interrupt1, TDD} = T_{IU} + 20 + T_{SI} + T_{RA}$ ms

In case of inter-frequency cell reselection to a TDD cell and when the UE does not need measurement occasions to perform inter-frequency TDD measurements, the interruption time shall be less than

$T_{interrupt2, TDD} = T_{IU} + 20 + T_{RA}$ 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_{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 [16].
- T_{RA} is the additional delay caused by the random access procedure.

< Next changed section >

8.1.2.4 TDD measurements

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

In the CELL_DCH state when a transmission gap pattern sequence with the "TDD measurements" purpose is provided by the network, the UE shall continuously measure ~~detected~~ identified inter frequency TDD cells and search for new inter frequency TDD cells indicated in the measurement control information.

In order for the requirements in the following subsections to apply, the Beacon timeslots of the inter-frequency TDD cells indicated in the measurement control information shall either be synchronised or non-overlapping in time such that the UE can measure an inter-frequency TDD cell at least once in every transmission gap pattern as given in [7] for the slot allocation case in use in this cell and by assuming 2*0.5 ms implementation margin per transmission gap.

~~the~~ UTRAN ~~must~~ shall provide a transmission gap pattern sequence with measurement purpose TDD measurement using the ~~following~~ combinations for TGL1, TGL2 and TGD in Table 8.2:

Table 8.2

TGL1 [slots]	TGL2 [slots]	TGD [slots]
10	-	undefined
10	10	15…269
14	7	15…269

~~If reporting of the values for TGSN_proposed is requested by the network while P-CCPCH RSCP is measured by the UE, and this is supported by the UE, values for TGSN_proposed shall be extracted by use of the following formula and reported to the network together with the P-CCPCH RSCP results in the measurement report:~~

~~TGSN_proposed=~~
~~(FDD slot in which the starting point of the P-CCPCH slot of the monitored TDD cell was observed) – (1 slot)~~

8.1.2.4.1 Identification of a new cell

When transmission gaps are scheduled for inter-frequency TDD measurements, ~~T~~the UE shall be able to identify ~~a~~ new detectable inter-frequency TDD cell belonging to the monitored set within

~~$$T_{identify\ TDD\ inter} = Max\left\{ 5000, T_{basic\ identify\ TDD\ inter} \cdot \frac{T_{Measurement\ Period\ TDD\ inter}}{T_{TDD\ inter}} \cdot N_{Freq} \right\} ms$$~~

$$T_{identify\ TDD\ inter} = Max\left\{ 5000, N_{basic\ identify\ TDD\ inter} \cdot \frac{T_{Measurement\ Period\ TDD\ inter}}{N_{TDD\ inter}} \cdot N_{Freq} \right\} ms$$

If the UE does not need compressed mode to perform inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within 5000 ms.

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

An inter-frequency TDD cell shall be considered detectable when P-CCPCH-_Ec/Io ≥ -8 dB~~,~~ and SCH_Ec/Io ≥ -13 dB ~~and SCH_Ec/Ior is equally divided between primary synchronisation code and the sum of all secondary synchronisation codes, where the secondary synchronisation codes are also equally divided. When L3 filtering is used an additional delay can be expected~~.

~~Where t~~The received P-CCPCH-_E_c/I_o is defined as

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

and the received SCH-_E_c/I_o is defined as

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

8.1.2.4.2 P-CCPCH RSCP ~~M~~measurement period

When transmission gaps ~~as previously described~~ are scheduled for ~~TDD~~ inter frequency TDD measurements, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.11 and with a measurement period as given by

~~$T_{measurement\ inter} = Max\left\{T_{Measurement\_Period\ TDD\ Inter}, T_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{Measurement\_Period\ TDD\ Inter}}{T_{TDD\ Inter}} \cdot N_{Freq}\right\} ms$~~

$$T_{measurement\ TDD\ inter} = Max\left\{T_{Measurement\ Period\ TDD\ inter}, N_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{Measurement\ Period\ TDD\ inter}}{N_{TDD\ inter}} \cdot N_{Freq}\right\} ms$$

If the UE does not need compressed mode to perform inter-frequency TDD measurements, the measurement period for inter-frequency TDD measurements shall be 480 ms.

The UE shall be capable of performing P-CCPCH RSCP measurements for $X_{basic\ measurement\ TDD\ inter}$ inter-frequency TDD cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measurement\ TDD\ inter}$.

~~where~~

~~$X_{basic\ measurement\ TDD\ inter}$~~ = 6 (cells)

$T_{Measurement\_Period\ TDD\ inter}$ = 480 ms. The time period used for calculating the measurement period $T_{measurement\_TDD\ inter}$ for inter frequency P-CCPCH RSCP measurements.

~~T~~$N_{TDD\ inter}$: This is the ~~minimum time that is available~~ smallest resulting integer number of transmission gap patterns in a transmission gap pattern sequence assigned to UE by UTRAN for inter-frequency TDD measurements~~,~~ during the time period $T_{Measurement\_Period\ TDD\ inter}$ with an arbitrarily chosen timing. ~~The minimum time is calculated by using the actual idle length within the transmission gap as given in the table 11 of Annex B in TS 25.212 and by assuming 2*500 µs for implementation margin.~~

~~T~~$N_{basic\_identify\_TDD\_inter}$ =80~~0 ms~~. This is the number of transmission gap patterns in a transmission gap pattern sequence for inter-frequency TDD measurements during the time period used in the inter frequency TDD equation where the maximum allowed time for the UE to identify a new inter-frequency TDD cell is defined.

~~T~~$N_{basic\_measurement\_TDD\ inter}$ = 5~~0 ms~~. This is the number of transmission gap patterns in a transmission gap pattern sequence for inter-frequency TDD measurements during the time ~~time~~ period $T_{Measurement\_Period\ TDD\ inter}$ with an arbitrarily chosen timing that is used in the inter-frequency TDD equation ~~for defining~~ where the measurement period for inter-frequency P-CCPCH RSCP measurements is defined.

N_{Freq}: This is the ~~N~~number of TDD frequencies indicated in the inter frequency measurement control information.

8.1.2.4.3 Periodic Reporting

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

8.1.2.4.4 Event Triggered Reporting

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

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report, until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted resulting when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ TDD\ inter}$ defined in Section 8.1.2.4.1 When L3 filtering is used an additional delay can be expected.

If a cell has been detectable at least for the time period $T_{identify\_TDD\ inter}$ and then enters or leave the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ TDD\ Inter}$ provided the timing to that cell has not changed more than +/- 32 chips while transmission gap has not been available and the L3 filter has not been used.

< Next changed section >

8.4.2.4 TDD measurements

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

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

8.4.2.4.1 Identification of a new cell

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

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

where

$T_{basic\_identify\_TDD\_inter}$ = 800ms.~~is specified in 8.1.2.4.2.~~

$N_{Freq,TDD}$: Number of TDD frequencies indicated in the ~~I~~inter-frequency cell info list

T_{Meas} is specified in section 8.4.2.1.

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

If the UE does not need measurement occasions to perform inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within 5000 ms.

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

An inter-frequency TDD cell shall be considered detectable when P-CCPCH_Ec/Io ≥ -8 dB and SCH_Ec/Io ≥ -13 dB.

The received P-CCPCH E_c/I_o is defined as

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

and the received SCH_E_c/I_o is defined as

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

8.4.2.4.2 P-CCPCH RSCP ~~M~~measurement period

When a measurement occasion cycle as previously described is scheduled for ~~TDD~~ inter frequency TDD measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.11~~ and 9.1.2~~ and with a measurement period ~~i~~as given by

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

where

$T_{basic\_measurement\_TDD\ inter}$ = 50 ms.~~is specified in section 8.1.2.4.2.~~

$T_{Measurement\_Period\ TDD\ inter}$ is specified in section 8.1.2.4.2.

T_{Meas} is specified in section 8.4.2.1.

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

$N_{Freq,TDD}$ ~~is specified in section 8.4.2.4.1~~: This is the number of TDD frequencies indicated in the inter-frequency cell info list

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

The UE shall be capable of performing P-CCPCH RSCP measurements for $X_{basic\ measurement\ TDD\ inter}$ inter-frequency TDD cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\ TDD}$.

$X_{basic\ measurement\ TDD\ inter}$ is defined in section 8.1.2.4.2

< Next changed section >

A.4.4 FDD/TDD ~~c~~Cell ~~r~~Re-selection

A.4.4.1 Test Purpose and Environment

This test is to verify the requirement for the FDD/TDD cell re-selection delay ~~-~~reported in section 4.2.2.

This scenario implies the presence of ~~1~~ UTRA FDD and 1 UTRA TDD cell as given in Table A.4.8~~,~~ ~~and~~ A.4.9 and A.4.10. The maximum repetition period of the relevant system information blocks that need to be received by the UE to camp on a cell shall be 1280 ms.

~~The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.~~

Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.8: General test parameters for ~~the~~ FDD/TDD ~~c~~Cell ~~r~~Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	FDD cell
	Neighbour cells		Cell2	TDD cell
Final condition	Active cell		Cell2	TDD cell
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
~~T_{SI}~~		~~s~~	~~1.28~~	~~The value shall be used for all cells in the test.~~
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

~~**Table A.4.9: FDD/TDD cell re-selection**~~

~~**Parameter**~~	~~**Unit**~~	~~**Cell 1**~~		~~**Cell 2**~~			
~~Timeslot Number~~		~~n.a~~	~~n.a.~~	~~0~~		~~8~~	
		~~T 1~~	~~T 2~~	~~T1~~	~~T2~~	~~T 1~~	~~T 2~~
~~UTRA RF Channel Number~~		~~Channel 1~~		~~Channel 2~~			
~~CPICH_Ec/Ior~~	~~dB~~	~~-10~~	~~-10~~	~~n.a.~~		~~n.a.~~	
~~PCCPCH_Ec/Ior~~	~~dB~~	~~-12~~	~~-12~~	~~-3~~	~~-3~~		
~~SCH_Ec/Ior~~	~~dB~~	~~-12~~	~~-12~~	~~-9~~	~~-9~~	~~-9~~	~~-9~~
~~SCH_t_{offset}~~		~~n.a.~~	~~n.a.~~	~~0~~	~~0~~	~~0~~	~~0~~
~~PICH_Ec/Ior~~		~~-15~~	~~-15~~			~~-3~~	~~-3~~
~~OCNS~~	~~dB~~	~~-0,941~~	~~-0,941~~	~~-4,28~~	~~-4,28~~	~~-4,28~~	~~-4,28~~
~~$\hat{I}_{or}/I_{oc}$~~	~~dB~~	~~3~~	~~-5~~	~~-2~~	~~6~~	~~-2~~	~~6~~
~~I_{oc}~~	~~dBm/3.84 MHz~~	~~-70~~					
~~CPICH_RSCP~~	~~dBm~~	~~-77~~	~~-85~~	~~n.a.~~		~~n.a.~~	
~~PCCPCH_RSCP~~	~~dBm~~	~~n.a.~~	~~n.a.~~	~~-75~~	~~-67~~		
~~Qrxlevmin~~	~~dBm~~	~~-115~~		~~-103~~			
~~Qoffset $1_{s,n}$~~	~~dB~~	~~C1,C2:+12~~		~~C2,C1:-12~~			
~~Qhyst 1_s~~	~~dB~~	~~0~~		~~0~~			
~~Treselection~~	~~s~~	~~0~~		~~0~~			
~~Sintersearch~~	~~dB~~	~~0~~		~~0~~			
~~Propagation Condition~~		~~AWGN~~		~~AWGN~~			

Table A.4.9: Cell 1 specific test parameters for FDD/TDD Cell Re-Selection

Parameter	**Unit**	**Cell 1**	
		T1	**T2**
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
P-CCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	9	3
I_{oc}	dBm / 3.84 MHz	-70	
CPICH_RSCP	dBm	-71	-77
Propagation Condition		AWGN	
Cell selection and reselection quality measure		CPICH_Ec/No	
Qrxlevmin	dBm	-115	
Qoffset$1_{s,n}$	dB	0	
Qhyst1	dB	0	
PENALTY_TIME	s	0	
TEMPORARY_OFFSET	dB	0	
Treselection	s	0	
Sintrasearch	dB	not sent	
Sintersearch	dB	not sent	

Table A.4.10: Cell 2 specific test parameters for FDD/TDD Cell Re-Selection

Parameter	Unit	Cell 2			
DL timeslot number		0		8	
		T1	T2	T1	T2
UTRA RF Channel Number		Channel 2			
P-CCPCH_Ec/Ior	dB	-3		n.a.	
PICH_Ec/Ior	dB	n.a.		-3	
SCH_Ec/Ior	dB	-9			
SCH_t_{offset}	dB	10			
OCNS_Ec/Ior	dB	-3.12			
$\hat{I}_{or}/I_{oc}$	dB	-4	2	-4	2
P-CCPCH RSCP	dBm	-77	-71	n.a.	n.a.
I_{oc}	dBm/ 3,84 MHz	-70			
Propagation Condition		AWGN			
Qrxlevmin	dBm	-103			
$Qoffset2_{s,n}$	dB	0			
Qhyst2	dB	0			
PENALTY_TIME	s	0			
TEMPORARY_OFFSET	dB	0			
Treselection	s	0			
Sintrasearch	dB	not sent			
Sintersearch	dB	not sent			
Note that the transmit energy per PN chip for the SCH is averaged over the 256 chip duration when the SCH is present in the time slot.					

~~NOTE: The purpose of this test case is to evaluate the delay of the FDD/TDD re-selection process, it is not intended to give reasonable values for a FDD/TDD cell re-selection.~~

A.4.4.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RRC CONNECTION REQUEST message to perform a Location Registration on cell 2.

The cell re-selection delay shall be less than 8 s.

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

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateTDD} + T_{SI}$,

~~-~~where:

~~- $T_{evaluateTDD}$: A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ TDD}$ of 6.4s according to Table 4.1 in section 4.2.2.7.~~

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

$T_{evaluateTDD}$ See Table 4.1 in section 4.2.2.

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

This gives a total of 7.68 s, allow 8s in the test case.

< Next changed section >

A.5.3 FDD/TDD ~~Hard~~ Handover

~~NOTE: This section is included for consistency with numbering with section 5 currently no test covering requirements in sections 5.3.2.1 and 5.3.2.2 exists.~~

A.5.3.1 Test purpose and Environment

The purpose of this test is to verify the requirement for the FDD/TDD handover delay in CELL_DCH state reported in section 5.3.2.1.

The test parameters are given in Table A.5.3, A.5.3A and A.5.3B below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. The P-CCPCH RSCP of the best cell on the unused frequency shall be reported together with Event 2C reporting. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration message with activation time at the beginning of T3 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16].

The UL DPCH in cell 2 shall be transmitted in timeslot 10.

Table A.5.3: General test parameters for FDD/TDD handover

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1 and in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Compressed mode			A.22 set 3	As specified in TS25.101 section A.5
Initial conditions	Active cell		Cell 1	FDD cell
	Neighbour cell		Cell 2	TDD cell
Final condition	Active cell		Cell 2	TDD cell
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	Hysteresis parameter for event 2C
Time to Trigger		ms	0	
Threshold non-used frequency		dBm	-75	Applicable for Event 2C
Filter coefficient			0	
Monitored cell list size			6 FDD neighbours on Channel 1 6 TDD neighbours on Channel 2	
T_{SI}		s	1.28	The value shall be used for all cells in the test
T1		s	5	
T2		s	15	
T3		s	5	

Table A.5.3A: Cell 1 specific test parameters for FDD/TDD handover

Parameter	Unit	Cell 1	
		T1, T2	T3
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
P-CCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	Note 1	n.a.
OCNS_Ec/Ior	dB	Note 2	
$\hat{I}_{or}/I_{oc}$	dB	0	
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-13	
Propagation Condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop Note 2 : The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}			

Table A.5.3B: Cell 2 specific test parameters for FDD/TDD handover

Parameter	Unit	Cell 2								
DL timeslot number		0			2			8		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 2								
P-CCPCH_Ec/Ior	dB	-3			n.a.			n.a.		
PICH_Ec/Ior	dB	n.a.			n.a.			-3		
SCH_Ec/Ior	dB	-9			n.a.			-9		
SCH_t_{offset}	dB	5			n.a.			5		
DPCH_Ec/Ior	dB	n.a.			n.a.		Note 1	n.a.		
OCNS_Ec/Ior	dB	-3.12			0		Note 2	-3.12		
$\hat{I}_{or}/I_{oc}$	dB	-Inf	6		-Inf	6		-Inf	6	
P-CCPCH RSCP	dBm	-Inf	-67		n.a.			n.a.		
I_{oc}	dBm/ 3,84 MHz	-70								
Propagation Condition		AWGN								
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior. Note that the transmit energy per PN chip for the SCH is averaged over the 256 chip duration when the SCH is present in the time slot.										

