# TSG-RAN Meeting #12 *RP-010352*
# Stockholm, Sweden, 12 - 15 June 2001

**Title:** **Agreed CRs (Release '99 and Rel-4 category A) to TS 25.123 (2)**

**Source:** **TSG-RAN WG4**

**Agenda item:** **8.4.3**

| WG4 doc | Status WG4 | Spec | CR | Phase | Title | Cat | V old | V new |
|---|---|---|---|---|---|---|---|---|
| R4-010694 | agreed | 25.123 | 66 | R99 | General section 5 corrections | F | 3.5.0 | 3.6.0 |
| R4-010806 | agreed | 25.123 | 67 | Rel-4 | General section 5 corrections | A | 4.0.0 | 4.1.0 |
| R4-010695 | agreed | 25.123 | 68 | R99 | Correction to chapter 4.2 Cell re-selection | F | 3.5.0 | 3.6.0 |
| R4-010680 | agreed | 25.123 | 69 | Rel-4 | Correction to chapter 4.2 Cell re-selection | A | 4.0.0 | 4.1.0 |
| R4-010708 | agreed | 25.123 | 70 | R99 | TDD Measurements in Cell DCH State | F | 3.5.0 | 3.6.0 |
| R4-010730 | agreed | 25.123 | 71 | Rel-4 | TDD measurements in Cell DCH State | A | 4.0.0 | 4.1.0 |
| R4-010709 | agreed | 25.123 | 72 | R99 | GSM Measurements in Cell DCH State | F | 3.5.0 | 3.6.0 |
| R4-010731 | agreed | 25.123 | 73 | Rel-4 | GSM measurement in CELL_DCH State | A | 4.0.0 | 4.1.0 |
| R4-010487 | agreed | 25.123 | 79 | R99 | Measurements in Cell FACH State | F | 3.5.0 | 3.6.0 |
| R4-010792 | agreed | 25.123 | 80 | Rel-4 | Measurements in cell_FACH state | A | 4.0.0 | 4.1.0 |
| R4-010475 | agreed | 25.123 | 81 | R99 | TDD Measurement Test Cases | F | 3.5.0 | 3.6.0 |
| R4-010795 | agreed | 25.123 | 82 | Rel-4 | TDD measurement test cases | A | 4.0.0 | 4.1.0 |
| R4-010488 | agreed | 25.123 | 83 | R99 | FDD Measurement Test Cases | F | 3.5.0 | 3.6.0 |
| R4-010796 | agreed | 25.123 | 84 | Rel-4 | FDD measurement test cases | A | 4.0.0 | 4.1.0 |

**3GPP TSG RAN WG4 Meeting #17** **R4-010694**

**Gothenburg, Sweden 21st - 25th May 2001**

*CR-Form-v4*

# CHANGE REQUEST

⌘ **25.123** **CR** **66** ⌘ ev **-** ⌘ Current version: **3.5.0** ⌘

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

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | General section 5 corrections |
| ***Source:*** | ⌘ | RAN WG4 |
| ***Work item code:*** | ⌘ | TEI |
| ***Date:*** | ⌘ | 2001-05-21 |
| ***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:*** | ⌘ | Correction of TDD/FDD handover requirement. Correction of references. |
| ***Summary of change:*** | ⌘ | The interruption time already includes the time required for the TDD/FDD re-configuration, thus the corresponding statement has to be corrected. |
| ***Consequences if not approved:*** | ⌘ | Incorrect requirement for TDD/FDD handover based on an undefined statement. Wrong references. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 5, 5.1, 5.2, 5.3, 5.5, 5.6 |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications<br>☐ Test specifications<br>☐ O&M Specifications |
| | ⌘ | |
| ***Other comments:*** | ⌘ | |

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

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

# 5 UTRAN Connected Mode Mobility

This section contains the requirements on the mobility procedures in UTRAN connected mode such as handover and cell re-selection.
Requirements related to the measurements in support of the execution of the UTRAN connected mode mobility procedures are specified, currently not necessarily for all UTRAN connected mode states, in section 8 .
The radio links the UE shall use are controlled by UTRAN with RRC signalling.
UE behaviour in response to UTRAN RRC messages is described in TS25.331.
The purpose of Cell reselection in CELL_FACH, CELL_PCH and URA_PCH states is that the UE shall select a better cell according to the cell reselection criteria in TS 25.~~303~~304. CELL_FACH, CELL_PCH and URA_PCH states are described in TS 25.331.
~~The handover process should be implemented in both the UE and UTRAN. The UE measurements and which radio links the UE shall use is controlled by UTRAN with RRC signalling.~~
~~Measurements are specified in TS25.225 and UE behaviour in response to UTRAN RRC messages is described in 3GPP TS 25.331. Further descriptions of the measurement procedures can be found in chapter 8.~~

## 5.1 TDD/TDD Handover

### 5.1.1 Introduction

The purpose of TDD/TDD handover is to change the cell of the connection between UE and UTRAN. The handover procedure is initiated from UTRAN with a RRC message that implies a handover, refer to TS25.331.The handover procedure may cause the UE to change its frequency.

### 5.1.2 Requirements

#### 5.1.2.1 TDD/TDD Handover delay

Procedure delay for all procedures, that can command a ~~hard~~ handover, are specified in TS25.331 section 13.5.2~~11.5~~.
When the UE receives a RRC message implying ~~hard~~ handover with the activation time "now" or earlier than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.
If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH at the designated activation time.
where:
$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.1.2.2.

#### 5.1.2.2 Interruption time

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

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

**Table 5.1 TDD/TDD handover – interruption time**

| TDD/TDD handover case | Maximum delay [ms] | |
|---|---|---|
| | One Known Cell in HO command | One Unknown Cell in HO command |
| Intra-frequency | 40 | 350 |
| Inter-frequency | 40 | 350 |

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

The requirement in Table 5-1 for the unknown cell shall apply if the signal quality of the unknown cell is good enough for successful synchronisation with one attempt.

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

# 5.2 TDD/FDD Handover

## 5.2.1 Introduction

The purpose of TDD/FDD handover is to change the mode between FDD and TDD.
The handover procedure is initiated from UTRAN with a handover command message , refer to TS25.331. The handover procedure causes the UE to change its frequency.

## 5.2.2 Requirements

These requirements shall apply only to TDD/FDD UE.
The requirements do not apply if FDD macro-diversity is used.

### 5.2.2.1 Handover delay

Procedure delay for all procedures, that can command a hard handover, are specified in ~~[~~TS25.331 section 13.5.2~~11.5]~~.
When the UE receives a RRC message implying hard handover with the activation time "now" or earlier than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.
If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH at the designated activation time.
where:
$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.2.2.2 ~~plus the time required for any kind of baseband or RF reconfiguration due to the change of the UTRAN mode~~.

### 5.2.2.2 Interruption time

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old DTCH and the time the UE starts transmission of the new uplink DPCCH . The interruption time shall be less than the value in table 5.2.
There is different requirement on the interruption time depending on if the cell is known or not.
The definition of known cell can be found in section 5.1.2.2.

**Table 5.2 TDD/FDD interruption time**

| cell present in the handover command message | Maximum delay [ms] | |
|---|---|---|
| | Known Cell | Unknown cell |
| 1 | [100] | [350] |

The interruption time includes the interruption uncertainty when changing the timing from the old TDD to the new FDD cell, which can be up to one frame (10ms) and the time required for measuring the downlink DPCCH channel as stated in TS 25.214 section 4.3.1.2 ~~into account~~.
The requirement in Table 5-2 for the unknown cell shall apply if the signal quality of the unknown cell is good enough for successful synchronisation with one attempt.

# 5.3 TDD/GSM Handover

~~In the early days of UMTS deployment it can be anticipated that the service area will not be as contiguous and extensive as existing second generation systems. It is also anticipated that UMTS network will be an overlay on the 2nd generation network and utilize the latter, in the minimum case, as a fall back to ensure continuity of service and maintain a good QoS as perceived by the user.~~

### 5.3.1 Introduction

The purpose of inter-RAT handover from UTRAN TDD to GSM is to transfer a connection between the UE and UTRAN TDD to GSM. The handover procedure is initiated from UTRAN with a RRC message (HANDOVER FROM UTRAN COMMAND). The procedure is described in TS25.331 section 8.3.7.

### 5.3.2 Requirements

These requirements shall apply only to TDD/GSM UE.
This clause presents some of the important aspects of GSM handover required to be performed by the UE. ~~For the full specifications reference should be made the GSM Technical Specifications.~~
The underlying requirement is to ensure continuity of service to the UMTS user. The handover requirements for 3G to GSM should be comparable to GSM to GSM handover requirements.

#### 5.3.2.1 Handover delay

When the UE receives a RRC HANDOVER FROM UTRAN COMMAND with the activation time "now" or earlier than the value in Table 5.3 from the end of the last TTI containing the RRC command, the UE shall be ready to transmit (as specified in GSM 05.10) on the new channel of the new RAT within the value in Table 5.3 from the last TTI containing the RRC command. If the access is delayed to an indicated activation time later than the value in Table 5-3 from the end of the last TTI containing the RRC command, the UE shall be ready to transmit (as specified in GSM 05.10) on the channel of the new RAT at the designated activation time.
The UE shall process the RRC procedures for the RRC HANDOVER FROM UTRAN COMMAND within 50 ms. If the activation time is used, it corresponds to the CFN of the UTRAN channel.

**Table 5-3: TDD/GSM handover –handover delay**

| UE synchronisation status | handover delay [ms] |
|---|---|
| The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received | 90 |
| The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received | 190 |

#### 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 channel and the time the UE is ready to transmit on the new channel, shall be less than the value in Table 5.4.
The requirement in Table 5.4 for the case, that UE is not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received, is valid when the signal quality of the GSM cell is good enough for successful synchronisation with one attempt.

**Table 5-4: TDD/GSM handover - interruption time**

| Synchronisation status | Interruption time [ms] |
|---|---|
| The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received | 40 |
| The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received | 140 |

NEXT CHANGED SECTION

## 5.5 Cell Re-selection in Cell_PCH

### 5.5.1 Introduction

When a Cell Re-selection process is triggered according to 25.331, the UE shall evaluate the cell re-selection criteria specified in TS 25.304~~3~~, based on radio measurements, and if a better cell is found that cell is selected.

### 5.5.2 Requirements

Requirements for cell re-selection in Cell_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1, according to TS25.331.

## 5.6 Cell Re-selection in URA_PCH

### 5.6.1 Introduction

When a Cell Re-selection process is triggered according to 25.331, the UE shall evaluate the cell re-selection criteria specified in TS 25.304~~3~~, based on radio measurements, and if a better cell is found that cell is selected.

### 5.6.2 Requirements

Requirements for cell re-selection in URA_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1, according to TS25.331.

**3GPP TSG RAN WG4 Meeting #17** **R4-010806**

**Gothenburg, Sweden 21st - 25th May 2001**

*CR-Form-v4*

# CHANGE REQUEST

⌘ **25.123** **CR** **67** ⌘ ev **-** ⌘ Current version: **4.0.0** ⌘

*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 **X** Core Network ☐

| | | |
|---|---|---|
| ***Title:*** | ⌘ | General section 5 corrections |
| ***Source:*** | ⌘ | RAN WG4 |
| ***Work item code:*** | ⌘ | TEI |
| ***Date:*** | ⌘ | 2001-05-21 |
| ***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:*** | ⌘ | Corresponding REL-4 CR to R4-010694. Correction of TDD/FDD handover requirement. Correction of references. |
| ***Summary of change:*** | ⌘ | The same corrections as proposed in this document were proposed for R99, refer to R4-010694. |
| ***Consequences if not approved:*** | ⌘ | Incorrect requirement for TDD/FDD handover based on an undefined statement. Wrong references. Inconsistency between different releases. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 5, 5.1, 5.2, 5.3, 5.5, 5.6 |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications ☐ Test specifications ☐ O&M Specifications ⌘ |
| ***Other comments:*** | ⌘ | |

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

# 5 UTRAN Connected Mode Mobility

This section contains the requirements on the mobility procedures in UTRAN connected mode such as handover and cell re-selection.
Requirements related to the measurements in support of the execution of the UTRAN connected mode mobility procedures are specified, currently not necessarily for all UTRAN connected mode states, in section 8 .
The radio links the UE shall use are controlled by UTRAN with RRC signalling.
UE behaviour in response to UTRAN RRC messages is described in TS25.331.
The purpose of Cell reselection in CELL_FACH, CELL_PCH and URA_PCH states is that the UE shall select a better cell according to the cell reselection criteria in TS 25.304~~3~~. CELL_FACH, CELL_PCH and URA_PCH states are described in TS 25.331.
~~The handover process should be implemented in both the UE and UTRAN. The UE measurements and which radio links the UE shall use is controlled by UTRAN with RRC signalling.~~
~~Measurements are specified in TS25.225 and UE behaviour in response to UTRAN RRC messages is described in 3GPP TS 25.331. Further descriptions of the measurement procedures can be found in chapter 8.~~

## 5.1 TDD/TDD Handover

### 5.1.1 Introduction

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

### 5.1.2 Requirements

#### 5.1.2.1 TDD/TDD Handover delay

##### 5.1.2.1.1 3.84 Mcps TDD option

Procedure delay for all procedures, that can command a ~~hard~~ handover, are specified in TS25.331 section 13.5.2~~11.5~~.
When the UE receives a RRC message implying ~~hard~~ handover with the activation time "now" or earlier than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.
If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH at the designated activation time.
where:
$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.1.2.2.1.

##### 5.1.2.1.2 1.28 Mcps TDD option

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

$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.1.2.2.2.

### 5.1.2.2 Interruption time

#### 5.1.2.2.1 3.84 Mcps TDD option

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

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

**Table 5.1 TDD/TDD handover – interruption time**

| TDD/TDD handover case | Maximum delay [ms] | |
|---|---|---|
| | One Known Cell in HO command | One Unknown Cell in HO command |
| Intra-frequency | 40 | 350 |
| Inter-frequency | 40 | 350 |

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

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

#### 5.1.2.2.2 1.28 Mcps TDD option

The interruption time i.e. the time between the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCCH, shall be less than the value in table 5.1A. There is different requirement on the interruption time depending on if the cell is known or not.
A cell shall be regarded as known by the UE if
it has been measured during the last 5 seconds or
a dedicated connection existed between the UE and the cell during the last 5 seconds.

**Table 5.1A: TDD/ TDD handover – interruption time**

| cell in the handover command message | Maximum delay [ms] | |
|---|---|---|
| | Known Cell | Unknown Cell |
| 1 | [40] | [350] |

The interruption time includes the time that can elapse till the appearance of the channel required for the synchronisation. And the time that can elapse till the appearance of the DwPTS in which the new uplink SYNC1 shall be transmitted ,or in case of high chip rate TDD the new uplink DPCH, shall be transmitted , which can be up to one frame (10ms).
The requirement in Table 5.1A for the cell shall apply if the signal quality of the unknown cell is good enough for successful synchronisation with one attempt.

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

## 5.2 TDD/FDD Handover

### 5.2.1 Introduction

The purpose of TDD/FDD handover is to change the mode between FDD and TDD.
The handover procedure is initiated from UTRAN with a handover command message , refer to TS25.331. The handover procedure causes the UE to change its frequency.

## 5.2.2 Requirements

These requirements shall apply only to TDD/FDD UE.
The requirements do not apply if FDD macro-diversity is used.

### 5.2.2.1 Handover delay

#### 5.2.2.1.1 3.84 Mcps TDD option

Procedure delay for all procedures, that can command a hard handover, are specified in ~~[~~TS25.331 section 13.5.2~~11.5]~~.
When the UE receives a RRC message implying hard handover with the activation time "now" or earlier than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.
If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH at the designated activation time.
where:
$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.2.2.2 ~~plus the time required for any kind of baseband or RF reconfiguration due to the change of the UTRAN mode~~.

#### 5.2.2.1.2 1.28 Mcps TDD option

When the UE receives a RRC message that implies a handover, with the activation time "now" or earlier than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.
If the access is delayed to an indicated activation time later than $D_{handover}$ seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH at the designated activation time.
where:
$D_{handover}$ equals the RRC procedure delay defined in TS25.331 Section 13.5.2 plus the interruption time stated in section 5.2.2.2.2 plus the time required for any kind of baseband or RF reconfiguration due to the change of the UTRAN mode.

### 5.2.2.2 Interruption time

#### 5.2.2.2.1 3.84 Mcps TDD option

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old DTCH and the time the UE starts transmission of the new uplink DPCCH . The interruption time shall be less than the value in table 5.2.
There is different requirement on the interruption time depending on if the cell is known or not.
The definition of known cell can be found in section 5.1.2.2.

**Table 5.2 TDD/FDD interruption time**

| cell present in the handover command message | Maximum delay [ms] | |
|---|---|---|
| | Known Cell | Unknown cell |
| 1 | [100] | [350] |

The interruption time includes the interruption uncertainty when changing the timing from the old TDD to the new FDD cell, which can be up to one frame (10ms) and the time required for measuring the downlink DPCCH channel as stated in TS 25.214 section 4.3.1.2 ~~into account~~.
The requirement in Table 5.2 for the unknown cell shall apply if the signal quality of the unknown cell is good enough for successful synchronisation with one attempt.

