

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

**RP-010314**

**Title:** Agreed CRs (Release '99 and Rel-4 category A) to TS 25.331 (4)

**Source:** TSG-RAN WG2

**Agenda item:** 8.2.3

Doc-1st-	Status-	Spec	CR	Rev	Phase	Subject	Cat	Version	Versio
R2-011270	agreed	25.331	812	1	R99	Corrections to RRC procedure performance	F	3.6.0	3.7.0
R2-011271	agreed	25.331	813		Rel-4	Corrections to RRC procedure performance	A	4.0.0	4.1.0
R2-011272	agreed	25.331	814	1	R99	Removal of mapping function	F	3.6.0	3.7.0
R2-011273	agreed	25.331	815		Rel-4	Removal of mapping function	A	4.0.0	4.1.0
R2-011489	agreed	25.331	816	3	R99	Security clarifications	F	3.6.0	3.7.0
R2-011490	agreed	25.331	817		Rel-4	Security clarifications	A	4.0.0	4.1.0
R2-011443	agreed	25.331	818	1	R99	Corrections to UE Positioning	F	3.6.0	3.7.0
R2-011444	agreed	25.331	819		Rel-4	Corrections to UE Positioning	A	4.0.0	4.1.0
R2-011281	agreed	25.331	824	1	R99	Definition of DPCH numbering	F	3.6.0	3.7.0
R2-011282	agreed	25.331	825		Rel-4	Definition of DPCH numbering	A	4.0.0	4.1.0
R2-011403	agreed	25.331	826	4	R99	Corrections to System Information Procedure	F	3.6.0	3.7.0
R2-011446	agreed	25.331	827		Rel-4	Corrections to System Information Procedure	A	4.0.0	4.1.0
R2-011284	agreed	25.331	828	1	R99	Relation between DOFF and DPCH Frame Offset	F	3.6.0	3.7.0
R2-011445	agreed	25.331	829		Rel-4	Relation between DOFF and DPCH Frame Offset	A	4.0.0	4.1.0
R2-011288	agreed	25.331	830	1	R99	Procedures for "same as UL"	F	3.6.0	3.7.0
R2-011289	agreed	25.331	831		Rel-4	Procedures for "same as UL"	A	4.0.0	4.1.0
R2-011303	agreed	25.331	836	1	R99	Editorial and minor corrections	F	3.6.0	3.7.0
R2-011304	agreed	25.331	837		Rel-4	Editorial and minor corrections	A	4.0.0	4.1.0
R2-011447	agreed	25.331	838	1	R99	Editorial Correction	F	3.6.0	3.7.0
R2-011448	agreed	25.331	839		Rel-4	Editorial Correction	A	4.0.0	4.1.0

## CHANGE REQUEST

⌘ **25.331 CR 812** ⌘ rev **r1** ⌘ Current version: **3.6.0** ⌘

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

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

<b>Title:</b>	⌘ Corrections to RRC procedure performance		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 2001-05-24
<b>Category:</b>	⌘ F	<b>Release:</b>	⌘ R99
	Use <u>one</u> of the following categories: <b>F</b> (essential correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (Addition of feature), <b>C</b> (Functional modification of feature) <b>D</b> (Editorial modification)		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900.		

**Reason for change:** ⌘

1. In case a reconfiguration implies a state change from CELL\_DCH to CELL\_FACH, the performance requirements need also take reading of system information into account.
2. When entering state CELL\_DCH, RRC performance requirements should include time according to IE "SRB delay".
3. Missing performance requirement on UE reception of PAGING TYPE 1 in state CELL\_PCH/URA\_PCH until UE sends CELL UPDATE.

Backward Compatibility Analysis: The changes in this CR are backwards compatible. No functionality is corrected, just performance. \_

**Summary of change:** ⌘

Corrections in the RRC procedure performance requirements table (13.5):  
 "Common channel" and "Dedicated channel" is separated into "Target state CELL\_DCH", "From state CELL\_DCH to state CELL\_FACH", and "From state CELL\_FACH to state CELL\_FACH".

No performance requirements stated for reconfigurations from state CELL\_DCH to state CELL\_FACH, since UE need to read relevant SIBs on BCH. The performance depends on the SIB scheduling.

Table entry added for UE reception of PAGING TYPE 1 in state CELL\_PCH/URA\_PCH until UE sends CELL UPDATE. Performance requirements includes repetition period of SIB7 (FDD) and SIB14 (TDD). UE need to read SIB7/SIB14 on BCH before sending the CELL UPDATE message.

Editorial: "SIGNALLING FLOW RELEASE" message is changed into "SIGNALLING CONNECTION RELEASE".

Editorial: "UE CAPABILITY ENQUIRY INFORMATION" message changed into "UE CAPABILITY INFORMATION".

<b>Consequences if not approved:</b>	⌘	Unclear RRC performance requirements.	
<b>Clauses affected:</b>	⌘	13.5	
<b>Other specs Affected:</b>	⌘	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘
<b>Other comments:</b>	⌘		

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

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

## 13.5 UE RRC Procedure Performance

This subclause defines the performance requirements related to RRC procedures in the UE. Where the total delay is impacted by processing of variable length on the physical layer (e.g. physical layer synchronisation), references to appropriate specifications are given.

### 13.5.1 Definitions

The following definitions of N1 and N2 are valid only for this UE RRC Procedure Performance specification.

N1 = upper limit on the time required to execute modifications in UE after the reception of a UTRAN -> UE message has been completed. Where applicable (e.g. the physical layer transmission is impacted), the changes shall be adopted in the beginning of the next TTI starting after N1. N1 is specified as a multiple of 10 ms.

N2 = number of 10 ms radio frames from end of reception of UTRAN -> UE message on UE physical layer before the transmission of the UE -> UTRAN response message must be ready to start on a transport channel with no access delay other than the TTI alignment (e.g. DCH, therefore excluding delays caused by RACH procedure etc). The UE response message transmission from the physical layer shall begin at the latest  $(N2*10)+TTI$  ms after completion of the reception of the last TTI carrying the triggering UTRAN -> UE message. When Target State is CELL\_DCH, the UE response message transmission from the physical layer may be additionally delayed by the value of IE "SRB delay".

N1 and N2 are independent (e.g.  $N2-N1$  is not restricted to being less than or equal to 10ms).

### 13.5.2 RRC procedure performance values

NOTE: Times indicated in the table do not include cell reselection.

Procedure title:	UTRAN -> UE	UE -> UTRAN	N1	N2	Notes
<b>RRC Connection Management Procedures</b>					
Broadcast of system information	SYSTEM INFORMATION				N2 is not applicable for any system information messages, because there is no response message from the UE.
Master Information Block	SYSTEM INFORMATION		5	NA	No system information data shall be lost due to processing of a MIB received with no detectable errors. This means that the UE shall buffer all system information data received after the MIB until the data can be processed according to the information in the MIB, unless the MIB was received erroneously.
System Information Block type 1	SYSTEM INFORMATION		10	NA	
System Information Block type 2	SYSTEM INFORMATION		10	NA	
System Information Block type 3	SYSTEM INFORMATION		10	NA	
System Information Block type 4	SYSTEM INFORMATION		10	NA	
System Information Block type 5	SYSTEM INFORMATION		10	NA	
System Information Block type 6	SYSTEM INFORMATION		10	NA	
System Information Block type 7	SYSTEM INFORMATION		5	NA	
System Information Block type 8	SYSTEM INFORMATION		10	NA	
System Information Block type 9	SYSTEM INFORMATION		5	NA	
System Information Block type 10	SYSTEM INFORMATION		5	NA	
System Information Block type 11	SYSTEM INFORMATION		10	NA	
System Information Block type 12	SYSTEM INFORMATION		10	NA	
System Information Block type 13	SYSTEM INFORMATION		10	NA	
System Information Block type 14	SYSTEM INFORMATION		10	NA	
System Information Block type 15	SYSTEM INFORMATION		10	NA	
System Information Block type 16	SYSTEM INFORMATION		10	NA	
System Information Block type 18	SYSTEM INFORMATION		10	NA	
RRC connection establishment <i>Dedicated channel</i> <i>Target state CELL_DCH</i>	RRC CONNECTION SETUP	RRC CONNECTION SETUP COMPLETE	10	NA	N1 measures time to the start of tx / rx on DPCH. N2 cannot be specified, because RRC CONNECTION SETUP COMPLETE message is transmitted only after physical layer synchronisation, which also depends on the Node B.  The performance of the physical layer synchronisation procedure is specified in [19] and [20]

RRC connection establishment <a href="#">Common channel</a> <a href="#">Target state</a> <a href="#">CELL_FACH</a>	RRC CONNECTION SETUP	RRC CONNECTION SETUP COMPLETE	10	11	N1 and N2 applicable as defined (N2 can be tested from the initiation of the power ramp on RACH).
RRC connection release <a href="#">Dedicated channel</a> <a href="#">From</a> <a href="#">CELL_DCH state</a>	RRC CONNECTION RELEASE	RRC CONNECTION RELEASE COMPLETE	5	8	N1 sets the requirement for the time from the completion of the last repetition of the RRC CONNECTION RELEASE COMPLETE message to the release of the physical channel.  N2 sets the requirement from the end of successful reception of the RRC CONNECTION RELEASE message to the start of the first transmission of the RRC CONNECTION RELEASE COMPLETE message.
RRC connection release <a href="#">Common channel</a> <a href="#">From</a> <a href="#">CELL_FACH state</a>	RRC CONNECTION RELEASE	RRC CONNECTION RELEASE COMPLETE	NA	11	N1 represents UE internal configuration that cannot be externally observed.
<a href="#">Paging</a>	<a href="#">PAGING TYPE 1</a>	<a href="#">CELL_UPDATE</a>	<a href="#">10</a>	<a href="#">11+T</a>	<a href="#">T is the repetition period of SIB7 (applicable for FDD) and SIB14 (applicable for TDD)</a>
UE capability enquiry	UE CAPABILITY ENQUIRY	UE CAPABILITY <del>ENQUIRY</del> INFORMATION	NA	8	N1 is not applicable because the UE configuration does not change.
Security mode control	SECURITY MODE COMMAND	SECURITY MODE COMPLETE	5	8	
Signalling <del>flow</del> -connection release procedure	SIGNALLING <del>FLOW</del> -CONNECTION RELEASE		5	NA	N2 is not applicable because there is no response message.
Counter check	COUNTER CHECK	COUNTER CHECK RESPONSE	NA	8	N1 is not applicable because the UE configuration does not change.
<b>Radio Bearer control procedures</b>					
Radio bearer establishment <a href="#">Dedicated channel</a> <a href="#">Target state</a> <a href="#">CELL_DCH</a>	RADIO BEARER SETUP	RADIO BEARER SETUP COMPLETE / FAILURE	10	NA	N2 cannot be specified, because the RADIO BEARER SETUP COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.
Radio bearer establishment <a href="#">From state</a> <a href="#">CELL_FACH to state</a> <a href="#">CELL_FACH</a> <a href="#">Common channel</a>	RADIO BEARER SETUP	RADIO BEARER SETUP COMPLETE / FAILURE	10	11	
Radio bearer establishment <a href="#">From</a> <a href="#">CELL_DCH to</a> <a href="#">CELL_FACH</a>	<a href="#">RADIO BEARER SETUP</a>	<a href="#">RADIO BEARER SETUP COMPLETE</a>	<a href="#">NA</a>	<a href="#">NA</a>	<a href="#">N1 and N2 cannot be specified, because UE need to read SIBs on BCH before sending RADIO BEARER SETUP COMPLETE</a>
Radio bearer reconfiguration <a href="#">Target state</a> <a href="#">CELL_DCH</a> <a href="#">Dedicated channel</a>	RADIO BEARER RECONFIGURATION	RADIO BEARER RECONFIGURATION COMPLETE / FAILURE	10	NA	N2 cannot be specified, because the RADIO BEARER RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.

Radio bearer reconfiguration <i>From state CELL_FACH to state CELL_FACHCommon-channel</i>	RADIO BEARER RECONFIGURATION	RADIO BEARER RECONFIGURATION COMPLETE / FAILURE	10	11	
Radio bearer reconfiguration <i>From state CELL_DCH to state CELL_FACH</i>	RADIO BEARER RECONFIGURATION	RADIO BEARER RECONFIGURATION COMPLETE	NA	NA	N1 and N2 cannot be specified, because UE need to read SIBs on BCH before sending RADIO BEARER RECONFIGURATION COMPLETE
Radio bearer release <i>Target state CELL_DCH</i>	RADIO BEARER RELEASE	RADIO BEARER RELEASE COMPLETE / FAILURE	10	11	
Radio bearer release <i>From state CELL_FACH to state CELL_FACH</i>	RADIO BEARER RELEASE	RADIO BEARER RELEASE COMPLETE / FAILURE	10	11	
Radio bearer release <i>From state CELL_DCH to state CELL_FACH</i>	RADIO BEARER RELEASE	RADIO BEARER RELEASE COMPLETE	NA	NA	N1 and N2 cannot be specified, because UE need to read SIBs on BCH before sending RADIO BEARER RECONFIGURATION COMPLETE
Transport channel reconfiguration <i>Target state CELL_DCHDedicated-channel</i>	TRANSPORT CHANNEL RECONFIGURATION	TRANSPORT CHANNEL RECONFIGURATION COMPLETE / FAILURE	10	NA	N2 cannot be specified, because the TRANSPORT CHANNEL RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.
Transport channel reconfiguration <i>From state CELL_FACH to state CELL_FACHCommon-channel</i>	TRANSPORT CHANNEL RECONFIGURATION	TRANSPORT CHANNEL RECONFIGURATION COMPLETE / FAILURE	10	11	
Transport channel reconfiguration <i>From state CELL_DCH to state CELL_FACH</i>	TRANSPORT CHANNEL RECONFIGURATION	TRANSPORT CHANNEL RECONFIGURATION COMPLETE	NA	NA	N1 and N2 cannot be specified, because UE need to read SIBs on BCH before sending TRANSPORT CHANNEL RECONFIGURATION COMPLETE
Transport format combination control <i>AM or UM RLC mode</i>	TRANSPORT FORMAT COMBINATION CONTROL	TRANSPORT FORMAT COMBINATION CONTROL FAILURE	5	8	
Transport format combination control <i>Transparent mode</i>	TRANSPORT FORMAT COMBINATION CONTROL		5	NA	N2 is not applicable because no response message is defined.
Physical channel reconfiguration <i>Target state CELL_DCHDedicated-channel</i>	PHYSICAL CHANNEL RECONFIGURATION	PHYSICAL CHANNEL RECONFIGURATION COMPLETE / FAILURE	8	NA	N2 cannot be specified, because the PHYSICAL CHANNEL RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.