A.5.3.2 Test Requirements

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

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

< Next changed section >

A.8.3 TDD measurements

A.8.3.1 Correct reporting of TDD neighbours in AWGN propagation condition

A.8.3.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of ~~an~~ events when measuring on ~~a~~ UTRA TDD cells. The~~is~~ test will partly verify the requirements in section 8.1.2~~.3~~ and 9.1.

~~The test consists of two successive time periods, with a time duration T1 and T2 respectively. The test parameters are given in Table A.8.13 and A.8.14. In the measurement control information it is indicated to the UE that event triggered reporting with Event 2C shall be used.~~

The test parameters are given in Table A.8.3A, A.8.3B and A.8.3C below. The test consists of two successive time periods, with time duration of T1 and T2 respectively. Two cells shall be present in the test, cell 1 being the serving UTRA FDD cell and cell 2 being a UTRA TDD neighbour cell.

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. The P-CCPCH RSCP of the best cell on the unused frequency shall be reported together with Event 2C reporting. At the start of time duration T1, the UE may not have any timing information of cell 2.

The TTI of the uplink DCCH shall be 20ms.

Table A.8.~~13~~A: General test parameters for Correct reporting of TDD neighbours in AWGN propagation condition

~~Parameter~~	~~Unit~~	~~Value~~	~~Comment~~
~~DCH parameters~~		~~DL Reference Measurement Channel 12.2 kbps~~	~~As specified in TS 25.101 section A.3.1~~
~~Power Control~~		~~On~~	
~~Compressed mode~~		~~Case 2.1~~	~~Gap length specified in section 8.1.2.3 and the other parameters as specified in TS 25.101 section A.5.~~
~~Active cell~~		~~Cell 1~~	
~~Reporting Threshold~~	~~dB~~		
~~Hysteresis~~	~~dB~~		
~~Time to Trigger~~	~~ms~~		
~~Filter coefficient~~			
~~Monitored cell list size~~		~~Total X~~ ~~Y on frequency Channel 2~~	~~Measurement control information is sent before the compressed mode pattern starts.~~
~~T1~~	~~s~~		
~~T2~~	~~s~~		

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Compressed mode			A.22 set 3	As specified in TS25.101 section A.5
Initial conditions	Active cell		Cell 1	FDD cell
	Neighbour cell		Cell 2	TDD cell
Final condition	Active cell		Cell 1	FDD cell
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	Hysteresis parameter for event 2C
Time to Trigger		ms	0	
Threshold non-used frequency		dBm	-71	Applicable for Event 2C
Filter coefficient			0	
Monitored cell list size			6 FDD neighbours on Channel 1 6 TDD neighbours on Channel 2	
T1		s	15	
T2		s	10	

Table A.8.~~14~~3B: Cell 1 specific test parameters for Correct reporting of TDD neighbours in AWGN propagation condition

~~Parameter~~	~~Unit~~	~~Cell 1~~		~~Cell 2~~			
~~Timeslot Number~~		~~n.a.~~		~~0~~		~~8~~	
		~~T1~~	~~T2~~	~~T1~~	~~T2~~	~~T1~~	~~T2~~
~~UTRA RF Channel Number~~		~~Channel 1~~		~~Channel 2~~			
~~CPICH_Ec/Ior~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~n.a.~~		~~n.a.~~	
~~PCCPCH_Ec/Ior~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~-3~~	~~-3~~		
~~SCH_Ec/Ior~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~-9~~	~~-9~~	~~-9~~	~~-9~~
~~SCH_t_{offset}~~		~~n.a.~~	~~n.a.~~	~~15~~	~~15~~	~~15~~	~~15~~
~~PICH_Ec/Ior~~		~~[ ]~~	~~[ ]~~			~~-3~~	~~-3~~
~~DCH_Ec/Ior~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~-~~	~~-~~	~~-~~	~~-~~
~~OCNS~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~-4.28~~	~~-4.28~~	~~-4.28~~	~~-4.28~~
~~$\hat{I}_{or}/I_{oc}$~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~[ ]~~	~~[ ]~~	~~[ ]~~	~~[ ]~~
~~I_{oc}~~	~~dBm/3.84 MHz~~	~~-70~~		~~-70~~			
~~CPICH_Ec/Io~~		~~[ ]~~		~~n.a.~~			
~~PCCPCH_RSCP~~	~~dB~~	~~n.a.~~	~~n.a.~~	~~[ ]~~	~~[ ]~~	~~[ ]~~	~~[ ]~~
~~Propagation Condition~~		~~AWGN~~					

~~NOTE: The DPCH of the TDD cell is located in an other timeslot than 0 or 8.~~

Parameter	Unit	Cell 1
		T1, T2
UTRA RF Channel Number		Channel 1
CPICH_Ec/Ior	dB	-10
P-CCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DPCH_Ec/Ior	dB	Note 1
OCNS_Ec/Ior	dB	Note 2
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	-70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN
Note 1: The DPCH level is controlled by the power control loop Note 2 : The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{oc}.		

Table A.5.3C: Cell 2 specific test parameters for Correct reporting of TDD neighbours in AWGN propagation condition

Parameter	Unit	Cell 2			
DL timeslot number		0		8	
		T1	T2	T1	T2
UTRA RF Channel Number		Channel 2			
P-CCPCH_Ec/Ior	dB	-3		n.a.	
PICH_Ec/Ior	dB	n.a.		-3	
SCH_Ec/Ior	dB	-9			
SCH_t_{offset}	dB	10			
OCNS_Ec/Ior	dB	-3.12			
P-CCPCH RSCP	dBm	-75	-67	n.a.	n.a.
$\hat{I}_{or}/I_{oc}$	dB	-2	6	-2	6
I_{oc}	dBm/ 3,84 MHz	-70			
Propagation Condition		AWGN			
Note that the transmit energy per PN chip for the SCH is averaged over the 256 chip duration when the SCH is present in the time slot.					

A.8.3.1.2 Test Requirements

~~a) The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than [5] seconds from the start of time period T2.~~

~~b) The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.~~

The UE shall send one Event 2C triggered measurement report for Cell 2 with a measurement reporting delay less than 8.8 s from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of events correctly reported during repeated tests shall be at least 90%.

< Next changed section >

A.9.1.8 P-CCPCH RSCP

A.9.1.8.1 Test Purpose and Environment

~~These measurements consider *P-CCPCH RSCP* measurements. This requirement is only valid for UEs supporting FDD and TDD.~~

The purpose of this test is to verify that the P-CCPCH RSCP measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.11 and applies to UE supporting this capability.

~~In this case the cells are on different frequencies. Table A.9.13 defines the limits of signal strengths and code powers, where the requirement is applicable. Cell 1 is the active cell (FDD) and cell 2 is a TDD cell.~~

A.9.1.8.1.1 Inter frequency test parameters

In this case both cells are on different frequencies and compressed mode as specified in TS 25.101 section A.5, set 3 of table A.22, is applied. Cell 1 is a UTRA FDD cell and cell 2 is a UTRA TDD cell.

P-CCPCH RSCP inter frequency absolute accuracy requirements are tested by using test parameters in Table A.9.13.

Table A.9.13: P-CCPCH RSCP Inter frequency test parameters

Parameter	Unit	Cell 1	Cell 2
Timeslot Number		n.a.	k
UTRA RF Channel Number		Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10	n.a.
PCCPCH_Ec/Ior	dB	-12	-3
SCH_Ec/Ior	dB	-12	-
SCH_t_{offset}		n.a.	-
PICH_Ec/Ior		-15	-
DPCH_Ec/Ior	dB	[ ]	[ ]
OCNS	dB	[To Be Calculated]	[ ]
$\hat{I}_{or}/I_{oc}$	dB	[ ]	[ ]
I_{oc}	dBm/3.84 MHz	Note 1	-70
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94 ... -70 -94... -50	-94 ... -70 -94... -50
Propagation condition	-	AWGN	AWGN
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

Parameter	Unit	Test 1		Test 2	
		Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		n.a.	**0** | **8**	n.a.	**0** | **8**
UTRA RF Channel number		Channel 2	Channel 1	Channel 2	Channel 1
CPICH_Ec/Ior	dB	-10	n.a.	-10	n.a.
P-CCPCH_Ec/Ior	dB	-12	-3 | n.a.	-12	-3 | n.a
SCH_Ec/Ior	dB	-12	-9	-12	-9
SCH t_{offset}		n.a.	5	n.a.	5
PICH_Ec/Ior	dB	-15	n.a. | -3	-15	n.a. | -3
DPCH_Ec/Ior	dB	-15	n.a.	-15	n.a.
OCNS_Ec/Ior	dB	-1.11	-3.12	-1.11	-3.12
Ioc	dBm/ 3.84 MHz	-60	-57.7	-84	-84.7
Îor/Ioc	dB	9.54	7	0	3
P-CCPCH RSCP, Note 1	dBm	n.a.	-53.7 | n.a.	n.a.	-84.7 | n.a.
CPICH RSCP, Note 1	dBm	-60.46	n.a.	-94	n.a.
Io, Note 1	dBm/3.84 MHz	-50	-50	-81	-80
Propagation condition	-	AWGN		AWGN	
Note 1: P-CCPCH RSCP, CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves. Note that the transmit energy per PN chip for the SCH is averaged over the 256 chip duration when the SCH is present in the time slot.					
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed, test parameters for test 2 shall be set within 5 seconds so that the UE does not lose the Cell 2 in between the test.					

A.9.1.8.2 Test Requirements

The P-CCPCH RSCP measurement accuracy shall meet the requirements in section 9.1.11.

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

3GPP TSG RAN WG4 Meeting #23 **R4-020914**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5.1

CHANGE REQUEST

⌘ **25.133** **CR** **414** ⌘ **rev** **-** ⌘ Current version: **4.4.0** ⌘

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

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

Title:	⌘	Corrections of FDD-TDD (3.84 Mcps option) requirements and test cases
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

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

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change: ⌘

Completion of FDD-TDD handover interruption time requirements (5.3)

- Requirements on FDD-TDD HO interruption time still no finalized, i.e. in square brackets

Completion of FDD-TDD measurement requirements in CELL_DCH and CELL_FACH states (8.1.2.4 and 8.4.2.4)

- Correction needed for existing requirements on identification time Tidentify TDD inter and measurement period Tmeasurement TDD inter because not adapted to a TDD measurement approach when in compressed mode
- Requirements on number Xbasic measurement TDD inter of TDD cells to be measured during Tmeasurement TDD inter are missing
- Removal of FDD requirements that are not valid in a TDD context

Corrections to test case for FDD-TDD cell re-selection in Idle Mode (A.4.4)

- Corrections of incorrect signal level settings and clarification to test conditions and parameter settings

Completion of test case for TDD neighbor reporting in CELL_DCH state (A.8.3)

- Test settings still unfinalized, i.e. empty or in square brackets
- Test conditions and parameter settings partially missing.

Completion of P-CCPCH RSCP measurement accuracy test cases (A.9.8)

- Test settings still unfinalized, i.e. empty or in square brackets
- Test conditions and parameter settings completely missing.

Corrections to inter-frequency FDD-TDD cell re-selection requirements

	(4.2.2.4) - Correction to P-CCPCH RSCP cell re-selection hysteresis values based upon equivalent P-CPCCH RSCP accuracy requirements in CELL_DCH and CELL_FACH state **Corrections to FDD-TDD cell re-selection requirements and interruption time in CELL_FACH state (5.5.2.1.3 and 5.5.2.2.2)** - Correction needed because some key time delays for FDD-TDD cell re-selection delay in CELL_FACH are not taken into account **Introduction of FDD-TDD handover test case (A.5.3)** - FDD/TDD HO test case on requirements in section 5.3 still missing
Summary of change: ⌘	**Completion of FDD-TDD handover interruption time requirements (5.3)** - 40 ms for known and 200ms for unknown target cell case with additional 30ms when SFN decoding is required **Completion of FDD-TDD measurement requirements in CELL_DCH and CELL_FACH states (8.1.2.4 and 8.4.2.4)** - Correction to requirements on identification time Tidentify TDD inter and measurement period Tmeasurement TDD inter - Xbasic measurement TDD inter set to 6 (cells) - Removal of FDD requirements that are not valid in a TDD context **Corrections to test case for FDD-TDD cell re-selection in Idle Mode (A.4.4)** - Corrections to incorrect signal level settings and clarification to test conditions and parameter settings **Completion of test case for TDD neighbor reporting in CELL_DCH state (A.8.3)** - Completion of test conditions and parameter settings **Completion of P-CCPCH RSCP measurement accuracy test cases (A.9.8)** - Completion of test conditions and parameter settings **Corrections to inter-frequency FDD-TDD cell re-selection requirements (4.2.2.4)** - Cell re-selection when TDD neighbor cell P-CCPCH RSCP reception level 5dB higher than current serving cell - Evaluation of TDD neighbor cells dependent from the number of TDD carriers **Corrections to FDD-TDD cell re-selection requirements and interruption time in CELL_FACH state (5.5.2.1.3 and 5.5.2.2.2)** - Correction to FDD-TDD cell re-selection delays and interruption times **Introduction of FDD-TDD handover test case (A.5.3)** - New FDD/TDD HO test case on requirements in section 5.3
Consequences if not approved: ⌘	Critical FDD-TDD requirements in the ara of Connected Mode measurements, Handover interruption time, Cell Re-selection in Idle Mode and CELL_FACH state incomplete and corresponding test cases missing or not feasible. **Isolated impact analysis:** This CR contains corrections to FDD-TDD relevant parts of TS25.133 where this specification is incomplete and where parts of critical dual-mode FDD-TDD UE requirements and test cases are missing. Note that this CR does only impact requirement on FDD-TDD inter-working as set

	by WG4, i.e. there is no impact on Technical Specifications under the responsibility of other RAN WG's.

Clauses affected:	⌘	2; 4.2.2.4; 5.3; 5.5.2.1; 5.5.2.1.3; 5.5.2.2.2; 8.1.2.4; 8.4.2.4; A.4.4; A.5.3; A.8.3; A.9.1.8		
Other specs affected:	⌘	[ ] Other core specifications [X] Test specifications [ ] O&M Specifications	⌘	TS25.101
Other comments:	⌘	Accompanying CR165 to 25.101 R99 and corresponding cat-A's. Equivalent CRs in other Releases: CR401 cat. F to 25.133 v3.9.0, CR415 cat. A to 25.133 v5.2.0		

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] (void)

[2] 3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".

[3] 3GPP TS 25.101: "UE Radio transmission and reception (FDD)".

[4] 3GPP TS 25.104: "UTRA (BS) FDD; Radio transmission and reception ".

[5] 3GPP TS 25.102: "UTRA (UE) TDD; Radio transmission and reception ".

[6] 3GPP TS 25.105: "UTRA (BS); Radio transmission and reception".

[7] ~~void.~~3GPP TS 25.212: "Multiplexing and channel coding (FDD)".

[8] 3GPP TS 25.141: "Base station conformance testing (FDD)".

[9] 3GPP TS 25.142: "Base station conformance testing (TDD)".

[10] 3GPP TS 25.113: "Base station EMC".

[11] 3GPP TR 25.942: "RF System scenarios".

[12] 3GPP TR 25.922: "Radio Resource Management Strategies".