#### 5.2.2.2.2 1.28 Mcps TDD option

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCCH, shall be less than the value in table 5.2A
There is different requirement on the depending on if the cell is known or not.

**Table 5.2A: 1.28 Mcps TDD/FDD interruption time**

| cell in the handover command message | Maximum update delay [ms] | |
|---|---|---|
| | Known Cell | Unknown Cell |
| 1 | [100 ] | [ 350] |

The interruption time includes the interruption uncertainty when changing the timing from the old 1.28 Mcps TDD OPTION to the new FDD cell, which can be up to one frame (10ms) and the time required for measuring the downlink DPCCH channel as stated in TS 25.214 section 4.3.1.2 into account.
The requirement in Table 5.2A for the unknown cell shall apply if the signal quality of the unknown cell is good enough for successful synchronisation with one attempt.

# 5.3 TDD/GSM Handover

~~In the early days of UMTS deployment it can be anticipated that the service area will not be as contiguous and extensive as existing second generation systems. It is also anticipated that UMTS network will be an overlay on the 2nd generation network and utilize the latter, in the minimum case, as a fall back to ensure continuity of service and maintain a good QoS as perceived by the user.~~

## 5.3.1 Introduction

The purpose of inter-RAT handover from UTRAN TDD to GSM is to transfer a connection between the UE and UTRAN TDD to GSM. The handover procedure is initiated from UTRAN with a RRC message (HANDOVER FROM UTRAN COMMAND). The procedure is described in TS25.331 section 8.3.7.

## 5.3.2 Requirements

These requirements shall apply only to TDD/GSM UE.
This clause presents some of the important aspects of GSM handover required to be performed by the UE. ~~For the full specifications reference should be made the GSM Technical Specifications.~~
The underlying requirement is to ensure continuity of service to the UMTS user. The handover requirements for 3G to GSM should be comparable to GSM to GSM handover requirements.

### 5.3.2.1 Handover delay

#### 5.3.2.1.1 3.84 Mcps TDD option

When the UE receives a RRC HANDOVER FROM UTRAN COMMAND with the activation time "now" or earlier than the value in Table 5.3 from the end of the last TTI containing the RRC command, the UE shall be ready to transmit (as specified in GSM 05.10) on the new channel of the new RAT within the value in Table 5.3 from the last TTI containing the RRC command. If the access is delayed to an indicated activation time later than the value in Table 5.3 from the end of the last TTI containing the RRC command, the UE shall be ready to transmit (as specified in GSM 05.10) on the channel of the new RAT at the designated activation time.
The UE shall process the RRC procedures for the RRC HANDOVER FROM UTRAN COMMAND within 50 ms. If the activation time is used, it corresponds to the CFN of the UTRAN channel.

**Table 5.3: TDD/GSM handover –handover delay**

| UE synchronisation status | handover delay [ms] |
|---|---|
| The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received | 90 |
| The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received | 190 |

#### 5.3.2.1.2 1.28 Mcps TDD option

When the UE receives a RRC HANDOVER COMMAND with the activation time "now" or earlier than the value in Table 5.3A from the end of the last TTI containing the RRC command, the UEit shall be ready to transmit (as specified in GSM 45.010) on the new channel within the new RAT within the value in Table 5.3A from the last TTI containing the RRC command, If the access is delayed to an indicated activation time later than the value in Table 5.3A from the end of the last TTI containing the RRC command, the UE shall be ready to transmit (as specified in GSM 45.010) on the channel of the new RAT at the designated activation time.

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

**Table 5.3.A: 1.28 Mcps TDD/GSM handover –handover delay**

| UE synchronisation status | handover delay [ms] |
|---|---|
| The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received | 90 |
| The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received | 190 |

### 5.3.2.2 Interruption time

#### 5.3.2.2.1 3.84 Mcps TDD option

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old channel and the time the UE is ready to transmit on the new channel, shall be less than the value in Table 5.4. The requirement in Table 5.4 for the case, that UE is not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received, is valid when the signal quality of the GSM cell is good enough for successful synchronisation with one attempt.

**Table 5.4: TDD/GSM handover - interruption time**

| Synchronisation status | Interruption time [ms] |
|---|---|
| The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received | 40 |
| The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received | 140 |

#### 5.3.2.2.2 1.28 Mcps TDD option

The interruption time, i.e. the time between the end of last TTI containing a transport block on the old channel and the time the UE is ready to transmit on the new channel, shall be less than the value in Table 5.4A. The requirement in Table 5.4A for the case, that UE is not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received, is valid when the signal quality of the GSM cell is good enough for successful synchronisation with one attempt.

**Table 5.4A: TDD/GSM handover - interruption time**

| Synchronisation status | Interruption time [ms] |
|---|---|
| The UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received | 40 |
| The UE has not synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received | 140 |

NEXT CHANGED SECTION

## 5.5 Cell Re-selection in Cell_PCH

### 5.5.1 Introduction

When a Cell Re-selection process is triggered according to 25.331, the UE shall evaluate the cell re-selection criteria specified in TS 25.304~~3~~, based on radio measurements, and if a better cell is found that cell is selected.

### 5.5.2 Requirements

#### 5.5.2.1 3.84 Mcps option

Requirements for cell re-selection in Cell_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1, according to TS25.331.

#### 5.5.2.2 1.28 Mcps option

Same requirements as for cell re-selection in idle mode shall apply.

## 5.6 Cell Re-selection in URA_PCH

### 5.6.1 Introduction

When a Cell Re-selection process is triggered according to 25.331, the UE shall evaluate the cell re-selection criteria specified in TS 25.304~~3~~, based on radio measurements, and if a better cell is found that cell is selected.

### 5.6.2 Requirements

#### 5.6.2.1 3.84 Mcps option

Requirements for cell re-selection in URA_PCH state are the same as for cell re-selection in idle mode, see section 4.2. The UE shall support all DRX cycle lengths in table 4.1, according to TS25.331.

#### 5.6.2.2 1.28 Mcps option

Same requirements as for cell re-selection in idle mode shall apply.

**3GPP TSG RAN WG4 Meeting #17** **R4-010695**

**Gothenburg, Sweden 21st - 25th May 2001**

*CR-Form-v3*

# CHANGE REQUEST

⌘ **TS25.123 CR 68** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Corrections to chapter 4.2 Cell reselection |
| ***Source:*** | ⌘ | RAN WG4 |
| ***Work item code:*** | ⌘ | TEI |
| ***Date:*** | ⌘ | 23-05-2001 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | R99 |

*Use one of the following categories:*
- ***F*** *(essential 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:*** | ⌘ | Modifications are made in order to complement the requirements. |
| ***Summary of change:*** | ⌘ | - CPICH Ec/No is added as a measurement quantity for inter-frequency FDD cell measurements (chapter 4.2.2.4).<br>- text corrections in chapters 4.2.2.2, 4.2.2.3, 4.2.2.4<br>- |
| ***Consequences if not approved:*** | ⌘ | RRM performance requirements are not in line with TS 25.304. Measurements needed for FDD cell ranking are not fully described. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 4.2.2.2, 4.2.2.3, 4.2.2.4 |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications ⌘<br>☐ Test specifications<br>☐ O&M Specifications |
| ***Other comments:*** | ⌘ | |

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

# 4.2 Cell Re-selection

## 4.2.1 Introduction

The cell reselection procedure allows the UE to select a more suitable cell and camp on it.

When the UE is in *Normally Camped* state on a TDD cell, the UE shall attempt to detect, synchronise and monitor intra-frequency, inter-frequency and inter-RAT cells indicated in the measurement control system information of the serving cell. If the occasions/triggers occur, as specified in 25.304, the UE shall perform the Cell Reselection Evaluation process.

## 4.2.2 Requirements

### 4.2.2.1 Measurement and evaluation of cell selection criteria $S_{rxlev}$ of serving cell

The UE shall measure the PCCPCH RSCP level of the serving cell and evaluate the cell selection criterion $S_{rxlev}$ defined in TS25.304 for the serving cell at least once per DRX cycle. The UE shall filter the PCCPCH RSCP measurement of the serving cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$ (see table 4.1).

If the UE has evaluated in $N_{serv}$ successive measurements that the serving cell does not fulfil the cell selection criterion $S_{rxlex}$, 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 the on searches and measurements of the neighbour cells indicated in the measurement control system information for [TBD] s, the UE shall initiate cell selection procedures for the selected PLMN as defined in TS25.304.

### 4.2.2.2 Measurement of intra-frequency cells

The UE shall measure PCCPCH RSCP at least every $T_{measureTDD}$ (see table 4.1) for intra-frequency cells that are detected and measured according to the measurement rules. $T_{measureTDD}$ is defined in Table 4.1. The UE shall filter PCCPCH 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 $T_{measureTDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better than the serving cell within $T_{evaluateTDD}$ (see table 4.1), from the moment the intra-frequency cell became at least 2 dB better ranked than the current serving cell, provided that Treselection timer is set to zero.

~~If parameter Treselection has value different from zero, the UE shall evaluate an intra-frequency cell better than the serving cell during the Treselection time, before the UE shall reselect the new cell.~~

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 Measurement of inter-frequency TDD cells

The UE shall measure PCCPCH RSCP at least every $(N_{carrier}-1) * T_{measureTDD}$ (see table 4.1) for inter-frequency cells that are detected and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for TDD cells. The maximum number of carriers is 3 including the carrier the UE is camped on. 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 $(N_{carrier}-1) * T_{evaluateTDD}$ 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-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 than the current serving cell provided that Treselection timer is set to zero.

~~If Treselection timer has a value different from zero, the UE shall evaluate an inter-frequency cell better than the serving cell during the Treselection time, before the UE shall reselect the new cell.~~

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 Measurement of inter-frequency FDD cells

The UE shall measure the signal level CPICH RSCP and CPICH Ec/Io of each FDD neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in TS25.304, at least every $T_{measureFDD}$ (see table 4.1). The UE shall filter CPICH RSCP measurements of each measured inter-frequency cell using at least 2 measurements. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

CPICH RSCP is used as basic measurement quantity for cell rankingeselection,. Tthe filtering 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 $NFDD_{carrier}$ * $T_{evaluateFDD}$ 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-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 5 dB better than the current serving cell provided that Treselection timer is set to zero.

~~If Treselection timer has value different from zero, the UE shall evaluate an inter-frequency cell better ranked than the serving cell during the Treselection time, before the UE shall reselect the new cell.~~

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. If FDD cell has been ranked as the best cell and IE cell_selection_and_reselection-quality_measure is set to CPICH Ec/No, then UE shall perform a second ranking of the FDD cells using CPICH Ec/Io as the measurement quantity, before performing cell re-selection. ~~The use of mapping functions is indicated in the broadcast.~~

### 4.2.2.5 Measurement of inter-RAT GSM cells

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

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

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

The UTRAN to GSM Cell Re-Selection allows a UE, supporting both radio access technologies and camped on a UTRAN cell, to re-select a GSM cell and camp on it according to the cell re-selection criteria described in TS 25.304.

### 4.2.2.6 Evaluation of cell reselection 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 once every DRX cycle.

Cell reselection shall take place immediately after the UE has found a better suitable cell unless the UE has made cell reselection within the last 1 second.

### 4.2.2.7 Maximum interruption time in paging reception

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

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

At inter-frequency and inter-RAT cell re-selection, the UE shall monitor the downlink of current serving cell for paging reception until the UE is capable to start monitoring downlink channels for paging reception of the target inter-frequency cell. The interruption time must not exceed T_REP + 50 ms. T_REP is the longest repetition period for the system information required to be read by the UE to camp on the cell.

These requirements assume sufficient radio conditions, so that decoding of system information can be made without errors.

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

| DRX cycle length [s] | $N_{serv}$ [number of successive measurements] | $T_{measureTDD}$ [s] (number of DRX cycles) | $T_{evaluateTDD}$ [s] (number of DRX cycles) | $T_{measureFDD}$ [s] (number of DRX cycles) | $T_{evaluateFDD}$ [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 Numbers of cells in neighbouring cell list

The UE shall be capable of monitoring 32 intra-frequency TDD cells (including serving cell), 32 inter-frequency cells (including TDD Mode cells and FDD Mode cells if FDD is supported by the UE). The TDD inter-frequency cells can be located on two additional frequencies besides the serving cell and the inter-frequency FDD cells can be located on up to 3 carriers. In addition the UE shall be able to monitor 32 GSM carriers if GSM is supported by the UE. UE measurement activity is controlled by measurement rules defined in TS25.304, allowing the UE to limit its measurement activity if certain conditions are fulfilled.

**3GPP TSG RAN WG4 Meeting #17** **R4-010680**

**Gothenburg, Sweden 21st - 25th May 2001**

*CR-Form-v3*

# CHANGE REQUEST

⌘ **TS25.123 CR 69** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Corrections to chapter 4.2 Cell reselection |
| ***Source:*** | ⌘ | RAN WG4 |
| ***Work item code:*** | ⌘ | TEI |
| ***Date:*** | ⌘ | 23-05-2001 |
| ***Category:*** | ⌘ | **A** |
| ***Release:*** | ⌘ | REL-4 |

*Use one of the following categories:*
- ***F*** *(essential 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:*** | ⌘ | Modifications are made in order to complement the requirements. |
| ***Summary of change:*** | ⌘ | - CPICH Ec/No is added as a measurement quantity for inter-frequency FDD cell measurements (chapter 4.2.2.4).<br>- text corrections in chapters 4.2.2.2, 4.2.2.3, 4.2.2.4<br>- |
| ***Consequences if not approved:*** | ⌘ | RRM performance requirements are not in line with TS 25.304. Measurements needed for FDD cell ranking are not fully described. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 4.2.2.2, 4.2.2.3, 4.2.2.4 |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications ⌘<br>☐ Test specifications<br>☐ O&M Specifications |
| ***Other comments:*** | ⌘ | |

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

# 4.2 Cell Re-selection

## 4.2.1 Introduction

The cell reselection procedure allows the UE to select a more suitable cell and camp on it.

When the UE is in *Normally Camped* state on a TDD cell, the UE shall attempt to detect, synchronise and monitor intra-frequency, inter-frequency and inter-RAT cells indicated in the measurement control system information of the serving cell. If the occasions/triggers occur, as specified in 25.304, the UE shall perform the Cell Reselection Evaluation process.

## 4.2.2 Requirements

### 4.2.2.1 Measurement and evaluation of cell selection criteria $S_{rxlev}$ of serving cell

#### 4.2.2.1.1 3.84 Mcps TDD option

The UE shall measure the PCCPCH RSCP level of the serving cell and evaluate the cell selection criterion $S_{rxlev}$ defined in TS25.304 for the serving cell at least once per DRX cycle. The UE shall filter the PCCPCH RSCP measurement of the serving cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureTDD}/2$ (see table 4.1).

If the UE has evaluated in $N_{serv}$ successive measurements that the serving cell does not fulfil the cell selection criterion $S_{rxlex}$, 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 the on searches and measurements of the neighbour cells indicated in the measurement control system information for [TBD] s, the UE shall initiate cell selection procedures for the selected PLMN as defined in TS25.304.

#### 4.2.2.1.2 1.28 Mcps TDD option

The UE shall measure the PCCPCH RSCP level of the serving cell and evaluate the cell selection criterion S defined in TS25.304 for the serving cell once per DRX cycle. The UE shall filter the PCCPCH RSCP level of the serving cell using at least 2 measurements, which are taken so that the time difference between the measurements is at least $T_{measureNTDD}/2$ (see table 4.1A).

If the UE has evaluated in $N_{serv}$ successive measurements 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 the on searches and measurements of the neighbour cells indicated in the measurement control system information for [TBD] s, the UE shall initiate cell selection procedures for the selected PLMN as defined in TS25.304.

### 4.2.2.2 Measurement of intra-frequency cells

#### 4.2.2.2.1 3.84 Mcps option

The UE shall measure PCCPCH RSCP at least every $T_{measureTDD}$ (see table 4.1) for intra-frequency cells that are detected and measured according to the measurement rules. $T_{measureTDD}$ is defined in Table 4.1. The UE shall filter PCCPCH 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 $T_{measureTDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better than the serving cell within $T_{evaluateTDD}$ (see table 4.1), from the moment the intra-frequency cell became at least 2 dB better ranked than the current serving cell, provided that Treselection timer is set to zero.

~~If parameter Treselection has value different from zero, the UE shall evaluate an intra-frequency cell better than the serving cell during the Treselection time, before the UE shall reselect the new cell.~~

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.

#### 4.2.2.2.2 1.28 Mcps option

The UE shall measure PCCPCH RSCP at least every $T_{measureNTDD}$ (see table 4.1A) for intra-frequency cells that are detected and measured according to the measurement rules. $T_{measureNTDD}$ is defined in Table 4.1A. The UE shall filter PCCPCH 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 $T_{measureNTDD}/2$.