Physical channel reconfiguration <i>From state CELL_FACH to state CELL_FACHCommon-channel</i>	PHYSICAL CHANNEL RECONFIGURATION	PHYSICAL CHANNEL RECONFIGURATION COMPLETE / FAILURE	8	9	
Physical channel reconfiguration <i>From state CELL_DCH to state CELL_FACH</i>	<u>PHYSICAL CHANNEL RECONFIGURATION</u>	<u>PHYSICAL CHANNEL RECONFIGURATION COMPLETE</u>	<u>NA</u>	<u>NA</u>	<u>N1 and N2 cannot be specified, because UE need to read SIBs on BCH before sending PHYSICAL CHANNEL RECONFIGURATION COMPLETE</u>
Physical Shared Channel Allocation [TDD only]	PHYSICAL SHARED CHANNEL ALLOCATION		5	NA	N2 is not applicable because no response message is defined.
Uplink Physical Channel Control [TDD only]	UPLINK PHYSICAL CHANNEL CONTROL		NA	NA	Requirements for outer loop and timing advance adjustments are defined in [22] and [20].
<b>RRC connection mobility procedures</b>					
Cell update	CELL UPDATE CONFIRM		<u>5</u>		
		UTRAN MOBILITY INFORMATION CONFIRM	5	8	
		PHYSICAL CHANNEL RECONFIGURATION COMPLETE <i>Target state CELL_FACH</i>	8	9	
		<u>PHYSICAL CHANNEL RECONFIGURATION COMPLETE</u> <i>Target state CELL_DCH</i>	<u>8</u>	<u>NA</u>	<u>N2 cannot be specified, because the PHYSICAL CHANNEL RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.</u>
		TRANSPORT CHANNEL RECONFIGURATION COMPLETE <i>Target state CELL_FACH</i>	10	11	
		<u>TRANSPORT CHANNEL RECONFIGURATION COMPLETE</u> <i>Target state CELL_DCH</i>	<u>10</u>	<u>NA</u>	<u>N2 cannot be specified, because the PHYSICAL CHANNEL RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.</u>
		<u>RADIO BEARER RECONFIGURATION COMPLETE</u> <i>Target state CELL_FACH</i>	<u>10</u>	<u>11</u>	



		<u>RADIO BEARER RECONFIGURATION COMPLETE</u> <u>Target state</u> <u>CELL DCH</u>	10	NA	<u>N2 cannot be specified, because the PHYSICAL CHANNEL RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.</u>
		<u>RADIO BEARER RELEASE COMPLETE</u> <u>Target state</u> <u>CELL DCH</u>	10	11	
URA update	URA UPDATE CONFIRM	UTRAN MOBILITY INFORMATION CONFIRM	5	8	
UTRAN mobility information	UTRAN MOBILITY INFORMATION	UTRAN MOBILITY INFORMATION CONFIRM / FAILURE	5	8	
Active set update	ACTIVE SET UPDATE	ACTIVE SET UPDATE COMPLETE / FAILURE	NA	8	The requirements on UE combining and power control performance for both UL and DL are specified by RAN WG4 in [21] and [19].  Also in case of branch addition the COMPLETE / FAILURE message is transmitted without waiting for the new branch to stabilise, therefore N2 is specified.
Inter-RAT handover to UTRAN	HANDOVER TO UTRAN COMMAND (other system)	HANDOVER TO UTRAN COMPLETE	NA	NA	The performance of this procedure is specified in 05.10.
Inter-RAT handover from UTRAN	HANDOVER FROM UTRAN COMMAND	HANDOVER FROM UTRAN FAILURE	NA	NA	The performance of this procedure is specified in [19] and [20].
<b>Measurement procedures</b>					
Measurement control	MEASUREMENT CONTROL	MEASUREMENT CONTROL FAILURE	5	8	Response to measurement inquiry depends on physical layer measurement. Response time is defined in [19] and [20]. N1 and N2 only define the processing of the message.

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## CHANGE REQUEST

⌘ **25.331 CR 813** ⌘ 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  Radio Access Network  Core Network

**Title:** ⌘ Corrections to RRC procedure performance

**Source:** ⌘ TSG-RAN WG2

**Work item code:** ⌘ TEI

**Date:** ⌘ 2001-05-24

**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:** ⌘
1. In case a reconfiguration implies a state change from CELL\_DCH to CELL\_FACH, the performance requirements need also take reading of system information into account.
  2. When entering state CELL\_DCH, RRC performance requirements should include time according to IE "SRB delay".
  3. Missing performance requirement on UE reception of PAGING TYPE 1 in state CELL\_PCH/URA\_PCH until UE sends CELL UPDATE.

Backward Compatibility Analysis: The changes in this CR are backwards compatible. No functionality is corrected, just performance.

**Summary of change:** ⌘ Corrections in the RRC procedure performance requirements table (13.5): "Common channel" and "Dedicated channel" is separated into "Target state CELL\_DCH", "From state CELL\_DCH to state CELL\_FACH", and "From state CELL\_FACH to state CELL\_FACH".

No performance requirements stated for reconfigurations from state CELL\_DCH to state CELL\_FACH, since UE need to read relevant SIBs on BCH. The performance depends on the SIB scheduling.

Table entry added for UE reception of PAGING TYPE 1 in state CELL\_PCH/URA\_PCH until UE sends CELL UPDATE. Performance requirements includes repetition period of SIB7 (FDD) and SIB14 (TDD). UE need to read SIB7/SIB14 on BCH before sending the CELL UPDATE message.

Editorial: "SIGNALLING FLOW RELEASE" message is changed into "SIGNALLING CONNECTION RELEASE".

Editorial: "UE CAPABILITY ENQUIRY INFORMATION" message changed into "UE CAPABILITY INFORMATION".

<b>Consequences if not approved:</b>	⌘	Unclear RRC performance requirements.	
<b>Clauses affected:</b>	⌘	13.5.1, 13.5.2	
<b>Other specs Affected:</b>	⌘	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘
<b>Other comments:</b>	⌘		

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## 13.5 UE RRC Procedure Performance

This subclause defines the performance requirements related to RRC procedures in the UE. Where the total delay is impacted by processing of variable length on the physical layer (e.g. physical layer synchronisation), references to appropriate specifications are given.

### 13.5.1 Definitions

The following definitions of N1 and N2 are valid only for this UE RRC Procedure Performance specification.

N1 = upper limit on the time required to execute modifications in UE after the reception of a UTRAN -> UE message has been completed. Where applicable (e.g. the physical layer transmission is impacted), the changes shall be adopted in the beginning of the next TTI starting after N1. N1 is specified as a multiple of 10 ms.

N2 = number of 10 ms radio frames from end of reception of UTRAN -> UE message on UE physical layer before the transmission of the UE -> UTRAN response message must be ready to start on a transport channel with no access delay other than the TTI alignment (e.g. DCH, therefore excluding delays caused by RACH procedure etc). The UE response message transmission from the physical layer shall begin at the latest  $(N2*10)+TTI$  ms after completion of the reception of the last TTI carrying the triggering UTRAN -> UE message. When Target State is CELL\_DCH, the UE response message transmission from the physical layer may be additionally delayed by the value of IE "SRB delay".

N1 and N2 are independent (e.g.  $N2-N1$  is not restricted to being less than or equal to 10ms).

### 13.5.2 RRC procedure performance values

NOTE: Times indicated in the table do not include cell reselection.

Procedure title:	UTRAN -> UE	UE -> UTRAN	N1	N2	Notes
<b>RRC Connection Management Procedures</b>					
Broadcast of system information	SYSTEM INFORMATION				N2 is not applicable for any system information messages, because there is no response message from the UE.
Master Information Block	SYSTEM INFORMATION		5	NA	No system information data shall be lost due to processing of a MIB received with no detectable errors. This means that the UE shall buffer all system information data received after the MIB until the data can be processed according to the information in the MIB, unless the MIB was received erroneously.
System Information Block type 1	SYSTEM INFORMATION		10	NA	
System Information Block type 2	SYSTEM INFORMATION		10	NA	
System Information Block type 3	SYSTEM INFORMATION		10	NA	
System Information Block type 4	SYSTEM INFORMATION		10	NA	
System Information Block type 5	SYSTEM INFORMATION		10	NA	
System Information Block type 6	SYSTEM INFORMATION		10	NA	
System Information Block type 7	SYSTEM INFORMATION		5	NA	
System Information Block type 8	SYSTEM INFORMATION		10	NA	
System Information Block type 9	SYSTEM INFORMATION		5	NA	
System Information Block type 10	SYSTEM INFORMATION		5	NA	
System Information Block type 11	SYSTEM INFORMATION		10	NA	
System Information Block type 12	SYSTEM INFORMATION		10	NA	
System Information Block type 13	SYSTEM INFORMATION		10	NA	
System Information Block type 14	SYSTEM INFORMATION		10	NA	
System Information Block type 15	SYSTEM INFORMATION		10	NA	
System Information Block type 16	SYSTEM INFORMATION		10	NA	
System Information Block type 18	SYSTEM INFORMATION		10	NA	
RRC connection establishment <i>Dedicated channel</i> <i>Target state CELL_DCH</i>	RRC CONNECTION SETUP	RRC CONNECTION SETUP COMPLETE	10	NA	N1 measures time to the start of tx / rx on DPCH. N2 cannot be specified, because RRC CONNECTION SETUP COMPLETE message is transmitted only after physical layer synchronisation, which also depends on the Node B.  The performance of the physical layer synchronisation procedure is specified in [19] and [20]

RRC connection establishment <a href="#">Common channel</a> <a href="#">Target state</a> <a href="#">CELL_FACH</a>	RRC CONNECTION SETUP	RRC CONNECTION SETUP COMPLETE	10	11	N1 and N2 applicable as defined (N2 can be tested from the initiation of the power ramp on RACH).
RRC connection release <a href="#">Dedicated channel</a> <a href="#">From</a> <a href="#">CELL_DCH state</a>	RRC CONNECTION RELEASE	RRC CONNECTION RELEASE COMPLETE	5	8	N1 sets the requirement for the time from the completion of the last repetition of the RRC CONNECTION RELEASE COMPLETE message to the release of the physical channel.  N2 sets the requirement from the end of successful reception of the RRC CONNECTION RELEASE message to the start of the first transmission of the RRC CONNECTION RELEASE COMPLETE message.
RRC connection release <a href="#">Common channel</a> <a href="#">From</a> <a href="#">CELL_FACH state</a>	RRC CONNECTION RELEASE	RRC CONNECTION RELEASE COMPLETE	NA	11	N1 represents UE internal configuration that cannot be externally observed.
<a href="#">Paging</a>	<a href="#">PAGING TYPE 1</a>	<a href="#">CELL_UPDATE</a>	<a href="#">10</a>	<a href="#">11+ T</a>	<a href="#">T is the repetition period of SIB7 (applicable for FDD) and SIB14 (applicable for TDD)</a>
UE capability enquiry	UE CAPABILITY ENQUIRY	UE CAPABILITY <del>ENQUIRY</del> INFORMATION	NA	8	N1 is not applicable because the UE configuration does not change.
Security mode control	SECURITY MODE COMMAND	SECURITY MODE COMPLETE	5	8	
Signalling <del>flow</del> -connection release procedure	SIGNALLING <del>FLOW</del> -CONNECTION RELEASE		5	NA	N2 is not applicable because there is no response message.
Counter check	COUNTER CHECK	COUNTER CHECK RESPONSE	NA	8	N1 is not applicable because the UE configuration does not change.
<b>Radio Bearer control procedures</b>					
Radio bearer establishment <a href="#">Dedicated channel</a> <a href="#">Target state</a> <a href="#">CELL_DCH</a>	RADIO BEARER SETUP	RADIO BEARER SETUP COMPLETE / FAILURE	10	NA	N2 cannot be specified, because the RADIO BEARER SETUP COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.
Radio bearer establishment <a href="#">From state</a> <a href="#">CELL_FACH to state</a> <a href="#">CELL_FACH</a> <a href="#">Common channel</a>	RADIO BEARER SETUP	RADIO BEARER SETUP COMPLETE / FAILURE	10	11	
Radio bearer establishment <a href="#">From</a> <a href="#">CELL_DCH to</a> <a href="#">CELL_FACH</a>	<a href="#">RADIO BEARER SETUP</a>	<a href="#">RADIO BEARER SETUP COMPLETE</a>	<a href="#">NA</a>	<a href="#">NA</a>	<a href="#">N1 and N2 cannot be specified, because UE need to read SIBs on BCH before sending RADIO BEARER SETUP COMPLETE</a>
Radio bearer reconfiguration <a href="#">Target state</a> <a href="#">CELL_DCH</a> <a href="#">Dedicated channel</a>	RADIO BEARER RECONFIGURATION	RADIO BEARER RECONFIGURATION COMPLETE / FAILURE	10	NA	N2 cannot be specified, because the RADIO BEARER RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.

Radio bearer reconfiguration <i>From state CELL_FACH to state CELL_FACHCommon-channel</i>	RADIO BEARER RECONFIGURATION	RADIO BEARER RECONFIGURATION COMPLETE / FAILURE	10	11	
Radio bearer reconfiguration <i>From state CELL_DCH to state CELL_FACH</i>	RADIO BEARER RECONFIGURATION	RADIO BEARER RECONFIGURATION COMPLETE	NA	NA	N1 and N2 cannot be specified, because UE need to read SIBs on BCH before sending RADIO BEARER RECONFIGURATION COMPLETE
Radio bearer release <i>Target state CELL_DCH</i>	RADIO BEARER RELEASE	RADIO BEARER RELEASE COMPLETE / FAILURE	10	11	
Radio bearer release <i>From state CELL_FACH to state CELL_FACH</i>	RADIO BEARER RELEASE	RADIO BEARER RELEASE COMPLETE / FAILURE	10	11	
Radio bearer release <i>From state CELL_DCH to state CELL_FACH</i>	RADIO BEARER RELEASE	RADIO BEARER RELEASE COMPLETE	NA	NA	N1 and N2 cannot be specified, because UE need to read SIBs on BCH before sending RADIO BEARER RECONFIGURATION COMPLETE
Transport channel reconfiguration <i>Target state CELL_DCHDedicated-channel</i>	TRANSPORT CHANNEL RECONFIGURATION	TRANSPORT CHANNEL RECONFIGURATION COMPLETE / FAILURE	10	NA	N2 cannot be specified, because the TRANSPORT CHANNEL RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.
Transport channel reconfiguration <i>From state CELL_FACH to state CELL_FACHCommon-channel</i>	TRANSPORT CHANNEL RECONFIGURATION	TRANSPORT CHANNEL RECONFIGURATION COMPLETE / FAILURE	10	11	
Transport channel reconfiguration <i>From state CELL_DCH to state CELL_FACH</i>	TRANSPORT CHANNEL RECONFIGURATION	TRANSPORT CHANNEL RECONFIGURATION COMPLETE	NA	NA	N1 and N2 cannot be specified, because UE need to read SIBs on BCH before sending TRANSPORT CHANNEL RECONFIGURATION COMPLETE
Transport format combination control <i>AM or UM RLC mode</i>	TRANSPORT FORMAT COMBINATION CONTROL	TRANSPORT FORMAT COMBINATION CONTROL FAILURE	5	8	
Transport format combination control <i>Transparent mode</i>	TRANSPORT FORMAT COMBINATION CONTROL		5	NA	N2 is not applicable because no response message is defined.
Physical channel reconfiguration <i>Target state CELL_DCHDedicated-channel</i>	PHYSICAL CHANNEL RECONFIGURATION	PHYSICAL CHANNEL RECONFIGURATION COMPLETE / FAILURE	8	NA	N2 cannot be specified, because the PHYSICAL CHANNEL RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.