[13] 3GPP TS 25.215: "Physical Layer Measurements (FDD)".

[14] 3GPP TS 25.225: "Physical Layer Measurements (TDD)".

[15] 3GPP TS 25.302: "Services provided by Physical Layer".

[16] 3GPP TS 25.331: "Radio Resource Control (RRC) Protocol Specification".

[17] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes"

[18] 3GPP TS 25.214: "Physical layer procedures (FDD)"

[19] 3GPP TS 25.321: " Medium Access Control (MAC) protocol specification"

[20] 3GPP TS 25.303: "Interlayer procedures in Connected Mode"

[21] 3GPP TS 45.008: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control"

[22] 3GPP TS 45.005: "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception"

< Next changed section >

4.2.2.4 Measurements of inter-frequency TDD cells

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

The UE shall measure ~~the~~ P-CCPCH RSCP at least every $N_{carrierTDD}$ * $T_{measureTDD}$ (see table 4.1) ~~of~~ for ~~each~~ inter-frequency TDD ~~neighbour~~ cells that are identified and measured according to the measurement rules~~indicated in the measurement control system information of the serving cell, according to the measurement rules defined in TS25.304, at least every $T_{measureTDD}$ (see table 4.1)~~. The parameter $N_{carrierTDD}$ is the number of carriers used for inter-frequency TDD cells. The UE shall filter P-CCPCH RSCP measurements of each measured inter-frequency TDD cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$.

The filtering of P-CCPCH RSCP shall be such that the UE shall be capable of evaluating that an already ~~detected~~ identified inter-frequency TDD cell has become better ranked than the serving cell within $N_{carrierTDD}$* $T_{evaluateTDD}$ from the moment the inter-frequency TDD cell became at least ~~3~~5 dB better ranked than the current serving cell provided that Treselection timer is set to zero. For non-~~detected~~ identified inter-frequency TDD cells, the filtering shall be such that the UE shall be capable of evaluating that an inter-frequency TDD cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency TDD cell became at least ~~3~~5 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency TDD cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency TDD cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.~~ The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.~~

< Next changed section >

5.3 FDD/TDD Handover

5.3.1 Introduction

The purpose of FDD/TDD ~~hard~~ handover is to change the radio access mode ~~between~~ from FDD ~~and~~ to TDD. The FDD/TDD handover procedure is initiated from UTRAN with a RRC message that implies a hard handover~~, refer to TS25.331~~ as described in [16].

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

5.3.2.1 ~~Hard~~ FDD/TDD handover delay

RRC ~~P~~procedure ~~delay~~ performance values for all RRC procedures~~,~~ that can command a hard handover~~,~~ are specified in ~~TS25.331 section 13.5.2~~[16].

When the UE receives a RRC message implying ~~hard~~ FDD/TDD 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~~ performance value as defined in ~~TS25.331 Section 13.5.2~~[16] 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, is dependent on whether the target cell is known for the UE or not. ~~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.~~

If FDD/TDD handover is commanded, the interruption time shall be less than,

$T_{interrupt} = T_{offset} + T_{UL} + 30*F_{SFN} + 20*KC + 180*UC$ ms

where,

T_{offset}	Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel
T_{UL}	Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell
F_{SFN}	Equal to 1 if SFN decoding is required and equal to 0 otherwise
KC	Equal to 1 if a known target cell is indicated in the RRC message implying FDD/TDD handover and equal to 0 otherwise
UC	Equal to 1 if an unknown target cell is indicated in the RRC message implying FDD/TDD handover and equal to 0 otherwise

~~In this interruption requirement a~~ An inter-frequency TDD target cell shall be considered known by the UE, if ~~is known if~~ the target 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~~**
	~~SFN not to be decoded~~	**~~SFN needs to be decoded~~**	**~~SFN needs to be decoded~~**
~~1~~	~~[100]~~	~~[130]~~	~~[400]~~

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

The interruption time requirements ~~in Table 5.1~~ for ~~the~~ an unknown target cell shall apply only if the signal quality of the unknown target cell is ~~good enough~~ sufficient for successful synchronisation with one attempt.

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

< Next changed section >

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 $T_{reselection}$ is set to 0. Otherwise the Cell reselection delay is increased $T_{reselection}$ 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 cell 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 section 9. The measurements used for S-criteria and cell re-selection evaluation in CELL_FACH shall be performed according to section 8.4.

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 the preambles on the PRACH for sending 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 the ~~C~~cell ~~R~~re-selection process and the moment in time when the UE starts sending the RRC CELL UPDATE message to the UTRAN on the RACH.

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.

< Next changed section >

5.5.2.1.3 FDD-TDD cell reselection

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

The cell re-selection delay in CELL_FACH state in FDD to an inter-frequency TDD cell shall be less than,

~~$T_{reselection,TDD} = T_{identify,TDD} + 100 + T_{SI} + T_{RA}$ ms~~

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

where

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

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} ~~= T~~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~~[16] for a UTRAN cell.

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

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

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

where

$T_{Measurement\ TDD\ inter}$ is specified in 8.4.2.4.1.

Th~~is~~ese requirements assume~~s~~ radio conditions to be sufficient, so that reading of system information can be done without errors.

< Next changed section >

5.5.2.2.2 FDD-TDD cell reselection

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

The interruption time, ~~i.e.~~ is defined as the time period between the last TTI the UE monitors the FACH ~~channel~~ on the serving cell and the time instant the UE starts to transmit the RRC CELL UPDATE message in the target inter-frequency TDD cell on the RACH.

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

~~$T_{interrupt,TDD} = 100 + T_{si} + T_{RA}$ 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.~~

In case of inter-frequency cell reselection to a TDD cell and when the UE needs measurement occasions to perform inter-frequency TDD measurements, the interruption time shall be less than

$T_{interrupt1, TDD} = T_{IU} + 20 + T_{SI} + T_{RA}$ ms

In case of inter-frequency cell reselection to a TDD cell and when the UE does not need measurement occasions to perform inter-frequency TDD measurements, the interruption time shall be less than

$T_{interrupt2, TDD} = T_{IU} + 20 + T_{RA}$ 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_{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 [16].
- T_{RA} is the additional delay caused by the random access procedure.

< Next changed section >

8.1.2.4 TDD measurements

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

In the CELL_DCH state when a transmission gap pattern sequence with the "TDD measurements" purpose is provided by the network, the UE shall continuously measure ~~detected~~ identified inter frequency TDD cells and search for new inter frequency TDD cells indicated in the measurement control information.

In order for the requirements in the following subsections to apply, the Beacon timeslots of the inter-frequency TDD cells indicated in the measurement control information shall either be synchronised or non-overlapping in time such that the UE can measure an inter-frequency TDD cell at least once in every transmission gap pattern as given in [7] for the slot allocation case in use in this cell and by assuming 2*0.5 ms implementation margin per transmission gap.

~~the~~ UTRAN ~~must~~ shall provide a transmission gap pattern sequence with measurement purpose TDD measurement using the ~~following~~ combinations for TGL1, TGL2 and TGD in Table 8.2:

Table 8.2

TGL1 [slots]	TGL2 [slots]	TGD [slots]
10	-	undefined
10	10	15…269
14	7	15…269

~~If reporting of the values for TGSN_proposed is requested by the network while P-CCPCH RSCP is measured by the UE, and this is supported by the UE, values for TGSN_proposed shall be extracted by use of the following formula and reported to the network together with the P-CCPCH RSCP results in the measurement report:~~

~~TGSN_proposed=~~
~~(FDD slot in which the starting point of the P-CCPCH slot of the monitored TDD cell was observed) – (1 slot)~~

8.1.2.4.1 Identification of a new cell

When transmission gaps are scheduled for inter-frequency TDD measurements, ~~T~~the UE shall be able to identify ~~a~~ new detectable inter-frequency TDD cell belonging to the monitored set within

~~$$T_{identify\ TDD\ inter} = Max\left\{ 5000, T_{basic\ identify\ TDD\ inter} \cdot \frac{T_{Measurement\ Period\ TDD\ inter}}{T_{TDD\ inter}} \cdot N_{Freq} \right\} ms$$~~

$$T_{identify\ TDD\ inter} = Max\left\{ 5000, N_{basic\ identify\ TDD\ inter} \cdot \frac{T_{Measurement\ Period\ TDD\ inter}}{N_{TDD\ inter}} \cdot N_{Freq} \right\} ms$$

If the UE does not need compressed mode to perform inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within 5000 ms.

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

An inter-frequency TDD cell shall be considered detectable when P-CCPCH-_Ec/Io ≥ -8 dB~~,~~ and SCH_Ec/Io ≥ -13 dB ~~and SCH_Ec/Ior is equally divided between primary synchronisation code and the sum of all secondary synchronisation codes, where the secondary synchronisation codes are also equally divided. When L3 filtering is used an additional delay can be expected~~.

~~Where t~~The received P-CCPCH-_E_c/I_o is defined as

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

and the received SCH-_E_c/I_o is defined as

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

8.1.2.4.2 P-CCPCH RSCP ~~M~~measurement period

When transmission gaps ~~as previously described~~ are scheduled for ~~TDD~~ inter frequency TDD measurements, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.11 and with a measurement period as given by

~~$T_{measurement\ inter} = Max\left\{T_{Measurement\_Period\ TDD\ Inter}, T_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{Measurement\_Period\ TDD\ Inter}}{T_{TDD\ Inter}} \cdot N_{Freq}\right\} ms$~~

$$T_{measurement\ TDD\ inter} = Max\left\{T_{Measurement\ Period\ TDD\ inter}, N_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{Measurement\ Period\ TDD\ inter}}{N_{TDD\ inter}} \cdot N_{Freq}\right\} ms$$

If the UE does not need compressed mode to perform inter-frequency TDD measurements, the measurement period for inter-frequency TDD measurements shall be 480 ms.

The UE shall be capable of performing P-CCPCH RSCP measurements for $X_{basic\ measurement\ TDD\ inter}$ inter-frequency TDD cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measurement\ TDD\ inter}$.

~~where~~

~~$X_{basic\ measurement\ TDD\ inter}$~~ = 6 (cells)

$T_{Measurement\_Period\ TDD\ inter}$ = 480 ms. The time period used for calculating the measurement period $T_{measurement\_TDD\ inter}$ for inter frequency P-CCPCH RSCP measurements.

~~T~~$N_{TDD\ inter}$: This is the ~~minimum time that is available~~ smallest resulting integer number of transmission gap patterns in a transmission gap pattern sequence assigned to UE by UTRAN for inter-frequency TDD measurements~~,~~ during the time period $T_{Measurement\_Period\ TDD\ inter}$ with an arbitrarily chosen timing. ~~The minimum time is calculated by using the actual idle length within the transmission gap as given in the table 11 of Annex B in TS 25.212 and by assuming 2*500 µs for implementation margin.~~

~~T~~$N_{basic\_identify\_TDD\_inter}$ =80~~0 ms~~. This is the number of transmission gap patterns in a transmission gap pattern sequence for inter-frequency TDD measurements during the time period used in the inter frequency TDD equation where the maximum allowed time for the UE to identify a new inter-frequency TDD cell is defined.

~~T~~$N_{basic\_measurement\_TDD\ inter}$ = 5~~0 ms~~. This is the number of transmission gap patterns in a transmission gap pattern sequence for inter-frequency TDD measurements during the time ~~time~~ period $T_{Measurement\_Period\ TDD\ inter}$ with an arbitrarily chosen timing that is used in the inter-frequency TDD equation ~~for defining~~ where the measurement period for inter-frequency P-CCPCH RSCP measurements is defined.

N_{Freq}: This is the ~~N~~number of TDD frequencies indicated in the inter frequency measurement control information.

8.1.2.4.3 Periodic Reporting

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

8.1.2.4.4 Event Triggered Reporting

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

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report, until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH~~.~~ This measurement reporting delay excludes a delay uncertainty ~~resulted~~ resulting when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ TDD\ inter}$ defined in Section 8.1.2.4.1 When L3 filtering is used an additional delay can be expected.

~~If a cell has been detectable at least for the time period $T_{identify\_TDD\ inter}$ and then enters or leave the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ TDD\ Inter}$ provided the timing to that cell has not changed more than +/- 32 chips while transmission gap has not been available and the L3 filter has not been used.~~

< Next changed section >

8.4.2.4 TDD measurements

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

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

8.4.2.4.1 Identification of a new cell

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

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

where

$T_{basic\_identify\_TDD\_inter}$ = 800ms.~~is specified in 8.1.2.4.2.~~

$N_{Freq,TDD}$: Number of TDD frequencies indicated in the ~~I~~inter-frequency cell info list

T_{Meas} is specified in section 8.4.2.1.

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

If the UE does not need measurement occasions to perform inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within 5000 ms.

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

An inter-frequency TDD cell shall be considered detectable when P-CCPCH Ec/Io ≥ -8 dB and SCH Ec/Io ≥ -13 dB.

The received P-CCPCH E_c/I_o is defined as

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

and the received SCH E_c/I_o is defined as

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

8.4.2.4.2 P-CCPCH RSCP ~~M~~measurement period

When a measurement occasion cycle as previously described is scheduled for ~~TDD~~ inter frequency TDD measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.11~~ and 9.1.2~~ and with a measurement period ~~i~~as given by

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

where

$T_{basic\_measurement\_TDD\ inter}$ = 50 ms.~~is specified in section 8.1.2.4.2.~~

$T_{Measurement\_Period\ TDD\ inter}$ is specified in section 8.1.2.4.2.

T_{Meas} is specified in section 8.4.2.1.

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

$N_{Freq,TDD}$ ~~is specified in section 8.4.2.4.1~~: This is the number of TDD frequencies indicated in the inter-frequency cell info list

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

The UE shall be capable of performing P-CCPCH RSCP measurements for $X_{basic\ measurement\ TDD\ inter}$ inter-frequency TDD cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\ TDD}$.

$X_{basic\ measurement\ TDD\ inter}$ is defined in section 8.1.2.4.2

< Next changed section >

A.4.4 FDD/TDD ~~c~~Cell ~~r~~Re-selection

A.4.4.1 Test Purpose and Environment

This test is to verify the requirement for the FDD/TDD cell re-selection delay ~~-~~reported in section 4.2.2.

This scenario implies the presence of ~~1~~ UTRA FDD and 1 UTRA TDD cell as given in Table A.4.8~~,~~ ~~and~~ A.4.9 and A.4.10. The maximum repetition period of the relevant system information blocks that need to be received by the UE to camp on a cell shall be 1280 ms.