The filtering shall be such that the UE shall be capable of evaluating that an intra-frequency cell has become better than the serving cell within $T_{evaluateNTDD}$ (see table 4.1A), from the moment the intra-frequency cell became at least [2] dB better ranked than the current serving cell, provided that Treselection timer is set to zero and PCCPCH RSCP is used as measurement quantity for cell reselection.

~~If parameter Treselection has value different from zero, the UE shall evaluate an intra-frequency cell better than the serving cell during the Treselection time, before the UE shall reselect the new cell.~~

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 Measurement of inter-frequency TDD cells

#### 4.2.2.3.1 3.84 Mcps option

The UE shall measure PCCPCH RSCP at least every $(N_{carrier}-1) * T_{measureTDD}$ (see table 4.1) for inter-frequency cells that are detected and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for TDD cells. The maximum number of carriers is 3 including the carrier the UE is camped on. 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 $(N_{carrier}-1) * T_{evaluateTDD}$ 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-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 than the current serving cell provided that Treselection timer is set to zero.

~~If Treselection timer has a value different from zero, the UE shall evaluate an inter-frequency cell better than the serving cell during the Treselection time, before the UE shall reselect the new cell.~~

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.

#### 4.2.2.3.2 1.28 Mcps option

The UE shall measure PCCPCH RSCP at least every $(N_{carrier}-1) * T_{measureNTDD}$ (see table 4.1A) for inter-frequency cells that are detected and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for 1.28 Mcps TDD OPTION cells. The maximum number of carriers is [3] including the carrier the UE is camped on. 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 $T_{measureNTDD}/2$.

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 $(N_{carrier}-1) * T_{evaluateNTDD}$ 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-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 than the current serving cell provided that Treselection timer is set to zero.

~~If Treselection timer has a value different from zero, the UE shall evaluate an inter-frequency cell better than the serving cell during the Treselection time, before the UE shall reselect the new cell.~~

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.

### 4.2.2.3A 1.28 Mcps TDD to 3.84 Mcps TDD cell re-selection

This requirement only applies to 1.28 Mcps UEs supporting this mode.

The ranking of the low and high chip rate TDD cells shall be made according to the cell reselection criteria specified in TS25.304. The use of mapping functions is indicated in the broadcast.

The UE shall measure PCCPCH RSCP at least every $N_{TDDcarrier}$ * $T_{measureTDD}$ (see table 4.1A) for inter-frequency cells that are detected and measured according to the measurement rules. The parameter $N_{carrier}$ is the number of carriers used for 3.84 Mcps TDD cells. The maximum number of carriers is 3.The UE shall filter PCCPCH RSCP measurements of each measured high chip rate 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 PCCPCH RSCP shall be such that the UE shall be capable of evaluating that a high chip rate TDD cell has become better ranked than the serving cell within $N_{TDDcarrier}$ * $T_{evaluateTDD}$ from the moment the inter-frequency cell became at least [3] 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 than the current serving cell provided that Treselection timer is set to zero.

### 4.2.2.4 Measurement of inter-frequency FDD cells

#### 4.2.2.4.1 3.84 Mcps option

The UE shall measure the signal level CPICH RSCP and CPICH Ec/Io of each FDD neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in TS25.304, at least every $T_{measureFDD}$ (see table 4.1). The UE shall filter CPICH RSCP measurements of each measured inter-frequency cell using at least 2 measurements. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

CPICH RSCP is used as basic measurement quantity for cell rankingeselection, the filtering 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 $NFDD_{carrier}$ * $T_{evaluateFDD}$ 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-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 5 dB better than the current serving cell provided that Treselection timer is set to zero.

~~If Treselection timer has value different from zero, the UE shall evaluate an inter-frequency cell better ranked than the serving cell during the Treselection time, before the UE shall reselect the new cell.~~

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. If FDD cell has been ranked as the best cell and IE cell selection and reselection-quality measure is set to CPICH Ec/No, then UE shall perform a second ranking of the FDD cells using CPICH Ec/Io as the measurement quantity, before performing cell re-selection.~~The use of mapping functions is indicated in the broadcast.~~

#### 4.2.2.4.2 1.28 Mcps option

This requirement only applies to 1.28 Mcps UEs supporting this mode.

The UE shall measure the signal level CPICH RSCP and CPICH Ec/Io of each FDD neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in TS25.304, at least every $T_{measureFDD}$ (see table 4.1A). The UE shall filter CPICH RSCP measurements of each measured inter-frequency cell using at least 2 measurements. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

CPICH RSCP is used as basic measurement quantity for cell rankingeselection, the filtering 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 $NFDD_{carrier}$ * $T_{evaluateFDD}$ 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-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 [5] dB better than the current serving cell provided that Treselection timer is set to zero.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS25.304. If FDD cell has been ranked as the best cell and IE cell_selection_and_reselection-quality_measure is set to CPICH Ec/No, then UE shall perform a second ranking of the FDD cells using CPICH Ec/Io as the measurement quantity, before performing cell re-selection.The use of mapping functions is indicated in the broadcast.

### 4.2.2.5 Measurement of inter-RAT GSM cells

**3GPP TSG RAN WG4 Meeting #17** **R4-010708**

**Gothenburg, Sweden 21st - 25th May 2001**

*CR-Form-v*

# CHANGE REQUEST

⌘ **25.123** **CR** **70** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | TDD Measurements in CELL_DCH State |
| ***Source:*** | ⌘ | RAN WG4 |
| ***Work item code:*** | ⌘ | TEI |
| ***Date:*** | ⌘ | 2001-05-21 |
| ***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:*** | ⌘ | Removal of TBD and square brackets tasks after re-structuring of the specification are not completed. Alignment of requirements for TDD intra frequency and inter frequency measurements procedures with requirements in specifications 25.133 and 25.331 is necessary. |
| ***Summary of change:*** | ⌘ | - Removal of square brackets for the included figures in the requirements and alignment with other specifications where necessary and agreed by RAN4#16<br>- Alignment of definition of $T_{TDD\ inter}$ and $N_{Freq}$ with requirements as agreed by RAN4 RRM Drafting group<br>- Removal of requirements in square brackets by alignment of requirements for event triggered reporting with with requirements as agreed by RAN4 RRM Drafting group<br>- Inclusion of side conditions for TDD cells SCH ratio between primary and secondary codes in section 8.1.2.6<br>- Removal of editors notes |
| ***Consequences if not approved:*** | ⌘ | Remaining inconsistency in specifications |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 8.1.2.2, 8.1.2.3, 8.1.2.6 |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications ⌘<br>☐ Test specifications<br>☐ O&M Specifications |
| ***Other comments:*** | ⌘ | |

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## 8.1.2 Requirements

### 8.1.2.1 UE Measurement Capability

The UE shall be able to support and process up to

32 intra frequency TDD cells, and

32 inter frequency TDD cells, distributed on up to 2 additional TDD carriers.

Depending on UE capability, the UE shall also in addition be able to support and process 32 FDD cells, distributed on up to 3 FDD carriers.

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

Performance requirements for different types of measurements and different number of cells are defined in the following sections.

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

### 8.1.2.2 TDD intra frequency measurements

During the CELL_DCH state the UE shall continuously measure detected intra frequency cells and search for new intra frequency cells in the monitoring set. In case the network requests the UE to report unlisted cells, the UE shall also search for intra frequency cells outside the monitored set. Intra frequency measurements can be performed (simultaneously to data reception from the active cell) in all time slots not allocated to transmission nor the time used for inter frequency measurements.

#### 8.1.2.2.1 Identification of a new cell

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

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

#### 8.1.2.2.2 UE P-CCPCH measurement capability

In the CELL_DCH state the measurement period for intra frequency measurements is 200 ms. When no inter frequency measurement is scheduled, the UE shall be capable of performing P-CCPCH measurements for 6 detected intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When inter-frequency measurements are required by the network, the UE shall be capable of performing P-CCPCH measurements for at least $Y_{measurement\ intra}$ cells , where $Y_{measurement\ intra}$ is defined in the following equation. The detectable cells, that were not measured during that measurement period, shall be measured in the following measurement periods. The measurement accuracy for all measured cells shall be as specified in the section 9.

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

whereby function Floor(x) takes the integer part of x.

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

$T_{Measurement\_Period,\ Intra}$ = 200 ms. The measurement period for Intra frequency P-CCPCH measurements.

$T_{Intra}$ : This is the minimum time (representing a time corresponding to an integer number of full slots)~~as full slots~~ that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. It is assumed for the requirement that the slot allocation allows measurement windows to be of minimum duration necessary to perform the measurements.

$T_{basic\_identify\_TDD,\ intra}$ = 800 ms. This is the time period used in the intra frequency equation where the maximum allowed time for the UE to identify a new TDD cell is defined. (side conditions are defined in subclause 8.1.2.6).

#### 8.1.2.2.3 Periodic Reporting

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

#### 8.1.2.2.4 Event-triggered Periodic Reporting

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

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.2.5 Event Triggered Reporting.

#### 8.1.2.2.5 Event Triggered Reporting

Reported measurements ~~contained~~ 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~~from when a report is triggered at the physical layer according to the event,~~ 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 when inserting the measurement report to the TTI of the uplink DCCH . The delay uncertainty is twice the TTI of the uplink DCCH.

~~Editors Note: The test cases in section A.8 will need revisions to reflect the general requirements.~~

~~Unless otherwise stated, event triggered measurement reporting delay shall be less than 480 ms.~~

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra}$ defined in Section 8.1.2.2.1. When L3 filtering is used an additional delay can be expected..

If a cell has been detectable at least for the time period $T_{identify\ intra}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ when the L3 filter has not been used.

### 8.1.2.3 TDD inter frequency measurements

When signalled by the network during CELL_DCH state, the UE shall continuously measure detected inter frequency cells and search for new inter frequency cells indicated in the measurement control information.

#### 8.1.2.3.1 Identification of a new cell

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

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

#### 8.1.2.3.2 Measurement period

When TDD inter frequency measurements are scheduled, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in section 9 with measurement period given by

$$T_{measurement\ \ inter} = Max\left\{480, T_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{Measurement\ \ Period,\ Inter}}{T_{Inter}} \cdot N_{Freq}\right\} ms$$

In case of a dual receiver UE, the measurement period for inter frequency measurements is 480 ms.

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

$T_{Inter:}$ This is the minimum time (representing a time corresponding to an integer number of full slots)~~in full slots~~ available for inter frequency measurements during the period $T_{Measurement\_Period\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation ~~whereby HW settling time and synchronisation time has to be taken into account~~ and is calculated by assuming 2*0.5 ms for implementation margin (for the description of the idle intervals see Annex A of 25.225). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

$T_{basic\_identify\_TDD,inter}$ = ~~5000~~ 800 ms. This is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD cell is defined. (side conditions are defined in subclause 8.1.2.6).

$T_{basic\_measurement\_TDD\ inter}$ = ~~200~~ 50 ms. This is the time period used in the equation for defining the measurement period for inter frequency P-CCPCH measurements.

$N_{Freq}$~~≤3~~ Number of TDD frequencies indicated in the inter frequency measurement control information.

~~Note: It is still under consideration how to incorporate a time needed for adjusting asynchronous timing between intra and inter frequency measurement periods and UE HW settling time into the equations.~~

#### 8.1.2.3.3 Periodic Reporting

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

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.3.4 Event Triggered Reporting.

#### 8.1.2.3.4 Event Triggered Reporting

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

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

The measurement reporting delay is defined as the time between any event that will trigger a measurement report~~from when a report is triggered at the physical layer according to the event,~~ until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted 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 $T_{identify\ inter}$ defined in Section 8.1.2.3.1. When L3 filtering is used an additional delay can be expected.~~The measurement reporting delay shall be less than [5] seconds~~.

If a cell has been detectable at least for the time period $T_{identify\_inter}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Inter}$ when the L3 filter has not been used.

### 8.1.2.4 FDD measurements

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

In the CELL_DCH state when FDD inter frequency measurements are scheduled the UE shall continuously measure detected inter frequency FDD cells and search for new inter frequency cells indicated in the measurement control information.

The UE shall be capable of measuring the requested measurement quantity of at least 32 cells on a maximum of 3 frequencies.

#### 8.1.2.4.1 Identification of a new cell

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

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

#### 8.1.2.4.2 Measurement period

When FDD inter frequency measurements are scheduled, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9 with measurement period given by

$$T_{\text{measurement FDD inter}} = Max\left\{[480], T_{\text{basic measurement FDD inter}} \cdot \frac{T_{\text{Measurement Period FDD inter}}}{T_{\text{FDD inter}}} \cdot N_{Freq}\right\} ms$$

$T_{\text{Measurement\_Period FDD inter}}$ = [480] ms. The period used for calculating the measurement period $T_{\text{measurement\_FDD inter}}$ for inter frequency CPICH measurements.

$T_{\text{FDD inter:}}$ This is the minimum time that is available for inter frequency measurements, during the period $T_{\text{Measurement\_Period FDD inter}}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation whereby HW settling time and synchronisation time has to be taken into account (for the description of the idle intervals see Annex A of 25.225). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

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

$T_{\text{basic\_measurement\_FDD inter}}$ = TBD ms. This is the time period used in the equation for defining the measurement period for inter frequency CPICH measurements.

$N_{Freq}$: ≤ 3 Number of FDD frequencies indicated in the 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.

Editors note: The measurement accuracy in combination with event triggered reporting is an open issue and the above sentence shall be revised when this is settled.

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 from when a report is triggered at the physical layer according to the event until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertanty is twice the TTI of the uplink DCCH.

The measurement reporting delay shall be less then [5] seconds.

### 8.1.2.5 GSM measurements

The requirements in this section applies only to UE supporting TDD and GSM.

When signalled by UTRAN during CELL_DCH state, the UE shall continuously measure GSM cells and search for new GSM cells given in the monitored set.

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified.

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

For the UE performing GSM measurements, the requirements in GSM 05.08 shall apply.

#### 8.1.2.5.1 GSM carrier RSSI

An UE supporting GSM measurements shall be able to measure GSM carrier RSSI levels of GSM cells from the monitored set with acquisition speed defined in table 8.1. In the CELL_DCH state the measurement period for the GSM carrier RSSI measurement is 480 ms.

The UE shall meet the measurement accuracy requirements stated for RXLEV in GSM 05.08, when the given measurement time allows the UE to the take the same amount of GSM carrier RSSI samples as stated in the GSM specification during the measurement period.

**Table 8.1**

| Idle Interval Length (slots) | Number of GSM carrier RSSI measurements. |
|---|---|
| 4 | 1 |
| 5 | 2 |
| >5 | ≥3 |

In the calculation of the number of GSM carrier measurements based on the the idle interval length, the switching time [600 us] is already taken into account. For the description of the idle intervals see Annex A of 25.225.
In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods. This means that, in this particular case, the L1 reporting period to higher layers of a GSM neighbour can be a multiple of the measurement period.

#### 8.1.2.5.2 BSIC verification

The procedure for UE measurements on a GSM cell with BSIC verified requested can be divided in the following two tasks:

1) Initial BSIC identification
   Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the FDD and GSM cell. The UE shall trigger the initial BSIC identification within the available idle intervals as specified in TS 25.225, Annex A (Fig. A.1). The requirements for Initial BSIC identification can be found in 8.1.2.5.2.1 Initial BSIC identification

2) BSIC re-confirmation
   Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available idle intervals as specified in TS 25.225, Annex A (Fig. A.1). The requirements for Initial BSIC identification can be found in 8.1.2.5.2.2 BSIC re-confirmation

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified. If GSM measurements are requested with BSIC verified the UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The BSIC of a GSM cell is considered to be "verified" if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification) and from that moment the BSIC shall be re-confirmed at least once every $T_{\text{re-confirm abort}}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". The time requirement for initial BSIC identification, $T_{\text{identify abor}}$, and the BSIC re-confirmation interval $T_{\text{re-confirm abort}}$ can be found in the sections below.

The worst-case time for identification of one previously not identified GSM cell measurement is specified in TS 25.225, Annex A.

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

#### 8.1.2.5.2.1 Initial BSIC identification

This measurement is performed in the idle intervals as specified in TS 25.225, Annex A (Fig. A.1).

For GSM cells that are requested with BSIC verified the UE shall attempt to decode the SCH on the BCCH carrier of as least [6] GSM cells indicated in the measurement control information. The UE shall give priority for synchronisation attempts in decreasing signal strength order. The UE shall be able to perform initial BSIC identification on one new GSM cell within the time specified in Annex A in TS 25.225.

When N new GSM cells are to be BSIC identified the time is changed to N *$T_{identify\ abort}$, with

$T_{identify\ abort}$ = [5000] ms. This is the time necessary to identify one new GSM cell.It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

If the BSIC of a GSM cell has been successfully identified the UE shall continue BSIC identification with the next cell, in signal strength order, for at least the [6] strongest GSM cells 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 identified the BSIC within $T_{identify\ abort}$, the UE shall abort the BSIC identification attempts for that GSM cell. The UE shall continue to try to perform BSIC identification on the next GSM cell in signal strength order. The GSM cell for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the [6] strongest GSM cells with unknown BSIC in the monitored set.