Physical channel reconfiguration <i>From state CELL_FACH to state CELL_FACHCommon-channel</i>	PHYSICAL CHANNEL RECONFIGURATION	PHYSICAL CHANNEL RECONFIGURATION COMPLETE / FAILURE	8	9	
Physical channel reconfiguration <i>From state CELL_DCH to state CELL_FACH</i>	<u>PHYSICAL CHANNEL RECONFIGURATION</u>	<u>PHYSICAL CHANNEL RECONFIGURATION COMPLETE</u>	<u>NA</u>	<u>NA</u>	<u>N1 and N2 cannot be specified, because UE need to read SIBs on BCH before sending PHYSICAL CHANNEL RECONFIGURATION COMPLETE</u>
Physical Shared Channel Allocation [TDD only]	PHYSICAL SHARED CHANNEL ALLOCATION		5	NA	N2 is not applicable because no response message is defined.
Uplink Physical Channel Control [TDD only]	UPLINK PHYSICAL CHANNEL CONTROL		NA	NA	Requirements for outer loop and timing advance adjustments are defined in [22] and [20].
<b>RRC connection mobility procedures</b>					
Cell update	CELL UPDATE CONFIRM		<u>5</u>		
		UTRAN MOBILITY INFORMATION CONFIRM	5	8	
		PHYSICAL CHANNEL RECONFIGURATION COMPLETE <i>Target state CELL_FACH</i>	8	9	
		<u>PHYSICAL CHANNEL RECONFIGURATION COMPLETE</u> <i>Target state CELL_DCH</i>	<u>8</u>	<u>NA</u>	<u>N2 cannot be specified, because the PHYSICAL CHANNEL RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.</u>
		TRANSPORT CHANNEL RECONFIGURATION COMPLETE <i>Target state CELL_FACH</i>	10	11	
		<u>TRANSPORT CHANNEL RECONFIGURATION COMPLETE</u> <i>Target state CELL_DCH</i>	<u>10</u>	<u>NA</u>	<u>N2 cannot be specified, because the PHYSICAL CHANNEL RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.</u>
		<u>RADIO BEARER RECONFIGURATION COMPLETE</u> <i>Target state CELL_FACH</i>	<u>10</u>	<u>11</u>	

		<a href="#">RADIO BEARER RECONFIGURATION COMPLETE</a> <a href="#">Target state</a> <a href="#">CELL_DCH</a>	10	NA	<a href="#">N2 cannot be specified, because the PHYSICAL CHANNEL RECONFIGURATION COMPLETE / FAILURE message is transmitted only after physical layer synchronisation, which depends also on Node B.</a>
		<a href="#">RADIO BEARER RELEASE COMPLETE</a> <a href="#">Target state</a> <a href="#">CELL_DCH</a>	10	11	
URA update	URA UPDATE CONFIRM	UTRAN MOBILITY INFORMATION CONFIRM	5	8	
UTRAN mobility information	UTRAN MOBILITY INFORMATION	UTRAN MOBILITY INFORMATION CONFIRM / FAILURE	5	8	
Active set update	ACTIVE SET UPDATE	ACTIVE SET UPDATE COMPLETE / FAILURE	NA	8	The requirements on UE combining and power control performance for both UL and DL are specified by RAN WG4 in [21] and [19].  Also in case of branch addition the COMPLETE / FAILURE message is transmitted without waiting for the new branch to stabilise, therefore N2 is specified.
Inter-RAT handover to UTRAN	HANDOVER TO UTRAN COMMAND (other system)	HANDOVER TO UTRAN COMPLETE	NA	NA	The performance of this procedure is specified in 05.10.
Inter-RAT handover from UTRAN	HANDOVER FROM UTRAN COMMAND	HANDOVER FROM UTRAN FAILURE	NA	NA	The performance of this procedure is specified in [19] and [20].
<b>Measurement procedures</b>					
Measurement control	MEASUREMENT CONTROL	MEASUREMENT CONTROL FAILURE	5	8	Response to measurement inquiry depends on physical layer measurement. Response time is defined in [19] and [20]. N1 and N2 only define the processing of the message.

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## CHANGE REQUEST

⌘ **25.331 CR 814** ⌘ rev **r1** ⌘ Current version: **3.6.0** ⌘

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

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

<b>Title:</b>	⌘ Removal of mapping function		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 2001-05-24
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ R99
	<p>Use <u>one</u> of the following categories:</p> <p><b>F</b> (essential correction)</p> <p><b>A</b> (corresponds to a correction in an earlier release)</p> <p><b>B</b> (Addition of feature),</p> <p><b>C</b> (Functional modification of feature)</p> <p><b>D</b> (Editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>		<p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2)</p> <p>R96 (Release 1996)</p> <p>R97 (Release 1997)</p> <p>R98 (Release 1998)</p> <p>R99 (Release 1999)</p> <p>REL-4 (Release 4)</p> <p>REL-5 (Release 5)</p>

**Reason for change:** ⌘ The mapping function used at idle mode cell re-selection causes an additional inaccuracy. The amount of this inaccuracy varies depending on the defined mapping function. This issue is also discussed and agreed in R4-010286. Originally the mapping function was introduced to cope with the comparison of different types of measurement quantities in inter-RAT and inter-mode cell reselections. However, now TS25.304 clearly defines that CPICH RSCP is always used as measurement quantity when UTRA FDD cells are compared with GSM or TDD cells. The use mapping function in a network is therefore questioned.

Backwards compatibility analysis: This CR is not backwards compatible. For UE and network implementations using FDD/TDD to GSM re-selection. For such implementations, settings of parameter Qoffset will have a different understanding for FDD/TDD to GSM cell re-selection evaluation after introduction of this CR. Reasons: Qoffset was added to the measured value after the measured value had been ‘normalised’ to the value range 0..99. The rest of the proposed modifications are backwards compatible.

**Summary of change:** ⌘ A description in chapter 8 is added to clarify that when the IE “mapping info” is received in this version of the standard, it shall be ignored.

In tabular format, IE “Cell selection and re-selection info for SIB3/4”, IE “Mapping info” is changed from MD to OP. This does not affect the ASN.1.

“dB” is added for IEs Qhyst1, Qhyst2, Qoffset1, Qoffset2, Temporary\_Offset1, Temporary\_offset2.

New section 10.3.7.x added to describe the mapping from signalled Qhcs value (range 0..99) to the actual threshold limits used in the cell re-selection rules in TS 25.304 .

Related CR on 25.304, originally submitted as R2-010937

**Consequences if not approved:** ⌘ UE performance requirement for cell reselection defined in TS25.133 are not applicable for the cell reselection criteria in TS25.304. Cell reselection performance is degraded unnecessarily. Therefore, mapping function will not be used.

**Clauses affected:** ⌘ 8.6.2.x (new), 10.3.2.3, 10.3.2.4, 10.3.7.10, 10.3.7.11, 10.3.7.12, 10.3.7.x (new)

**Other specs affected:** ⌘  Other core specifications ⌘ TS 25.304 v3.6.0  
 Test specifications  
 O&M Specifications

**Other comments:** ⌘

### How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: [http://www.3gpp.org/3G\\_Specs/CRs.htm](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. 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.

### 8.6.2.x Mapping info

If the IE "Mapping info" is recieved, the UE shall in this version of the specification ignore the contents of this IE.

### 10.3.2.3 Cell selection and re-selection info for SIB3/4

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Mapping Info	<a href="#">MDOP</a>		Mapping info 10.3.2.5	<del>Contains mapping function for quality measurements. Default is an implicit mapping: <math>Q_{map} = Q_{meas,LEV_i}</math> [4].</del>
Cell_selection_and_reselection_quality_measure	MP		Enumerated (CPICH Ec/N0, CPICH RSCP)	Choice of measurement (CPICH Ec/N0 or CPICH RSCP) to use as quality measure Q for FDD cells.
CHOICE mode	MP			
>FDD				
>>S <sub>intrasearch</sub>	OP		Integer (-32..20 by step of 2)	[4] [dB]
>>S <sub>intersearch</sub>	OP		Integer (-32..20 by step of 2)	[4] [dB]
>>S <sub>searchHCS</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>RAT List	OP	1 to <maxOther RAT>		
>>>RAT identifier	MP		Enumerated (GSM, cdma2000)	
>>>S <sub>search,RAT</sub>	MP		Integer (-105..91 by step of 2)	[4] [dB]
>>>S <sub>HCS,RAT</sub>	OP		Integer (-32..20 by step of 2)	[4] [dB]
>>S <sub>limit,SearchRAT</sub>	OP		Integer (-32..20 by step of 2)	[4] [dB]
>TDD				
>>S <sub>intrasearch</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]

>>S <sub>intersearch</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>S <sub>searchHCS</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>RAT List	OP	1 to <maxOther RAT>		
>>>RAT identifier	MP		Enumerated (GSM, cdma2000)	
>>>S <sub>search,RAT</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>>S <sub>HCS,RAT</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>>S <sub>limit,SearchRAT</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
Qhyst1 <sub>s</sub>	MP		Integer (0..40 by step of 2)	[4] [dB]
Qhyst2 <sub>s</sub>	CV-FDD-Quality-Measure		Integer (0..40 by step of 2)	Default value is Qhyst1 <sub>s</sub> [4] [dB]
Treselection <sub>s</sub>	MP		Integer (0..31)	[s]
HCS Serving cell Information	OP		HCS Serving cell information 10.3.7.12	
Maximum allowed UL TX power	MP		Maximum allowed UL TX power 10.3.6.39	[dBm] UE_TXPWR_MAX_RACH in [4].
CHOICE <i>mode</i>	MP			
>FDD				
>>Qqualmin	MP		Integer (-20..0)	Ec/N0, [dB]
>>Qrxlevmin	MP		Integer (-115..-25 by step of 2)	RSCP, [dBm]
>TDD				
>>Qrxlevmin	MP		Integer (-115..-25 by step of 2)	RSCP, [dBm]

Condition	Explanation
CV-FDD-Quality-Measure	Presence is not allowed if the IE "Cell_selection_and_reselection_quality_measure" has the value CPICH RSCP, otherwise the IE is mandatory and has a default value.



### 10.3.2.4 Cell selection and re-selection info for SIB11/12

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Qoffset1 <sub>s,n</sub>	MD		Real(-50.0..50.0 by step of 1)	Default value is 0. <a href="#">[dB]</a>
Qoffset2 <sub>s,n</sub>	CV-FDD-Quality-Measure		Real(-50.0..50.0 by step of 1)	Default value is 0. <a href="#">[dB]</a>
Maximum allowed UL TX power	MD		Maximum allowed UL TX power 10.3.6.39	[dBm] UE_TXPWR_MAX_RACH in [4]. Default is the Maximum allowed UL TX power for the serving cell
HCS neighbouring cell information	OP		HCS Neighbouring cell information 10.3.7.11	
CHOICE mode	MP			
>FDD				
>>Qqualmin	MD		Integer (-20..0)	Ec/N0, [dB] Default value is Qqualmin for the serving cell
>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell
>TDD				
>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell
>GSM				
>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell

Condition	Explanation
FDD-Quality-Measure	Presence is not allowed if the IE "Cell_selection_and_reselection_quality_measure" has the value CPICH RSCP, otherwise the IE is mandatory and has a default value.

## 10.3.7.10 HCS Cell re-selection information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Penalty_time	MD		Integer(0, 10, 20, 30, 40, 50, 60)	Default value is 0 which means = not used In seconds
Temporary_offsets	CV-Penalty used			
>Temporary_offset1	MP		Integer(10, 20, 30, 40, 50, 60, 70, infinity)	[dB]
>Temporary_offset2	CV-FDD-Quality-Measure		Integer(10, 20, 30, 40, 50, 60, 70, infinity)	Default value is Temporary_offset1 [dB]

Condition	Explanation
Penalty used	Not allowed if IE Penalty time equals 'not used' else MP
FDD-Quality-Measure	Presence is not allowed if the IE "Cell_selection_and_reselection_quality_measure" has the value CPICH RSCP, otherwise the IE is mandatory and has a default value.

## 10.3.7.11 HCS neighbouring cell information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
HCS_PRIO	MD		Integer (0..7)	Default value = 0
<a href="#">Q<sub>HCS</sub></a>	MD		<a href="#">Q<sub>HCS</sub></a> <a href="#">10.3.7.x Integer (-0..99)</a>	Default value = 0
HCS Cell Re-selection Information	OP		HCS Cell Re-selection Information 10.3.7.10	

## 10.3.7.12 HCS Serving cell information

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
HCS_PRIO	MD		Integer (0..7)	Default value = 0
<a href="#">Q<sub>HCS</sub></a>	MD		<a href="#">Integer(-0..99)</a> <a href="#">Q<sub>HCS</sub></a> <a href="#">10.3.7.x</a>	Default value = 0
T <sub>C<sub>max</sub></sub>	MD		Integer(0, 30, 60, 120, 180, 240)	[s] Default value is 0 which means = not used
N <sub>CR</sub>	CV-UE speed detector		Integer(1..16)	Default value = 8
T <sub>C<sub>max</sub>Hyst</sub>	CV-UE speed detector		Integer(0, 10..70 by step of 10)	[s] Default value is 0 which means = not used

Condition	Explanation
UE Speed detector	Not allowed if T <sub>C<sub>max</sub></sub> equals 'not used' else MP

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10.3.7.x Qhcs

<u>Information Element/Group name</u>	<u>Need</u>	<u>Multi</u>	<u>Type and Reference</u>	<u>Semantics description</u>
<u>Qhcs</u>	<u>MP</u>		<u>Integer(0..99)</u>	<p><u>Qhcs, mapped from CPICH Ec/No (FDD), see [4] [dB]</u>  <u>0: -24</u>  <u>1: -23.5</u>  <u>2: -23</u>  <u>3: -22.5</u>                      ...  <u>45: -1.5</u>  <u>46: -1</u>  <u>47: -0.5</u>  <u>48: 0</u>  <u>49: (spare)</u>                      ...  <u>98: (spare)</u>  <u>99: (spare)</u></p> <p><u>Qhcs, mapped from CPICH RSCP (FDD), see [4] [dBm]</u>  <u>0: -115</u>  <u>1: -114</u>  <u>2: -113</u>                      :  <u>88: -27</u>  <u>89: -26</u>  <u>90: -(spare)</u>  <u>91: -(spare)</u>                      :  <u>98: -(spare)</u>  <u>99: -(spare)</u></p> <p><u>Qhcs, mapped from PCCPCH RSCP (TDD), see [4] [dBm]</u>  <u>0: -115</u>  <u>1: -114</u>  <u>2: -113</u>                      :  <u>88: -27</u>  <u>89: -26</u>  <u>90: -(spare)</u>  <u>91: -(spare)</u>                      :  <u>98: -(spare)</u>  <u>99: -(spare)</u></p>

				<p><a href="#">Qhcs level, mapped from Averaged received signal level RXLEV (GSM), see [4]</a> [dBm] <a href="#">0: -110</a> <a href="#">1: -109</a> <a href="#">2: -108</a> : <a href="#">61: -49</a> <a href="#">62: -48</a> <a href="#">63: -47</a> <a href="#">64: -46</a> <a href="#">65: -45</a> <a href="#">66: -44</a> <a href="#">67: -43</a> <a href="#">68: -42</a> <a href="#">69: -41</a> <a href="#">70: -40</a> <a href="#">71: -39</a> <a href="#">72: -38</a> <a href="#">73: -37</a> <a href="#">74: -(spare)</a> : <a href="#">98: -(spare)</a> <a href="#">99: -(spare)</a></p>
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## CHANGE REQUEST

⌘ **25.331 CR 815** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

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

<b>Title:</b>	⌘ Removal of mapping function		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 2001-05-24
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ REL-4
	<p>Use <u>one</u> of the following categories:</p> <p><b>F</b> (essential correction)</p> <p><b>A</b> (corresponds to a correction in an earlier release)</p> <p><b>B</b> (Addition of feature),</p> <p><b>C</b> (Functional modification of feature)</p> <p><b>D</b> (Editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>		<p>Use <u>one</u> of the following releases:</p> <p><b>2</b> (GSM Phase 2)</p> <p><b>R96</b> (Release 1996)</p> <p><b>R97</b> (Release 1997)</p> <p><b>R98</b> (Release 1998)</p> <p><b>R99</b> (Release 1999)</p> <p><b>REL-4</b> (Release 4)</p> <p><b>REL-5</b> (Release 5)</p>

**Reason for change:** ⌘ The mapping function used at idle mode cell re-selection causes an additional inaccuracy. The amount of this inaccuracy varies depending on the defined mapping function. This issue is also discussed and agreed in R4-010286. Originally the mapping function was introduced to cope with the comparison of different types of measurement quantities in inter-RAT and inter-mode cell reselections. However, now TS25.304 clearly defines that CPICH RSCP is always used as measurement quantity when UTRA FDD cells are compared with GSM or TDD cells. The use mapping function in a network is therefore questioned.

Backwards compatibility: This CR is not backwards compatible. For UE and network implementations using FDD/TDD to GSM re-selection. For such implementations, settings of parameter Qoffset will have a different understanding for FDD/TDD to GSM cell re-selection evaluation after introduction of this CR. Reasons: Qoffset was added to the measured value after the measured value had been 'normalised' to the value range 0..99. The rest of the modifications are backwards compatible.

**Summary of change:** ⌘ A description in chapter 8 is added to clarify that when the IE "mapping info" is received in this version of the standard, it shall be ignored.

In tabular format, IE "Cell selection and re-selection info for SIB3/4", IE "Mapping info" is changed from MD to OP. This does not affect the ASN.1.

"dB" is added for IEs Qhyst1, Qhyst2, Qoffset1, Qoffset2, Temporary\_Offset1, Temporary\_offset2.

New section 10.3.7.x added to describe the mapping from signalled Qhcs value (range 0..99) to the actual threshold limits used in the cell re-selection rules in TS 25.304 .

Related CR on 25.304, originally submitted as R2-010937

**Consequences if not approved:** ⌘ UE performance requirement for cell reselection defined in TS25.133 are not applicable for the cell reselection criteria in TS25.304. Cell reselection performance is degraded unnecessarily. Therefore, mapping function will not be used.