~~The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.~~

Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.8: General test parameters for ~~the~~ FDD/TDD ~~c~~Cell ~~r~~Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	FDD cell
	Neighbour cells		Cell2	TDD cell
Final condition	Active cell		Cell2	TDD cell
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
~~T_{SI}~~		~~s~~	~~1.28~~	~~The value shall be used for all cells in the test.~~
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

~~**Table A.4.9: FDD/TDD cell re-selection**~~

~~**Parameter**~~	~~**Unit**~~	~~**Cell 1**~~		~~**Cell 2**~~			
~~Timeslot Number~~		~~n.a~~	~~n.a.~~	~~0~~		~~8~~	
		~~T 1~~	~~T 2~~	~~T1~~	~~T2~~	~~T 1~~	~~T 2~~
~~UTRA RF Channel Number~~		~~Channel 1~~		~~Channel 2~~			
~~CPICH_Ec/Ior~~	~~dB~~	~~-10~~	~~-10~~	~~n.a.~~		~~n.a.~~	
~~PCCPCH_Ec/Ior~~	~~dB~~	~~-12~~	~~-12~~	~~-3~~	~~-3~~		
~~SCH_Ec/Ior~~	~~dB~~	~~-12~~	~~-12~~	~~-9~~	~~-9~~	~~-9~~	~~-9~~
~~SCH_t_{offset}~~		~~n.a.~~	~~n.a.~~	~~0~~	~~0~~	~~0~~	~~0~~
~~PICH_Ec/Ior~~		~~-15~~	~~-15~~			~~-3~~	~~-3~~
~~OCNS~~	~~dB~~	~~-0,941~~	~~-0,941~~	~~-4,28~~	~~-4,28~~	~~-4,28~~	~~-4,28~~
~~$\hat{I}_{or}/I_{oc}$~~	~~dB~~	~~3~~	~~-5~~	~~-2~~	~~6~~	~~-2~~	~~6~~
~~I_{oc}~~	~~dBm/3.84 MHz~~	~~-70~~					
~~CPICH_RSCP~~	~~dBm~~	~~-77~~	~~-85~~	~~n.a.~~		~~n.a.~~	
~~PCCPCH_RSCP~~	~~dBm~~	~~n.a.~~	~~n.a.~~	~~-75~~	~~-67~~		
~~Qrxlevmin~~	~~dBm~~	~~-115~~		~~-103~~			
~~Qoffset $1_{s,n}$~~	~~dB~~	~~C1,C2:+12~~		~~C2,C1:-12~~			
~~Qhyst 1_s~~	~~dB~~	~~0~~		~~0~~			
~~Treselection~~	~~s~~	~~0~~		~~0~~			
~~Sintersearch~~	~~dB~~	~~0~~		~~0~~			
~~Propagation Condition~~		~~AWGN~~		~~AWGN~~			

Table A.4.9: Cell 1 specific test parameters for FDD/TDD Cell Re-Selection

Parameter	**Unit**	**Cell 1**	
		T1	**T2**
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
P-CCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	9	3
I_{oc}	dBm / 3.84 MHz	-70	
CPICH_RSCP	dBm	-71	-77
Propagation Condition		AWGN	
Cell selection and reselection quality measure		CPICH_Ec/No	
Qrxlevmin	dBm	-115	
Qoffset$1_{s,n}$	dB	0	
Qhyst1	dB	0	
PENALTY_TIME	s	0	
TEMPORARY_OFFSET	dB	0	
Treselection	s	0	
Sintrasearch	dB	not sent	
Sintersearch	dB	not sent	

Table A.4.10: Cell 2 specific test parameters for FDD/TDD Cell Re-Selection

Parameter	Unit	Cell 2			
DL timeslot number		0		8	
		T1	T2	T1	T2
UTRA RF Channel Number		Channel 2			
P-CCPCH_Ec/Ior	dB	-3		n.a.	
PICH_Ec/Ior	dB	n.a.		-3	
SCH_Ec/Ior	dB	-9			
SCH_t_{offset}	dB	10			
OCNS_Ec/Ior	dB	-3.12			
$\hat{I}_{or}/I_{oc}$	dB	-4	2	-4	2
P-CCPCH RSCP	dBm	-77	-71	n.a.	n.a.
I_{oc}	dBm/ 3,84 MHz	-70			
Propagation Condition		AWGN			
Qrxlevmin	dBm	-103			
$Qoffset2_{s,n}$	dB	0			
Qhyst2	dB	0			
PENALTY_TIME	s	0			
TEMPORARY_OFFSET	dB	0			
Treselection	s	0			
Sintrasearch	dB	not sent			
Sintersearch	dB	not sent			
Note that the transmit energy per PN chip for the SCH is averaged over the 256 chip duration when the SCH is present in the time slot.					

~~NOTE: The purpose of this test case is to evaluate the delay of the FDD/TDD re-selection process, it is not intended to give reasonable values for a FDD/TDD cell re-selection.~~

A.4.4.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RRC CONNECTION REQUEST message to perform a Location Registration on cell 2.

The cell re-selection delay shall be less than 8 s.

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

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateTDD} + T_{SI}$,

~~-~~where:

~~- $T_{evaluateTDD}$: A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ TDD}$ of 6.4s according to Table 4.1 in section 4.2.2.7.~~

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

$T_{evaluateTDD}$ See Table 4.1 in section 4.2.2.

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

This gives a total of 7.68 s, allow 8s in the test case.

< Next changed section >

A.5.3 FDD/TDD ~~Hard~~ Handover

~~NOTE: This section is included for consistency with numbering with section 5 currently no test covering requirements in sections 5.3.2.1 and 5.3.2.2 exists.~~

A.5.3.1 Test purpose and Environment

The purpose of this test is to verify the requirement for the FDD/TDD handover delay in CELL_DCH state reported in section 5.3.2.1.

The test parameters are given in Table A.5.3, A.5.3A and A.5.3B below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. The P-CCPCH RSCP of the best cell on the unused frequency shall be reported together with Event 2C reporting. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration message with activation time at the beginning of T3 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16].

The UL DPCH in cell 2 shall be transmitted in timeslot 10.

Table A.5.3: General test parameters for FDD/TDD handover

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1 and in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Compressed mode			A.22 set 3	As specified in TS25.101 section A.5
Initial conditions	Active cell		Cell 1	FDD cell
	Neighbour cell		Cell 2	TDD cell
Final condition	Active cell		Cell 2	TDD cell
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	Hysteresis parameter for event 2C
Time to Trigger		ms	0	
Threshold non-used frequency		dBm	-75	Applicable for Event 2C
Filter coefficient			0	
Monitored cell list size			6 FDD neighbours on Channel 1 6 TDD neighbours on Channel 2	
T_{SI}		s	1.28	The value shall be used for all cells in the test
T1		s	5	
T2		s	15	
T3		s	5	

Table A.5.3A: Cell 1 specific test parameters for FDD/TDD handover

Parameter	Unit	Cell 1	
		T1, T2	T3
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
P-CCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	Note 1	n.a.
OCNS_Ec/Ior	dB	Note 2	
$\hat{I}_{or}/I_{oc}$	dB	0	
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-13	
Propagation Condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop Note 2 : The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}			

Table A.5.3B: Cell 2 specific test parameters for FDD/TDD handover

Parameter	Unit	Cell 2								
DL timeslot number		0			2			8		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 2								
P-CCPCH_Ec/Ior	dB	-3			n.a.			n.a.		
PICH_Ec/Ior	dB	n.a.			n.a.			-3		
SCH_Ec/Ior	dB	-9			n.a.			-9		
SCH_t_{offset}	dB	5			n.a.			5		
DPCH_Ec/Ior	dB	n.a.			n.a.		Note 1	n.a.		
OCNS_Ec/Ior	dB	-3.12			0		Note 2	-3.12		
$\hat{I}_{or}/I_{oc}$	dB	-Inf	6		-Inf	6		-Inf	6	
P-CCPCH RSCP	dBm	-Inf	-67		n.a.			n.a.		
I_{oc}	dBm/ 3,84 MHz	-70								
Propagation Condition		AWGN								
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior. Note that the transmit energy per PN chip for the SCH is averaged over the 256 chip duration when the SCH is present in the time slot.										

A.5.3.2 Test Requirements

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

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

< Next changed section >

A.8.3 TDD measurements

A.8.3.1 Correct reporting of TDD neighbours in AWGN propagation condition

A.8.3.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of ~~an~~ events when measuring on ~~a~~ UTRA TDD cells. The~~is~~ test will partly verify the requirements in section 8.1.2~~.3~~ and 9.1.

~~The test consists of two successive time periods, with a time duration T1 and T2 respectively. The test parameters are given in Table A.8.13 and A.8.14. In the measurement control information it is indicated to the UE that event triggered reporting with Event 2C shall be used.~~

The test parameters are given in Table A.8.3A, A.8.3B and A.8.3C below. The test consists of two successive time periods, with time duration of T1 and T2 respectively. Two cells shall be present in the test, cell 1 being the serving UTRA FDD cell and cell 2 being a UTRA TDD neighbour cell.

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. The P-CCPCH RSCP of the best cell on the unused frequency shall be reported together with Event 2C reporting. At the start of time duration T1, the UE may not have any timing information of cell 2.

The TTI of the uplink DCCH shall be 20ms.

Table A.8.~~13~~A: General test parameters for Correct reporting of TDD neighbours in AWGN propagation condition

~~Parameter~~	~~Unit~~	~~Value~~	~~Comment~~
~~DCH parameters~~		~~DL Reference Measurement Channel 12.2 kbps~~	~~As specified in TS 25.101 section A.3.1~~
~~Power Control~~		~~On~~	
~~Compressed mode~~		~~Case 2.1~~	~~Gap length specified in section 8.1.2.3 and the other parameters as specified in TS 25.101 section A.5.~~
~~Active cell~~		~~Cell 1~~	
~~Reporting Threshold~~	~~dB~~		
~~Hysteresis~~	~~dB~~		
~~Time to Trigger~~	~~ms~~		
~~Filter coefficient~~			
~~Monitored cell list size~~		~~Total X~~ ~~Y on frequency Channel 2~~	~~Measurement control information is sent before the compressed mode pattern starts.~~
~~T1~~	~~s~~		
~~T2~~	~~s~~		

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Compressed mode			A.22 set 3	As specified in TS25.101 section A.5
Initial conditions	Active cell		Cell 1	FDD cell
	Neighbour cell		Cell 2	TDD cell
Final condition	Active cell		Cell 1	FDD cell
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	Hysteresis parameter for event 2C
Time to Trigger		ms	0	
Threshold non-used frequency		dBm	-71	Applicable for Event 2C
Filter coefficient			0	
Monitored cell list size			6 FDD neighbours on Channel 1 6 TDD neighbours on Channel 2	
T1		s	15	
T2		s	10	

Table A.8.~~14~~3B: Cell 1 specific test parameters for Correct reporting of TDD neighbours in AWGN propagation condition

~~Parameter~~	~~Unit~~	~~Cell 1~~		~~Cell 2~~			
~~Timeslot Number~~		~~n.a.~~		~~0~~		~~8~~	
		~~T1~~	~~T2~~	~~T1~~	~~T2~~	~~T1~~	~~T2~~
~~UTRA RF Channel Number~~		~~Channel 1~~		~~Channel 2~~			
~~CPICH_Ec/Ior~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~n.a.~~		~~n.a.~~	
~~PCCPCH_Ec/Ior~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~-3~~	~~-3~~		
~~SCH_Ec/Ior~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~-9~~	~~-9~~	~~-9~~	~~-9~~
~~SCH_t_{offset}~~		~~n.a.~~	~~n.a.~~	~~15~~	~~15~~	~~15~~	~~15~~
~~PICH_Ec/Ior~~		~~[ ]~~	~~[ ]~~			~~-3~~	~~-3~~
~~DCH_Ec/Ior~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~-~~	~~-~~	~~-~~	~~-~~
~~OCNS~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~-4.28~~	~~-4.28~~	~~-4.28~~	~~-4.28~~
~~$\hat{I}_{or}/I_{oc}$~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~[ ]~~	~~[ ]~~	~~[ ]~~	~~[ ]~~
~~I_{oc}~~	~~dBm/3.84 MHz~~	~~-70~~		~~-70~~			
~~CPICH_Ec/Io~~		~~[ ]~~		~~n.a.~~			
~~PCCPCH_RSCP~~	~~dB~~	~~n.a.~~	~~n.a.~~	~~[ ]~~	~~[ ]~~	~~[ ]~~	~~[ ]~~
~~Propagation Condition~~		~~AWGN~~					

~~NOTE: The DPCH of the TDD cell is located in an other timeslot than 0 or 8.~~

Parameter	Unit	Cell 1
		T1, T2
UTRA RF Channel Number		Channel 1
CPICH_Ec/Ior	dB	-10
P-CCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DPCH_Ec/Ior	dB	Note 1
OCNS_Ec/Ior	dB	Note 2
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	-70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN
Note 1: The DPCH level is controlled by the power control loop Note 2 : The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{oc}.		

Table A.5.3C: Cell 2 specific test parameters for Correct reporting of TDD neighbours in AWGN propagation condition

Parameter	Unit	Cell 2			
DL timeslot number		0		8	
		T1	T2	T1	T2
UTRA RF Channel Number		Channel 2			
P-CCPCH_Ec/Ior	dB	-3		n.a.	
PICH_Ec/Ior	dB	n.a.		-3	
SCH_Ec/Ior	dB	-9			
SCH_t_{offset}	dB	10			
OCNS_Ec/Ior	dB	-3.12			
P-CCPCH RSCP	dBm	-75	-67	n.a.	n.a.
$\hat{I}_{or}/I_{oc}$	dB	-2	6	-2	6
I_{oc}	dBm/ 3,84 MHz	-70			
Propagation Condition		AWGN			
Note that the transmit energy per PN chip for the SCH is averaged over the 256 chip duration when the SCH is present in the time slot.					

A.8.3.1.2 Test Requirements

~~a) The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than [5] seconds from the start of time period T2.~~

~~b) The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.~~

The UE shall send one Event 2C triggered measurement report for Cell 2 with a measurement reporting delay less than 8.8 s from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of events correctly reported during repeated tests shall be at least 90%.

< Next changed section >

A.9.1.8 P-CCPCH RSCP

A.9.1.8.1 Test Purpose and Environment

~~These measurements consider *P-CCPCH RSCP* measurements. This requirement is only valid for UEs supporting FDD and TDD.~~

The purpose of this test is to verify that the P-CCPCH RSCP measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.11 and applies to UE supporting this capability.

~~In this case the cells are on different frequencies. Table A.9.13 defines the limits of signal strengths and code powers, where the requirement is applicable. Cell 1 is the active cell (FDD) and cell 2 is a TDD cell.~~

A.9.1.8.1.1 Inter frequency test parameters

In this case both cells are on different frequencies and compressed mode as specified in TS 25.101 section A.5, set 3 of table A.22, is applied. Cell 1 is a UTRA FDD cell and cell 2 is a UTRA TDD cell.

P-CCPCH RSCP inter frequency absolute accuracy requirements are tested by using test parameters in Table A.9.13.

Table A.9.13: P-CCPCH RSCP inter frequency test parameters

Parameter	Unit	Cell 1	Cell 2
Timeslot Number		n.a.	k
UTRA RF Channel Number		Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10	n.a.
PCCPCH_Ec/Ior	dB	-12	-3
SCH_Ec/Ior	dB	-12	-
SCH_t_{offset}		n.a.	-
PICH_Ec/Ior		-15	-
DPCH_Ec/Ior	dB	[ ]	[ ]
OCNS	dB	[To Be Calculated]	[ ]
$\hat{I}_{or}/I_{oc}$	dB	[ ]	[ ]
I_{oc}	dBm/3.84 MHz	Note 1	-70
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94 ... -70 -94... -50	-94 ... -70 -94... -50
Propagation condition	-	AWGN	AWGN
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

Parameter	Unit	Test 1		Test 2	
		Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		n.a.	**0** | **8**	n.a.	**0** | **8**
UTRA RF Channel number		Channel 2	Channel 1	Channel 2	Channel 1
CPICH_Ec/Ior	dB	-10	n.a.	-10	n.a.
P-CCPCH_Ec/Ior	dB	-12	-3 | n.a.	-12	-3 | n.a
SCH_Ec/Ior	dB	-12	-9	-12	-9
SCH_t_{offset}		n.a.	5	n.a.	5
PICH_Ec/Ior	dB	-15	n.a. | -3	-15	n.a. | -3
DPCH_Ec/Ior	dB	-15	n.a.	-15	n.a.
OCNS_Ec/Ior	dB	-1.11	-3.12	-1.11	-3.12
Ioc	dBm/ 3.84 MHz	-60	-57.7	-84	-84.7
Îor/Ioc	dB	9.54	7	0	3
P-CCPCH RSCP, Note 1	dBm	n.a.	-53.7 | n.a.	n.a.	-84.7 | n.a.
CPICH RSCP, Note 1	dBm	-60.46	n.a.	-94	n.a.
Io, Note 1	dBm/3.84 MHz	-50	-50	-81	-80
Propagation condition	-	AWGN		AWGN	
Note 1: P-CCPCH RSCP, CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves. Note that the transmit energy per PN chip for the SCH is averaged over the 256 chip duration when the SCH is present in the time slot.					
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed, test parameters for test 2 shall be set within 5 seconds so that the UE does not lose the Cell 2 in between the test.					

A.9.1.8.2 Test Requirements

The P-CCPCH RSCP measurement accuracy shall meet the requirements in section 9.1.11.