#### 8.1.2.5.2.2 BSIC re-confirmation

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

This measurement shall be based on the idle intervals as specified in TS 25.225, Annex A (Fig. A.1).The time requirement for BSIC re-confirmation is specified in Annex A in TS 25.225.

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

If more than one BSIC can be decoded within the same measurement window given by the idle intervals, 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 [6] strongest GSM cells in the monitored list.

$T_{re\text{-}confirm\ abort}$ = [5000] ms. This is the BSIC reconfirmation interval.

It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

### 8.1.2.6 TDD Synchronisation to new cells

Time for synchronisation to new cell is defined as the time from when the cell appears until the time when the cell is reported in a RRC message to the network. The time needed to synchronise depends on the level of the received signal and is different for inter and intra frequency cells.

These time limits are used in the requirements for the measurements in paragraph 8.1.2 as well as preconditions in paragraph 9.

The requirements given for by $T_{basic\ identify\ TDD,\ intra}$ and by $T_{basic\ identify\ TDD,\ inter}$ are valid under the following side conditions:

$$\left(\frac{P-CCPCH\_E_c}{I_o}\right)_{in\ dB} \geq -8dB$$

$$\left(\frac{SCH\_E_c}{I_o}\right)_{in\ dB} \geq -13dB$$

where 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

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

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.

# 8.2 Parallel Measurements in CELL_DCH State

## 8.2.1 Introduction

The purpose with this section is to ensure that all UE can handle a certain number of measurements in parallel. The measurements are defined in TS 25.225, the measurement model is defined in TS 25.302 and measurement accuracies are specified in section 9. Control of measurement reporting is specified in TS 25.331 and measurements reporting delays are specified in section 8.1. For the description of the idle intervals see TS 25.225, Annex A.

## 8.2.2 Requirements

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

The UE shall be able to perform parallel measurements according to table 8-2.

In addition to the requirements in table 8-2 the UE shall in parallel, in state CELL_DCH, also be able to measure and report the quantities according to section 8-2.

**Table 8.2 Parallel measurement requirements**

| Measurement quantity | Number of parallel measurements possible to request from the UE |
|---|---|
| Transport channel BLER | [1] per TrCh |
| UE transmitted power | [1] |
| SFN-SFN observed time difference type 2 | [] |
| UE GPS Timing of Cell Frames for UP | [] |

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

## 8.3 Capabilities for Support of Event Triggering and Reporting Criteria

### 8.3.1 Introduction

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

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

### 8.3.2 Requirements

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

The UE shall be able to support in parallel per category up to $E_{cat}$ reporting criteria according to Table 8.6.

**3GPP TSG RAN WG4 Meeting #17** **R4-010730**

**Gothenburg, Sweden 21st - 25th May 2001**

*CR-Form-v4*

# CHANGE REQUEST

⌘ **25.123** **CR** **71** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | TDD Measurements in CELL_DCH State |
| ***Source:*** | ⌘ | RAN WG4 |
| ***Work item code:*** | ⌘ | TEI |
| ***Date:*** | ⌘ | 24-May-2001 |
| ***Category:*** | ⌘ | **A** |
| ***Release:*** | ⌘ | REL-4 |

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- ***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:*** | ⌘ | This CR corresponds to R99 CR TDOC R4-010708. |
| ***Summary of change:*** | ⌘ | Alignment of the requirement on TDD intra frequency and inter frequency measurements with requirements in R99 |
| ***Consequences if not approved:*** | ⌘ | Inconsistence between R99 and REL-4 |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 8.1.2.2, 8.1.2.3, 8.1.2.6 |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications ⌘<br>☐ Test specifications<br>☐ O&M Specifications |
| ***Other comments:*** | ⌘ | |

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### 8.1.2.2 TDD intra frequency measurements

During the CELL_DCH state the UE shall continuously measure detected intra frequency cells and search for new intra frequency cells in the monitoring set. In case the network requests the UE to report unlisted cells, the UE shall also search for intra frequency cells outside the monitored set. Intra frequency measurements can be performed (simultaneously to data reception from the active cell) in all time slots not allocated to transmission nor the time used for inter frequency measurements.

#### 8.1.2.2.1 Identification of a new cell

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

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

#### 8.1.2.2.2 UE P-CCPCH measurement capability

In the CELL_DCH state the measurement period for intra frequency measurements is 200 ms. When no inter frequency measurement is scheduled, the UE shall be capable of performing P-CCPCH measurements for 6 detected intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When inter-frequency measurements are required by the network, the UE shall be capable of performing P-CCPCH measurements for at least $Y_{\text{measurement intra}}$ cells , where $Y_{\text{measurement intra}}$ is defined in the following equation. The detectable cells, that were not measured during that measurement period, shall be measured in the following measurement periods. The measurement accuracy for all measured cells shall be as specified in the section 9.

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

whereby function Floor(x) takes the integer part of x.

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

$T_{\text{Measurement\_Period, Intra}}$ =200 ms. The measurement period for Intra frequency P-CCPCH measurements.

$T_{\text{Intra}}$ : This is the minimum time (representing a time corresponding to an integer number of full slots) that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. It is assumed for the requirement that the slot allocation allows measurement windows to be of minimum duration necessary to perform the measurements.

$T_{\text{basic\_identify\_TDD, intra}}$ = 800 ms. This is the time period used in the intra frequency equation where the maximum allowed time for the UE to identify a new TDD cell is defined. (side conditions are defined in subclause 8.1.2.6).

#### 8.1.2.2.3 Periodic Reporting

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

#### 8.1.2.2.4 Event-triggered Periodic Reporting

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

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.2.5 Event Triggered Reporting.

#### 8.1.2.2.5 Event Triggered Reporting

Reported measurements ~~contained~~ 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~~from when a report is triggered at the physical layer according to the event,~~ 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 when inserting the measurement report to the TTI of the uplink DCCH . The delay uncertainty is twice the TTI of the uplink DCCH.

~~Editors Note: The test cases in section A.8 will need revisions to reflect the general requirements.~~

~~Unless otherwise stated, event triggered measurement reporting delay shall be less than 480 ms.~~

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra}$ defined in Section 8.1.2.2.1. When L3 filtering is used an additional delay can be expected..

If a cell has been detectable at least for the time period $T_{identify\ intra}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ when the L3 filter has not been used.

## 8.1.2.3 TDD inter frequency measurements

When signalled by the network during CELL_DCH state, the UE shall continuously measure detected inter frequency cells and search for new inter frequency cells indicated in the measurement control information.

### 8.1.2.3.1 Identification of a new cell

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

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

### 8.1.2.3.2 Measurement period

When TDD inter frequency measurements are scheduled, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in section 9 with measurement period given by

$$T_{measurement\ inter} = Max\left\{480, T_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{Measurement\ Period,\ Inter}}{T_{Inter}} \cdot N_{Freq}\right\} ms$$

In case of a dual receiver UE, the measurement period for inter frequency measurements is 480 ms.

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

$T_{Inter}$: This is the minimum time (representing a time corresponding to an integer number of full slots) available for inter frequency measurements during the period $T_{Measurement\_Period\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation ~~whereby HW settling time and synchronisation time has to be taken into account~~ and is calculated by assuming 2*0.5 ms for implementation margin (for the description of the idle intervals see Annex A of 25.225). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

$T_{basic\_identify\_TDD,inter}$ = ~~5000~~ 800 ms. This is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD cell is defined. (side conditions are defined in subclause 8.1.2.6).

$T_{basic\_measurement\_TDD\ inter}$ = ~~200~~ 50 ms. This is the time period used in the equation for defining the measurement period for inter frequency P-CCPCH measurements.

$N_{Freq}$~~≤3~~ Number of TDD frequencies indicated in the inter frequency measurement control information.

~~Note: It is still under consideration how to incorporate a time needed for adjusting asynchronous timing between intra and inter frequency measurement periods and UE HW settling time into the equations.~~

### 8.1.2.3.3 Periodic Reporting

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

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.3.4 Event Triggered Reporting.

### 8.1.2.3.4 Event Triggered Reporting

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

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

The measurement reporting delay is defined as the time between any event that will trigger a measurement report~~from when a report is triggered at the physical layer according to the event,~~ until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted 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 $T_{identify\ inter}$ defined in Section 8.1.2.3.1. When L3 filtering is used an additional delay can be expected.~~The measurement reporting delay shall be less than [5] seconds.~~

If a cell has been detectable at least for the time period $T_{identify\_inter}$ and then enters the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Inter}$ when the L3 filter has not been used.

----------end of changes in subclause 8.1.2.2 and 8.1.2.3.----------

## 8.1.2.6 TDD Synchronisation to new cells

Time for synchronisation to new cell is defined as the time from when the cell appears until the time when the cell is reported in a RRC message to the network. The time needed to synchronise depends on the level of the received signal and is different for inter and intra frequency cells.

These time limits are used in the requirements for the measurements in paragraph 8.1.2 as well as preconditions in paragraph 9.

The requirements given for by $T_{basic\ identify\ TDD,\ intra}$ and by $T_{basic\ identify\ TDD,\ inter}$ are valid under the following side conditions:

$$\left(\frac{P-CCPCH\_E_c}{I_o}\right)_{in\ dB} \geq -8dB$$

$$\left(\frac{SCH\_E_c}{I_o}\right)_{in\ dB} \geq -13dB$$

where 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

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

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.

**3GPP TSG RAN WG4 Meeting #17** **R4-010709**

**Gothenburg, Sweden 21st - 25th May 2001**

*CR-Form-v*

# CHANGE REQUEST

⌘ **25.123** **CR** **72** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | GSM Measurements in CELL_DCH State |
| ***Source:*** | ⌘ | RAN WG4 |
| ***Work item code:*** | ⌘ | TEI |
| ***Date:*** | ⌘ | 2001-05-21 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | R99 |

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- ***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:*** | ⌘ | Adding and improvement of requirements for UE measurements procedures. Replacements of TBDs. |
| ***Summary of change:*** | ⌘ | Alignments with TS 25.133, replacements of TBDs. |
| ***Consequences if not approved:*** | ⌘ | Inconsistency to other TS, definition of unwanted requirements, essential requirements would be missing |

| | | | | |
|---|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 8.1.2.5 | | |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications<br>☐ Test specifications<br>☐ O&M Specifications | ⌘ | |
| ***Other comments:*** | ⌘ | | | |

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

$$T_{measurement\ \ FDD\ inter} = Max\left\{[480], T_{basic\ measurement\ FDD\ inter} \cdot \frac{T_{Measurement\ \ Period\ \ FDD\ inter}}{T_{FDD\ inter}} \cdot N_{Freq}\right\} ms$$

$T_{Measurement\_Period\ FDD\ inter}$ = [480] ms. The period used for calculating the measurement period $T_{measurement\_FDD\ inter}$ for inter frequency CPICH measurements.

$T_{FDD\ inter:}$ This is the minimum time that is available for inter frequency measurements, during the period $T_{Measurement\_Period\ FDD\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation whereby HW settling time and synchronisation time has to be taken into account (for the description of the idle intervals see Annex A of 25.225). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

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

$T_{basic\_measurement\_FDD\ inter}$ = TBD ms. This is the time period used in the equation for defining the measurement period for inter frequency CPICH measurements.

$N_{Freq}$: ≤ 3 Number of FDD frequencies indicated in the 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.

Editors note: The measurement accuracy in combination with event triggered reporting is an open issue and the above sentence shall be revised when this is settled.

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 from when a report is triggered at the physical layer according to the event until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertanty is twice the TTI of the uplink DCCH.

The measurement reporting delay shall be less then [5] seconds.

### 8.1.2.5 GSM measurements

The requirements in this section applies only to UE supporting TDD and GSM.

When signalled by UTRAN during CELL_DCH state, the UE shall continuously measure GSM cells and search for new GSM cells given in the monitored set.

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified.

If BSIC verified is requested for a GSM cell the UE shall only report measurement quantities for that GSM cell with a BSIC "verified" according to section 8.1.2.5.2 "BSIC verification". If BSIC verification is not required for a GSM cell the UE shall report measurement quantities for that GSM cell irrespectively if the BSIC has been verified or not verified according to section 8.1.2.5.2 "BSIC verification". .

~~For~~ If the UE does not need to perform~~ing~~ GSM measurements in the idle intervals only, the requirements of handover measurements in ~~GSM~~ TS 05.08 shall apply.

### 8.1.2.5.1 GSM carrier RSSI

An UE supporting GSM measurements shall be able to measure GSM carrier RSSI levels of GSM cells from the monitored set with acquisition speed defined in table 8.1. In the CELL_DCH state the measurement period for the GSM carrier RSSI measurement is 480 ms.

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

~~**Table 8.1**~~

| ~~Idle Interval Length (slots)~~ | ~~Number of GSM carrier RSSI measurements.~~ |
|---|---|
| ~~4~~ | ~~1~~ |
| ~~5~~ | ~~2~~ |
| ~~>5~~ | ~~≥3~~ |

**Table 8.1**

| Idle Interval Length (slots) | Number of GSM carrier RSSI meaqsurements |
|---|---|
| 3 | 1 |
| 4 | 2 |
| 5 | 3 |
| 7 | 6 |
| 10 | 10 |
| 13 | 14 |

~~In the calculation of the number of GSM carrier measurements based on the the idle interval length, the switching time [600 us~~s~~] is already taken into account.~~ For the description of the idle intervals see Annex A of 25.225.
In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods. This means that, in this particular case, the L1 reporting period to higher layers of a GSM neighbour can be a multiple of the measurement period.

### 8.1.2.5.2 BSIC verification

The procedure for BSIC verification ~~UE measurements~~ on a GSM cell ~~with BSIC verified requested~~ can be divided into the following two tasks:

1) Initial BSIC identification
   Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the ~~FDD~~ TDD and GSM cell. The UE shall trigger the initial BSIC identification within the available idle intervals as specified in TS 25.225, Annex A (Fig. A.1). The requirements for Initial BSIC identification can be found in section 8.1.2.5.2.1 -"Initial BSIC identification".

2) BSIC re-confirmation
   Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available idle intervals as specified in TS 25.225, Annex A (Fig. A.1). The requirements for Initial BSIC identification can be found in section 8.1.2.5.2 —"BSIC re-confirmation—".

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified. If GSM measurements are requested with BSIC verified the UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification) and from that moment the BSIC shall be re-confirmed at least once every $T_{\text{re-confirm abort}}$ seconds. Otherwise the BSIC of the GSM cell is considered as “non-verified”. The time requirement for initial BSIC identification, $T_{\text{identify abort}}$, and the BSIC re-confirmation interval $T_{\text{re-confirm abort}}$ can be found in the sections below.

The worst-case time for identification of one previously not identified GSM cell measurement is specified in TS 25.225, Annex A.

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

#### 8.1.2.5.2.1 Initial BSIC identification

This measurement is performed in the idle intervals as specified in TS 25.225, Annex A (Fig. A.1).

For GSM cells that are requested with BSIC verified the UE shall attempt to decode the SCH on the BCCH carrier of ~~as the least [6]~~8 strongest BCCH carriers of the GSM cells indicated in the measurement control information. The UE shall give priority for ~~synchronisation~~ 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 UE shall be able to perform initial BSIC identification on one new GSM cell within the time specified in Annex A in TS 25.225.~~

~~When N new GSM cells are to be BSIC identified the time is changed to N *$T_{identify\ abort}$, with~~

~~$T_{identify\ abort}$ = [5000] ms. This is the time necessary to identify one new GSM cell.It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.~~

If the BSIC of a GSM BCCH carrier~~cell~~ has been successfully ~~identified~~ decoded the UE shall immediately continue BSIC identification with the next ~~cell~~GSM BCCH carrier, in signal strength order, ~~for at least the [6] strongest GSM cells~~ 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 ~~identified~~ decoded the BSIC of the GSM BCCH ~~BSIC~~ carrier within $T_{identify\ abort}$, the UE shall abort the BSIC decoding ~~identification~~ attempts for that GSM ~~cell~~BCCH carrier. The UE shall continue to try to perform BSIC ~~identification~~ decoding of~~on~~ the next GSM BCCH carrier~~cell~~ in signal strength order. The GSM BCCH carrier~~cell~~ for which the BSIC decoding ~~identification~~ failed shall not be re-considered for BSIC decoding ~~identification~~ until BSIC decoding ~~identification~~ attempts have been made for all the rest of the ~~[6]~~8 strongest GSM BCCH carriers~~cells~~ in the monitored set with unknown BSIC ~~in the monitored set~~.

The UE shall be able to perform initial BSIC decoding on one new GSM BCCH carrier within the time specified in Annex A in TS 25.225.

When N new GSM cells are to be BSIC identified the time is changed to N *$T_{identify\ abort}$, with

$T_{identify\ abort}$ = 5000 ms. This is the time necessary to identify one new GSM cell. It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

#### 8.1.2.5.2.2 BSIC re-confirmation

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

~~This measurement shall be based on the idle intervals as specified in TS 25.225, Annex A (Fig. A.1).The time requirement for BSIC re-confirmation is specified in Annex A in TS 25.225.~~

The UE shall maintain the timing information of at least ~~[6]~~8 identified GSM cells. Initial timing information is obtained from the initial BSIC ~~identification~~decoding. The timing information shall be updated every time the BSIC is decoded.