**Clauses affected:** ⌘ 8.6.2.x (new), 10.3.2.3, 10.3.2.4, 10.3.7.10, 10.3.7.11, 10.3.7.12, 10.3.7.x (new)

**Other specs affected:** ⌘  Other core specifications ⌘ TS 25.304 v3.6.0  
 Test specifications  
 O&M Specifications

**Other comments:** ⌘

### How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: [http://www.3gpp.org/3G\\_Specs/CRs.htm](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.

### 8.6.2.x Mapping info

If the IE "Mapping info" is recieved, the UE shall in this version of the specification ignore the contents of this IE.



### 10.3.2.3 Cell selection and re-selection info for SIB3/4

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Mapping Info	<a href="#">MDOP</a>		Mapping info 10.3.2.5	<del>Contains mapping function for quality measurements. Default is an implicit mapping: <math>Q_{map} = Q_{meas,LEV_i}</math> [4].</del>
Cell_selection_and_reselection_quality_measure	MP		Enumerated (CPICH Ec/N0, CPICH RSCP)	Choice of measurement (CPICH Ec/N0 or CPICH RSCP) to use as quality measure Q for FDD cells.
CHOICE mode	MP			
>FDD				
>>S <sub>intrasearch</sub>	OP		Integer (-32..20 by step of 2)	[4] [dB]
>>S <sub>intersearch</sub>	OP		Integer (-32..20 by step of 2)	[4] [dB]
>>S <sub>searchHCS</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>RAT List	OP	1 to <maxOther RAT>		
>>>RAT identifier	MP		Enumerated (GSM, cdma2000)	
>>>S <sub>search,RAT</sub>	MP		Integer (-105..91 by step of 2)	[4] [dB]
>>>S <sub>HCS,RAT</sub>	OP		Integer (-32..20 by step of 2)	[4] [dB]
>>S <sub>limit,SearchRAT</sub>	OP		Integer (-32..20 by step of 2)	[4] [dB]
>TDD				
>>S <sub>intrasearch</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]

>>S <sub>intersearch</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>S <sub>searchHCS</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>RAT List	OP	1 to <maxOther RAT>		
>>>RAT identifier	MP		Enumerated (GSM, cdma2000)	
>>>S <sub>search,RAT</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>>S <sub>HCS,RAT</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>>S <sub>limit,SearchRAT</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
Qhyst1 <sub>s</sub>	MP		Integer (0..40 by step of 2)	[4] [dB]
Qhyst2 <sub>s</sub>	CV-FDD-Quality-Measure		Integer (0..40 by step of 2)	Default value is Qhyst1 <sub>s</sub> [4] [dB]
Treselection <sub>s</sub>	MP		Integer (0..31)	[s]
HCS Serving cell Information	OP		HCS Serving cell information 10.3.7.12	
Maximum allowed UL TX power	MP		Maximum allowed UL TX power 10.3.6.39	[dBm] UE_TXPWR_MAX_RACH in [4].
CHOICE <i>mode</i>	MP			
>FDD				
>>Qqualmin	MP		Integer (-20..0)	Ec/NO, [dB]
>>Qrxlevmin	MP		Integer (-115..-25 by step of 2)	RSCP, [dBm]
>TDD				
>>Qrxlevmin	MP		Integer (-115..-25 by step of 2)	RSCP, [dBm]

Condition	Explanation
CV-FDD-Quality-Measure	Presence is not allowed if the IE "Cell_selection_and_reselection_quality_measure" has the value CPICH RSCP, otherwise the IE is mandatory and has a default value.

### 10.3.2.4 Cell selection and re-selection info for SIB11/12

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Qoffset1 <sub>s,n</sub>	MD		Real(-50.0..50.0 by step of 1)	Default value is 0. <a href="#">[dB]</a>
Qoffset2 <sub>s,n</sub>	CV-FDD-Quality-Measure		Real(-50.0..50.0 by step of 1)	Default value is 0. <a href="#">[dB]</a>
Maximum allowed UL TX power	MD		Maximum allowed UL TX power 10.3.6.39	[dBm] UE_TXPWR_MAX_RACH in [4]. Default is the Maximum allowed UL TX power for the serving cell
HCS neighbouring cell information	OP		HCS Neighbouring cell information 10.3.7.11	
CHOICE mode	MP			
>FDD				
>>Qqualmin	MD		Integer (-20..0)	Ec/N0, [dB] Default value is Qqualmin for the serving cell
>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell
>TDD				
>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell
>GSM				
>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell

Condition	Explanation
FDD-Quality-Measure	Presence is not allowed if the IE "Cell_selection_and_reselection_quality_measure" has the value CPICH RSCP, otherwise the IE is mandatory and has a default value.

## 10.3.7.10 HCS Cell re-selection information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Penalty_time	MD		Integer(0, 10, 20, 30, 40, 50, 60)	Default value is 0 which means = not used In seconds
Temporary_offsets	CV-Penalty used			
>Temporary_offset1	MP		Integer(10, 20, 30, 40, 50, 60, 70, infinity)	[dB]
>Temporary_offset2	CV-FDD-Quality-Measure		Integer(10, 20, 30, 40, 50, 60, 70, infinity)	Default value is Temporary_offset1 [dB]

Condition	Explanation
Penalty used	Not allowed if IE Penalty time equals 'not used' else MP
FDD-Quality-Measure	Presence is not allowed if the IE "Cell_selection_and_reselection_quality_measure" has the value CPICH RSCP, otherwise the IE is mandatory and has a default value.

## 10.3.7.11 HCS neighbouring cell information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
HCS_PRIO	MD		Integer (0..7)	Default value = 0
<a href="#">Q<sub>HCS</sub></a>	MD		<a href="#">Q<sub>HCS</sub></a> <a href="#">10.3.7.x Integer (-0..99)</a>	Default value = 0
HCS Cell Re-selection Information	OP		HCS Cell Re-selection Information 10.3.7.10	

## 10.3.7.12 HCS Serving cell information

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
HCS_PRIO	MD		Integer (0..7)	Default value = 0
<a href="#">Q<sub>HCS</sub></a>	MD		<a href="#">Integer(-0..99)</a> <a href="#">Q<sub>HCS</sub></a> <a href="#">10.3.7.x</a>	Default value = 0
T <sub>Crmax</sub>	MD		Integer(0, 30, 60, 120, 180, 240)	[s] Default value is 0 which means = not used
N <sub>CR</sub>	CV-UE speed detector		Integer(1..16)	Default value = 8
T <sub>CrmaxHyst</sub>	CV-UE speed detector		Integer(0, 10..70 by step of 10)	[s] Default value is 0 which means = not used

Condition	Explanation
UE Speed detector	Not allowed if T <sub>Crmax</sub> equals 'not used' else MP

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10.3.7.x Qhcs

<u>Information Element/Group name</u>	<u>Need</u>	<u>Multi</u>	<u>Type and Reference</u>	<u>Semantics description</u>
<u>Qhcs</u>	<u>MP</u>		<u>Integer(0..99)</u>	<p><u>Qhcs, mapped from CPICH Ec/No (FDD), see [4]</u> [dB] 0: -24 1: -23.5 2: -23 3: -22.5 ... 45: -1.5 46: -1 47: -0.5 48: 0 49: (spare) ... 98: (spare) 99: (spare)</p> <p><u>Qhcs, mapped from CPICH RSCP (FDD), see [4]</u> [dBm] 0: -115 1: -114 2: -113 : 88: -27 89: -26 90: -(spare) 91: -(spare) : 98: -(spare) 99: -(spare)</p> <p><u>Qhcs, mapped from PCCPCH RSCP (TDD), see [4]</u> [dBm] 0: -115 1: -114 2: -113 : 88: -27 89: -26 90: -(spare) 91: -(spare) : 98: -(spare) 99: -(spare)</p>

				<p><a href="#">Qhcs level, mapped from Averaged received signal level RXLEV (GSM), see [4]</a> [dBm] <a href="#">0: -110</a> <a href="#">1: -109</a> <a href="#">2: -108</a> : <a href="#">61: -49</a> <a href="#">62: -48</a> <a href="#">63: -47</a> <a href="#">64: -46</a> <a href="#">65: -45</a> <a href="#">66: -44</a> <a href="#">67: -43</a> <a href="#">68: -42</a> <a href="#">69: -41</a> <a href="#">70: -40</a> <a href="#">71: -39</a> <a href="#">72: -38</a> <a href="#">73: -37</a> <a href="#">74: -(spare)</a> : <a href="#">98: -(spare)</a> <a href="#">99: -(spare)</a></p>
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## CHANGE REQUEST

⌘ **25.331 CR 816** ⌘ rev **r3** ⌘ Current version: **3.6.0** ⌘

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

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

<b>Title:</b>	⌘ Security clarifications		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 2001-05-21
<b>Category:</b>	⌘ F	<b>Release:</b>	⌘ R99
	Use <u>one</u> of the following categories: <b>F</b> (essential correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (Addition of feature), <b>C</b> (Functional modification of feature) <b>D</b> (Editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

<b>Reason for change:</b>	⌘ These are essential corrections that are needed in order to interpret the specification of security for both UE and UTRAN clearly.
<b>Summary of change:</b>	⌘ <ul style="list-style-type: none"> <li>• Minor editorial corrections</li> <li>• Include a TSG T WG3 specification in the reference list that specifies the THRESHOLD value that is stored on the USIM.</li> <li>• The Handling of the THRESHOLD as read from the USIM is completely specified according to TSG SA WG3 TS 33.102. The START values for each CN domain are compared with the THRESHOLD at RRC connection release procedure.</li> <li>• Handling of START during RRC connection establishment when USIM is present and not present.</li> <li>• The hyper frame numbers are initialised for the first time as part of the very first Security mode control procedure for a given RRC connection, for the existing signalling radio bearers, in both UE and UTRAN with the START values as received in the IE "START list" in the RRC CONNECTION SETUP COMPLETE message.</li> <li>• Clarification of the actions when new keys are received. The case for TM RBs was missing and is now included. Also, the variable INTEGRITY_PROTECTION_INFO is updated upon reception of new keys ie the HFNs are set to zero but the RRC SN is preserved.</li> <li>• For TM RBs there exist two IEs that related to the CFN activation time. The first is IE "Ciphering activation time for DPCH" (only included in downlink messages) and the second is the IE "COUNT-C activation time info" (only included in uplink messages). The latter IE is only included in the UL if the former IE is not included in the downlink for the cases as specified in this clarification.</li> <li>• A single START value is sent when establishing new radio bearers in RADIO BEARER SETUP COMPLETE. The UE must wait for the L2 ack on the RADIO BEARER SETUP COMPLETE message before initialising and starting the radio bearer, as UTRAN must use (as required) the START value</li> </ul>



indicated in the RADIO BEARER SETUP COMPLETE message to setup the new radio bearer. This START value that is sent updates the most recently calculated START value in both UE and UTRAN. This START value is only applicable for RLC AM and UM RBs. The START value to be used for the TM RLC RBs is clarified.

- Text has been included to specify what UTRAN should do on reception of IE "START" and for IE "START list", ie this is to update the mostly recently calculated START values with the values of these IEs.
  - Included actions when UTRAN should change to the new ciphering and integrity protection configuration.
  - When a CELL UPDATE is sent for a UE not in CELL\_DCH state then the MAC-d HFNs for each CN domain need to be updated with the START value as indicated in IE "START list". This is as ciphered TM RBs do not exist when not in CELL\_DCH state.
  - Editorial updates to the hyper frame numbers section
  - Clarified that if the calculated value of START wraps around it shall be set to the maximum START value. This should not really happen so frequently as operators should invoke the authentication procedure to generate new keys frequently enough to avoid this situation. However, for very long connection times, it is possible that the wrap around of the calculated START needs to be handled. It may be good to send an LS to S3 to indicate that they should update the START formula in TS 33.102 for this case.
  - In the MAC-I calculation, it is clarified how the COUNT-I is constructed.
  - It is clarified how the keys used on the SRBs are from the CN domain for which the most recent security negotiation took place. This is now in line with TS 33.102.
  - It is clarified that if during the establishment of one or more RABs for new RBs for one or more CN domains is not allowed, as it is only possible to send a START value for a single CN domain in the RADIO BEARER SETUP COMPLETE message. However, this does not prohibit the reconfiguration of existing RBs from one or more CN domains at the same time.
  - It is clarified that COUNT-Cs are initialised and start incrementing upon completion of the RADIO BEARER SETUP COMPLETE (UE has to wait for L2 ack on the COMPLETE).
- 
- IE "COUNT-C activation time" is now not only included when moving to CELL\_DCH only.
  - Included IE "COUNT-C activation time" in HANDOVER TO UTRAN COMPLETE message. The corresponding procedure text to handle the immediate start of ciphering when going from GSM to UMTS is included in 8.3.6.3.
  - When HO from UTRAN to another RAT, the START values for each CN domain are stored in the USIM.
  - Updated 8.1.12 to include the case when there are pending activation times for security configuration change on one or more radio bearers and/or signalling radio bearers. If activation times are pending then the latest Security mode control should use that activation time, otherwise any suitable activation time can be chosen.
  - The indication provided to upper layers on security configuration change is clarified.
  - Ciphering configuration change may not only happen on RB2 (10.3.3.17).
  - Counter check procedure assumes that the COUNT-C for AM and UM are always available – even if ciphering has not been activated. Therefore, COUNT-C for AM and UM bearers should never be stopped, once started.
  - 
  - An LS was received from S3 and N1 in response to an LS sent from R2 (R2-010981). The outcome has been that the THRESHOLD check should be done at the RRC connection release (when going to idle mode) as suggested by RAN2 in tdoc (R2-010981). The changes have been updated accordingly in this Rev 2 of CR 816.

- When we handover from UTRAN to another RAT we need to store the START values in the USIM (8.3.7.4).
- A case was missing in R2-010853 if the UE sent the IE "GSM security capability" in the RRC CONNECTION SETUP COMPLETE and UTRAN did not include this in the SECURITY MODE COMMAND. In this case, the UE shall release the RRC connection.

**Backwards compatibility**

- Addition of IE "COUNT-C activation time" is a not a backwards compatible change. This is however essential to ensure that ciphering can be started immediately when going from GSM to UMTS. Implementations not supporting this change present in this CR will likely get a decoding error resulting in a failed handover attempt to UMTS.
- This CR attempts to clarify the general security procedures according to common understanding and represents no additional functionality. Only, interpretations of the security procedures from earlier versions of the specification that are not aligned with this CR may be backwards incompatible. However, the clarifications in this CR are essential for the correct operation of the security procedures in UTRAN.

**Consequences if not approved:** ☞ The possibility that different UE and UTRAN implementations will interpret the specification of security differently, thereby causing the inevitable loss of the RRC connection.