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

3GPP TSG RAN WG4 Meeting #23 **R4-020915**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5.1

CHANGE REQUEST

⌘ **25.133** **CR** **415** ⌘ **rev** **-** ⌘ Current version: **5.2.0** ⌘

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

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

Title:	⌘	Corrections of FDD-TDD (3.84 Mcps option) requirements and test cases
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

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

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change: ⌘

Completion of FDD-TDD handover interruption time requirements (5.3)

- Requirements on FDD-TDD HO interruption time still no finalized, i.e. in square brackets

Completion of FDD-TDD measurement requirements in CELL_DCH and CELL_FACH states (8.1.2.4 and 8.4.2.4)

- Correction needed for existing requirements on identification time Tidentify TDD inter and measurement period Tmeasurement TDD inter because not adapted to a TDD measurement approach when in compressed mode
- Requirements on number Xbasic measurement TDD inter of TDD cells to be measured during Tmeasurement TDD inter are missing
- Removal of FDD requirements that are not valid in a TDD context

Corrections to test case for FDD-TDD cell re-selection in Idle Mode (A.4.4)

- Corrections of incorrect signal level settings and clarification to test conditions and parameter settings

Completion of test case for TDD neighbor reporting in CELL_DCH state (A.8.3)

- Test settings still unfinalized, i.e. empty or in square brackets
- Test conditions and parameter settings partially missing.

Completion of P-CCPCH RSCP measurement accuracy test cases (A.9.8)

- Test settings still unfinalized, i.e. empty or in square brackets
- Test conditions and parameter settings completely missing.

Corrections to inter-frequency FDD-TDD cell re-selection requirements

	(4.2.2.4) - Correction to P-CCPCH RSCP cell re-selection hysteresis values based upon equivalent P-CPCCH RSCP accuracy requirements in CELL_DCH and CELL_FACH state **Corrections to FDD-TDD cell re-selection requirements and interruption time in CELL_FACH state (5.5.2.1.3 and 5.5.2.2.2)** - Correction needed because some key time delays for FDD-TDD cell re-selection delay in CELL_FACH are not taken into account **Introduction of FDD-TDD handover test case (A.5.3)** - FDD/TDD HO test case on requirements in section 5.3 still missing
Summary of change: ⌘	**Completion of FDD-TDD handover interruption time requirements (5.3)** - 40 ms for known and 200ms for unknown target cell case with additional 30ms when SFN decoding is required **Completion of FDD-TDD measurement requirements in CELL_DCH and CELL_FACH states (8.1.2.4 and 8.4.2.4)** - Correction to requirements on identification time Tidentify TDD inter and measurement period Tmeasurement TDD inter - Xbasic measurement TDD inter set to 6 (cells) - Removal of FDD requirements that are not valid in a TDD context **Corrections to test case for FDD-TDD cell re-selection in Idle Mode (A.4.4)** - Corrections to incorrect signal level settings and clarification to test conditions and parameter settings **Completion of test case for TDD neighbor reporting in CELL_DCH state (A.8.3)** - Completion of test conditions and parameter settings **Completion of P-CCPCH RSCP measurement accuracy test cases (A.9.8)** - Completion of test conditions and parameter settings **Corrections to inter-frequency FDD-TDD cell re-selection requirements (4.2.2.4)** - Cell re-selection when TDD neighbor cell P-CCPCH RSCP reception level 5dB higher than current serving cell - Evaluation of TDD neighbor cells dependent from the number of TDD carriers **Corrections to FDD-TDD cell re-selection requirements and interruption time in CELL_FACH state (5.5.2.1.3 and 5.5.2.2.2)** - Correction to FDD-TDD cell re-selection delays and interruption times **Introduction of FDD-TDD handover test case (A.5.3)** - New FDD/TDD HO test case on requirements in section 5.3
Consequences if not approved: ⌘	Critical FDD-TDD requirements in the ara of Connected Mode measurements, Handover interruption time, Cell Re-selection in Idle Mode and CELL_FACH state incomplete and corresponding test cases missing or not feasible. **Isolated impact analysis:** This CR contains corrections to FDD-TDD relevant parts of TS25.133 where this specification is incomplete and where parts of critical dual-mode FDD-TDD UE requirements and test cases are missing. Note that this CR does only impact requirement on FDD-TDD inter-working as set

	by WG4, i.e. there is no impact on Technical Specifications under the responsibility of other RAN WG's.

Clauses affected:	⌘	2; 4.2.2.4; 5.3; 5.5.2.1; 5.5.2.1.3; 5.5.2.2.2; 8.1.2.4; 8.4.2.4; A.4.4; A.5.3; A.8.3; A.9.1.8		
Other specs affected:	⌘	[ ] Other core specifications [X] Test specifications [ ] O&M Specifications	⌘	TS25.101
Other comments:	⌘	Accompanying CR165 to 25.101 R99 and corresponding cat-A's. Equivalent CRs in other Releases: CR401 cat. F to 25.133 v3.9.0, CR414 cat. A to 25.133 v4.4.0		

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] (void)

[2] 3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".

[3] 3GPP TS 25.101: "UE Radio transmission and reception (FDD)".

[4] 3GPP TS 25.104: "UTRA (BS) FDD; Radio transmission and reception ".

[5] 3GPP TS 25.102: "UTRA (UE) TDD; Radio transmission and reception ".

[6] 3GPP TS 25.105: "UTRA (BS); Radio transmission and reception".

[7] ~~void.~~3GPP TS 25.212: "Multiplexing and channel coding (FDD)".

[8] 3GPP TS 25.141: "Base station conformance testing (FDD)".

[9] 3GPP TS 25.142: "Base station conformance testing (TDD)".

[10] 3GPP TS 25.113: "Base station EMC".

[11] 3GPP TR 25.942: "RF System scenarios".

[12] 3GPP TR 25.922: "Radio Resource Management Strategies".

[13] 3GPP TS 25.215: "Physical Layer Measurements (FDD)".

[14] 3GPP TS 25.225: "Physical Layer Measurements (TDD)".

[15] 3GPP TS 25.302: "Services provided by Physical Layer".

[16] 3GPP TS 25.331: "Radio Resource Control (RRC) Protocol Specification".

[17] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes"

[18] 3GPP TS 25.214: "Physical layer procedures (FDD)"

[19] 3GPP TS 25.321: " Medium Access Control (MAC) protocol specification"

[20] 3GPP TS 25.303: "Interlayer procedures in Connected Mode"

[21] 3GPP TS 45.008: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control"

[22] 3GPP TS 45.005: "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception"

< Next changed section >

4.2.2.4 Measurements of inter-frequency TDD cells

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

The UE shall measure ~~the~~ P-CCPCH RSCP at least every $N_{carrierTDD}$ * $T_{measureTDD}$ (see table 4.1) ~~of~~ for ~~each~~ inter-frequency TDD ~~neighbour~~ cells that are identified and measured according to the measurement rules~~indicated in the measurement control system information of the serving cell, according to the measurement rules defined in TS25.304, at least every $T_{measureTDD}$ (see table 4.1)~~. The parameter $N_{carrierTDD}$ is the number of carriers used for inter-frequency TDD cells. The UE shall filter P-CCPCH RSCP measurements of each measured inter-frequency TDD cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$.

The filtering of P-CCPCH RSCP shall be such that the UE shall be capable of evaluating that an already ~~detected~~ identified inter-frequency TDD cell has become better ranked than the serving cell within $N_{carrierTDD}$* $T_{evaluateTDD}$ from the moment the inter-frequency TDD cell became at least ~~3~~5 dB better ranked than the current serving cell provided that Treselection timer is set to zero. For non-~~detected~~ identified inter-frequency TDD cells, the filtering shall be such that the UE shall be capable of evaluating that an inter-frequency TDD cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency TDD cell became at least ~~3~~5 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency TDD cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency TDD cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.~~ The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.~~

< Next changed section >

5.3 FDD/TDD Handover

5.3.1 Introduction

The purpose of FDD/TDD ~~hard~~ handover is to change the radio access mode ~~between~~ from FDD ~~and~~ to TDD. The FDD/TDD handover procedure is initiated from UTRAN with a RRC message that implies a hard handover~~, refer to TS25.331~~ as described in [16].

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

5.3.2.1 ~~Hard~~ FDD/TDD handover delay

RRC ~~P~~procedure ~~delay~~ performance values for all RRC procedures~~,~~ that can command a hard handover~~,~~ are specified in ~~TS25.331 section 13.5.2~~[16].

When the UE receives a RRC message implying ~~hard~~ FDD/TDD 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~~ performance value as defined in ~~TS25.331 Section 13.5.2~~[16] 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, is dependent on whether the target cell is known for the UE or not. ~~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.~~

If FDD/TDD handover is commanded, the interruption time shall be less than,

$T_{interrupt} = T_{offset} + T_{UL} + 30*F_{SFN} + 20*KC + 180*UC$ ms

where,

T_{offset}	Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel
T_{UL}	Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell
F_{SFN}	Equal to 1 if SFN decoding is required and equal to 0 otherwise
KC	Equal to 1 if a known target cell is indicated in the RRC message implying FDD/TDD handover and equal to 0 otherwise
UC	Equal to 1 if an unknown target cell is indicated in the RRC message implying FDD/TDD handover and equal to 0 otherwise

~~In this interruption requirement a~~ An inter-frequency TDD target cell shall be considered known by the UE, if ~~is known if~~ the target 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~~**
	~~SFN not to be decoded~~	**~~SFN needs to be decoded~~**	**~~SFN needs to be decoded~~**
~~1~~	~~[100]~~	~~[130]~~	~~[400]~~

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

The interruption time requirements ~~in Table 5.1~~ for ~~the~~ an unknown target cell shall apply only if the signal quality of the unknown target cell is ~~good enough~~ sufficient for successful synchronisation with one attempt.

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

< Next changed section >

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 $T_{reselection}$ is set to 0. Otherwise the Cell reselection delay is increased $T_{reselection}$ 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 cell 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 section 9. The measurements used for S-criteria and cell re-selection evaluation in CELL_FACH shall be performed according to section 8.4.

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 the preambles on the PRACH for sending 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 the ~~C~~cell ~~R~~re-selection process and the moment in time when the UE starts sending the RRC CELL UPDATE message to the UTRAN on the RACH.

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.

< Next changed section >

5.5.2.1.3 FDD-TDD cell reselection

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

The cell re-selection delay in CELL_FACH state in FDD to an inter-frequency TDD cell shall be less than,

~~$T_{reselection,TDD} = T_{identify,TDD} + 100 + T_{SI} + T_{RA}$ ms~~

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

where

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

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} ~~= T~~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~~[16] for a UTRAN cell.

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

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

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

where

$T_{Measurement\ TDD\ inter}$ is specified in 8.4.2.4.1.

Th~~is~~ese requirements assume~~s~~ radio conditions to be sufficient, so that reading of system information can be done without errors.

< Next changed section >

5.5.2.2.2 FDD-TDD cell reselection

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

The interruption time, ~~i.e.~~ is defined as the time period between the last TTI the UE monitors the FACH ~~channel~~ on the serving cell and the time instant the UE starts to transmit the RRC CELL UPDATE message in the target inter-frequency TDD cell on the RACH.

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

~~$T_{interrupt,TDD} = 100 + T_{si} + T_{RA}$ 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.~~

In case of inter-frequency cell reselection to a TDD cell and when the UE needs measurement occasions to perform inter-frequency TDD measurements, the interruption time shall be less than

$T_{interrupt1, TDD} = T_{IU} + 20 + T_{SI} + T_{RA}$ ms

In case of inter-frequency cell reselection to a TDD cell and when the UE does not need measurement occasions to perform inter-frequency TDD measurements, the interruption time shall be less than

$T_{interrupt2, TDD} = T_{IU} + 20 + T_{RA}$ 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_{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 [16].
- T_{RA} is the additional delay caused by the random access procedure.

< Next changed section >

8.1.2.4 TDD measurements

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

In the CELL_DCH state when a transmission gap pattern sequence with the "TDD measurements" purpose is provided by the network, the UE shall continuously measure ~~detected~~ identified inter frequency TDD cells and search for new inter frequency TDD cells indicated in the measurement control information.

In order for the requirements in the following subsections to apply, the Beacon timeslots of the inter-frequency TDD cells indicated in the measurement control information shall either be synchronised or non-overlapping in time such that the UE can measure an inter-frequency TDD cell at least once in every transmission gap pattern as given in [7] for the slot allocation case in use in this cell and by assuming 2*0.5 ms implementation margin per transmission gap.

~~the~~ UTRAN ~~must~~ shall provide a transmission gap pattern sequence with measurement purpose TDD measurement using the ~~following~~ combinations for TGL1, TGL2 and TGD in Table 8.2:

Table 8.2

TGL1 [slots]	TGL2 [slots]	TGD [slots]
10	-	undefined
10	10	15…269
14	7	15…269

~~If reporting of the values for TGSN_proposed is requested by the network while P-CCPCH RSCP is measured by the UE, and this is supported by the UE, values for TGSN_proposed shall be extracted by use of the following formula and reported to the network together with the P-CCPCH RSCP results in the measurement report:~~

~~TGSN_proposed=~~
~~(FDD slot in which the starting point of the P-CCPCH slot of the monitored TDD cell was observed) – (1 slot)~~

8.1.2.4.1 Identification of a new cell

When transmission gaps are scheduled for inter-frequency TDD measurements, ~~T~~the UE shall be able to identify ~~a~~ new detectable inter-frequency TDD cell belonging to the monitored set within

~~$$T_{identify\ TDD\ inter} = Max\left\{ 5000, T_{basic\ identify\ TDD\ inter} \cdot \frac{T_{Measurement\ Period\ TDD\ inter}}{T_{TDD\ inter}} \cdot N_{Freq} \right\} ms$$~~

$$T_{identify\ TDD\ inter} = Max\left\{ 5000, N_{basic\ identify\ TDD\ inter} \cdot \frac{T_{Measurement\ Period\ TDD\ inter}}{N_{TDD\ inter}} \cdot N_{Freq} \right\} ms$$

If the UE does not need compressed mode to perform inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within 5000 ms.

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

An inter-frequency TDD cell shall be considered detectable when P-CCPCH-_Ec/Io ≥ -8 dB~~,~~ and SCH_Ec/Io ≥ -13 dB ~~and SCH_Ec/Ior is equally divided between primary synchronisation code and the sum of all secondary synchronisation codes, where the secondary synchronisation codes are also equally divided. When L3 filtering is used an additional delay can be expected~~.

~~Where t~~The received P-CCPCH-_E_c/I_o is defined as

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

and the received SCH-_E_c/I_o is defined as

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

8.1.2.4.2 P-CCPCH RSCP ~~M~~measurement period

When transmission gaps ~~as previously described~~ are scheduled for ~~TDD~~ inter frequency TDD measurements, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.11 and with a measurement period as given by

~~$T_{measurement\ inter} = Max\left\{T_{Measurement\_Period\ TDD\ Inter}, T_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{Measurement\_Period\ TDD\ Inter}}{T_{TDD\ Inter}} \cdot N_{Freq}\right\} ms$~~

$$T_{measurement\ TDD\ inter} = Max\left\{T_{Measurement\ Period\ TDD\ inter}, N_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{Measurement\ Period\ TDD\ inter}}{N_{TDD\ inter}} \cdot N_{Freq}\right\} ms$$

If the UE does not need compressed mode to perform inter-frequency TDD measurements, the measurement period for inter-frequency TDD measurements shall be 480 ms.

The UE shall be capable of performing P-CCPCH RSCP measurements for $X_{basic\ measurement\ TDD\ inter}$ inter-frequency TDD cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measurement\ TDD\ inter}$.

~~where~~

~~$X_{basic\ measurement\ TDD\ inter}$~~ = 6 (cells)

$T_{Measurement\_Period\ TDD\ inter}$ = 480 ms. The time period used for calculating the measurement period $T_{measurement\_TDD\ inter}$ for inter frequency P-CCPCH RSCP measurements.