If more than one BSIC can be decoded within the same measurement window given by the idle intervals, 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~~ BCCH carrier within $T_{re\text{-}confirm\_abort}$ seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM BCCH carrier~~cell~~. The GSM BCCH carrier ~~cell~~ shall be treated as a new GSM BCCH carrier ~~cell~~ with unidentified BSIC and the GSM BCCH carrier ~~cell~~ shall be moved to the initial BSIC ~~identification~~ decoding

procedure, see section 8.1.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the ~~[6]~~8 strongest GSM cells in the monitored list.

This measurement shall be based on the idle intervals as specified in TS 25.225, Annex A (Fig. A.1).The time requirement for BSIC re-confirmation is specified in Annex A in TS 25.225.

$T_{\text{re-confirm abort}}$ = ~~[~~5000~~]~~ ms. This is the BSIC reconfirmation interval.

It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

### 8.1.2.6 TDD Synchronisation to new cells

Time for synchronisation to new cell is defined as the time from when the cell appears until the time when the cell is reported in a RRC message to the network. The time needed to synchronise depends on the level of the received signal and is different for inter and intra frequency cells.

These time limits are used in the requirements for the measurements in paragraph 8.1.2 as well as preconditions in paragraph 9.

The requirements given for by $T_{\text{basic identify TDD, intra}}$ and by $T_{\text{basic identify TDD, inter}}$ are valid under the following side conditions:

$$\left(\frac{P-CCPCH\_E_c}{I_o}\right)_{in\ dB} \geq -8dB$$

$$\left(\frac{SCH\_E_c}{I_o}\right)_{in\ dB} \geq -13dB$$

where the received P-CCPCH $E_c/I_o$ is defined as

**3GPP TSG RAN WG4 Meeting #17** **R4-010731**

**Gothenburg, Sweden 21st - 25th May 2001**

*CR-Form-v4*

# CHANGE REQUEST

⌘ **25.123** **CR** **73** ⌘ ev **-** ⌘ Current version: **4.0.0** ⌘

*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 **X** Core Network ☐

| | | |
|---|---|---|
| ***Title:*** | ⌘ | GSM Measurements in CELL_DCH State |
| ***Source:*** | ⌘ | RAN WG4 |
| ***Work item code:*** | ⌘ | TEI |
| ***Date:*** | ⌘ | 24-May-2001 |
| ***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:*** | ⌘ | This CR corresponds to R99 CR TDOC R4-010709. |
| ***Summary of change:*** | ⌘ | Alignment of the requirement on GSM measurements with requirements in R99 |
| ***Consequences if not approved:*** | ⌘ | Inconsistence between R99 and REL-4 |

| | | | | |
|---|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 8.1.2.5 | | |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications<br>☐ Test specifications<br>☐ O&M Specifications | ⌘ | |
| ***Other comments:*** | ⌘ | | | |

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

### 8.1.2.5 GSM measurements

The requirements in this section applies only to UE supporting TDD and GSM.

When signalled by UTRAN during CELL_DCH state, the UE shall continuously measure GSM cells and search for new GSM cells given in the monitored set.

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified.

If BSIC verified is requested for a GSM cell the UE shall only report measurement quantities for that GSM cell with a BSIC "verified" according to section 8.1.2.5.2 "BSIC verification". If BSIC verification is not required for a GSM cell the UE shall report measurement quantities for that GSM cell irrespectively if the BSIC has been verified or not verified according to section 8.1.2.5.2 "BSIC verification".

~~For~~ If the UE does not need to perform~~ing~~ GSM measurements in the idle intervals only, the requirements of handover measurements in ~~GSM~~ TS 05.08 shall apply.

#### 8.1.2.5.1 GSM carrier RSSI

An UE supporting GSM measurements shall be able to measure GSM carrier RSSI levels of GSM cells from the monitored set with acquisition speed defined in table 8.1. In the CELL_DCH state the measurement period for the GSM carrier RSSI measurement is 480 ms.

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

~~**Table 8.1**~~

| ~~Idle Interval Length (slots)~~ | ~~Number of GSM carrier RSSI measurements.~~ |
|---|---|
| ~~4~~ | ~~1~~ |
| ~~5~~ | ~~2~~ |
| ~~>5~~ | ~~≥3~~ |

**Table 8.1**

| Idle Interval Length (slots) | Number of GSM carrier RSSI meagsurements |
|---|---|
| 3 | 1 |
| 4 | 2 |
| 5 | 3 |
| 7 | 6 |
| 10 | 10 |
| 13 | 14 |

~~In the calculation of the number of GSM carrier measurements based on the the idle interval length, the switching time [600 us] is already taken into account.~~ For the description of the idle intervals see Annex A of 25.225.
In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods. This means that, in this particular case, the L1 reporting period to higher layers of a GSM neighbour can be a multiple of the measurement period.

#### 8.1.2.5.2 BSIC verification

The procedure for BSIC verification ~~UE measurements~~ on a GSM cell ~~with BSIC verified requested~~ can be divided into the following two tasks:

1) Initial BSIC identification
   Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the

relative timing between the ~~FDD~~ TDD and GSM cell. The UE shall trigger the initial BSIC identification within the available idle intervals as specified in TS 25.225, Annex A (Fig. A.1). The requirements for Initial BSIC identification can be found in section 8.1.2.5.2.1 -"Initial BSIC identification".

2) BSIC re-confirmation
Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available idle intervals as specified in TS 25.225, Annex A (Fig. A.1). The requirements for Initial BSIC identification can be found in section 8.1.2.5.2.2 -"BSIC re-confirmation".

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified. If GSM measurements are requested with BSIC verified the UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The BSIC of a GSM cell is considered to be "verified" if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification) and from that moment the BSIC shall be re-confirmed at least once every $T_{\text{re-confirm abort}}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". The time requirement for initial BSIC identification, $T_{\text{identify abort}}$, and the BSIC re-confirmation interval $T_{\text{re-confirm abort}}$ can be found in the sections below.

The worst-case time for identification of one previously not identified GSM cell measurement is specified in TS 25.225, Annex A.

The UE shall be able to perform BSIC verification- at levels down to the reference sensitivity level or reference interference levels as specified in TS 05.05.~~GSM 45.005~~.

### 8.1.2.5.2.1 Initial BSIC identification

This measurement is performed in the idle intervals as specified in TS 25.225, Annex A (Fig. A.1).

For GSM cells that are requested with BSIC verified the UE shall attempt to decode the SCH on the BCCH carrier of ~~as the least [6]~~ 8 strongest BCCH carriers of the GSM cells indicated in the measurement control information. The UE shall give priority for ~~synchronisation~~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 UE shall be able to perform initial BSIC identification on one new GSM cell within the time specified in Annex A in TS 25.225.~~

~~When N new GSM cells are to be BSIC identified the time is changed to N *$T_{\text{identify abort}}$, with~~

~~$T_{\text{identify abort}}$ =[5000] ms. This is the time necessary to identify one new GSM cell.It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.~~

If the BSIC of a GSM BCCH carrier~~cell~~ has been successfully ~~identified~~ decoded the UE shall immediately continue BSIC identification with the next ~~cell~~GSM BCCH carrier, in signal strength order, ~~for at least the [6] strongest GSM cells~~ 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 ~~identified~~ decoded the BSIC of the GSM BCCH ~~BSIC~~ carrier within $T_{\text{identify abort}}$, the UE shall abort the BSIC decoding ~~identification~~ attempts for that GSM ~~cell~~BCCH carrier. The UE shall continue to try to perform BSIC ~~identification~~ decoding of~~on~~ the next GSM BCCH carrier~~cell~~ in signal strength order. The GSM BCCH carrier~~cell~~ for which the BSIC decoding ~~identification~~ failed shall not be re-considered for BSIC decoding ~~identification~~ until BSIC decoding ~~identification~~ attempts have been made for all the rest of the ~~[6]~~8 strongest GSM BCCH carruers~~cells~~ in the monitored set with unknown BSIC ~~in the monitored set~~.

The UE shall be able to perform initial BSIC decoding on one new GSM BCCH carrier within the time specified in Annex A in TS 25.225.

When N new GSM cells are to be BSIC identified the time is changed to N *$T_{\text{identify abort}}$, with

$T_{\text{identify abort}}$ = 5000 ms. This is the time necessary to identify one new GSM cell. It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

### 8.1.2.5.2.2 BSIC re-confirmation

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

~~This measurement shall be based on the idle intervals as specified in TS 25.225, Annex A (Fig. A.1).The time requirement for BSIC re-confirmation is specified in Annex A in TS 25.225.~~

The UE shall maintain the timing information of at least ~~[6]~~8 identified GSM cells. Initial timing information is obtained from the initial BSIC ~~identification~~decoding. The timing information shall be updated every time the BSIC is decoded.

If more than one BSIC can be decoded within the same measurement window given by the idle intervals, 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~~ BCCH carier within $T_{re\text{-}confirm\_abort}$ seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM BCCH carrier~~cell~~. The GSM BCCH carrier~~cell~~ shall be treated as a new GSM BCCH carrier ~~cell~~ with unidentified BSIC and the GSM BCCH carrier ~~cell~~ shall be moved to the initial BSIC ~~identification~~ decoding procedure, see section 8.1.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the ~~[6]~~8 strongest GSM cells in the monitored list.

This measurement shall be based on the idle intervals as specified in TS 25.225, Annex A (Fig. A.1).The time requirement for BSIC re-confirmation is specified in Annex A in TS 25.225.

$T_{re\text{-}confirm\ abort}$ =~~[~~5000~~]~~ ms. This is the BSIC reconfirmation interval.

It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements.

**3GPP TSG RAN WG4 Meeting #17** **R4-010487**

**Gothenburg, Sweden 21st - 25th May 2001**

CR-Form-v

# CHANGE REQUEST

⌘ **25.123 CR 79** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Measurements in CELL_FACH State |
| ***Source:*** | ⌘ | RAN WG4 |
| ***Work item code:*** | ⌘ | TEI |
| ***Date:*** | ⌘ | 2001-05-21 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | R99 |

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- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(Addition of feature),*
- ***C*** *(Functional modification of feature)*
- ***D*** *(Editorial modification)*

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

*Use one of the following releases:*

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

| | | |
|---|---|---|
| ***Reason for change:*** | ⌘ | Requirements for measurements in CELL_FACH state are missing. |
| ***Summary of change:*** | ⌘ | Inclusion of Requirements for Measurements in CELL_FACH State. |
| ***Consequences if not approved:*** | ⌘ | Missing requirements for Measurements in CELL_FACH State. |

| | | | | |
|---|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 8.4.2 | | |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications<br>☐ Test specifications<br>☐ O&M Specifications | ⌘ | |
| ***Other comments:*** | ⌘ | | | |

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

For the measurement categories: Intra-frequency, Inter frequency and Inter-RAT the UE need not support more than 14 reporting criteria in total. For the measurement categories Traffic volume and Quality measurements the UE need not support more than 16 reporting criteria in total.

**Table 8-6 Requirements for reporting criteria per measurement category**

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

# 8.4 Measurements in CELL_FACH State

## 8.4.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL_FACH state. The measurements are defined in TS 25.225, the measurement model is defined in TS 25.302 and measurement accuracies are specified in section 9. Control of measurement reporting is specified in TS 25.331 and parallel measurements are specified in section 8.2. For the description of the idle intervals see TS 25.225, Annex A.

## 8.4.2 Requirements

### 8.4.2.1 UE Measurement Capability

The UE shall be able to monitor up to

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

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

The requirements in section 9 on P-CCPCH RSCP measurements are applicable for a UE performing measurements according to this section. For inter-frequency FDD, TDD and GSM cell re-selection, measurement occasions as specified in TS 25.331 and idle intervals as described in TS 25.225 are used to find and measure on other cells.

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

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

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

where the following parameters are defined:

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

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

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

M_REP is the Measurement Occasion cycle length in number of frames as specified in TS 25.331.

$N_{TTI}$ is the number of frames in each measurement occasion, equal to the length of the largest TTI on the SCCPCH monitored by the UE.

### 8.4.2.2 TDD intra frequency measurements

During the CELL_FACH state the UE shall continuously measure detected intra frequency cells and search for new intra frequency cells in the monitoring set. In case the network requests the UE to report unlisted cells, the UE shall also search for intra frequency cells outside the monitored set. Intra frequency measurements can be performed (simultaneously to data reception from the active cell) in all time slots not allocated to transmission nor the time used for inter frequency measurements.

#### 8.4.2.2.1 Identification of a new cell

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

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

#### 8.4.2.2.2 UE P-CCPCH measurement capability

In the CELL_FACH state the measurement period for intra frequency measurements is 200 ms. When no inter frequency measurement is scheduled, the UE shall be capable of performing P-CCPCH measurements for 6 detected intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When inter-frequency measurements are required by the network, the UE shall be capable of performing P-CCPCH measurements for at least $Y_{measurement\ intra}$ cells , where $Y_{measurement\ intra}$ is defined in the following equation. The detectable cells, that were not measured during that measurement period, shall be measured in the following measurement periods. The measurement accuracy for all measured cells shall be as specified in the section 9.

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

whereby function Floor(x) takes the integer part of x.

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

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

$T_{Intra}$ : is specified in section 8.1.2.2.2

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

#### 8.4.2.2.3 Periodic Reporting

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

#### 8.4.2.2.4 Event Triggered Reporting

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

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

### 8.4.2.3 TDD inter frequency measurements

When signalled by the network during CELL_FACH state, the UE shall continuously measure detected inter frequency cells and search for new inter frequency cells indicated in the measurement control information.

#### 8.4.2.3.1 Identification of a new cell

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

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

#### 8.4.2.3.2 Measurement period

When TDD inter frequency measurements are scheduled, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in section 9 with measurement period given by

$$T_{measurement\ inter} = Max\left\{480, T_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{Measurement\ Period,\ Inter}}{T_{Inter\ FACH}} \cdot N_{Freq}\right\} ms$$

$T_{Measurement\_Period\ Inter}$ is specified in section 8.1.2.3.2

$T_{Inter\ FACH}$: This is the minimum time as full slots that is available for the inter frequency measurements during the period $T_{Measurement\_Period\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation and on measurement occasions during CELL_FACH state and is calculated by assuming 2*0.5 ms for implementation margin (for the description of the idle intervals see Annex A of 25.225 and for definition of measurement occasions during CELL_FACH state given by M_REP and TTI see TS 25.331). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements. During the measurement occasions for CELL_FACH state the UE shall measure primarily cells that can not be measured in the idle intervalls.

$T_{basic\_identify\_TDD,inter}$ is specified in section 8.1.2.3.2

$T_{basic\_measurement\_TDD\ inter}$ is specified in section 8.1.2.3.2

$N_{Freq}$ is specified in section 8.1.2.3.2

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

#### 8.4.2.3.3 Periodic Reporting

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

#### 8.4.2.3.4 Event Triggered Reporting

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

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

### 8.4.2.4 FDD measurements

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

In the CELL_FACH state when FDD inter frequency measurements are scheduled the UE shall continuously measure detected inter frequency FDD cells and search for new inter frequency cells indicated in the measurement control information.

The UE shall be capable of measuring the requested measurement quantity of at least 32 cells on a maximum of 3 frequencies.

#### 8.4.2.4.1 Identification of a new cell

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

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

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

#### 8.4.2.4.2 Measurement period

When FDD inter frequency measurements are scheduled, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9 with measurement period given by

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

$T_{\text{Measurement\_Period FDD inter}}$ is specified in section 8.1.2.4.2

$T_{\text{Inter FACH:}}$ is specified in section 8.4.2.3.2

$T_{\text{basic\_identify\_FDD,inter}}$ is specified in section 8.1.2.4.2

$T_{\text{basic\_measurement\_FDD inter}}$ is specified in section 8.1.2.4.2.

$N_{\text{Freq}}$ is specified in section 8.1.2.4.2

#### 8.4.2.4.3 Periodic Reporting

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

#### 8.4.2.4.4 Event Triggered Reporting

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

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

### 8.4.2.5 GSM measurements

The requirements in this section applies only to UE supporting TDD and GSM.

When signalled by UTRAN during CELL_FACH state, the UE shall continuously measure GSM cells and search for new GSM cells given in the monitored set.

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified.

If BSIC verified is requested for a GSM cell the UE shall only report measurement quantities for that GSM cell with a BSIC “verified”. If BSIC verification is not required for a GSM cell the UE shall report measurement quantities for that GSM cell irrespectively if the BSIC has been verified or not verified.

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

For the UE performing GSM measurements, the requirements in GSM 05.08 shall apply.

### 8.4.2.5.1 GSM carrier RSSI

An UE supporting GSM measurements shall meet the minimum number of GSM carrier RSSI measurements specified in table 8.7. In the CELL_FACH state the measurement period for the GSM carrier RSSI measurement is 480 ms.