**Clauses affected:** ☞ 2, 8.1.3.2, 8.1.3.5, 8.1.3.6, 8.1.3.7, 8.1.3.8, 8.1.3.9, 8.1.3.10, 8.1.4.2, 8.1.4.3, 8.1.4.6, 8.1.4.9, 8.1.12.1, 8.1.12.2.1, 8.1.12.2.2, 8.1.12.3, 8.1.12.4a, 8.1.12.4b, 8.1.12.4c (new), 8.1.12.5, 8.1.12.6, 8.1.15, 8.2.2.3, 8.2.2.4, 8.2.2.5, 8.2.2.12b, 8.3.1.5, 8.3.6.3, 8.3.7.4, 8.3.7.5, 8.3.7.6, 8.3.7.8, 8.5.2, 8.5.8, 8.5.9, 8.5.10, 8.5.10.1, 8.5.10.3, 8.6.3.4, 8.6.3.5, 8.6.4.1, 8.6.4.2, 8.6.4.3, 10.2.13, 10.2.23, 10.2.28, 10.2.31, 10.2.34, 10.2.51, 10.3.3.17, 11.2, 13.4.1, 13.4.11a

**Other specs affected:** ☞  Other core specifications ☞   
 Test specifications  
 O&M Specifications

**Other comments:** ☞

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## 2 References

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

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

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 25.301: "Radio Interface Protocol Architecture".
- [3] 3GPP TS 25.303: "Interlayer Procedures in Connected Mode".
- [4] 3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode".
- [5] 3GPP TS 24.008: "Mobile radio interface layer 3 specification, Core Network Protocols - Stage 3".
- [6] 3GPP TS 25.103: "RF Parameters in Support of RRM".
- [7] 3GPP TS 25.215: "Physical layer – Measurements (FDD)".
- [8] 3GPP TS 25.225: "Physical layer – Measurements (TDD)".
- [9] 3GPP TS 25.401: "UTRAN overall description".
- [10] 3GPP TS 25.402: "Synchronization in UTRAN, stage 2".
- [11] 3GPP TS 23.003: "Numbering, addressing and identification".
- [12] ICD-GPS-200: "Navstar GPS Space Segment/Navigation User Interface".
- [13] RTCM-SC104: "RTCM Recommended Standards for Differential GNSS Service (v.2.2)".
- [14] 3GPP TR 25.921: "Guidelines and Principles for protocol description and error handling".
- [15] 3GPP TS 25.321: "MAC protocol specification".
- [16] 3GPP TS 25.322: "RLC Protocol Specification".
- [17] 3GPP TS 24.007: "Mobile radio interface signalling layer 3" General Aspects.
- [18] 3GPP TS 25.305: "Stage 2 Functional Specification of Location Services in UTRAN".
- [19] 3GPP TS 25.133: "Requirements for Support of Radio Resource Management (FDD)".
- [20] 3GPP TS 25.123: "Requirements for Support of Radio Resource Management (TDD)".
- [21] 3GPP TS 25.101: "UE Radio Transmission and Reception (FDD)".
- [22] 3GPP TS 25.102: "UE Radio Transmission and Reception (TDD)".
- [23] 3GPP TS 23.060: "General Packet Radio Service (GPRS), Service description, Stage 2".
- [24] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".
- [25] 3GPP TS 23.122: "NAS Functions related to Mobile Station (MS) in idle mode".

- [26] 3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".
- [27] 3GPP TS 25.212: "Multiplexing and channel coding (FDD)".
- [28] 3GPP TS 25.213: "Spreading and modulation (FDD)".
- [29] 3GPP TS 25.214: "Physical layer procedures (FDD)".
- [30] 3GPP TS 25.221: "Physical channels and mapping of transport channels onto physical channels (TDD)".
- [31] 3GPP TS 25.222: "Multiplexing and channel coding (TDD)".
- [32] 3GPP TS 25.223: "Spreading and modulation (TDD)".
- [33] 3GPP TS 25.224: "Physical Layer Procedures (TDD)".
- [34] 3GPP TS 25.302: "Services provided by the physical layer".
- [35] 3GPP TS 25.306 "UE Radio Access Capabilities".
- [36] 3GPP TS 25.323: "Packet Data Convergence Protocol (PDCP) Specification".
- [37] 3GPP TS 25.324: "Broadcast/Multicast Control BMC".
- [38] 3GPP TR 25.922: "Radio resource management strategies".
- [39] 3GPP TR 25.925: "Radio interface for broadcast/multicast services".
- [40] 3GPP TS 33.102: "Security Architecture".
- [41] 3GPP TS 34.108: "Common Test Environments for User Equipment (UE) Conformance Testing".
- [42] 3GPP TS 34.123-2: "User Equipment (UE) conformance specification; Part 2: Implementation Conformance Statement (ICS) proforma specification".
- [43] 3GPP TS 04.18: "Mobile radio interface layer 3 specification, Radio Resource Control Protocol".
- [44] 3GPP TS 04.60: "General Packet Radio Service (GPRS), MS-BSS interface; RLC/MAC".
- [45] 3GPP TS 05.05: "Radio transmission and reception".
- [46] 3GPP TS 05.08: "Radio subsystem link control".
- [47] ITU-T Recommendation X.680, (12/97) "Information Technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".
- [48] ITU-T Recommendation X.681, (12/97) "Information Technology - Abstract Syntax Notation One (ASN.1): Information object specification".
- [49] ITU-T Recommendation X.691, (12/97) "Information technology - ASN.1 encoding rules - Specification of Packed Encoding Rules (PER)".
- [50] 3GPP TS 31.102: "Characteristics of the USIM Application".

### 8.1.3 RRC connection establishment

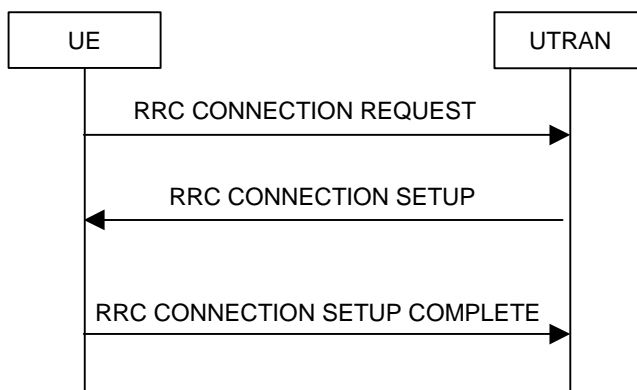


Figure 8: RRC Connection Establishment, network accepts RRC connection

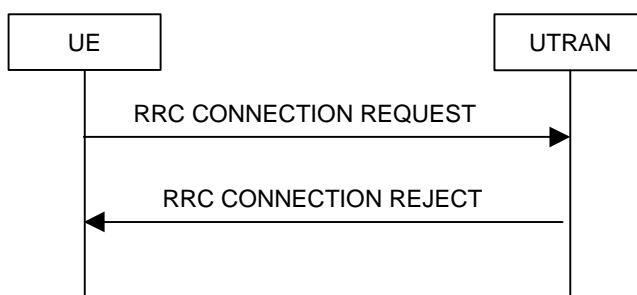


Figure 9: RRC Connection Establishment, network rejects RRC connection

#### 8.1.3.1 General

The purpose of this procedure is to establish an RRC connection.

#### 8.1.3.2 Initiation

The UE shall initiate the procedure when upper layers in the UE requests the establishment of a signalling connection and the UE is in idle mode (no RRC connection exists), as specified in subclause 8.1.8.

Upon initiation of the procedure, the UE shall:

- set the variable `PROTOCOL_ERROR_INDICATOR` to `FALSE`;
- if the USIM is present:
  - set the value of “THRESHOLD” in the variable “START\_THRESHOLD” by the 20 MSBs of the value stored in the USIM [50] for the maximum value of START for each CN Domain;
  - if the “START” stored in the USIM [50] for any CN domain is greater than the value “THRESHOLD” of the variable START\_THRESHOLD then delete the ciphering and integrity keys that are stored in the USIM;
  - delete the ciphering and integrity keys that are stored in the USIM;
  - inform the deletion of keys to upper layers;
- set the IE "Initial UE identity" in the variable `INITIAL_UE_IDENTITY` according to subclause 8.5.1;
- set the contents of the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;
- set CFN in relation to SFN of current cell according to subclause 8.5.15;

~~—delete the ciphering and integrity protection key in the USIM if the START for any CN domain is greater than the value "THRESHOLD" of the variable START\_THRESHOLD. The deletion of the keys shall be informed to upper layers.~~

- perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH;
- submit the RRC CONNECTION REQUEST message for transmission on the uplink CCCH;
- set counter V300 to 1; and
- start timer T300 when the MAC layer indicates success or failure to transmit the message;
- select a Secondary CCPCH according to [4];
- start receiving all FACH transport channels mapped on the selected Secondary CCPCH.

### 8.1.3.3 RRC CONNECTION REQUEST message contents to set

The UE shall, in the transmitted RRC CONNECTION REQUEST message:

- set the IE "Establishment cause" to the value of the variable ESTABLISHMENT\_CAUSE;
- set the IE "Initial UE identity" to the value of the variable INITIAL\_UE\_IDENTITY;
- set the IE "Protocol error indicator" to the value of the variable PROTOCOL\_ERROR\_INDICATOR;
- include a measurement report in the IE "Measured results on RACH", as specified in the IE "Intra-frequency reporting quantity for RACH reporting" and the IE "Maximum number of reported cells on RACH" in System Information Block type 11.

### 8.1.3.4 Reception of an RRC CONNECTION REQUEST message by the UTRAN

Upon receiving an RRC CONNECTION REQUEST message, UTRAN should either:

- submit an RRC CONNECTION SETUP message to the lower layers for transmission on the downlink CCCH; or
- submit an RRC CONNECTION REJECT message on the downlink CCCH. In the RRC CONNECTION REJECT message, the UTRAN may direct the UE to another UTRA carrier or to another system. After the RRC CONNECTION REJECT message has been sent, all context information for the UE may be deleted in UTRAN.

### 8.1.3.5 Cell re-selection or T300 timeout

- if the UE has not yet received an RRC CONNECTION SETUP message with the value of the IE "Initial UE identity" equal to the value of the variable INITIAL\_UE\_IDENTITY; and
- if cell re-selection or expiry of timer T300 occurs;

the UE shall:

- check the value of V300; and
  - if V300 is equal to or smaller than N300:
    - if cell re-selection occurred:
      - set CFN in relation to SFN of current cell according to subclause 8.5.15;
      - set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;
      - perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13; and
      - apply the given Access Service Class when accessing the RACH;
      - submit a new RRC CONNECTION REQUEST message to lower layers for transmission on the uplink CCCH;

- increment counter V300;
- restart timer T300 when the MAC layer indicates success or failure to transmit the message;
- if V300 is greater than N300:
  - enter idle mode.
  - consider the procedure to be unsuccessful;
  - Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2;
- ~~The the~~ procedure ends.

### 8.1.3.6 Reception of an RRC CONNECTION SETUP message by the UE

The UE shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION SETUP message with the value of the variable INITIAL\_UE\_IDENTITY.

If the values are different, the UE shall:

- ignore the rest of the message;

If the values are identical, the UE shall:

- stop timer T300, and act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following:
  - if the UE will be in the CELL\_FACH state at the conclusion of this procedure:
    - if the IE "Frequency info" is included:
      - select a suitable UTRA cell according to [4] on that frequency;
      - select PRACH according to subclause 8.6.6.2;
      - select Secondary CCPCH according to subclause 8.6.6.5;
- enter a state according to subclause 8.6.3.3;
- submit an RRC CONNECTION SETUP COMPLETE message to the lower layers on the uplink DCCH after successful state transition per subclause 8.6.3.3, with the contents set as specified below:
  - set the IE "RRC transaction identifier" to
    - the value of "RRC transaction identifier" in the entry for the RRC CONNECTION SETUP message in the table "Accepted transactions" in the variable TRANSACTIONS; and
    - clear that entry.

~~- if the USIM is present then:~~

~~— if the START value stored in the USIM [50] for any CN domain is greater than the value "THRESHOLD" of the variable START\_THRESHOLD then:~~

~~— set the "START" for each CN domain in the IE "START list" in the RRC CONNECTION SETUP COMPLETE message to zero;~~

~~— else:~~

~~- set the "START" for each CN domain in the IE "START list" in the RRC CONNECTION SETUP COMPLETE message with the corresponding START value that is stored in the USIM [50];~~

~~- then, set the START value stored in the USIM [50] for any CN domain to the value "THRESHOLD" of the variable START\_THRESHOLD;~~

- if the USIM is not present:
  - set the "START" for each CN domain in the IE "START list" in the RRC CONNECTION SETUP message to zero;
- ~~calculate START values for each CN domain according to subclause 8.5.9 and include the result in the IE "START list";~~
- if the IE "UE radio access FDD capability update requirement" included in the RRC CONNECTION SETUP message has the value TRUE:
  - include its UTRAN-specific FDD capabilities and its UTRAN –specific capabilities common to FDD and TDD in the IE "UE radio access capability";
- if the IE "UE radio access TDD capability update requirement" included in the RRC CONNECTION SETUP message has the value TRUE:
  - include its UTRAN-specific TDD capabilities and its UTRAN –specific capabilities common to FDD and TDD in the IE "UE radio access capability";
- if the IE "System specific capability update requirement list" is present in the RRC CONNECTION SETUP message:
  - include its inter-RAT capabilities for the requested systems in the IE "UE system specific capability".

When of the RRC CONNECTION SETUP COMPLETE message has been submitted to lower layers for transmission the UE shall:

- if the UE has entered CELL\_FACH state:
  - start timer T305 using its initial value if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;
- update its variable UE\_CAPABILITY\_TRANSFERRED which UE capabilities it has transmitted to the UTRAN;
- if the IE "Transport format combination subset" was not included in the RRC CONNECTION SETUP message:
  - set the IE "Current TFC subset" in the variable TFS\_SUBSET to "Full transport format combination set";
- set the "Status" in the variable CIPHERING\_STATUS to "Not started";
- set the "Reconfiguration" in the variable CIPHERING\_STATUS to FALSE;
- set the "Status" in the variable INTEGRITY\_PROTECTION\_INFO to "Not started";
- set the "Historical status" in the variable INTEGRITY\_PROTECTION\_INFO to "Never been active";
- set the "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to FALSE;
- set the variable CELL\_UPDATE\_STARTED to FALSE;
- set the variable ORDERED\_RECONFIGURATION to FALSE;
- set the variable FAILURE\_INDICATOR to FALSE;
- set the variable INCOMPATIBLE\_SECURITY\_RECONFIGURATION to FALSE;
- set the variable INVALID\_CONFIGURATION to FALSE;
- set the variable PROTOCOL\_ERROR\_INDICATOR to FALSE;
- set the variable PROTOCOL\_ERROR\_REJECT to FALSE;
- set the variable TGSN\_REPORTED to FALSE;
- set the variable UNSUPPORTED\_CONFIGURATION to FALSE;



- clear all optional IEs in all variables, except those optional IEs that are set in this procedure;
- consider the procedure to be successful;

And the procedure ends.

### 8.1.3.7 Physical channel failure or cell re-selection

- If the UE failed to establish, per subclause 8.5.4, the physical channel(s) indicated in the RRC CONNECTION SETUP message; or
- if the UE performs cell re-selection; or
- if the UE will be in the CELL\_FACH state at the conclusion of this procedure; and
  - if the received RRC CONNECTION SETUP message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCCH info" (for TDD), and the UE selected another cell than indicated by this IE; or
  - if the contents of the variable C\_RNTI is empty
- after having received an RRC CONNECTION SETUP message with the value of the IE "Initial UE identity" equal to the value of the variable INITIAL\_UE\_IDENTITY; and
- before the RRC CONNECTION SETUP COMPLETE message is delivered to lower layers for transmission:

the UE shall:

- clear the entry for the RRC CONNECTION SETUP message in the table "Accepted transactions" in the variable TRANSACTIONS;
- check the value of V300, and:
  - if V300 is equal to or smaller than N300:
    - set CFN in relation to SFN of current cell according to subclause 8.5.15;
    - set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;
    - perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH;
    - submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH;
    - increment counter V300; and
    - restart timer T300 when the MAC layer indicates success or failure in transmitting the message;
  - if V300 is greater than N300:
    - enter idle mode;
    - perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;
    - consider the procedure to be successful;
- ~~The~~ procedure ends.

### 8.1.3.8 Invalid RRC CONNECTION SETUP message, unsupported configuration or invalid configuration

If the UE receives an RRC CONNECTION SETUP message which contains an IE "Initial UE identity" with a value which is identical to the value of the variable INITIAL\_UE\_IDENTITY, but the RRC CONNECTION SETUP message contains a protocol error causing the variable PROTOCOL\_ERROR\_REJECT to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling as follows. The UE shall:

- clear the entry for the RRC CONNECTION SETUP message in the table "Rejected transactions" in the variable TRANSACTIONS and proceed as below;

If the UE receives an RRC CONNECTION SETUP message which contains an IE "Initial UE identity" with a value which is identical to the value of the variable INITIAL\_UE\_IDENTITY; and

- the RRC CONNECTION SETUP message contained a configuration the UE does not support; and/or
- the variable UNSUPPORTED\_CONFIGURATION becomes set to TRUE due to the received RRC CONNECTION SETUP message; and/or
- the variable INVALID\_CONFIGURATION becomes set to TRUE due to the received RRC CONNECTION SETUP message;

the UE shall:

- clear the entry for the RRC CONNECTION SETUP message in the table "Accepted transactions" in the variable TRANSACTIONS and proceed as below;
- if V300 is equal to or smaller than N300:
  - set the variable PROTOCOL\_ERROR\_INDICATOR to TRUE;
  - set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;
  - perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13; and
  - apply the given Access Service Class when accessing the RACH;
  - submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH;
  - increment counter V300; and
  - restart timer T300 when the MAC layer indicates success or failure in transmitting the message;
- if V300 is greater than N300:
  - enter idle mode;
  - perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;
  - consider the procedure to be successful;
  - ~~The~~ procedure ends.