~~T~~$N_{TDD\ inter}$: This is the ~~minimum time that is available~~ smallest resulting integer number of transmission gap patterns in a transmission gap pattern sequence assigned to UE by UTRAN for inter-frequency TDD measurements~~,~~ during the time period $T_{Measurement\_Period\ TDD\ inter}$ with an arbitrarily chosen timing. ~~The minimum time is calculated by using the actual idle length within the transmission gap as given in the table 11 of Annex B in TS 25.212 and by assuming 2*500 µs for implementation margin.~~

~~T~~$N_{basic\_identify\_TDD\_inter}$ =80~~0 ms~~. This is the number of transmission gap patterns in a transmission gap pattern sequence for inter-frequency TDD measurements during the time period used in the inter frequency TDD equation where the maximum allowed time for the UE to identify a new inter-frequency TDD cell is defined.

~~T~~$N_{basic\_measurement\_TDD\ inter}$ = 5~~0 ms~~. This is the number of transmission gap patterns in a transmission gap pattern sequence for inter-frequency TDD measurements during the time ~~time~~ period $T_{Measurement\_Period\ TDD\ inter}$ with an arbitrarily chosen timing that is used in the inter-frequency TDD equation ~~for defining~~ where the measurement period for inter-frequency P-CCPCH RSCP measurements is defined.

N_{Freq}: This is the ~~N~~number of TDD frequencies indicated in the inter frequency measurement control information.

8.1.2.4.3 Periodic Reporting

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

8.1.2.4.4 Event Triggered Reporting

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

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report, until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH~~.~~ This measurement reporting delay excludes a delay uncertainty ~~resulted~~ resulting when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ TDD\ inter}$ defined in Section 8.1.2.4.1 When L3 filtering is used an additional delay can be expected.

~~If a cell has been detectable at least for the time period $T_{identify\_TDD\ inter}$ and then enters or leave the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ TDD\ Inter}$ provided the timing to that cell has not changed more than +/- 32 chips while transmission gap has not been available and the L3 filter has not been used.~~

< Next changed section >

8.4.2.4 TDD measurements

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

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

8.4.2.4.1 Identification of a new cell

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

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

where

$T_{basic\_identify\_TDD\_inter}$ = 800ms.~~is specified in 8.1.2.4.2.~~

$N_{Freq,TDD}$: Number of TDD frequencies indicated in the ~~I~~inter-frequency cell info list

T_{Meas} is specified in section 8.4.2.1.

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

If the UE does not need measurement occasions to perform inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within 5000 ms.

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

An inter-frequency TDD cell shall be considered detectable when P-CCPCH Ec/Io ≥ -8 dB and SCH Ec/Io ≥ -13 dB.

The received P-CCPCH E_c/I_o is defined as

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

and the received SCH E_c/I_o is defined as

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

8.4.2.4.2 P-CCPCH RSCP ~~M~~measurement period

When a measurement occasion cycle as previously described is scheduled for ~~TDD~~ inter frequency TDD measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.11~~ and 9.1.2~~ and with a measurement period ~~i~~as given by

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

where

$T_{basic\_measurement\_TDD\ inter}$ = 50 ms.~~is specified in section 8.1.2.4.2.~~

$T_{Measurement\_Period\ TDD\ inter}$ is specified in section 8.1.2.4.2.

T_{Meas} is specified in section 8.4.2.1.

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

$N_{Freq,TDD}$ ~~is specified in section 8.4.2.4.1~~: This is the number of TDD frequencies indicated in the inter-frequency cell info list

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

The UE shall be capable of performing P-CCPCH RSCP measurements for $X_{basic\ measurement\ TDD\ inter}$ inter-frequency TDD cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\ TDD}$.

$X_{basic\ measurement\ TDD\ inter}$ is defined in section 8.1.2.4.2

< Next changed section >

A.4.4 FDD/TDD ~~c~~Cell ~~r~~Re-selection

A.4.4.1 Test Purpose and Environment

This test is to verify the requirement for the FDD/TDD cell re-selection delay ~~-~~reported in section 4.2.2.

This scenario implies the presence of ~~1~~ UTRA FDD and 1 UTRA TDD cell as given in Table A.4.8~~,~~ ~~and~~ A.4.9 and A.4.10. The maximum repetition period of the relevant system information blocks that need to be received by the UE to camp on a cell shall be 1280 ms.

~~The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.~~

Cell 1 and cell 2 shall belong to different Location Areas.

Table A.4.8: General test parameters for ~~the~~ FDD/TDD ~~c~~Cell ~~r~~Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	FDD cell
	Neighbour cells		Cell2	TDD cell
Final condition	Active cell		Cell2	TDD cell
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
~~T_{SI}~~		~~s~~	~~1.28~~	~~The value shall be used for all cells in the test.~~
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

~~**Table A.4.9: FDD/TDD cell re-selection**~~

~~**Parameter**~~	~~**Unit**~~	~~**Cell 1**~~		~~**Cell 2**~~			
~~Timeslot Number~~		~~n.a~~	~~n.a.~~	~~0~~		~~8~~	
		~~T 1~~	~~T 2~~	~~T1~~	~~T2~~	~~T 1~~	~~T 2~~
~~UTRA RF Channel Number~~		~~Channel 1~~		~~Channel 2~~			
~~CPICH_Ec/Ior~~	~~dB~~	~~-10~~	~~-10~~	~~n.a.~~		~~n.a.~~	
~~PCCPCH_Ec/Ior~~	~~dB~~	~~-12~~	~~-12~~	~~-3~~	~~-3~~		
~~SCH_Ec/Ior~~	~~dB~~	~~-12~~	~~-12~~	~~-9~~	~~-9~~	~~-9~~	~~-9~~
~~SCH_t_{offset}~~		~~n.a.~~	~~n.a.~~	~~0~~	~~0~~	~~0~~	~~0~~
~~PICH_Ec/Ior~~		~~-15~~	~~-15~~			~~-3~~	~~-3~~
~~OCNS~~	~~dB~~	~~-0,941~~	~~-0,941~~	~~-4,28~~	~~-4,28~~	~~-4,28~~	~~-4,28~~
~~$\hat{I}_{or}/I_{oc}$~~	~~dB~~	~~3~~	~~-5~~	~~-2~~	~~6~~	~~-2~~	~~6~~
~~I_{oc}~~	~~dBm/3.84 MHz~~	~~-70~~					
~~CPICH_RSCP~~	~~dBm~~	~~-77~~	~~-85~~	~~n.a.~~		~~n.a.~~	
~~PCCPCH_RSCP~~	~~dBm~~	~~n.a.~~	~~n.a.~~	~~-75~~	~~-67~~		
~~Qrxlevmin~~	~~dBm~~	~~-115~~		~~-103~~			
~~Qoffset $1_{s,n}$~~	~~dB~~	~~C1,C2:+12~~		~~C2,C1:-12~~			
~~Qhyst 1_s~~	~~dB~~	~~0~~		~~0~~			
~~Treselection~~	~~s~~	~~0~~		~~0~~			
~~Sintersearch~~	~~dB~~	~~0~~		~~0~~			
~~Propagation Condition~~		~~AWGN~~		~~AWGN~~			

Table A.4.9: Cell 1 specific test parameters for FDD/TDD Cell Re-Selection

Parameter	**Unit**	**Cell 1**	
		T1	**T2**
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
P-CCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	9	3
I_{oc}	dBm / 3.84 MHz	-70	
CPICH_RSCP	dBm	-71	-77
Propagation Condition		AWGN	
Cell selection and reselection quality measure		CPICH_Ec/No	
Qrxlevmin	dBm	-115	
Qoffset$1_{s,n}$	dB	0	
Qhyst1	dB	0	
PENALTY_TIME	s	0	
TEMPORARY_OFFSET	dB	0	
Treselection	s	0	
Sintrasearch	dB	not sent	
Sintersearch	dB	not sent	

Table A.4.10: Cell 2 specific test parameters for FDD/TDD Cell Re-Selection

Parameter	Unit	Cell 2			
DL timeslot number		0		8	
		T1	T2	T1	T2
UTRA RF Channel Number		Channel 2			
P-CCPCH_Ec/Ior	dB	-3		n.a.	
PICH_Ec/Ior	dB	n.a.		-3	
SCH_Ec/Ior	dB	-9			
SCH_t_{offset}	dB	10			
OCNS_Ec/Ior	dB	-3.12			
$\hat{I}_{or}/I_{oc}$	dB	-4	2	-4	2
P-CCPCH RSCP	dBm	-77	-71	n.a.	n.a.
I_{oc}	dBm/ 3,84 MHz	-70			
Propagation Condition		AWGN			
Qrxlevmin	dBm	-103			
$Qoffset2_{s,n}$	dB	0			
Qhyst2	dB	0			
PENALTY_TIME	s	0			
TEMPORARY_OFFSET	dB	0			
Treselection	s	0			
Sintrasearch	dB	not sent			
Sintersearch	dB	not sent			
Note that the transmit energy per PN chip for the SCH is averaged over the 256 chip duration when the SCH is present in the time slot.					

~~NOTE: The purpose of this test case is to evaluate the delay of the FDD/TDD re-selection process, it is not intended to give reasonable values for a FDD/TDD cell re-selection.~~

A.4.4.2 Test Requirements

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RRC CONNECTION REQUEST message to perform a Location Registration on cell 2.

The cell re-selection delay shall be less than 8 s.

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

NOTE:

The cell re-selection delay can be expressed as: $T_{evaluateTDD} + T_{SI}$,

~~-~~where:

~~- $T_{evaluateTDD}$: A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{evaluate\ TDD}$ of 6.4s according to Table 4.1 in section 4.2.2.7.~~

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

$T_{evaluateTDD}$ See Table 4.1 in section 4.2.2.

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

This gives a total of 7.68 s, allow 8s in the test case.

< Next changed section >

A.5.3 FDD/TDD ~~Hard~~ Handover

~~NOTE: This section is included for consistency with numbering with section 5 currently no test covering requirements in sections 5.3.2.1 and 5.3.2.2 exists.~~

A.5.3.1 Test purpose and Environment

The purpose of this test is to verify the requirement for the FDD/TDD handover delay in CELL_DCH state reported in section 5.3.2.1.

The test parameters are given in Table A.5.3, A.5.3A and A.5.3B below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. The P-CCPCH RSCP of the best cell on the unused frequency shall be reported together with Event 2C reporting. The test consists of three successive time periods, with a time duration of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration message with activation time at the beginning of T3 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16].

The UL DPCH in cell 2 shall be transmitted in timeslot 10.

Table A.5.3: General test parameters for FDD/TDD handover

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1 and in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Compressed mode			A.22 set 3	As specified in TS25.101 section A.5
Initial conditions	Active cell		Cell 1	FDD cell
	Neighbour cell		Cell 2	TDD cell
Final condition	Active cell		Cell 2	TDD cell
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	Hysteresis parameter for event 2C
Time to Trigger		ms	0	
Threshold non-used frequency		dBm	-75	Applicable for Event 2C
Filter coefficient			0	
Monitored cell list size			6 FDD neighbours on Channel 1 6 TDD neighbours on Channel 2	
T_{SI}		s	1.28	The value shall be used for all cells in the test
T1		s	5	
T2		s	15	
T3		s	5	

Table A.5.3A: Cell 1 specific test parameters for FDD/TDD handover

Parameter	Unit	Cell 1	
		T1, T2	T3
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
P-CCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	Note 1	n.a.
OCNS_Ec/Ior	dB	Note 2	
$\hat{I}_{or}/I_{oc}$	dB	0	
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-13	
Propagation Condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop Note 2 : The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}			

Table A.5.3B: Cell 2 specific test parameters for FDD/TDD handover

Parameter	Unit	Cell 2								
DL timeslot number		0			2			8		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 2								
P-CCPCH_Ec/Ior	dB	-3			n.a.			n.a.		
PICH_Ec/Ior	dB	n.a.			n.a.			-3		
SCH_Ec/Ior	dB	-9			n.a.			-9		
SCH_t_{offset}	dB	5			n.a.			5		
DPCH_Ec/Ior	dB	n.a.			n.a.		Note 1	n.a.		
OCNS_Ec/Ior	dB	-3.12			0		Note 2	-3.12		
$\hat{I}_{or}/I_{oc}$	dB	-Inf	6		-Inf	6		-Inf	6	
P-CCPCH RSCP	dBm	-Inf	-67		n.a.			n.a.		
I_{oc}	dBm/ 3,84 MHz	-70								
Propagation Condition		AWGN								
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior. Note that the transmit energy per PN chip for the SCH is averaged over the 256 chip duration when the SCH is present in the time slot.										

A.5.3.2 Test Requirements

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

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

< Next changed section >

A.8.3 TDD measurements

A.8.3.1 Correct reporting of TDD neighbours in AWGN propagation condition

A.8.3.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of ~~an~~ events when measuring on ~~a~~ UTRA TDD cells. The~~is~~ test will partly verify the requirements in section 8.1.2~~.3~~ and 9.1.

~~The test consists of two successive time periods, with a time duration T1 and T2 respectively. The test parameters are given in Table A.8.13 and A.8.14. In the measurement control information it is indicated to the UE that event triggered reporting with Event 2C shall be used.~~

The test parameters are given in Table A.8.3A, A.8.3B and A.8.3C below. The test consists of two successive time periods, with time duration of T1 and T2 respectively. Two cells shall be present in the test, cell 1 being the serving UTRA FDD cell and cell 2 being a UTRA TDD neighbour cell.

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. The P-CCPCH RSCP of the best cell on the unused frequency shall be reported together with Event 2C reporting. At the start of time duration T1, the UE may not have any timing information of cell 2.

The TTI of the uplink DCCH shall be 20ms.

Table A.8.~~13~~A: General test parameters for Correct reporting of TDD neighbours in AWGN propagation condition

~~Parameter~~	~~Unit~~	~~Value~~	~~Comment~~
~~DCH parameters~~		~~DL Reference Measurement Channel 12.2 kbps~~	~~As specified in TS 25.101 section A.3.1~~
~~Power Control~~		~~On~~	
~~Compressed mode~~		~~Case 2.1~~	~~Gap length specified in section 8.1.2.3 and the other parameters as specified in TS 25.101 section A.5.~~
~~Active cell~~		~~Cell 1~~	
~~Reporting Threshold~~	~~dB~~		
~~Hysteresis~~	~~dB~~		
~~Time to Trigger~~	~~ms~~		
~~Filter coefficient~~			
~~Monitored cell list size~~		~~Total X~~ ~~Y on frequency Channel 2~~	~~Measurement control information is sent before the compressed mode pattern starts.~~
~~T1~~	~~s~~		
~~T2~~	~~s~~		

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.101 section A.3.1
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Compressed mode			A.22 set 3	As specified in TS25.101 section A.5
Initial conditions	Active cell		Cell 1	FDD cell
	Neighbour cell		Cell 2	TDD cell
Final condition	Active cell		Cell 1	FDD cell
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	Hysteresis parameter for event 2C
Time to Trigger		ms	0	
Threshold non-used frequency		dBm	-71	Applicable for Event 2C
Filter coefficient			0	
Monitored cell list size			6 FDD neighbours on Channel 1 6 TDD neighbours on Channel 2	
T1		s	15	
T2		s	10	

Table A.8.~~14~~3B: Cell 1 specific test parameters for Correct reporting of TDD neighbours in AWGN propagation condition

~~Parameter~~	~~Unit~~	~~Cell 1~~		~~Cell 2~~			
~~Timeslot Number~~		~~n.a.~~		~~0~~		~~8~~	
		~~T1~~	~~T2~~	~~T1~~	~~T2~~	~~T1~~	~~T2~~
~~UTRA RF Channel Number~~		~~Channel 1~~		~~Channel 2~~			
~~CPICH_Ec/Ior~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~n.a.~~		~~n.a.~~	
~~PCCPCH_Ec/Ior~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~-3~~	~~-3~~		
~~SCH_Ec/Ior~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~-9~~	~~-9~~	~~-9~~	~~-9~~
~~SCH_t_{offset}~~		~~n.a.~~	~~n.a.~~	~~15~~	~~15~~	~~15~~	~~15~~
~~PICH_Ec/Ior~~		~~[ ]~~	~~[ ]~~			~~-3~~	~~-3~~
~~DCH_Ec/Ior~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~-~~	~~-~~	~~-~~	~~-~~
~~OCNS~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~-4.28~~	~~-4.28~~	~~-4.28~~	~~-4.28~~
~~$\hat{I}_{or}/I_{oc}$~~	~~dB~~	~~[ ]~~	~~[ ]~~	~~[ ]~~	~~[ ]~~	~~[ ]~~	~~[ ]~~
~~I_{oc}~~	~~dBm/3.84 MHz~~	~~-70~~		~~-70~~			
~~CPICH_Ec/Io~~		~~[ ]~~		~~n.a.~~			
~~PCCPCH_RSCP~~	~~dB~~	~~n.a.~~	~~n.a.~~	~~[ ]~~	~~[ ]~~	~~[ ]~~	~~[ ]~~
~~Propagation Condition~~		~~AWGN~~					

~~NOTE: The DPCH of the TDD cell is located in an other timeslot than 0 or 8.~~

Parameter	Unit	Cell 1
		T1, T2
UTRA RF Channel Number		Channel 1
CPICH_Ec/Ior	dB	-10
P-CCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
DPCH_Ec/Ior	dB	Note 1
OCNS_Ec/Ior	dB	Note 2
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	-70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN
Note 1: The DPCH level is controlled by the power control loop Note 2 : The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{oc}.		