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

**Table 8.7**

| Measurement Window Length (slots) | Number of GSM carrier RSSI measurements. |
|---|---|
| 3 | 1 |
| 4 | 2 |
| 5 | 3 |
| 7 | 6 |
| 10 | 10 |
| 13 | 14 |
| 15 | 16 |
| 30 | 32 |
| 60 | 64 |
| 120 | 128 |

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

### 8.4.2.5.2 BSIC verification

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

1) Initial BSIC identification
   Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the TDD and GSM cell. The UE shall trigger the initial BSIC identification within 50% of the available measurement windows. The requirements for Initial BSIC identification can be found in 8.4.2.5.2.1 Initial BSIC identification

2) BSIC re-confirmation
   Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement windows. The requirements for Initial BSIC identification can be found in 8.4.2.5.2.2 BSIC re-confirmation

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified. If GSM measurements are requested with BSIC verified the UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The BSIC of a GSM cell is considered to be "verified" if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification) and from that moment the BSIC shall be re-confirmed at least once every 6 times $T_{\text{re-confirm abort}}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". The time requirement for initial BSIC identification, $T_{\text{identify abort}}$, and the BSIC re-confirmation interval $T_{\text{re-confirm abort}}$ can be found in the sections below.

The worst-case time for identification of one previously not identified GSM cell measurement is specified in TS 25.225, Annex A.

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

#### 8.4.2.5.2.1 Initial BSIC identification

This measurement is performed in the measurement windows as described in 8.4.2.5.

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.

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

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

If the UE has not successfully identified the BSIC of the GSM BCCH carrier within $T_{identify\ abort}$, 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 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.

The UE shall be able to perform initial BSIC identification on one new GSM cell within the time specified in Annex A in TS 25.225.

When N new GSM cells are to be BSIC identified the time is changed to N *$T_{identify\ abort}$, with

$T_{identify\ abort}$ is specified in section 8.1.2.5.

#### 8.4.2.5.2.2 BSIC re-confirmation

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

The UE shall maintain the timing information of 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 measurement window allocated for GSM BSIC reconfirmation as described in 8.4.2.5, the UE shall attempt to decode the BSIC falling within the effective idle interval duration. If more than one BSIC can be decoded within the same measurement window, 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 8.4.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the 8 strongest GSM cells in the monitored list.

The time requirement for BSIC re-confirmation is specified in Annex A in TS 25.225.

$T_{re\text{-}confirm\ abort}$ is specified in section 8.1.2.5.

It is assumed for the requirement that the measurement windows possible due to higher layer parameters are of minimum duration necessary to perform the measurements.

# 9 Measurements performance requirements

One of the key services provided by the physical layer is the measurement of various quantities which are used to trigger or perform a multitude of functions. Both the UE and the UTRAN are required to perform a variety of measurements. The complete list of measurements is specified in 3GPP TS 25.302 "Services Provided by Physical Layer". The physical layer measurements for TDD are described and defined in 3GPP TS 25.225 "Physical layer – Measurements (TDD)". In this clause for TDD, per each measurement the relevant requirements on performance in terms of accuracy are reported.

Unless explicitly stated,

- Reported measurements shall be within defined range in 90 % of the cases.
- Measurement channel is 12,2 kbps as defined in 3GPP TS 25.102 annex A, clause A.3.1. This measurement channel is used both in active cell and cells to be measured.
- Physical channels used as defined in 3GPP TS 25.101 annex B.
- All requirements are defined when UE is in a CELL_DCH or CELL_FACH stage. The difference between modes are the reporting delay. Some of the measurements are not requested to be reported in both stages.
- Cell 1 is the active cell, if not otherwise stated.
- Single task reporting.
- Power control is active.

**3GPP TSG RAN WG4 Meeting #17** **R4-010792**

**Gothenburg, Sweden 21st - 25th May 2001**

*CR-Form-v4*

# CHANGE REQUEST

⌘ **25.123** **CR** **80** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

*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 **X** Core Network ☐

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Measurements in CELL_FACH State |
| ***Source:*** | ⌘ | RAN WG4 |
| ***Work item code:*** | ⌘ | TEI |
| ***Date:*** | ⌘ | 31.May 2001 |
| ***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:*** | ⌘ | REL-4 Cat A CR corresponding to R99 CR Tdoc R4-010487 |
| ***Summary of change:*** | ⌘ | Inclusion of Requirements for Measurements in CELL_FACH State. (3.84 Mcps TDD option) |
| ***Consequences if not approved:*** | ⌘ | Inconsistencys between releases. |

| | | | | |
|---|---|---|---|---|
| ***Clauses affected:*** | ⌘ | 8.4.2 | | |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications<br>☐ Test specifications<br>☐ O&M Specifications | ⌘ | |
| ***Other comments:*** | ⌘ | | | |

**How to create CRs using this form:**

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

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

# 8.4 Measurements in CELL_FACH State (3.84 Mcps option)

## 8.4.1 Introduction

This section contains requirements on the UE regarding measurement reporting in CELL_FACH state. The measurements are defined in TS 25.225, the measurement model is defined in TS 25.302 and measurement accuracies are specified in section 9. Control of measurement reporting is specified in TS 25.331 and parallel measurements are specified in section 8.2. For the description of the idle intervals see TS 25.225, Annex A.

## 8.4.2 Requirements

~~TBD~~

### 8.4.2.1 UE Measurement Capability

The UE shall be able to monitor up to

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

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

The requirements in section 9 on P-CCPCH RSCP measurements are applicable for a UE performing measurements according to this section. For inter-frequency FDD, TDD and GSM cell re-selection, measurement occasions as specified in TS 25.331 and idle intervals as described in TS 25.225 are used to find and measure on other cells.

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

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

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

where the following parameters are defined:

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

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

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

M_REP is the Measurement Occasion cycle length in number of frames as specified in TS 25.331.

$N_{TTI}$ is the number of frames in each measurement occasion, equal to the length of the largest TTI on the SCCPCH monitored by the UE.

## 8.4.2.2 TDD intra frequency measurements

During the CELL_FACH state the UE shall continuously measure detected intra frequency cells and search for new intra frequency cells in the monitoring set. In case the network requests the UE to report unlisted cells, the UE shall also search for intra frequency cells outside the monitored set. Intra frequency measurements can be performed (simultaneously to data reception from the active cell) in all time slots not allocated to transmission nor the time used for inter frequency measurements.

### 8.4.2.2.1 Identification of a new cell

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

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

### 8.4.2.2.2 UE P-CCPCH measurement capability

In the CELL_FACH state the measurement period for intra frequency measurements is 200 ms. When no inter frequency measurement is scheduled, the UE shall be capable of performing P-CCPCH measurements for 6 detected intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When inter-frequency measurements are required by the network, the UE shall be capable of performing P-CCPCH measurements for at least $Y_{measurement\ intra}$ cells , where $Y_{measurement\ intra}$ is defined in the following equation. The detectable cells, that were not measured during that measurement period, shall be measured in the following measurement periods. The measurement accuracy for all measured cells shall be as specified in the section 9.

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

whereby function Floor(x) takes the integer part of x.

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

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

$T_{Intra}$ : is specified in section 8.1.2.2.2

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

### 8.4.2.2.3 Periodic Reporting

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

### 8.4.2.2.4 Event Triggered Reporting

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

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

## 8.4.2.3 TDD inter frequency measurements

When signalled by the network during CELL_FACH state, the UE shall continuously measure detected inter frequency cells and search for new inter frequency cells indicated in the measurement control information.

### 8.4.2.3.1 Identification of a new cell

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

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

#### 8.4.2.3.2 Measurement period

When TDD inter frequency measurements are scheduled, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in section 9 with measurement period given by

$$T_{measurement\ inter} = Max\left\{480, T_{basic\ measurement\ TDD\ inter} \cdot \frac{T_{Measurement\ Period,\ Inter}}{T_{Inter\ FACH}} \cdot N_{Freq}\right\} ms$$

$T_{Measurement\_Period\ Inter}$ is specified in section 8.1.2.3.2

$T_{Inter\ FACH:}$ This is the minimum time as full slots that is available for the inter frequency measurements during the period $T_{Measurement\_Period\ inter}$ with an arbitrarily chosen timing. The minimum time depends on the channel allocation and on measurement occasions during CELL_FACH state and is calculated by assuming 2*0.5 ms for implementation margin (for the description of the idle intervals see Annex A of 25.225 and for definition of measurement occasions during CELL_FACH state given by M_REP and TTI see TS 25.331). It is assumed for the requirement that the slot allocation allows measurement windows in the idle periods to be of minimum duration necessary to perform the measurements. During the measurement occasions for CELL_FACH state the UE shall measure primarily cells that can not be measured in the idle intervalls.

$T_{basic\_identify\_TDD,inter}$ is specified in section 8.1.2.3.2

$T_{basic\_measurement\_TDD\ inter}$ is specified in section 8.1.2.3.2

$N_{Freq}$ is specified in section 8.1.2.3.2

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

#### 8.4.2.3.3 Periodic Reporting

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

#### 8.4.2.3.4 Event Triggered Reporting

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

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

### 8.4.2.4 FDD measurements

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

In the CELL_FACH state when FDD inter frequency measurements are scheduled the UE shall continuously measure detected inter frequency FDD cells and search for new inter frequency cells indicated in the measurement control information.

The UE shall be capable of measuring the requested measurement quantity of at least 32 cells on a maximum of 3 frequencies.

#### 8.4.2.4.1 Identification of a new cell

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

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

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

#### 8.4.2.4.2 Measurement period

When FDD inter frequency measurements are scheduled, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9 with measurement period given by

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

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

$T_{Inter\ FACH:}$ is specified in section 8.4.2.3.2

$T_{basic\_identify\_FDD,inter}$ is specified in section 8.1.2.4.2

$T_{basic\_measurement\_FDD\ inter}$ is specified in section 8.1.2.4.2.

$N_{Freq}$ is specified in section 8.1.2.4.2

#### 8.4.2.4.3 Periodic Reporting

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

#### 8.4.2.4.4 Event Triggered Reporting

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

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

### 8.4.2.5 GSM measurements

The requirements in this section applies only to UE supporting TDD and GSM.

When signalled by UTRAN during CELL_FACH state, the UE shall continuously measure GSM cells and search for new GSM cells given in the monitored set.

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified.

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

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

For the UE performing GSM measurements, the requirements in GSM 05.08 shall apply.

### 8.4.2.5.1 GSM carrier RSSI

An UE supporting GSM measurements shall meet the minimum number of GSM carrier RSSI measurements specified in table 8.7. In the CELL_FACH state the measurement period for the GSM carrier RSSI measurement is 480 ms.

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

**Table 8.7**

| Measurement Window Length (slots) | Number of GSM carrier RSSI measurements. |
|---|---|
| 3 | 1 |
| 4 | 2 |
| 5 | 3 |
| 7 | 6 |
| 10 | 10 |
| 13 | 14 |
| 15 | 16 |
| 30 | 32 |
| 60 | 64 |
| 120 | 128 |

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

### 8.4.2.5.2 BSIC verification

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

1) Initial BSIC identification
   Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the TDD and GSM cell. The UE shall trigger the initial BSIC identification within 50% of the available measurement windows. The requirements for Initial BSIC identification can be found in 8.4.2.5.2.1 Initial BSIC identification

2) BSIC re-confirmation
   Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement windows. The requirements for Initial BSIC identification can be found in 8.4.2.5.2.2 BSIC re-confirmation

Measurements on a GSM cell can be requested with BSIC verified or BSIC non-verified. If GSM measurements are requested with BSIC verified the UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The BSIC of a GSM cell is considered to be "verified" if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification) and from that moment the BSIC shall be re-confirmed at least once every 6 times $T_{\text{re-confirm abort}}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". The time requirement for initial BSIC identification, $T_{\text{identify abort}}$, and the BSIC re-confirmation interval $T_{\text{re-confirm abort}}$ can be found in the sections below.

The worst-case time for identification of one previously not identified GSM cell measurement is specified in TS 25.225, Annex A.

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

#### 8.4.2.5.2.1 Initial BSIC identification

This measurement is performed in the measurement windows as described in 8.4.2.5.

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.

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

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

If the UE has not successfully identified the BSIC of the GSM BCCH carrier within $T_{identify\ abort}$, 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 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.

The UE shall be able to perform initial BSIC identification on one new GSM cell within the time specified in Annex A in TS 25.225.

When N new GSM cells are to be BSIC identified the time is changed to N *$T_{identify\ abort}$, with

$T_{identify\ abort}$ is specified in section 8.1.2.5.

#### 8.4.2.5.2.2 BSIC re-confirmation

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

The UE shall maintain the timing information of 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 measurement window allocated for GSM BSIC reconfirmation as described in 8.4.2.5, the UE shall attempt to decode the BSIC falling within the effective idle interval duration. If more than one BSIC can be decoded within the same measurement window, 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 8.4.2.5.2.1. The UE shall be able to make BSIC re-confirmation attempts for the 8 strongest GSM cells in the monitored list.

The time requirement for BSIC re-confirmation is specified in Annex A in TS 25.225.

$T_{re\text{-}confirm\ abort}$ is specified in section 8.1.2.5.

It is assumed for the requirement that the measurement windows possible due to higher layer parameters are of minimum duration necessary to perform the measurements.

## 8.4A Measurements in CELL_FACH State (1.28 Mcps option)

(void)

# 9 Measurements performance requirements

**3GPP TSG RAN WG4 Meeting #17** **R4-010475**

**Gothenburg, Sweden 21st - 25th May 2001**

*CR-Form-v*

# CHANGE REQUEST

⌘ **25.123** **CR** **81** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | TDD Measurement Test Cases |
| ***Source:*** | ⌘ | RAN WG4 |
| ***Work item code:*** | ⌘ | TEI |
| ***Date:*** | ⌘ | 2001-05-21 |
| ***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:*** | ⌘ | Removal of square brackets by alignment with requirements on UE measurements procedures and completition of the test parameters. |
| ***Summary of change:*** | ⌘ | - Removal of square brackets for the test requirements<br>- Completition of the Ec/Io levels for the test scenario<br>- Addition of table including requirements for general test parameters |
| ***Consequences if not approved:*** | ⌘ | Remaining square brackets and missing parameters in specification. |

| | | | | |
|---|---|---|---|---|
| ***Clauses affected:*** | ⌘ | | | |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications<br>☐ Test specifications<br>☐ O&M Specifications | ⌘ | |
| ***Other comments:*** | ⌘ | | | |

**How to create CRs using this form:**

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.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 September 2000 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.5.5 Cell Re-selection in CELL_PCH

NOTE: Requirements for cell re-selection in Cell_PCH state are the same as for cell re-selection in idle mode, therefore no separate test cases are required.

### A.5.6 Cell Re-selection in URA_PCH

NOTE: Requirements for cell re-selection in URA_PCH state are the same as for cell re-selection in idle mode, therefore no seperate test cases are required.

## A.6 Dynamic channel allocation

NOTE: This section is included for consistency with numbering with section 6; currently no test covering requirements in this section exists.

## A.7 Timing characteristics

NOTE: This section is included for consistency with numbering with section 7; currently no test covering requirements in this section exists.