### 8.1.3.9 Reception of an RRC CONNECTION REJECT message by the UE

When the UE receives an RRC CONNECTION REJECT message on the downlink CCCH, it shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION REJECT message with the value of the variable INITIAL\_UE\_IDENTITY:

If the values are different, the UE shall ignore the rest of the message;

If the values are identical, the UE shall stop timer T300 and:

- if the IE "wait time"  $\neq 0$ , and
- if the IE "frequency info" is present and:
  - if V300 is equal to or smaller than N300:
    - initiate cell selection on the designated UTRA carrier;
    - after having selected and camped on a cell:
      - set CFN in relation to SFN of current cell according to subclause 8.5.15;

- set the contents of the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;
- perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH;
- transmit an RRC CONNECTION REQUEST message on the uplink CCCH;
- reset counter V300;
- start timer T300 when the MAC layer indicates success or failure in transmitting the message;
- disable cell reselection to original carrier until the time stated in the IE "wait time" has elapsed;
- if a cell selection on the designated carrier fails:
  - wait for the time stated in the IE "wait time";
  - set CFN in relation to SFN of current cell according to subclause 8.5.15;
  - set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;
  - perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH;
  - then submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH of the original serving cell;
  - increment counter V300;
  - restart timer T300 when the MAC layer indicates success or failure to transmit the message;
- if V300 is greater than N300:
  - enter idle mode;
  - perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;
  - consider the procedure to be successful;
  - ~~The~~ procedure ends.
- if the IE "inter-RAT info" is present and:
  - if V300 is equal to or smaller than N300:
    - perform cell selection in the designated system;
    - delay cell reselection to the original system until the time stated in the IE " wait time" has elapsed.
  - if cell selection in the designated system fails:
    - wait at least the time stated in the IE "wait time";
    - set CFN in relation to SFN of current cell according to subclause 8.5.15;
    - set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.2.
    - perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH;
    - then submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH;
    - increment counter V300;
    - restart timer T300 when the MAC layer indicates success or failure to transmit the message;
- if V300 is greater than N300:

- enter idle mode;
  - perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;
  - consider the procedure to be successful;
  - ~~The~~the procedure ends.
- If neither the IEs "frequency info" nor "inter-RAT info" are present and:
- if V300 is equal to or smaller than N300:
    - wait at least the time stated in the IE "wait time";
    - set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.2;
    - perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH;
    - submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH;
    - increment counter V300;
    - restart timer T300 when the MAC layer indicates success or failure to transmit the message;
  - if V300 is greater than N300:
    - enter idle mode;
    - perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;
    - consider the procedure to be successful;
    - ~~The~~the procedure ends.
- if the IE "wait time" = 0:
- enter idle mode;
  - perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;
  - consider the procedure to be successful;
  - ~~The~~the procedure ends.

#### 8.1.3.10 Invalid RRC CONNECTION REJECT message

If the UE receives an RRC CONNECTION REJECT message which contains an IE "Initial UE identity" with a value which is identical to the value of the IE "Initial UE identity" in the most recent RRC CONNECTION REQUEST message sent by the UE; but the RRC CONNECTION REJECT message contains a protocol error causing the variable PROTOCOL\_ERROR\_REJECT to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling as follows:

The UE shall:

- if the IE "wait time" is  $\leq 0$ , and:
  - if V300 is equal to or smaller than N300:
    - wait for the time stated in the IE "wait time";
    - set the variable PROTOCOL\_ERROR\_INDICATOR to TRUE;
    - set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;

- perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH;
- submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH;
- increment counter V300;
- restart timer T300 when the MAC layer indicates success or failure to transmit the message;
- if V300 is greater than N300:
  - enter idle mode;
  - perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;
  - consider the procedure to be successful;
  - The procedure ends.
- if the IE "wait time" is = 0:
  - enter idle mode;
  - perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;
  - consider the procedure to be successful;
  - ~~The~~ procedure ends.

### 8.1.4 RRC connection release

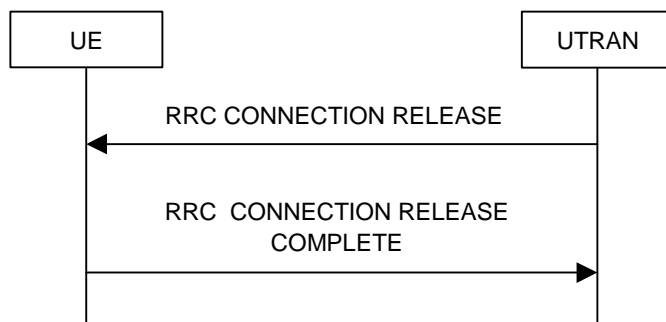


Figure 10: RRC Connection Release procedure on the DCCH



Figure 11: RRC Connection Release procedure on the CCCH

#### 8.1.4.1 General

The purpose of this procedure is to release the RRC connection including and all radio bearers between the UE and the UTRAN. By doing so, all established signalling connections will be released.

### 8.1.4.2 Initiation

When the UE is in state CELL\_DCH or CELL\_FACH, the UTRAN may at anytime initiate an RRC connection release by transmitting an RRC CONNECTION RELEASE message using UM RLC.

When UTRAN transmits an RRC CONNECTION RELEASE message in response to a CELL UPDATE (subclause 8.3.1) or URA UPDATE (subclause 8.3.2) message from the UE, UTRAN should use the downlink CCCH to transmit the message. In all other cases the downlink DCCH should be used.

UTRAN may transmit several RRC CONNECTION RELEASE messages to increase the probability of proper reception of the message by the UE. In such a case, the RRC SN for these repeated messages shall be the same. This shall also apply to the RRC CONNECTION RELEASE COMPLETE message. The number of repeated messages and the interval between the messages is a network option.

### 8.1.4.3 Reception of an RRC CONNECTION RELEASE message by the UE

The UE shall receive and act on an RRC CONNECTION RELEASE message in states CELL\_DCH and CELL\_FACH. Furthermore this procedure can interrupt any ongoing procedures with the UE in the above listed states.

When the UE receives the first RRC CONNECTION RELEASE message, it shall:

- if the USIM is present, and:
  - if the "START" stored in the USIM [50] for a CN domain is greater than the value "THRESHOLD" of the variable START\_THRESHOLD then:
    - delete the ciphering and integrity keys that are stored in the USIM for that CN domain;
    - inform the deletion of these keys to upper layers;
- in state CELL\_DCH:
  - initialise the counter V308 to zero;
  - set the IE "RRC transaction identifier" in the RRC CONNECTION RELEASE COMPLETE message to the value of "RRC transaction identifier" in the entry for the RRC CONNECTION RELEASE message in the table "Accepted transactions" in the variable TRANSACTIONS; and
  - clear that entry.
  - submit an RRC CONNECTION RELEASE COMPLETE message to the lower layers for transmission using UM RLC on the DCCH to the UTRAN;
  - if the IE "Rplmn information" is present:
    - the UE may:
      - store the IE on the ME together with the PLMN id for which it applies;
    - the UE may then:
      - utilise this information, typically indicating where a number of BCCH frequency ranges of a RAT may be expected to be found, during subsequent Rplmn selections of the indicated PLMN;
  - start timer T308 when the RRC CONNECTION RELEASE COMPLETE message is sent on the radio interface.
- in state CELL\_FACH:
  - if the RRC CONNECTION RELEASE message was received on the DCCH:
    - set the IE "RRC transaction identifier" in the RRC CONNECTION RELEASE COMPLETE message to the value of "RRC transaction identifier" in the entry for the RRC CONNECTION RELEASE message in the table "Accepted transactions" in the variable TRANSACTIONS; and
    - clear that entry;

- submit an RRC CONNECTION RELEASE COMPLETE message to the lower layers for transmission using AM RLC on the DCCH to the UTRAN.
- when the successful transmission of the RRC CONNECTION RELEASE COMPLETE message has been confirmed by the lower layers:
  - release all its radio resources; and
  - indicate the release of the established signalling connections (as stored in the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS) and established radio access bearers (as stored in the variable ESTABLISHED\_RABS) to upper layers; and
  - clear the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS;
  - clear the variable ESTABLISHED\_RABS;
  - pass the value of the IE "Release cause" received in the RRC CONNECTION RELEASE message to upper layers;
  - enter idle mode;
  - perform the actions specified in subclause 8.5.2 when entering idle mode;
- ~~And~~ and the procedure ends.
- if the RRC CONNECTION RELEASE message was received on the CCCH:
  - release all its radio resources;
  - indicate the release of the established signalling connections (as stored in the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS) and established radio access bearers (as stored in the variable ESTABLISHED\_RABS) to the upper layers;
  - clear the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS;
  - clear the variable ESTABLISHED\_RABS;
  - pass the value of the IE "Release cause" received in the RRC CONNECTION RELEASE message to upper layers;
  - enter idle mode;
  - perform the actions specified in subclause 8.5.2 when entering idle mode;
- ~~And~~ and the procedure ends.

#### 8.1.4.4 Invalid RRC CONNECTION RELEASE message

If the RRC CONNECTION RELEASE message contains a protocol error causing the variable PROTOCOL\_ERROR\_REJECT to be set to TRUE according to clause 9, and if the "protocol error cause" in PROTOCOL\_ERROR\_INFORMATION is set to any cause value except "ASN.1 violation or encoding error", the UE shall perform procedure specific error handling as follows:

The UE shall:

- ignore any IE(s) causing the error but treat the rest of the RRC CONNECTION RELEASE message as normal according to subclause 8.1.4.3, with an addition of the following actions;
- if the RRC CONNECTION RELEASE message was received on the DCCH:
  - set the IE "RRC transaction identifier" in the RRC CONNECTION RELEASE COMPLETE message to the value of "RRC transaction identifier" in the entry for the RRC CONNECTION RELEASE message in the table "Rejected transactions" in the variable TRANSACTIONS; and
  - clear that entry.
  - include the IE "Error indication" in the RRC CONNECTION RELEASE COMPLETE message with:

- the IE "Failure cause" set to the cause value "Protocol error" and
- the IE "Protocol error information" set to the value of the variable PROTOCOL\_ERROR\_INFORMATION;

#### 8.1.4.5 Cell re-selection or radio link failure

If the UE performs cell re-selection or the radio link failure criteria in subclause 8.5.6 is met at any time during the RRC connection release procedure and the UE has not yet entered idle mode, the UE shall perform a cell update procedure according to subclause 8.3.1.

#### 8.1.4.6 Expiry of timer T308, unacknowledged mode transmission

When in state CELL\_DCH and the timer T308 expires, the UE shall:

- increment V308 by one;
- if V308 is equal to or smaller than N308:
  - retransmit the RRC CONNECTION RELEASE COMPLETE message, without incrementing "Uplink RRC Message sequence number" for RB#1 in the variable INTEGRITY\_PROTECTION\_INFO;
- if V308 is greater than N308:
  - release all its radio resources;
  - indicate the release of the established signalling connections (as stored in the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS) and established radio access bearers (as stored in the variable ESTABLISHED\_RABS) to upper layers;
  - clear the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS;
  - clear the variable ESTABLISHED\_RABS;
  - enter idle mode;
  - perform the actions specified in subclause 8.5.2 when entering idle mode;
  - ~~And~~ and the procedure ends.

#### 8.1.4.7 Void

#### 8.1.4.8 Reception of an RRC CONNECTION RELEASE COMPLETE message by UTRAN

When UTRAN receives an RRC CONNECTION RELEASE COMPLETE message from the UE, it should:

- release all UE dedicated resources and the procedure ends on the UTRAN side.

#### 8.1.4.9 Unsuccessful transmission of the RRC CONNECTION RELEASE COMPLETE message, acknowledged mode transmission

When acknowledged mode was used and RLC does not succeed in transmitting the RRC CONNECTION RELEASE COMPLETE message, the UE shall:

- release all its radio resources;
- indicate the release of the established signalling connections (as stored in the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS) and established radio access bearers (as stored in the variable ESTABLISHED\_RABS) to upper layers;



- clear the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS;
- clear the variable ESTABLISHED\_RABS;
- enter idle mode;
- perform the actions specified in subclause 8.5.2 when entering idle mode;
- ~~And~~ and the procedure ends.

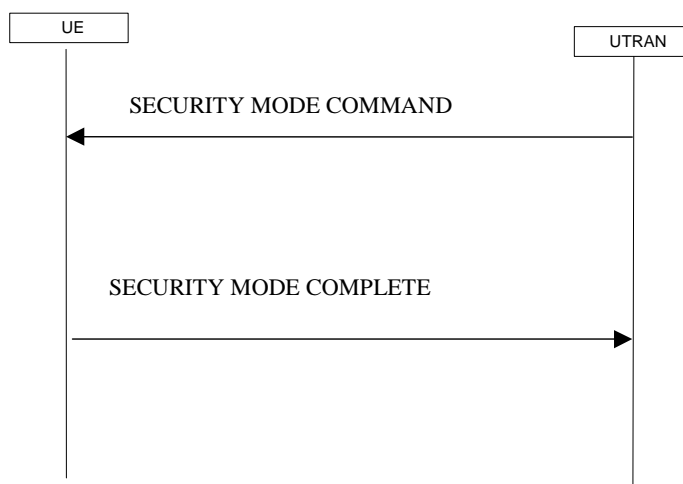
#### 8.1.4.10 Detection of loss of dedicated physical channel by UTRAN in CELL\_DCH state

If the release is performed from the state CELL\_DCH, and UTRAN detects loss of the dedicated physical channel according to subclause 8.5.6, UTRAN may release all UE dedicated resources, even if no RRC CONNECTION RELEASE COMPLETE message has been received.

#### 8.1.4.11 Failure to receive RRC CONNECTION RELEASE COMPLETE message by UTRAN

If UTRAN does not receive any RRC CONNECTION RELEASE COMPLETE message, it should release all UE dedicated resources.

### 8.1.12 Security mode control



**Figure 18: Security mode control procedure**

#### 8.1.12.1 General

The purpose of this procedure is to trigger the stop or start of ciphering or to command the restart of the ciphering with a new ciphering configuration, for all radio bearers and for all signalling radio bearers.

It is also used to start integrity protection or to modify the integrity protection configuration for uplink and downlink all signalling radio bearers.

#### 8.1.12.2 Initiation

##### 8.1.12.2.1 Ciphering configuration change

To stop or start/restart ciphering, UTRAN sends a SECURITY MODE COMMAND message on the downlink DCCH in AM RLC using the most recent ciphering configuration. If no such ciphering configuration exists then the SECURITY MODE COMMAND is not ciphered.

Prior to sending the SECURITY MODE COMMAND, for the CN domain indicated in the IE "CN domain identity" in the SECURITY MODE COMMAND, UTRAN should:

- if this is the first SECURITY MODE COMMAND sent for this RRC connection:
  - use the value "START" in the most recently received IE "START list" that belongs to the CN domain as indicated in the IE "CN domain identity" to initialise all hyper frame numbers for all the signalling radio bearers;
  - setting the 20 most significant bits of the hyper frame numbers for all ~~radio bearers and/or~~ signalling radio bearers to the START for that CN domain;
  - setting the remaining bits of the hyper frame numbers equal to zero.
- suspend all radio bearers using RLC-AM and RLC-UM;
- suspend all signalling radio bearers using RLC-AM and RLC-UM, except the signalling radio bearer used to send the SECURITY MODE COMMAND message on the downlink DCCH in RLC-AM;
- set, for the signalling radio bearer used to send the SECURITY MODE COMMAND, the "RLC send sequence number" in IE "Radio bearer downlink ciphering activation time info" in the IE "Ciphering mode info", at which time the new ciphering configuration shall be applied;
- include "Ciphering activation time for DPCH" in IE "Ciphering mode info" when a DPCH exists and is used for radio bearers using transparent mode RLC;
- set, for each suspended radio bearer and signalling radio bearer that has no pending ciphering activation time set by a previous security mode control procedure, a "RLC send sequence number" in IE "Radio bearer downlink ciphering activation time info" in the IE "Ciphering mode info", at which time the new ciphering configuration shall be applied;
- set, for each suspended radio bearer and signalling radio bearer that has a pending ciphering activation time set by a previous security mode control procedure, the same "RLC send sequence number" in IE "Radio bearer downlink ciphering activation time info" in the IE "Ciphering mode info" from that previous security mode control procedure, at which time the new latest ciphering configuration shall be applied-;

While suspended, radio bearers and signalling radio bearers shall not deliver RLC PDUs with sequence number greater than or equal to the number in IE "Radio bearer downlink ciphering activation time info".