Table A.5.3C: Cell 2 specific test parameters for Correct reporting of TDD neighbours in AWGN propagation condition

Parameter	Unit	Cell 2			
DL timeslot number		0		8	
		T1	T2	T1	T2
UTRA RF Channel Number		Channel 2			
P-CCPCH_Ec/Ior	dB	-3		n.a.	
PICH_Ec/Ior	dB	n.a.		-3	
SCH_Ec/Ior	dB	-9			
SCH_t_{offset}	dB	10			
OCNS_Ec/Ior	dB	-3.12			
P-CCPCH RSCP	dBm	-75	-67	n.a.	n.a.
$\hat{I}_{or}/I_{oc}$	dB	-2	6	-2	6
I_{oc}	dBm/ 3,84 MHz	-70			
Propagation Condition		AWGN			
Note that the transmit energy per PN chip for the SCH is averaged over the 256 chip duration when the SCH is present in the time slot.					

A.8.3.1.2 Test Requirements

~~a) The UE shall send one Event 2C triggered measurement report, with a measurement reporting delay less than [5] seconds from the start of time period T2.~~

~~b) The UE shall not send any measurement reports, as long as the reporting criteria are not fulfilled.~~

The UE shall send one Event 2C triggered measurement report for Cell 2 with a measurement reporting delay less than 8.8 s from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of events correctly reported during repeated tests shall be at least 90%.

< Next changed section >

A.9.1.8 P-CCPCH RSCP

A.9.1.8.1 Test Purpose and Environment

~~These measurements consider *P-CCPCH RSCP* measurements. This requirement is only valid for UEs supporting FDD and TDD.~~

The purpose of this test is to verify that the P-CCPCH RSCP measurement accuracy is within the specified limits. This test will verify the requirements in section 9.1.11 and applies to UE supporting this capability.

~~In this case the cells are on different frequencies. Table A.9.13 defines the limits of signal strengths and code powers, where the requirement is applicable. Cell 1 is the active cell (FDD) and cell 2 is a TDD cell.~~

A.9.1.8.1.1 Inter frequency test parameters

In this case both cells are on different frequencies and compressed mode as specified in TS 25.101 section A.5, set 3 of table A.22, is applied. Cell 1 is a UTRA FDD cell and cell 2 is a UTRA TDD cell.

P-CCPCH RSCP inter frequency absolute accuracy requirements are tested by using test parameters in Table A.9.13.

Table A.9.13: P-CCPCH RSCP inter frequency test parameters

Parameter	Unit	Cell 1	Cell 2
Timeslot Number		n.a.	k
UTRA RF Channel Number		Channel 1	Channel 2
CPICH_Ec/Ior	dB	-10	n.a.
PCCPCH_Ec/Ior	dB	-12	-3
SCH_Ec/Ior	dB	-12	-
SCH_t_{offset}		n.a.	-
PICH_Ec/Ior		-15	-
DPCH_Ec/Ior	dB	[ ]	[ ]
OCNS	dB	[To Be Calculated]	[ ]
$\hat{I}_{or}/I_{oc}$	dB	[ ]	[ ]
I_{oc}	dBm/3.84 MHz	Note 1	-70
Range 1:Io Range 2: Io	dBm/3.84 MHz	-94 ... -70 -94... -50	-94 ... -70 -94... -50
Propagation condition	-	AWGN	AWGN
NOTE 1: *Ioc* level shall be adjusted according the total signal power spectral density *Io* at receiver input and the geometry factor *Îor/Ioc*.			

Parameter	Unit	Test 1		Test 2	
		Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		n.a.	**0** | **8**	n.a.	**0** | **8**
UTRA RF Channel number		Channel 2	Channel 1	Channel 2	Channel 1
CPICH_Ec/Ior	dB	-10	n.a.	-10	n.a.
P-CCPCH_Ec/Ior	dB	-12	-3 | n.a.	-12	-3 | n.a
SCH_Ec/Ior	dB	-12	-9	-12	-9
SCH_t_{offset}		n.a.	5	n.a.	5
PICH_Ec/Ior	dB	-15	n.a. | -3	-15	n.a. | -3
DPCH_Ec/Ior	dB	-15	n.a.	-15	n.a.
OCNS_Ec/Ior	dB	-1.11	-3.12	-1.11	-3.12
Ioc	dBm/ 3.84 MHz	-60	-57.7	-84	-84.7
Îor/Ioc	dB	9.54	7	0	3
P-CCPCH RSCP, Note 1	dBm	n.a.	-53.7 | n.a.	n.a.	-84.7 | n.a.
CPICH RSCP, Note 1	dBm	-60.46	n.a.	-94	n.a.
Io, Note 1	dBm/3.84 MHz	-50	-50	-81	-80
Propagation condition	-	AWGN		AWGN	
Note 1: P-CCPCH RSCP, CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves. Note that the transmit energy per PN chip for the SCH is averaged over the 256 chip duration when the SCH is present in the time slot.					
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed, test parameters for test 2 shall be set within 5 seconds so that the UE does not lose the Cell 2 in between the test.					

A.9.1.8.2 Test Requirements

The P-CCPCH RSCP measurement accuracy shall meet the requirements in section 9.1.11.

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

3GPP TSG RAN WG4 Meeting #23 **R4-021045**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.133** **CR** **422** ⌘ **rev** **1** ⌘ Current version: **3.9.0** ⌘

*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:	⌘	Definition of "out of service area"
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**F**
Release:	⌘	R99

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	TS 25.331 uses the "out of service area" condition as a trigger to start RRC timers T316 and T317. However, proper definition of how to trigger 'out of service area' is missing.
Summary of change:	⌘	It has been added that UE in Idle, Cell_PCH and URA_PCH shall consider 'out of service area' if UE has not found any suitable cell among its neighbouring cells during the 12s period proceeding the Nserv number of DRX cycles with Cell selection criteria S not fulfilled for serving cell. It has been added that UE in Cell_FACH shall consider 'out of service area' if UE has not found any suitable cell among its neighbouring cells during a 4s period. Reference list is updated to cover TS 25.304. Isolated Impact: Minor impact on the implementation in Cell_FACH state when the UE shall consider "out of service area"
Consequences if not approved:	⌘	Definition of "out of service area" will be missing, leading to ambiguity in the use of RRC timers T316 and T317.

Clauses affected:	⌘	2, 4.4, 5.5.3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Equivalent CRs in other Releases: CR423r1 cat. A to 25.133 v4.4.0, CR424r1

	cat. A to 25.133 v5.2.0

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/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.

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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.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode". ~~(void)~~

[2] 3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".

[3] 3GPP TS 25.101: "UE Radio transmission and reception (FDD)".

[4] 3GPP TS 25.104: "UTRA (BS) FDD; Radio transmission and reception ".

[5] 3GPP TS 25.102: "UTRA (UE) TDD; Radio transmission and reception ".

[6] 3GPP TS 25.105: "UTRA (BS); Radio transmission and reception".

[7] void.

[8] 3GPP TS 25.141: "Base station conformance testing (FDD)".

[9] 3GPP TS 25.142: "Base station conformance testing (TDD)".

[10] 3GPP TS 25.113: "Base station EMC".

[11] 3GPP TR 25.942: "RF System scenarios".

[12] 3GPP TR 25.922: "Radio Resource Management Strategies".

[13] 3GPP TS 25.215: "Physical Layer Measurements (FDD)".

[14] 3GPP TS 25.225: "Physical Layer Measurements (TDD)".

[15] 3GPP TS 25.302: "Services provided by Physical Layer".

[16] 3GPP TS 25.331: "Radio Resource Control (RRC) Protocol Specification".

[17] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes"

[18] 3GPP TS 25.214: "Physical layer procedures (FDD)"

[19] 3GPP TS 25.321: " Medium Access Control (MAC) protocol specification"

[20] 3GPP TS 25.303: "Interlayer procedures in Connected Mode"

[21] 3GPP TS 05.08: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control"

[22] 3GPP TS 05.05: "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception"

---Next Section ---

4.2.2 Requirements

4.2.2.1 Measurement and evaluation of cell selection criteria S of serving cell

The UE shall measure the CPICH Ec/Io and CPICH RSCP level of the serving cell and evaluate the cell selection criterion S defined in [1] ~~TS25.304~~ for the serving cell at least every DRX cycle. The UE shall filter the CPICH Ec/Io and CPICH RSCP measurements of the serving cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$ (see table 4.1).

If the UE has evaluated in N_{serv} consecutive DRX cycles that the serving cell does not fulfil the cell selection criterion S, the UE shall initiate the measurements of all neighbour cells indicated in the measurement control system information, regardless of the measurement rules currently limiting UE measurement activities.

~~I~~f the UE has not found any new suitable cell based on searches and measurements of the neighbour cells indicated in the measurement control system information for 12 s, the UE shall initiate cell selection procedures for the selected PLMN as defined in [1]~~TS25.304~~.

After this 12 s period a UE in Cell:PCH or URA_PCH is considered to be “out of service area” and shall perform actions according to 25.331.

4.2.2.2 Measurements of intra-frequency cells

The UE shall measure CPICH Ec/Io and CPICH RSCP at least every $T_{measureFDD}$ (see table 4.1) for intra-frequency cells that are identified and measured according to the measurement rules. $T_{measureFDD}$ is defined in Table 4.1. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured intra-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better ranked than the serving cell within $T_{evaluateFDD}$ (see table 4.1), from the moment the intra-frequency cell became at least 3 dB better ranked than the current serving cell, provided that Treselection timer is set to zero and either CPICH Ec/Io or CPICH RSCP is used as measurement quantity for cell reselection.

If Treselection timer has a non zero value and the intra-frequency cell is better ranked than the serving cell, the UE shall evaluate this intra-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.3 Measurements of inter-frequency FDD cells

The UE shall measure CPICH Ec/Io and CPICH RSCP at least every $(N_{carrier}-1) * T_{measureFDD}$ (see table 4.1) for inter-frequency cells that are identified and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for FDD cells. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured inter-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$.

If CPICH Ec/Io is used as measurement quantity for cell reselection, the filtering shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has become better ranked than the serving cell within $(N_{carrier}-1) * T_{evaluateFDD}$ (see table 4.1) from the moment the inter-frequency cell became at least 3 dB better than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If CPICH RSCP is used as measurement quantity for cell reselection, the filtering shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has become better ranked than the serving cell within ($N_{carrier}$-1) * $T_{evaluateFDD}$ from the moment the inter-frequency cell became at least 5 dB better than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 5 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.4 Measurements of inter-frequency TDD cells

The UE shall measure the PCCPCH RSCP of each TDD neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in ~~TS25.304~~[1], at least every $T_{measureTDD}$ (see table 4.1). The UE shall filter PCCPCH RSCP measurements of each measured inter-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$.

The filtering of PCCPCH RSCP shall be such that the UE shall be capable of evaluating that an already detected inter-frequency cell has become better ranked than the serving cell within $N_{carrierTDD}$* $T_{evaluateTDD}$ from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero. For non-detected inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell. The ranking of the cells shall be made according to the cell reselection criteria specified in ~~TS25.304~~[1].

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~~[1], at least every $T_{measureGSM}$ (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.

If GSM measuremenst are required by the measurement rules in ~~TS25.304~~[1], 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~~[1]. 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 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~~[1] 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 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 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 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_{SI} + 50 ms. For inter-RAT cell re-selection the interruption time must not exceed T_{BCCH} + 50 ms.

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 TS 25.331 for a UTRAN cell.

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

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: $T_{measureFDD}$, $T_{evaluateFDD}$, $T_{measureTDD}$, $T_{evaluateTDD}$, and $T_{measureGSM}$

DRX cycle length [s]	N_{serv} [number of DRX cycles]	$T_{measureFDD}$ [s] (number of DRX cycles)	$T_{evaluateFDD}$ [s] (number of DRX cycles)	$T_{measureTDD}$ [s] (number of DRX cycles)	$T_{evaluateTDD}$ [s] (number of DRX cycles)	$T_{measureGSM}$ [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].

4.2.2.8 Number of cells in cell lists

For idle mode cell re-selection purposes, the UE shall be capable of monitoring:

- 32 intra-frequency cells (including serving cell), and
- 32 inter-frequency cells, including
  - FDD cells on maximum 2 additional carriers, and
  - Depending on UE capability, TDD cells distributed on up to 3 TDD carriers, and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers,

as indicated in cell information lists sent in system information (BCCH).

--- New Section ---

5.5.2.3 Measurement and evaluation of cell selection criteria S of serving cell

The S-criteria detection delay is defined as the time between the occurrence of an event which leads to that the cell selection criteria S for serving cell is not fulfilled and the moment in time when the UE detects that the cell selection criteria S for serving cell is not fulfilled.

The UE shall filter the CPICH Ec/Io and CPICH RSCP measurements used for cell selection criteria S evaluation of the serving cell over at least 3 measurement periods $T_{Measurement\_Period\ Intra}$.

The S-critera detection delay in CELL_FACH state shall be less than:

$$T_{S\text{-}criteria} = 5 \times T_{Measurement\_Period\ Intra}\ \text{ms}$$

where

$T_{Measurement\_Period\ Intra}$ = Specified in 8.4.2.2.2.

The UE is “out of service area” if the UE has evaluated for 4 s that that the serving cell does not fulfil the cell selection criterion S and if the UE has not found any new suitable cell based on searches and measurements of the neighbour cells indicated in the measurement control system information during these 4 s. When the UE is “out of service area” it shall initiate cell selection procedures for the selected PLMN as defined in [1].

3GPP TSG RAN WG4 Meeting #23 **R4-021046**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.133** **CR** **423** ⌘ **rev** **1** ⌘ Current version: **4.4.0** ⌘

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

Title:	⌘	Definition of "out of service area"
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-4

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

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change:	⌘	TS 25.331 uses the "out of service area" condition as a trigger to start RRC timers T316 and T317. However, proper definition of how to trigger 'out of service area' is missing.
Summary of change:	⌘	It has been added that UE in Cell_PCH and URA_PCH shall consider 'out of service area' if UE has not found any suitable cell among its neighbouring cells during the 12s period proceeding the Nserv number of DRX cycles with Cell selection criteria S not fulfilled for serving cell. It has been added that UE in Cell_FACH shall consider 'out of service area' if UE has not found any suitable cell among its neighbouring cells during a 4s period. Reference list is updated to cover TS 25.304.
Consequences if not approved:	⌘	Definition of "out of service area" will be missing, leading to ambiguity in the use of RRC timers T316 and T317.