## A.8 UE Measurements Procedures

### A.8.1 TDD intra frequency measurements

#### A.8.1.1 Event triggered reporting in AWGN propagation conditions

##### A.8.1.1.1 Test Purpose and Environment

This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event" as illustrated in Figure A.8-1. ~~The test parameters are shown in Table A.8-1. Hysteresis, absolute Threshold and Time to Trigger values~~General test parameters are given in the table A.8.1A below and they are signalled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used. P-CCPCH RSCP of the best cell has to be reported together with Event 1G reporting. New measurement control information, which defines neighbour cells etc., is always sent before the event starts. The cell specific test parameters are given in Table A.8.1B below

**Table A.8.1A: General test parameters for correct reporting of intra frequency neighbours in AWGN propagation condition**

| Parameter | Unit | Value | Comment |
|---|---|---|---|
| DPCH parameters active cell | | DL Reference Measurement Channel 12.2 kbps | As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0 or 8 |
| Power Control | | On | |
| Active cell | | Cell 1 | |
| Threshold used frequency | dB | -71 | Absolute P-CCPCH RSCP threshold for event 1G |
| Hysteresis | dB | 0 | |
| Time to Trigger | ms | 0 | |
| Filter coefficient | | 0 | |
| Monitored cell list size | | 24 | Measurement control information is sent before T1 starts. |
| T1 | s | 10 | |
| T2 | s | 10 | |

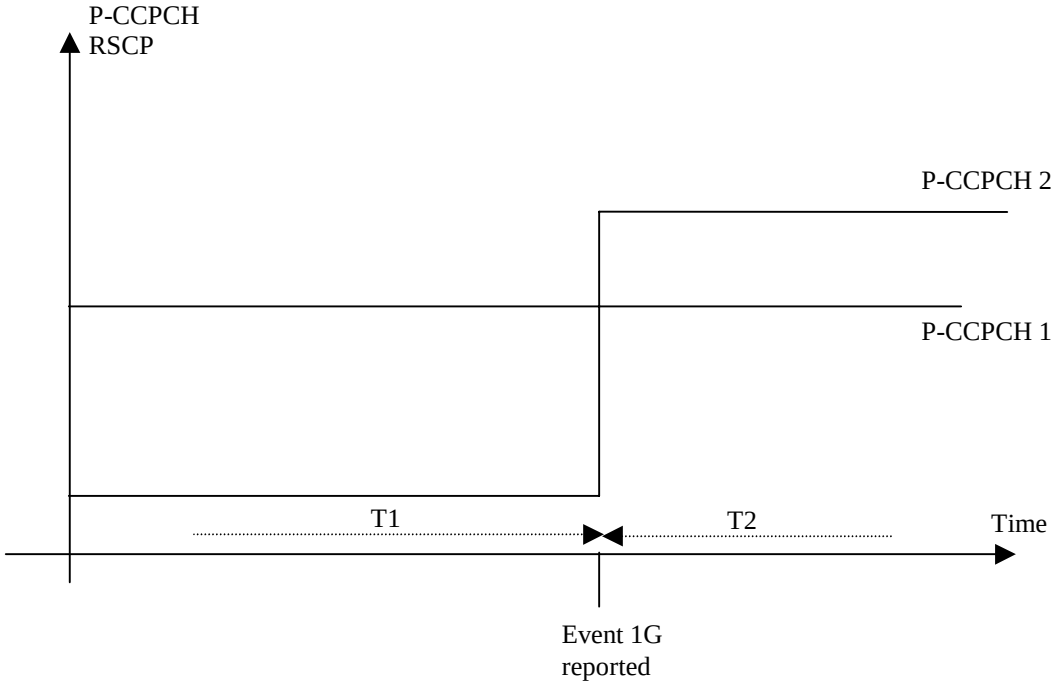


**Figure A.8.1: Illustration of parameters for handover measurement reporting test case**

**Table A.8.1B Cell specific parameters for correct reporting of intra frequency neighbours in AWGN propagation condition**

| Parameter | Unit | Cell 1 | | | | Cell 2 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Timeslot Number | | 0 | | 8 | | 0 | | 8 | |
| | | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| UTRA RF Channel Number | | Channel 1 ~~Channel 1~~ | | | | Channel 1 ~~Channel 1~~ | | | |
| PCCPCH_Ec/Ior | dB | -3 | -3 | | | -3 | -3 | | |
| SCH_Ec/Ior | dB | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 |
| SCH_$t_{offset}$ | | 0 | 0 | 0 | 0 | 15 | 15 | 15 | 15 |
| PICH_Ec/Ior | | | | -3 | -3 | | | -3 | -3 |
| | | | | | | | | | |
| OCNS | | -4,28 | -4,28 | -4,28 | -4,28 | -4,28 | -4,28 | -4,28 | -4,28 |
| $\hat{I}_{or}/I_{oc}$ | dB | 3 | 3 | 3 | 3 | -Infinity | 5 | -Infinity | 5 |
| $I_{oc}$ | dBm/3.84 MHz | -70 | | | | | | | |
| PCCPCH_RSCP | dB | -70 | -70 | | | -Infinity | -68 | | |
| ~~Absolute Threshold (SIR)~~ | ~~dB~~ | ~~[-]~~ | | | | | | | |
| ~~Hysteresis~~ | ~~dB~~ | ~~[-]~~ | | | | | | | |
| ~~Time to Trigger~~ | ~~msec~~ | ~~[-]~~ | | | | | | | |
| Propagation Condition | | AWGN | | | | | | | |

NOTE: The DPCH of all cells are located in an other timeslot than 0 or 8

#### A.8.1.1.2 Test Requirements

The UE shall send one Event 1G triggered measurement report, with a measurement reporting delay less than ~~[480]~~800 ms 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.

## A.8.2 TDD inter frequency measurements

### A.8.2.1 Correct reporting of neighbours in AWGN propagation condition

#### A.8.2.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency measurements. The test will partly verify the requirements in section 8.1.2.2.

This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event" ~~as illustrated in Figure A.8-2. The test parameters are shown in Table A.8-2.~~ General test parameters ~~Hysteresis, absolute Threshold and Time to Trigger values~~ are given in the table A.8.2A below and they are signalled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. P-CCPCH RSCP of the best cell has to be reported together with Event 2C reporting. New measurement control information, which defines neighbour cells etc., is always sent before the event starts.

The cell specific test parameters are shown in Table A.8.2B.

**Table A.8.2A: General test parameters for correct reporting of TDD inter frequency neighbours in AWGN propagation condition**

| Parameter | Unit | Value | Comment |
|---|---|---|---|
| DPCH parameters active cell | | DL Reference Measurement Channel 12.2 kbps | As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0 or 8 |
| Power Control | | On | |
| Active cell | | Cell 1 | |
| Threshold non used frequency | dB | -71 | Absolute P-CCPCH RSCP threshold for event 2C |
| Hysteresis | dB | 0 | |
| Time to Trigger | ms | 0 | |
| Filter coefficient | | 0 | |
| Monitored cell list size | | 24 on channel 1<br>16 on channel 2 | Measurement control information is sent before T1 starts. |
| T1 | s | 10 | |
| T2 | s | 10 | |

**Table A.8.2B Cell Specific Parameters for Correct Reporting of inter frequency Neighbours in AWGN Propagation Condition**

| Parameter | Unit | Cell 1 | | | | Cell 2 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Timeslot Number | | 0 | | 8 | | 0 | | 8 | |
| | | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| UTRA RF Channel Number | | Channel 1<br>~~Channel 1~~ | | | | Channel 2<br>~~Channel 2~~ | | | |
| P-CCPCH_Ec/Ior | dB | -3 | -3 | | | -3 | -3 | | |
| SCH_Ec/Ior | dB | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 |
| SCH_$t_{offset}$ | | 0 | 0 | 0 | 0 | 15 | 15 | 15 | 15 |
| PICH_Ec/Ior | | | | -3 | -3 | | | -3 | -3 |
| OCNS | | -4,28 | -4,28 | -4,28 | -4,28 | -4,28 | -4,28 | -4,28 | -4,28 |
| $\hat{I}_{or}/I_{oc}$ | dB | 3 | 3 | 3 | 3 | -Infinity | 6 | -Infinity | 6 |
| $I_{oc}$ | dBm/3.84 MHz | -70 | | | | | | | |
| PCCPCH_RSCP | dB | -70 | -70 | | | -Infinity | -67 | | |
| ~~Absolute Threshold (SIR)~~ | ~~dB~~ | ~~[ ]~~ | | | | | | | |
| ~~Hysteresis~~ | ~~dB~~ | ~~[ ]~~ | | | | | | | |
| ~~Time to Trigger~~ | ~~msec~~ | ~~[ ]~~ | | | | | | | |
| Propagation Condition | | AWGN | | | | | | | |

NOTE: The DPCH of all cells are located in an other timeslot than 0 or 8

### A.8.2.1.2 Test Requirements

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

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

**3GPP TSG RAN WG4 Meeting #17** **R4-010795**

**Gothenburg, Sweden 21st - 25th May 2001**

*CR-Form-v4*

# CHANGE REQUEST

⌘ **25.123** **CR** **82** ⌘ ev **-** ⌘ Current version: **4.0.0** ⌘

*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 **X** Core Network ☐

| | | |
|---|---|---|
| ***Title:*** | ⌘ | TDD Measurement Test Cases |
| ***Source:*** | ⌘ | RAN WG4 |
| ***Work item code:*** | ⌘ | TEI |
| ***Date:*** | ⌘ | 2001-05-21 |
| ***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:*** | ⌘ | Corresponding REL-4 CR to R4-010475 |
| ***Summary of change:*** | ⌘ | Similar changes as in R4-010475. In addition one 1.28Mcps table was renumbered, due to introduction of a table number that already existed and section A8.1.1.2 was divided for 1.28Mcps 3.84Mcps, due to the changes agreed for 3.84Mcps in R4-010475. |
| ***Consequences if not approved:*** | ⌘ | Inconsistency between R99 and REL-4. Remaining square brackets and missing test cases and parameters in specification. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | A.8 |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications ⌘<br>☐ Test specifications<br>☐ O&M Specifications |
| ***Other comments:*** | ⌘ | |

**How to create CRs using this form:**

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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.

# A.8 UE Measurements Procedures

## A.8.1 TDD intra frequency measurements

### A.8.1.1 Event triggered reporting in AWGN propagation conditions

#### A.8.1.1.1 Test Purpose and Environment

##### A.8.1.1.1.1 3.84 Mcps TDD option

This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event" as illustrated in Figure A.8-1. ~~The test parameters are shown in Table A.8-1. Hysteresis, absolute Threshold and Time to Trigger values~~General test parameters are given in the table A.8.1A below and they are signalled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used. P-CCPCH RSCP of the best cell has to be reported together with Event 1G reporting. New measurement control information, which defines neighbour cells etc., is always sent before the event starts. The cell specific test parameters are given in Table A.8.1B below.

**Table A.8.1A: General test parameters for correct reporting of intra frequency neighbours in AWGN propagation condition**

| Parameter | Unit | Value | Comment |
|---|---|---|---|
| DPCH parameters active cell | | DL Reference Measurement Channel 12.2 kbps | As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0 or 8 |
| Power Control | | On | |
| Active cell | | Cell 1 | |
| Threshold used frequency | dB | -71 | Absolute P-CCPCH RSCP threshold for event 1G |
| Hysteresis | dB | 0 | |
| Time to Trigger | ms | 0 | |
| Filter coefficient | | 0 | |
| Monitored cell list size | | 24 | Measurement control information is sent before T1 starts. |
| T1 | s | 10 | |
| T2 | s | 10 | |

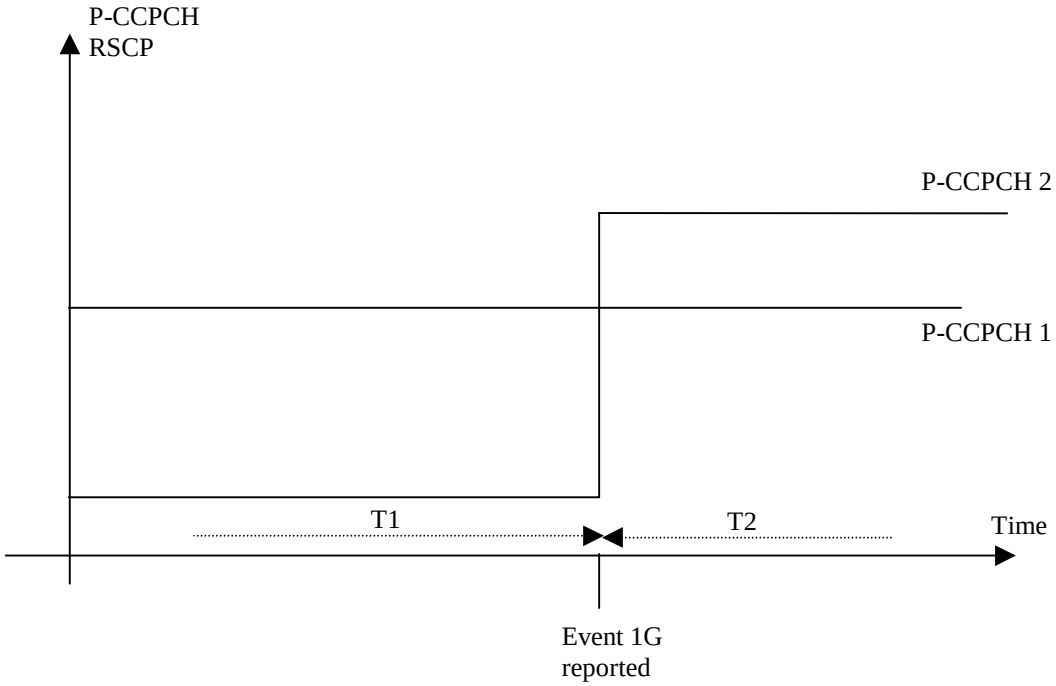


**Figure A.8.1: Illustration of parameters for handover measurement reporting test case**

**Table A.8.1B Cell specific parameters for correct reporting of intra frequency neighbours in AWGN propagation condition**

| Parameter | Unit | Cell 1 | | | | Cell 2 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Timeslot Number | | 0 | | 8 | | 0 | | 8 | |
| | | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| UTRA RF Channel Number | | Channel 1 | | | | Channel 1 | | | |
| ~~UTRA RF Channel Number~~ | | ~~Channel 1~~ | | ~~Channel 1~~ | | ~~Channel 1~~ | | ~~Channel 1~~ | |
| PCCPCH_Ec/Ior | dB | -3 | -3 | | | -3 | -3 | | |
| SCH_Ec/Ior | dB | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 |
| SCH_$t_{offset}$ | | 0 | 0 | 0 | 0 | 15 | 15 | 15 | 15 |
| PICH_Ec/Ior | | | | -3 | -3 | | | -3 | -3 |
| | | | | | | | | | |
| OCNS | | -4,28 | -4,28 | -4,28 | -4,28 | -4,28 | -4,28 | -4,28 | -4,28 |
| $\hat{I}_{or}/I_{oc}$ | dB | 3 | 3 | 3 | 3 | -Infinity | 5 | -Infinity | 5 |
| $I_{oc}$ | dBm/3.84 MHz | -70 | | | | | | | |
| PCCPCH_RSCP | dB | -70 | -70 | | | -Infinity | -68 | | |
| ~~Absolute Threshold (SIR)~~ | ~~dB~~ | ~~[ ]~~ | | | | | | | |
| ~~Hysteresis~~ | ~~dB~~ | ~~[ ]~~ | | | | | | | |
| ~~Time to Trigger~~ | ~~msec~~ | ~~[ ]~~ | | | | | | | |
| Propagation Condition | | AWGN | | | | | | | |

Note: The DPCH of all cells are located in an other timeslot than 0 or 8

### A.8.1.1.1.2 1.28 Mcps TDD option

This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event" as illustrated in Figure A. 8.1D~~A~~. The test parameters are shown in Table A. 8.1D~~A~~. Hysteresis, absolute Threshold and Time to Trigger values are given in the table below and they are signalled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G

shall be used. P-CCPCH RSCP of the best cell has to be reported together with Event 1G reporting. New measurement control information, which defines neighbour cells etc., is always sent before the event starts.

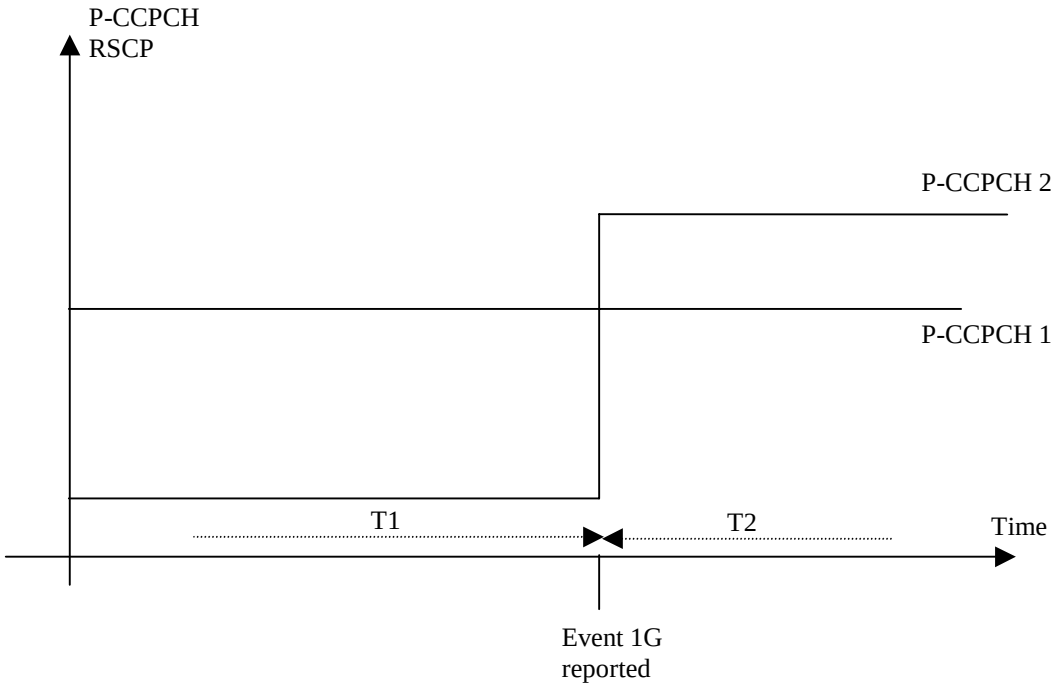


**Figure A. 8.1DA: Illustration of parameters for handover measurement reporting test case**

**Table A. 8.1A**

| Parameter | Unit | Cell 1 | | | | Cell 2 | | | |
|---|---|---|---|---|---|---|---|---|---|
| *Timeslot Number* | | 0 | | DwPTS | | 0 | | DwPTS | |
| | | **T1** | **T2** | **T1** | **T2** | **T1** | **T2** | **T1** | **T2** |
| *UTRA RF Channel Number* | | Channel 1 | | | | Channel 2 | | | |
| *PCCPCH_Ec/Ior* | dB | -3 | | | | -3 | | | |
| *DwPCH_Ec/Ior* | dB | | | 0 | | | | 0 | |
| $\hat{I}_{or}/I_{oc}$ | dB | [3] | [3] | | | -Infinity | [6] | | |
| $I_{oc}$ | dBm/1.28 MHz | -70 | | | | | | | |
| *PCCPCH_RSCP* | dBm | [-70] | [-70] | | | -Infinity | [-67] | | |
| Absolute Threshold (SIR) | dB | | | | | | | | |
| Hysteresis | dB | [ ] | | | | | | | |
| Time to Trigger | msec | [ ] | | | | | | | |
| Propagation Condition | | AWGN | | | | | | | |

NOTE: The DPCH of all cells are located in a timeslot other than 0.