When the successful delivery of the SECURITY MODE COMMAND has been confirmed by RLC, UTRAN shall:

- ~~for the radio bearers and signalling radio bearers, send an indication to upper layers that the new ciphering configuration has been activated when the activation time as been reached;~~
- resume all the suspended radio bearers and signalling radio bearers. The old ciphering configuration shall be applied for the transmission of RLC PDUs with RLC sequence number less than the number indicated in the IE "Radio bearer downlink ciphering activation time info", as sent to the UE. The new ciphering configuration shall be applied for the transmission of RLC PDUs with RLC sequence number greater than or equal to the number indicated in IE "Radio bearer downlink ciphering activation time info", sent to the UE.

#### 8.1.12.2.2 Integrity protection configuration change

To start or modify integrity protection, UTRAN sends a SECURITY MODE COMMAND message on the downlink DCCH in AM RLC using the new integrity protection configuration.

When the successful delivery of the SECURITY MODE COMMAND has been confirmed by RLC, UTRAN should:

- for the radio bearers and signalling radio bearers, send an indication to upper layers that the new integrity protection configuration has been activated when the activation time ~~has~~ elapsed;

### 8.1.12.3 Reception of SECURITY MODE COMMAND message by the UE

Upon reception of the SECURITY MODE COMMAND message, the UE shall perform the actions for the received information elements according to 8.6.

If the IE "Ciphering mode info" and the IE "Integrity protection mode info" are both not included in the SECURITY MODE COMMAND, the UE shall:

- set the variable INVALID\_CONFIGURATION to TRUE.

If the IE "Security capability" is the same as indicated by variable UE\_CAPABILITY\_TRANSFERRED, and the IE "GSM security capability" (if included in the SECURITY MODE COMMAND) is the same as indicated by the variable UE\_CAPABILITY\_TRANSFERRED, the UE shall:

- set the variable LATEST\_CONFIGURED\_CN\_DOMAIN equal to the IE "CN domain identity";
- if prior to the reception of SECURITY MODE COMMAND, the value of the IE "Status" in the variable "CIPHERING\_STATUS" is "Not started" and and the value of the IE "Historical status" in the variable "INTEGRITY\_PROTECTION\_INFO" is "Never been active" then:
  - use the value "START" in the most recently sent IE "START list" that belongs to the CN domain as indicated in the IE "CN domain identity" to initialise all hyper frame numbers for all the signalling radio bearers;
    - setting the 20 most significant bits of the hyper frame numbers for all radio bearers and/or signalling radio bearers to the START for that CN domain;
    - setting the remaining bits of the hyper frame numbers equal to zero.
- suspend all radio bearers and signalling radio bearers (except the signalling radio bearer used to receive the SECURITY MODE COMMAND message on the downlink DCCH in RLC-AM) using RLC-AM or RLC-UM that belong to the CN domain indicated in the IE "CN domain identity", with RLC sequence number greater than or equal to the number in IE "Radio bearer downlink ciphering activation time info" in the IE "Ciphering mode info";
- set the IE "RRC transaction identifier" in the SECURITY MODE COMPLETE message to the value of "RRC transaction identifier" in the entry for the SECURITY MODE ~~CONTROL\_COMMAND~~ message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- clear that entry;
- if the SECURITY MODE ~~CONTROL\_COMMAND~~ message contained the IE "Ciphering mode info":
  - include and set the IE "Radio bearer uplink ciphering activation time info" to the value of the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO, for the respective radio bearer and signalling radio bearer;
- if the SECURITY MODE ~~CONTROL\_COMMAND~~ message contained the IE "Integrity protection mode info" with the IE "Integrity protection mode command" set to "Modify":
  - include and set the IE "Integrity protection activation info" to the value of the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
- when the radio bearers and signalling radio bearers have been suspended:
  - send a SECURITY MODE COMPLETE message on the uplink DCCH in AM RLC, using the old ciphering configurations;
  - if the IE "Integrity protection mode info" was present in the SECURITY MODE COMMAND message:
    - start applying the new integrity protection configuration in the uplink for RB#2 from and including the transmitted SECURITY MODE COMPLETE message;
- when the successful delivery of the SECURITY MODE COMPLETE message has been confirmed by RLC:

- resume data transmission on any suspended radio bearer and signalling radio bearer mapped on RLC-AM or RLC-UM;
- if the SECURITY MODE ~~CONTROL\_COMMAND~~ message contained the IE "Ciphering mode info":
  - set the IE "Reconfiguration" in the variable CIPHERING\_STATUS to FALSE; and
  - clear the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO;
- if the SECURITY MODE ~~CONTROL\_COMMAND~~ message contained the IE "Integrity protection mode info":
  - set the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to FALSE; and
  - clear the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
- The procedure ends. If a RLC reset or re-establishment occurs after the SECURITY MODE COMPLETE message has been confirmed by RLC, but before the activation time for the new ciphering configuration has been reached, then the activation time shall be ignored and the new ciphering configuration shall be applied immediately after the RLC reset or RLC re-establishment;
- notify upper layers upon change of the security configuration.

For radio bearers and signalling radio bearers used by the CN indicated in the IE "CN domain identity", the UE shall:

~~— if a new integrity protection key has been received or a new ciphering key has been received:~~

~~— set the variable LATEST\_CONFIGURED\_CN\_DOMAIN equal to the IE "CN domain identity";~~

- if a new integrity protection key has been received:

- in the downlink:

- use the new key;

- set the IE "Downlink RRC HFN" for all signalling radio bearers in the variable INTEGRITY\_PROTECTION\_INFO HFN component of the downlink COUNT-I to zero at when the RRC sequence number in a received RRC message on the particular signalling radio bearer reaches the value for that signalling radio bearer indicated in IE "Downlink integrity protection activation info" included in the IE "Integrity protection mode info";

in the uplink:

- use the new key;

- set the IE "Uplink RRC HFN" for all signalling radio bearers in the variable INTEGRITY\_PROTECTION\_INFO HFN component of the uplink COUNT-I to zero at when the RRC sequence number in a transmitted RRC message on the particular signalling radio bearer reaches the value for that signalling radio bearer indicated in IE "Uplink integrity protection activation info";

- if a new ciphering key is available:

- for radio bearers using RLC-TM:

- use the new key in uplink and downlink;

- set the HFN component of the COUNT-C to zero at the CFN as indicated in the IE "Ciphering activation time for DPCH" in the IE "Ciphering mode info";

- for radio bearers using RLC-AM and RLC-UM:

- in the downlink:

- use the new key;

- set the HFN component of the downlink COUNT-C to zero at the RLC sequence number indicated in IE "Radio bearer downlink ciphering activation time info" in the IE "Ciphering mode info";

- in the uplink:
- use the new key;
- set the HFN component of the uplink COUNT-C to zero at the RLC sequence number indicated in IE "Radio bearer uplink ciphering activation time info".

If the IE "Security capability" is not the same as indicated by the variable UE\_CAPABILITY\_TRANSFERRED, or the IE "GSM security capability" (if included in the SECURITY MODE COMMAND) is not the same as indicated by the variable UE\_CAPABILITY\_TRANSFERRED, or if the IE "GSM security capability" is not included in the SECURITY MODE COMMAND and is included in the variable UE\_CAPABILITY\_TRANSFERRED, the UE shall:

- release all its radio resources;
- indicate the release of the established signalling connections (as stored in the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS) and established radio access bearers (as stored in the variable ESTABLISHED\_RABS) to upper layers;
- clear the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS;
- clear the variable ESTABLISHED\_RABS;
- enter idle mode;
- perform actions when entering idle mode as specified in subclause 8.5.2;
- ~~And~~ and the procedure ends.

#### 8.1.12.4 Void

##### 8.1.12.4a Incompatible simultaneous security reconfiguration

If the variable INCOMPATIBLE\_SECURITY\_RECONFIGURATION becomes set to TRUE of the received SECURITY MODE ~~CONTROL-COMMAND~~ message, the UE shall:

- transmit a SECURITY MODE FAILURE message on the uplink DCCH using AM RLC, using the ciphering and integrity protection configurations prior to the reception of this SECURITY MODE COMMAND;
- set the IE "RRC transaction identifier" in the SECURITY MODE FAILURE message to the value of "RRC transaction identifier" in the entry for the SECURITY MODE ~~CONTROL-COMMAND~~ message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- clear that entry;
- set the IE "failure cause" to the cause value "incompatible simultaneous reconfiguration";
- when the successful delivery of the SECURITY MODE FAILURE message has been confirmed by RLC:
  - set the variable INCOMPATIBLE\_SECURITY\_RECONFIGURATION to FALSE;
  - continue with any ongoing processes and procedures as if the invalid SECURITY MODE COMMAND message has not been received;
- ~~And~~ and the procedure ends.

##### 8.1.12.4b Cell update procedure during security reconfiguration

If:

- a cell update procedure according to subclause 8.3.1 is initiated; and
- the received SECURITY MODE ~~CONTROL-COMMAND~~ message causes either,

- the IE "Reconfiguration" in the variable CIPHERING\_STATUS to be set to TRUE; and/or
- the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to be set to TRUE:

the UE shall:

- abort the ongoing integrity and/or ciphering reconfiguration;
- resume data transmission on any suspended radio bearer and signalling radio bearer mapped on RLC-AM or RLC-UM;
- transmit a SECURITY MODE FAILURE message on the uplink DCCH using AM RLC, using the ciphering and integrity protection configurations prior to the reception of this SECURITY MODE COMMAND;
- set the IE "RRC transaction identifier" in the SECURITY MODE FAILURE message to the value of "RRC transaction identifier" in the entry for the SECURITY MODE ~~CONTROL-COMMAND~~ message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- clear that entry;
- set the IE "failure cause" to the cause value "cell update occurred";
- when the successful delivery of the SECURITY MODE FAILURE message has been confirmed by RLC:
  - if the SECURITY MODE ~~CONTROL-COMMAND~~ message contained the IE "Ciphering mode info":
    - set the IE "Reconfiguration" in the variable CIPHERING\_STATUS to FALSE; and
    - clear the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO;
  - if the SECURITY MODE ~~CONTROL-COMMAND~~ message contained the IE "Integrity protection mode info":
    - set the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to FALSE; and
    - clear the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
- continue with any ongoing processes and procedures as if the invalid SECURITY MODE COMMAND message has not been received; and
- ~~The~~the procedure ends.

#### 8.1.12.4c Invalid SECURITY MODE COMMAND message configuration

If the variable INVALID\_CONFIGURATION is set to TRUE due to the received SECURITY MODE COMMAND message the UE shall:

- transmit a SECURITY MODE COMMAND FAILURE message on the DCCH using AM RLC;
- set the IE "RRC transaction identifier" in the SECURITY MODE FAILURE message to the value of "RRC transaction identifier" in the entry for the SECURITY MODE COMMAND message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- clear that entry;
- set the IE "failure cause" to the cause value "invalid configuration";
- when the successful delivery of the SECURITY MODE FAILURE message has been confirmed by RLC:
  - set the variable INVALID\_CONFIGURATION to FALSE;
- continue with any ongoing processes and procedures as if the invalid SECURITY MODE COMMAND message has not been received;
- and the procedure ends.

### 8.1.12.5 Reception of SECURITY MODE COMPLETE message by the UTRAN

UTRAN should apply integrity protection on the received SECURITY MODE COMPLETE message and all subsequent messages with the new integrity protection configuration, if changed. When UTRAN has received a SECURITY MODE COMPLETE message and the integrity protection has successfully been applied, UTRAN shall:

- for radio bearers using RLC-AM or RLC-UM:
  - use the old ciphering configuration for received RLC PDUs with RLC sequence number less than the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent by the UE;
  - use the new ciphering configuration for received RLC PDUs with RLC sequence number greater than or equal to the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent by the UE;
  - if an RLC reset or re-establishment occurs after the SECURITY MODE COMPLETE message has been received by UTRAN before the activation time for the new ciphering configuration has been reached, ignore the activation time and apply the new ciphering configuration immediately after the RLC reset or RLC re-establishment;
- for radio bearers using RLC-TM:
  - use the new ciphering configuration for the received RLC PDUs at the CFN as indicated in the IE "Ciphering activation time for DPCH" in the IE "Ciphering mode info" as included in the SECURITY MODE COMMAND;
- ~~And~~ and the procedure ends.

### 8.1.12.6 Invalid SECURITY MODE COMMAND message

If the SECURITY MODE COMMAND message contains a protocol error causing the variable PROTOCOL\_ERROR\_REJECT to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling as follows:

- transmit a SECURITY MODE FAILURE message on the uplink DCCH using AM RLC;
- set the IE "RRC transaction identifier" in the SECURITY MODE FAILURE message to the value of "RRC transaction identifier" in the entry for the SECURITY MODE ~~CONTROL~~ COMMAND message in the table "Rejected transactions" in the variable TRANSACTIONS; and
- clear that entry;
- set the IE "failure cause" to the cause value "protocol error";
- include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL\_ERROR\_INFORMATION.
- when the successful delivery of the SECURITY MODE FAILURE message has been confirmed by RLC:
  - continue with any ongoing processes and procedures as if the invalid SECURITY MODE COMMAND message has not been received;
- aAnd the procedure ends.

### 8.1.13 Signalling connection release procedure



**Figure 19: Signalling connection release procedure, normal case**

#### 8.1.13.1 General

The signalling connection release procedure is used to notify to the UE that one of its ongoing signalling connections has been released. The procedure does not initiate the release of the RRC connection.

#### 8.1.13.2 Initiation of SIGNALLING CONNECTION RELEASE by the UTRAN

To initiate the procedure, the UTRAN transmits a SIGNALLING CONNECTION RELEASE message on DCCH using AM RLC.

#### 8.1.13.3 Reception of SIGNALLING CONNECTION RELEASE by the UE

Upon reception of a SIGNALLING CONNECTION RELEASE message, the UE shall:

- indicate the release of the signalling connection and pass the value of the IE "CN domain identity" to upper layers;
- remove the signalling connection with the identity indicated by the IE "CN domain identity" from the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS;
- clear the entry for the SIGNALLING CONNECTION RELEASE message in the table "Accepted transactions" in the variable TRANSACTIONS;
- The procedure ends.

#### 8.1.13.4 Invalid SIGNALLING CONNECTION RELEASE message

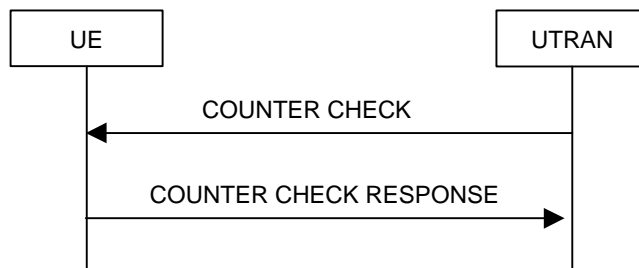
If the UE receives a SIGNALLING CONNECTION RELEASE message, which contains a protocol error causing the variable `PROTOCOL_ERROR_REJECT` to be set to `TRUE` according to clause 9, the UE shall perform procedure specific error handling as follows:

- include the IE "Identification of received message"; and
- set the IE "Received message type" to SIGNALLING CONNECTION RELEASE;
- set the IE "RRC transaction identifier" to the value of "RRC transaction identifier" in the entry for the SIGNALLING CONNECTION RELEASE message in the table "Rejected transactions" in the variable TRANSACTIONS; and
- clear that entry;
- include the IE "Protocol error information" with contents set to the value of the variable `PROTOCOL_ERROR_INFORMATION`;
- transmit an RRC STATUS message on the uplink DCCH using AM RLC



- when the RRC STATUS message has been submitted to lower layers for transmission:
- continue with any ongoing processes and procedures as if the invalid SIGNALLING CONNECTION RELEASE message has not been received.