Clauses affected:	⌘	2, 4.4, 5.5.3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Equivalent CRs in other Releases: CR422r1 cat. F to 25.133 v3.9.0, CR424r1 cat. A to 25.133 v5.2.0

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2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
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[1] 3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode".~~(void)~~

[2] 3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".

[3] 3GPP TS 25.101: "UE Radio transmission and reception (FDD)".

[4] 3GPP TS 25.104: "BTS Radio transmission and reception (FDD)".

[5] 3GPP TS 25.102: "UE Radio transmission and reception (TDD)".

[6] 3GPP TS 25.105: "BTS Radio transmission and reception (TDD)".

[7] void.

[8] 3GPP TS 25.141: "Base station conformance testing (FDD)".

[9] 3GPP TS 25.142: "Base station conformance testing (TDD)".

[10] 3GPP TS 25.113: "Base station EMC".

[11] 3GPP TR 25.942: "RF System scenarios".

[12] 3GPP TR 25.922: "RRM Strategies".

[13] 3GPP TS 25.215: "Physical Layer Measurements (FDD)".

[14] 3GPP TS 25.225: "Physical Layer Measurements (TDD)".

[15] 3GPP TS 25.302: "Services provided by Physical Layer".

[16] 3GPP TS 25.331: "RRC Protocol Specification".

[17] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes"

[18] 3GPP TS 25.214: "Physical layer procedures (FDD)"

[19] 3GPP TS 25.321: "MAC protocol specification"

[20] 3GPP TS 25.303: "Interlayer Procedures in Connected Mode"

[21] 3GPP TS 45.008: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control"

[22] 3GPP TS 45.005: "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception"

--- New Section ---

4.2.2 Requirements

4.2.2.1 Measurement and evaluation of cell selection criteria S of serving cell

The UE shall measure the CPICH Ec/Io and CPICH RSCP level of the serving cell and evaluate the cell selection criterion S defined in [1] ~~TS25.304~~ for the serving cell at least every DRX cycle. The UE shall filter the CPICH Ec/Io and CPICH RSCP measurements of the serving cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$ (see table 4.1).

If the UE has evaluated in N_{serv} consecutive DRX cycles that the serving cell does not fulfil the cell selection criterion S, the UE shall initiate the measurements of all neighbour cells indicated in the measurement control system information, regardless of the measurement rules currently limiting UE measurement activities.

If the UE has not found any new suitable cell based on searches and measurements of the neighbour cells indicated in the measurement control system information for 12 s, the UE shall initiate cell selection procedures for the selected PLMN as defined in [1]~~TS25.304~~.

After this 12 s period a UE in Cell:PCH or URA_PCH is considered to be “out of service area” and shall perform actions according to 25.331.

4.2.2.2 Measurements of intra-frequency cells

The UE shall measure CPICH Ec/Io and CPICH RSCP at least every $T_{measureFDD}$ (see table 4.1) for intra-frequency cells that are identified and measured according to the measurement rules. $T_{measureFDD}$ is defined in Table 4.1. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured intra-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better ranked than the serving cell within $T_{evaluateFDD}$ (see table 4.1), from the moment the intra-frequency cell became at least 3 dB better ranked than the current serving cell, provided that Treselection timer is set to zero and either CPICH Ec/Io or CPICH RSCP is used as measurement quantity for cell reselection.

If Treselection timer has a non zero value and the intra-frequency cell is better ranked than the serving cell, the UE shall evaluate this intra-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.3 Measurements of inter-frequency FDD cells

The UE shall measure CPICH Ec/Io and CPICH RSCP at least every $(N_{carrier}-1) * T_{measureFDD}$ (see table 4.1) for inter-frequency cells that are identified and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for FDD cells. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured inter-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$.

If CPICH Ec/Io is used as measurement quantity for cell reselection, the filtering shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has become better ranked than the serving cell within $(N_{carrier}-1) * T_{evaluateFDD}$ (see table 4.1) from the moment the inter-frequency cell became at least 3 dB better than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If CPICH RSCP is used as measurement quantity for cell reselection, the filtering shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has become better ranked than the serving cell within $(N_{carrier}-1) * T_{evaluateFDD}$ from the moment the inter-frequency cell became at least 5 dB better than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell

within 30 s from the moment the inter-frequency cell became at least 5 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.4 Measurements of inter-frequency TDD cells

The UE shall measure the PCCPCH RSCP of each TDD neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in [1]~~TS25.304~~, at least every $T_{measureTDD}$ (see table 4.1 TS25.133). The UE shall filter PCCPCH RSCP measurements of each measured inter-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$.

The filtering of PCCPCH RSCP shall be such that the UE shall be capable of evaluating that an already detected inter-frequency cell has become better ranked than the serving cell within $N_{carrierTDD}$* $T_{evaluateTDD}$ from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero. For non-detected inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell. The ranking of the cells shall be made according to the cell reselection criteria specified in [1]~~TS25.304~~.

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 [1]~~TS25.304~~, at least every $T_{measureGSM}$ (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.

If GSM measuremenst are required by the measurement rules in [1]~~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 [1]~~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 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 [1]~~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 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 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 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_{SI} + 50 ms. For inter-RAT cell re-selection the interruption time must not exceed T_{BCCH} + 50 ms.

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].

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: $T_{measureFDD}$, $T_{evaluateFDD}$, $T_{measureTDD}$, $T_{evaluateTDD}$, and $T_{measureGSM}$

DRX cycle length [s]	N_{serv} [number of DRX cycles]	$T_{measureFDD}$ [s] (number of DRX cycles)	$T_{evaluateFDD}$ [s] (number of DRX cycles)	$T_{measureTDD}$ [s] (number of DRX cycles)	$T_{evaluateTDD}$ [s] (number of DRX cycles)	$T_{measureGSM}$ [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].

4.2.2.8 Number of cells in cell lists

For idle mode cell re-selection purposes, the UE shall be capable of monitoring:

- 32 intra-frequency cells (including serving cell), and
- 32 inter-frequency cells, including
  - FDD cells on maximum 2 additional carriers, and
  - Depending on UE capability, TDD cells distributed on up to 3 TDD carriers, and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers,

as indicated in cell information lists sent in system information (BCCH).

--- New Section ---

5.5.2.3 Measurement and evaluation of cell selection criteria S of serving cell

The S-criteria detection delay is defined as the time between the occurrence of an event which leads to that the cell selection criteria S for serving cell is not fulfilled and the moment in time when the UE detects that the cell selection criteria S for serving cell is not fulfilled.

The UE shall filter the CPICH Ec/Io and CPICH RSCP measurements used for cell selection criteria S evaluation of the serving cell over at least 3 measurement periods $T_{Measurement\_Period\ Intra}$.

The S-critera detection delay in CELL_FACH state shall be less than:

$$T_{S\text{-}criteria} = 5 \times T_{Measurement\_Period\ Intra}\ \text{ms}$$

where

$T_{Measurement\_Period\ Intra}$ = Specified in 8.4.2.2.2.

The UE is “out of service area” if the UE has evaluated for 4 s that that the serving cell does not fulfil the cell selection criterion S and if the UE has not found any new suitable cell based on searches and measurements of the neighbour cells indicated in the measurement control system information during these 4 s. When the UE is “out of service area” it shall initiate cell selection procedures for the selected PLMN as defined in [1].

3GPP TSG RAN WG4 Meeting #23 **R4-021047**

Gyeongju, Korea 13th -17th May, 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.133** **CR** **424** ⌘ **rev** **1** ⌘ Current version: **5.2.0** ⌘

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

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

Title:	⌘	Definition of "out of service area"
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	17/5/2002
Category:	⌘	**A**
Release:	⌘	Rel-5

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

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change:	⌘	TS 25.331 uses the "out of service area" condition as a trigger to start RRC timers T316 and T317. However, proper definition of how to trigger 'out of service area' is missing.
Summary of change:	⌘	It has been added that UE in Cell_PCH and URA_PCH shall consider 'out of service area' if UE has not found any suitable cell among its neighbouring cells during the 12s period proceeding the Nserv number of DRX cycles with Cell selection criteria S not fulfilled for serving cell. It has been added that UE in Cell_FACH shall consider 'out of service area' if UE has not found any suitable cell among its neighbouring cells during a 4s period. Reference list is updated to cover TS 25.304.
Consequences if not approved:	⌘	Definition of "out of service area" will be missing, leading to ambiguity in the use of RRC timers T316 and T317.

Clauses affected:	⌘	2, 4.4, 5.5.3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	Equivalent CRs in other Releases: CR422r1 cat. F to 25.133 v3.9.0, CR423r1 cat. A to 25.133 v4.4.0

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/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.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode".~~(void)~~

[2] 3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".

[3] 3GPP TS 25.101: "UE Radio transmission and reception (FDD)".

[4] 3GPP TS 25.104: "BTS Radio transmission and reception (FDD)".

[5] 3GPP TS 25.102: "UE Radio transmission and reception (TDD)".

[6] 3GPP TS 25.105: "BTS Radio transmission and reception (TDD)".

[7] void.

[8] 3GPP TS 25.141: "Base station conformance testing (FDD)".

[9] 3GPP TS 25.142: "Base station conformance testing (TDD)".

[10] 3GPP TS 25.113: "Base station EMC".

[11] 3GPP TR 25.942: "RF System scenarios".

[12] 3GPP TR 25.922: "RRM Strategies".

[13] 3GPP TS 25.215: "Physical Layer Measurements (FDD)".

[14] 3GPP TS 25.225: "Physical Layer Measurements (TDD)".

[15] 3GPP TS 25.302: "Services provided by Physical Layer".

[16] 3GPP TS 25.331: "RRC Protocol Specification".

[17] ETSI ETR 273-1-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes"

[18] 3GPP TS 25.214: "Physical layer procedures (FDD)"

[19] 3GPP TS 25.321: "MAC protocol specification"

[20] 3GPP TS 25.303: "Interlayer Procedures in Connected Mode"

[21] 3GPP TS 45.008: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control"

[22] 3GPP TS 45.005: "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception"

--- New Section ---

4.2.2 Requirements

4.2.2.1 Measurement and evaluation of cell selection criteria S of serving cell

The UE shall measure the CPICH Ec/Io and CPICH RSCP level of the serving cell and evaluate the cell selection criterion S defined in ~~TS25.304~~[1] for the serving cell at least every DRX cycle. The UE shall filter the CPICH Ec/Io and CPICH RSCP measurements of the serving cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$ (see table 4.1).

If the UE has evaluated in N_{serv} consecutive DRX cycles that the serving cell does not fulfil the cell selection criterion S, the UE shall initiate the measurements of all neighbour cells indicated in the measurement control system information, regardless of the measurement rules currently limiting UE measurement activities.

If the UE has not found any new suitable cell based on searches and measurements of the neighbour cells indicated in the measurement control system information for 12 s, the UE shall initiate cell selection procedures for the selected PLMN as defined in ~~TS25.304~~[1].

After this 12 s period a UE in Cell:PCH or URA_PCH is considered to be “out of service area” and shall perform actions according to 25.331.

4.2.2.2 Measurements of intra-frequency cells

The UE shall measure CPICH Ec/Io and CPICH RSCP at least every $T_{measureFDD}$ (see table 4.1) for intra-frequency cells that are identified and measured according to the measurement rules. $T_{measureFDD}$ is defined in Table 4.1. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured intra-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better ranked than the serving cell within $T_{evaluateFDD}$ (see table 4.1), from the moment the intra-frequency cell became at least 3 dB better ranked than the current serving cell, provided that Treselection timer is set to zero and either CPICH Ec/Io or CPICH RSCP is used as measurement quantity for cell reselection.

If Treselection timer has a non zero value and the intra-frequency cell is better ranked than the serving cell, the UE shall evaluate this intra-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.3 Measurements of inter-frequency FDD cells

The UE shall measure CPICH Ec/Io and CPICH RSCP at least every $(N_{carrier}-1) * T_{measureFDD}$ (see table 4.1) for inter-frequency cells that are identified and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for FDD cells. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured inter-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureFDD}/2$.

If CPICH Ec/Io is used as measurement quantity for cell reselection, the filtering shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has become better ranked than the serving cell within $(N_{carrier}-1) * T_{evaluateFDD}$ (see table 4.1) from the moment the inter-frequency cell became at least 3 dB better than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If CPICH RSCP is used as measurement quantity for cell reselection, the filtering shall be such that the UE shall be capable of evaluating that an already identified inter-frequency cell has become better ranked than the serving cell within $(N_{carrier}-1) * T_{evaluateFDD}$ from the moment the inter-frequency cell became at least 5 dB better than the current serving cell provided that Treselection timer is set to zero. For non-identified inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell

within 30 s from the moment the inter-frequency cell became at least 5 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

4.2.2.4 Measurements of inter-frequency TDD cells

The UE shall measure the PCCPCH RSCP of each TDD neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in ~~TS25.304~~[1], at least every $T_{measureTDD}$ (see table 4.1 TS25.133). The UE shall filter PCCPCH RSCP measurements of each measured inter-frequency cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$.

The filtering of PCCPCH RSCP shall be such that the UE shall be capable of evaluating that an already detected inter-frequency cell has become better ranked than the serving cell within $N_{carrierTDD}$* $T_{evaluateTDD}$ from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero. For non-detected inter-frequency cells, the filtering shall be such that the UE shall be capable of evaluating that inter-frequency cell has become better ranked than the serving cell within 30 s from the moment the inter-frequency cell became at least 3 dB better ranked than the current serving cell provided that Treselection timer is set to zero.

If Treselection timer has a non zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell. The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304.

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~~[1], at least every $T_{measureGSM}$ (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.

If GSM measuremenst are required by the measurement rules in ~~TS25.304~~[1], 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~~[1]. 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 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 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 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 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_{SI} + 50 ms. For inter-RAT cell re-selection the interruption time must not exceed T_{BCCH} + 50 ms.

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].

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: $T_{measureFDD}$, $T_{evaluateFDD}$, $T_{measureTDD}$, $T_{evaluateTDD}$, and $T_{measureGSM}$

DRX cycle length [s]	N_{serv} [number of DRX cycles]	$T_{measureFDD}$ [s] (number of DRX cycles)	$T_{evaluateFDD}$ [s] (number of DRX cycles)	$T_{measureTDD}$ [s] (number of DRX cycles)	$T_{evaluateTDD}$ [s] (number of DRX cycles)	$T_{measureGSM}$ [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].

4.2.2.8 Number of cells in cell lists

For idle mode cell re-selection purposes, the UE shall be capable of monitoring:

- 32 intra-frequency cells (including serving cell), and
- 32 inter-frequency cells, including
  - FDD cells on maximum 2 additional carriers, and
  - Depending on UE capability, TDD cells distributed on up to 3 TDD carriers, and
- Depending on UE capability, 32 GSM cells distributed on up to 32 GSM carriers,

as indicated in cell information lists sent in system information (BCCH).

--- New Section ---

5.5.2.3 Measurement and evaluation of cell selection criteria S of serving cell

The S-criteria detection delay is defined as the time between the occurrence of an event which leads to that the cell selection criteria S for serving cell is not fulfilled and the moment in time when the UE detects that the cell selection criteria S for serving cell is not fulfilled.

The UE shall filter the CPICH Ec/Io and CPICH RSCP measurements used for cell selection criteria S evaluation of the serving cell over at least 3 measurement periods $T_{Measurement\_Period\ Intra}$.

The S-critera detection delay in CELL_FACH state shall be less than:

$$T_{S\text{-}criteria} = 5 \times T_{Measurement\_Period\ Intra}\ \text{ms}$$

where

$T_{Measurement\_Period\ Intra}$ = Specified in 8.4.2.2.2.

The UE is “out of service area” if the UE has evaluated for 4 s that that the serving cell does not fulfil the cell selection criterion S and if the UE has not found any new suitable cell based on searches and measurements of the neighbour cells indicated in the measurement control system information during these 4 s. When the UE is “out of service area” it shall initiate cell selection procedures for the selected PLMN as defined in [1].