### A.8.1.1.2 Test Requirements

#### A.8.1.1.2.1 for 3.84Mcps TDD option

The UE shall send one Event 1G triggered measurement report, with a measurement reporting delay less than 800~~[480]~~ ms 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.

A.8.1.1.2.2 for 1.28Mcps TDD option

The UE shall send one Event 1G triggered measurement report, with a measurement reporting delay less than [480] ms 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.

## A.8.2 TDD inter frequency measurements

### A.8.2.1 Correct reporting of neighbours in AWGN propagation condition

#### A.8.2.1.1 Test Purpose and Environment

A.8.2.1.1.1 for 3.84Mcps TDD option

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency measurements. The test will partly verify the requirements in section 8.1.2.2.

This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event" ~~as illustrated in Figure A.8-2~~. ~~The test parameters are shown in Table A.8-2. Hysteresis, absolute Threshold and Time to Trigger values~~General test parameters are given in the table A.8.2Abelow and they are signalled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. P-CCPCH RSCP of the best cell has to be reported together with Event 2C reporting. New measurement control information, which defines neighbour cells etc., is always sent before the event starts.

The cell specific test parameters are shown in Table A.8.2B.

**Table A.8.2A: General test parameters for correct reporting of TDD inter frequency neighbours in AWGN propagation condition**

| Parameter | Unit | Value | Comment |
|---|---|---|---|
| DPCH parameters active cell | | DL Reference Measurement Channel 12.2 kbps | As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0 or 8 |
| Power Control | | On | |
| Active cell | | Cell 1 | |
| Threshold non used frequency | dB | -71 | Absolute P-CCPCH RSCP threshold for event 2C |
| Hysteresis | dB | 0 | |
| Time to Trigger | ms | 0 | |
| Filter coefficient | | 0 | |
| Monitored cell list size | | 24 on channel 1<br>16 on channel 2 | Measurement control information is sent before T1 starts. |
| T1 | s | 10 | |
| T2 | s | 10 | |

**Table A.8.2B Cell Specific Parameters for Correct Reporting of Neighbours in AWGN Propagation Condition**

| Parameter | Unit | Cell 1 | | | | Cell 2 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Timeslot Number | | 0 | | 8 | | 0 | | 8 | |
| | | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| UTRA RF Channel Number | | Channel 1 | | | | Channel 2 | | | |
| ~~UTRA RF Channel Number~~ | | ~~Channel 1~~ | | ~~Channel 1~~ | | ~~Channel 2~~ | | ~~Channel 2~~ | |
| P-CCPCH_Ec/Ior | dB | -3 | -3 | | | -3 | -3 | | |
| SCH_Ec/Ior | dB | -9 | -9 | -9 | -9 | -9 | -9 | -9 | -9 |
| SCH_$t_{offset}$ | | 0 | 0 | 0 | 0 | 15 | 15 | 15 | 15 |
| PICH_Ec/Ior | | | | -3 | -3 | | | -3 | -3 |
| OCNS | | -4,28 | -4,28 | -4,28 | -4,28 | -4,28 | -4,28 | -4,28 | -4,28 |
| $\hat{I}_{or}/I_{oc}$ | dB | 3 | 3 | 3 | 3 | -Infinity | 6 | -Infinity | 6 |
| $I_{oc}$ | dBm/3.84 MHz | -70 | | | | | | | |
| PCCPCH_RSCP | dB | -70 | -70 | | | -Infinity | -67 | | |
| ~~Absolute Threshold (SIR)~~ | ~~dB~~ | ~~[ ]~~ | | | | | | | |
| ~~Hysteresis~~ | ~~dB~~ | ~~[ ]~~ | | | | | | | |
| ~~Time to Trigger~~ | ~~msec~~ | ~~[ ]~~ | | | | | | | |
| Propagation Condition | | AWGN | | | | | | | |

Note: The DPCH of all cells are located in an other timeslot than 0 or 8

### A.8.2.1.2 Test Requirements

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

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

**3GPP TSG RAN WG4 Meeting #17** **R4-010488**

**Gothenburg, Sweden 21st - 25th May 2001**

*CR-Form-v*

# CHANGE REQUEST

⌘ **25.123** **CR** **83** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

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

| | | |
|---|---|---|
| ***Title:*** | ⌘ | FDD Measurement Test Cases |
| ***Source:*** | ⌘ | RAN WG4 |
| ***Work item code:*** | ⌘ | TEI |
| ***Date:*** | ⌘ | 2001-05-21 |
| ***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:*** | ⌘ | Removal of square brackets by alignment with requirements on UE measurements procedures and completition of the test parameters. |
| ***Summary of change:*** | ⌘ | - Removal of square brackets for the test requirements<br>- Completition of the Ec/Io levels for the test scenario<br>- Addition of table including requirements for general test parameters |
| ***Consequences if not approved:*** | ⌘ | Remaining square brackets and missing parameters in specification. |

| | | | | |
|---|---|---|---|---|
| ***Clauses affected:*** | ⌘ | | | |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications<br>☐ Test specifications<br>☐ O&M Specifications | ⌘ | |
| ***Other comments:*** | ⌘ | | | |

**How to create CRs using this form:**

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

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

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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.8.3 FDD measurements

## A.8.3.1 Correct reporting of FDD neighbours in AWGN propagation condition

### A.8.3.1.1 Test Purpose and Environment

This test will derive that the terminal makes correct reporting of an event. Cell 1 is current active cell, Cell 2 is a FDD cell. The power level of CPICH ~~Ec/Io~~RSCP of cell 2 and the P-CCPCH RSCP of cell 1 is changed~~. Hysteresis, Absolute threshold and Time to Trigger values~~General test parameters are given in the table A.8.3A below and they are signalled from test device. New measurement control information, which defines neighbour cells etc., is always sent before the handover starts. ~~The number of neighbour cells in the measurement control information is FFS.~~ The test parameters are ~~shown~~ given in Table A.8.3B below.

**Table A.8.3A: General test parameters for Correct reporting of FDD neighbours in AWGN propagation condition**

| Parameter | Unit | Value | Comment |
|---|---|---|---|
| DPCH parameters active cell | | DL Reference Measurement Channel 12.2 kbps | As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0 or 8 |
| Power Control | | On | |
| Active cell | | Cell 1 | |
| Threshold non used frequency | dB | -86 | Absolute CPICH RSCP threshold for event 2C |
| Hysteresis | dB | 0 | |
| W non-used frequency | | 1 | Applicable for event 2C |
| Time to Trigger | ms | 0 | |
| Filter coefficient | | 0 | |
| Monitored cell list size | | 24 on channel 1<br>16 on channel 2 | Measurement control information is sent before T1 starts. |
| T1 | s | 10 | |
| T2 | s | 10 | |

**Table A.8.3B Cell Specific parameters for Correct reporting of FDD neighbours in AWGN propagation condition**

| Parameter | Unit | Cell 1 | | | | Cell 2 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Timeslot Number | | 0 | | 8 | | n.a | | n.a. | |
| | | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| UTRA RF Channel Number | | Channel 1 | | | | Channel 2 | | | |
| CPICH_Ec/Ior | dB | n.a. | | n.a. | | [ ]-10 | | [ ] | |
| PCCPCH_Ec/Ior | dB | -3 | -3 | | | [ ]-12 | | [ ] | |
| SCH_Ec/Ior | dB | -9 | -9 | -9 | -9 | [ ]-12 | | [ ] | |
| SCH_$t_{offset}$ | | 0 | 0 | 0 | 0 | n.a. | | n.a. | |
| PICH_Ec/Ior | | | | -3 | -3 | [ ]-15 | | [ ] | |
| ~~DCH_Ec/Ior~~ | ~~dB~~ | ~~n.a.~~ | ~~n.a.~~ | ~~n.a.~~ | ~~n.a.~~ | [ ] | | [ ] | |
| OCNS | dB | -4,28 | -4,28 | -4,28 | -4,28 | –0,941[ ] | | [ ] | |
| $\hat{I}_{or}/I_{oc}$ | dB | [ ]3 | [ ]3 | [ ]3 | [ ]3 | [ ] -infinity | -2 | [ ] | |
| $I_{oc}$ | dBm/3.84 MHz | -70 | | | | -70 | | | |
| CPICH_~~Ec/Io~~RSCP | | n.a. | | | | [ ] -infinity | -82 | | |
| | | | | | | | | | |
| PCCPCH_RSCP | dB | [ ]-70 | [ ]-70 | [ ]-70 | [ ]-70 | n.a. | | n.a. | |
| ~~Absolute Threshold (SIR)~~ | ~~dB~~ | [ ] | | | | [ ] | | | |
| ~~Hysteresis~~ | ~~dB~~ | [ ] | | | | [ ] | | | |
| ~~Time to Trigger~~ | ~~msec~~ | [ ] | | | | [ ] | | | |
| Propagation Condition | | AWGN | | | | AWGN | | | |

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

### A.8.3.1.2 Test Requirements

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.

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

## A.9 Measurement Performance Requirements

Unless explicitly stated:

- Reported measurements shall be within defined range in 90 % of the cases.
- Measurement channel is 12.2 kbps as defined in TS 25.102 annex A. This measurement channel is used both in active cell and cells to be measured.
- Cell 1 is the active cell.

**3GPP TSG RAN WG4 Meeting #17** **R4-010796**

**Gothenburg, Sweden 21st - 25th May 2001**

*CR-Form-v4*

# CHANGE REQUEST

⌘ **25.123** **CR** **84** ⌘ ev **-** ⌘ Current version: **4.0.0** ⌘

*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 **X** Core Network ☐

| | | |
|---|---|---|
| ***Title:*** | ⌘ | FDD Measurement Test Cases |
| ***Source:*** | ⌘ | RAN WG4 |
| ***Work item code:*** | ⌘ | TEI |
| ***Date:*** | ⌘ | 2001-05-21 |
| ***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:*** | ⌘ | Corresponding REL-4 CAT A CR to R4-010488 |
| ***Summary of change:*** | ⌘ | Corresponding REL-4 CAT A CR to R4-010488; in addition one table number is changed to avoid duplicated table numbers introduced by this CR. |
| ***Consequences if not approved:*** | ⌘ | Inconsistency between Releases. Remaining square brackets and missing test cases and parameters in specification. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | A.8 |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications<br>☐ Test specifications<br>☐ O&M Specifications |
| | ⌘ | |
| ***Other comments:*** | ⌘ | |

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

# A.8.3 FDD measurements

## A.8.3.1 Correct reporting of FDD neighbours in AWGN propagation condition

### A.8.3.1.1 Test Purpose and Environment

#### A.8.3.1.1.1 3.84 Mcps TDD option

This test will derive that the terminal makes correct reporting of an event. Cell 1 is current active cell, Cell 2 is a FDD cell. The power level of CPICH RSCP~~Ec/Io~~ of cell 2 and the P-CCPCH RSCP of cell 1 is changed~~. Hysteresis, Absolute threshold and Time to Trigger values~~ General test parameters are given in the table A.8.3A below and they are signalled from test device. New measurement control information, which defines neighbour cells etc., is always sent before the handover starts. ~~The number of neighbour cells in the measurement control information is FFS.~~ The test parameters are given~~shown~~ in Table A.8.3B below.

**Table A.8.3A: General test parameters for Correct reporting of FDD neighbours in AWGN propagation condition**

| Parameter | Unit | Value | Comment |
|---|---|---|---|
| DPCH parameters active cell | | DL Reference Measurement Channel 12.2 kbps | As specified in TS 25.102 section A. The DPCH is located in an other timeslot than 0 or 8 |
| Power Control | | On | |
| Active cell | | Cell 1 | |
| Threshold non used frequency | dB | -86 | Absolute CPICH RSCP threshold for event 2C |
| Hysteresis | dB | 0 | |
| W non-used frequency | | 1 | Applicable for event 2C |
| Time to Trigger | ms | 0 | |
| Filter coefficient | | 0 | |
| Monitored cell list size | | 24 on channel 1<br>16 on channel 2 | Measurement control information is sent before T1 starts. |
| T1 | s | 10 | |
| T2 | s | 10 | |

**Table A.8.3B Cell Specific parameters for Correct reporting of FDD neighbours in AWGN propagation condition**

| Parameter | Unit | Cell 1 | | | | Cell 2 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Timeslot Number | | 0 | | 8 | | n.a | | n.a. | |
| | | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| UTRA RF Channel Number | | Channel 1 | | | | Channel 2 | | | |
| CPICH_Ec/Ior | dB | n.a. | | n.a. | | -10 | | | |
| PCCPCH_Ec/Ior | dB | -3 | -3 | | | -12 | | | |
| SCH_Ec/Ior | dB | -9 | -9 | -9 | -9 | -12 | | | |
| SCH_$t_{offset}$ | | 0 | 0 | 0 | 0 | n.a. | | n.a. | |
| PICH_Ec/Ior | | | | -3 | -3 | -15 | | | |
| ~~DCH_Ec/Ior~~ | ~~DB~~ | ~~n.a.~~ | ~~n.a.~~ | ~~n.a.~~ | ~~n.a.~~ | | | | |
| OCNS | dB | -4,28 | -4,28 | -4,28 | -4,28 | -0,941 | | | |
| $\hat{I}_{or}/I_{oc}$ | dB | 3 | 3 | 3 | 3 | -infinity | -2 | | |
| $I_{oc}$ | dBm/3.84 MHz | -70 | | | | -70 | | | |
| CPICH_RSCP~~Ec/Io~~ | | n.a. | | | | -infinity | -82 | | |
| | | | | | | | | | |
| PCCPCH_RSCP | dB | -70 | -70 | -70 | -70 | n.a. | | n.a. | |
| ~~Absolute Threshold (SIR)~~ | ~~DB~~ | | | | | | | | |
| ~~Hysteresis~~ | ~~DB~~ | | | | | | | | |
| ~~Time to Trigger~~ | ~~msec~~ | | | | | | | | |
| Propagation Condition | | AWGN | | | | AWGN | | | |

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

### A.8.3.1.1.2 1.28 Mcps TDD option

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency measurements. The test will partly verify the requirements in section 8.1.2.2.

This test will derive that the terminal makes correct reporting of an event Cell 1 is the active cell, Cell 2 is a neighbour cell on the used frequency. The power level on Cell 1 is kept constant and the power level of Cell 2 is changed using "change of best cell event" as illustrated in Figure A. 8.1A. The test parameters are shown in Table A. 8.3DA. Hysteresis, absolute Threshold and Time to Trigger values are given in the table below and they are signalled from test device. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. P-CCPCH RSCP of the best cell has to be reported together with Event 2C reporting. New measurement control information, which defines neighbour cells etc., is always sent before the event starts.

The test parameters are shown in Table A. 8.3DA.

**Table A. 8.3DA: Cell Specific Parameters for Correct Reporting of Neighbours in AWGN Propagation Condition**

| Parameter | Unit | Cell 1 | | | | Cell 2 | | | |
|---|---|---|---|---|---|---|---|---|---|
| Timeslot Number | | 0 | | DwPTS | | 0 | | DwPTS | |
| | | T1 | T2 | T1 | T2 | T1 | T2 | T1 | T2 |
| UTRA RF Channel Number | | Channel 1 | | | | Channel 2 | | | |
| PCCPCH_Ec/Ior | dB | -3 | | | | -3 | | | |
| DwPCH_Ec/Ior | dB | | | 0 | | | | 0 | |
| $\hat{I}_{or}/I_{oc}$ | dB | [3] | [3] | | | -Infinity | [6] | | |
| $I_{oc}$ | dBm/1.28 MHz | -70 | | | | | | | |
| PCCPCH_RSCP | dBm | [-70] | [-70] | | | -Infinity | [-67] | | |
| Absolute Threshold (SIR) | dB | [ ] | | | | | | | |
| Hysteresis | dB | [ ] | | | | | | | |
| Time to Trigger | msec | [ ] | | | | | | | |
| Propagation Condition | | AWGN | | | | | | | |

Note: The DPCH of all cells are located in a timeslot other than 0.

## A.8.3.1.2 Test Requirements

### A.8.3.1.2.1 3.84 Mcps TDD option

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.

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

### A.8.3.1.2.2 1.28 Mcps TDD option

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

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