### 8.1.15 Counter check procedure



**Figure 21: Counter check procedure**

#### 8.1.15.1 General

The counter check procedure is used by the UTRAN to perform a local authentication. The purpose of the procedure is to check that the amount of data sent in both directions (uplink and downlink) over the duration of the RRC connection is identical at the UTRAN and at the UE (to detect a possible intruder – a 'man-in-the-middle' – from operating). It should be noted that this requires that the COUNT-C values for each radio bearer are maintained even if ciphering is not used. This procedure is only applicable to radio bearers using UM or AM mode of RLC. In this version, this procedure is not applied for radio bearers using transparent mode RLC.

#### 8.1.15.2 Initiation

The UTRAN monitors the COUNT-C value associated with each radio bearer using UM or AM RLC. The procedure is triggered whenever any of these values reaches a critical checking value. The granularity of these checking values and the values themselves are defined to the UTRAN by the visited network. The UTRAN initiates the procedure by sending a COUNTER CHECK message on the downlink DCCH.

#### 8.1.15.3 Reception of a COUNTER CHECK message by the UE

When the UE receives a COUNTER CHECK message it shall compare the COUNT-C MSB values received in the IE "RB COUNT-C MSB information" in the COUNTER CHECK message to the COUNT-C MSB values of the corresponding radio bearers.

The UE shall:

- set the IE "RRC transaction identifier" in the COUNTER CHECK RESPONSE message to the value of "RRC transaction identifier" in the entry for the COUNTER CHECK message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- clear that entry.

If

- there is one or more radio bearer(s) using UM or AM RLC mode stored in the variable ESTABLISHED\_RABS, which is (are) not included in the IE "RB COUNT-C MSB information"; or
- there is one or more radio bearer(s) included in the IE "RB COUNT-C MSB information", which is (are) not stored in the variable ESTABLISHED\_RABS; or
- for any radio bearer (excluding SRBs) using UM or AM RLC mode stored in the variable ESTABLISHED\_RABS and included in the IE "RB COUNT-C MSB information" with COUNT-C MSB values different from the MSB part of the COUNT-C values in the UE

the UE shall:

- include these radio bearers in the IE "RB COUNT-C information" in the COUNTER CHECK RESPONSE message. For any RB which is included in the IE "RB COUNT-C MSB information" in the COUNTER CHECK message but not stored in the variable ESTABLISHED\_RABS in the UE, the MSB part of COUNT-C values in the COUNTER CHECK RESPONSE message shall be set identical to COUNT-C-MSB values in the COUNTER CHECK message. The LSB part shall be filled by 0s;

The UE shall:

- submit a COUNTER CHECK RESPONSE message to lower layers for transmission on the uplink DCCH using AM RLC.

When the COUNTER CHECK RESPONSE message has been submitted to lower layers for transmission the procedure ends.

#### 8.1.15.4 Reception of the COUNTER CHECK RESPONSE message by UTRAN

If the UTRAN receives a COUNTER CHECK RESPONSE message that does not contain any COUNT-C values, the procedure ends.

If the UTRAN receives a COUNTER CHECK RESPONSE message that contains one or several COUNT-C values the UTRAN may release the RRC connection.

#### 8.1.15.5 Cell re-selection

If the UE performs cell re-selection anytime during this procedure it shall, without interrupting the procedure:

- initiate the cell update procedure according to subclause 8.3.1.

#### 8.1.15.6 Invalid COUNTER CHECK message

If the UE receives a COUNTER CHECK message, which contains a protocol error causing the variable PROTOCOL\_ERROR\_REJECT to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling as follows. The UE shall:

- transmit an RRC STATUS message on the uplink DCCH using AM RLC;
- include the IE "Identification of received message"; and
- set the IE "Received message type" to COUNTER CHECK; and
- set the IE "RRC transaction identifier" to the value of "RRC transaction identifier" in the entry for the UE COUNTER CHECK message in the table "Rejected transactions" in the variable TRANSACTIONS; and
- clear that entry;
- include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL\_ERROR\_INFORMATION;
- when the RRC STATUS message has been submitted to lower layers for transmission:
  - continue with any ongoing processes and procedures as if the invalid COUNTER CHECK message has not been received.

## 8.2 Radio Bearer control procedures

### 8.2.1 Radio bearer establishment

See subclause 8.2.2 Reconfiguration procedures.

### 8.2.2 Reconfiguration procedures

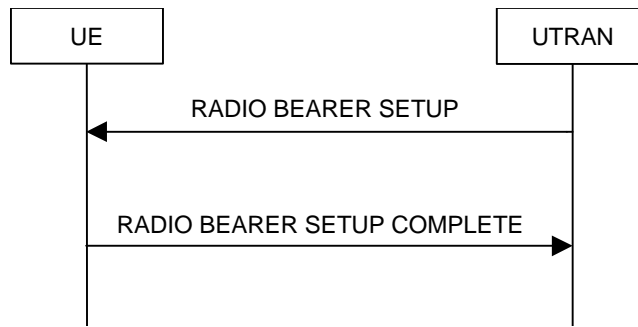


Figure 22: Radio Bearer Establishment, normal case

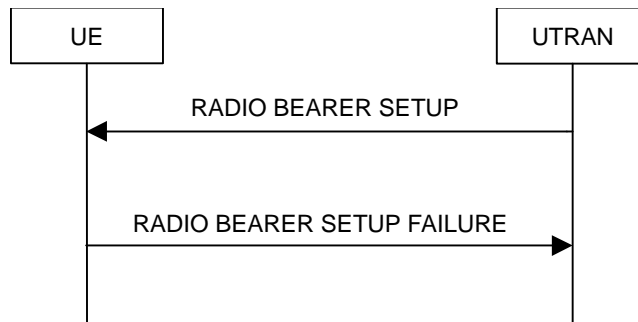


Figure 23: Radio Bearer Establishment, failure case

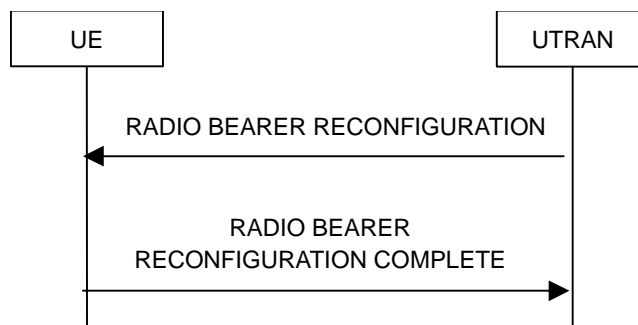


Figure 24: Radio bearer reconfiguration, normal flow

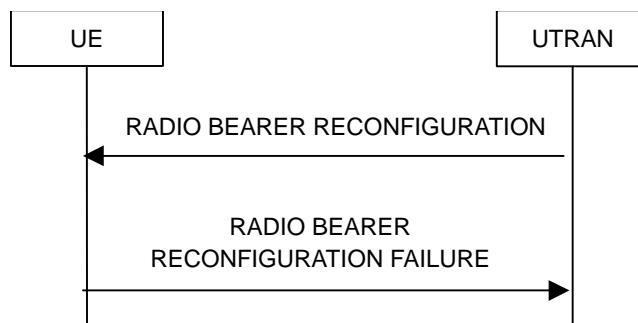


Figure 25: Radio bearer reconfiguration, failure case

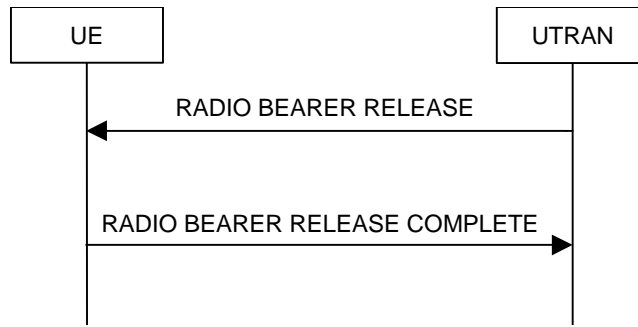


Figure 26: Radio Bearer Release, normal case

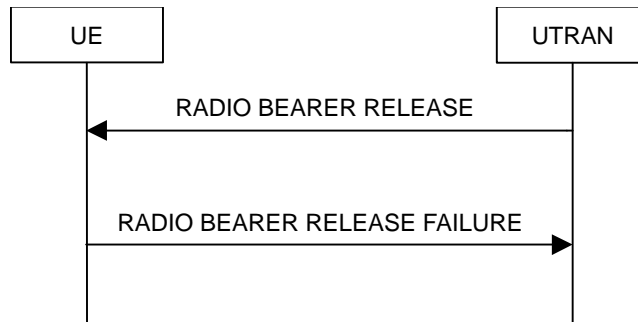


Figure 27: Radio Bearer Release, failure case

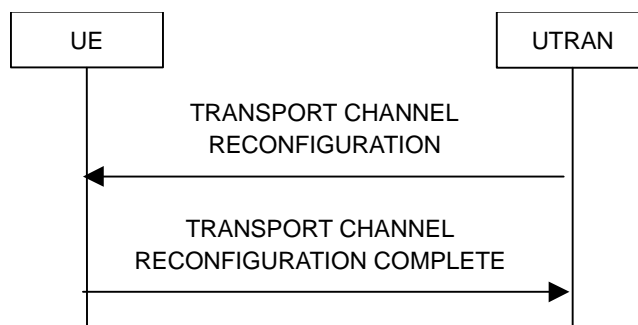


Figure 28: Transport channel reconfiguration, normal flow

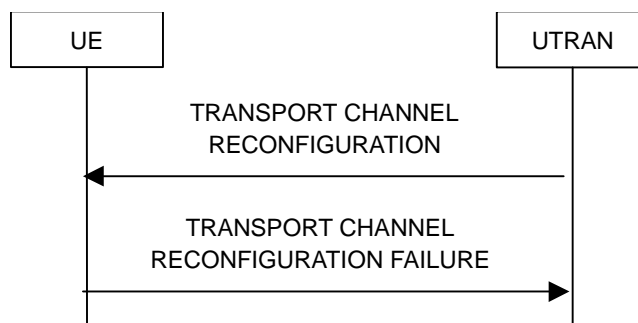


Figure 29: Transport channel reconfiguration, failure case

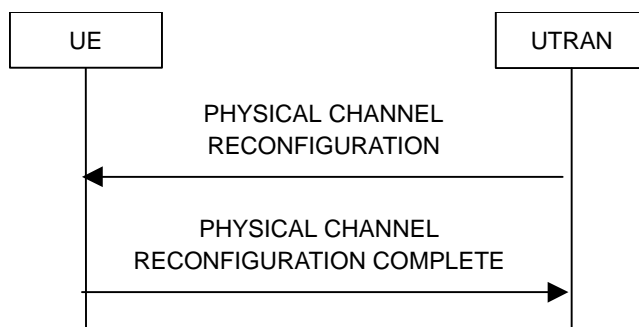


Figure 30: Physical channel reconfiguration, normal flow

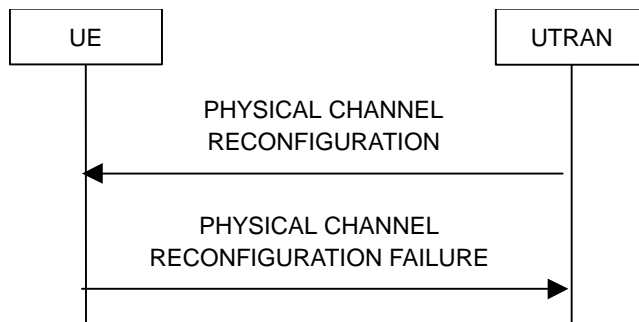


Figure 31: Physical channel reconfiguration, failure case

### 8.2.2.1 General

Reconfiguration procedures include the following procedures:

- the radio bearer establishment procedure;
- radio bearer reconfiguration procedure;
- the radio bearer release procedure;
- the transport channel reconfiguration procedure; and
- the physical channel reconfiguration procedure.

The radio bearer establishment procedure is used to establish new radio bearer(s).

The radio bearer reconfiguration procedure is used to reconfigure parameters for a radio bearer.

The radio bearer release procedure is used to release radio bearer(s).

The transport channel reconfiguration procedure is used to reconfigure transport channel parameters.

The physical channel reconfiguration procedure is used to establish, reconfigure and release physical channels.

While performing any of the above procedures, these procedures may perform a hard handover - see subclause 8.3.5.

### 8.2.2.2 Initiation

To initiate any one of the reconfiguration procedures, UTRAN should:

- configure new radio links in any new physical channel configuration;
- start transmission and reception on the new radio links;
- for a radio bearer establishment procedure:
  - transmit a RADIO BEARER SETUP message on the downlink DCCH using AM or UM RLC;

- for a radio bearer reconfiguration procedure:
  - transmit a RADIO BEARER RECONFIGURATION message on the downlink DCCH using AM or UM RLC;
- for a radio bearer release procedure:
  - transmit a RADIO BEARER RELEASE message on the downlink DCCH using AM or UM RLC;
- for a transport channel reconfiguration procedure:
  - transmit a TRANSPORT CHANNEL RECONFIGURATION message on the downlink DCCH using AM or UM RLC;
- for a physical channel reconfiguration procedure:
  - transmit a PHYSICAL CHANNEL RECONFIGURATION message on the downlink DCCH using AM or UM RLC;
- if the reconfiguration procedure is simultaneous with SRNS relocation procedure, and ciphering and/or integrity protection are activated:
  - transmit new ciphering and/or integrity protection information to be used after reconfiguration.
- if transport channels are added, reconfigured or deleted in uplink and/or downlink:
  - set TFCS according to the new transport channel(s).
- if transport channels are added or deleted in uplink and/or downlink, and RB Mapping Info applicable to the new configuration has not been previously provided to the UE, the UTRAN should:
  - send the RB Mapping Info for the new configuration.

In the Radio Bearer Reconfiguration procedure UTRAN may indicate that uplink transmission shall be stopped or continued on certain radio bearers. Uplink transmission on a signalling radio bearer used by the RRC signalling (RB1 or RB2) should not be stopped.

If the IE "Activation Time" is included, UTRAN should set it to a value taking the UE performance requirements into account.

UTRAN should take the UE capabilities into account when setting the new configuration.

If the message is used to initiate a transition from CELL\_DCH to CELL\_FACH state, the UTRAN may assign a common channel configuration of a given cell and C-RNTI to be used in that cell to the UE.

### 8.2.2.3 Reception of RADIO BEARER SETUP or RADIO BEARER RECONFIGURATION or RADIO BEARER RELEASE or TRANSPORT CHANNEL RECONFIGURATION or PHYSICAL CHANNEL RECONFIGURATION message by the UE

The UE shall be able to receive any of the following messages:

- RADIO BEARER SETUP message; or
- RADIO BEARER RECONFIGURATION message; or
- RADIO BEARER RELEASE message; or
- TRANSPORT CHANNEL RECONFIGURATION message; or
- PHYSICAL CHANNEL RECONFIGURATION message

and perform a hard handover, even if no prior UE measurements have been performed on the target cell and/or frequency.

If the UE receives:

- a RADIO BEARER SETUP message; or
- a RADIO BEARER RECONFIGURATION message; or
- a RADIO BEARER RELEASE message; or
- a TRANSPORT CHANNEL RECONFIGURATION message; or
- a PHYSICAL CHANNEL RECONFIGURATION message

it shall:

- set the variable ORDERED\_RECONFIGURATION to TRUE;
- may first release the current physical channel configuration and
- then establish a new physical channel configuration and act upon all received information elements as specified in subclause 8.6, unless specified in the following:
  - in FDD, if the IE "PDSCH code mapping" is included but the IE "PDSCH with SHO DCH Info" is not included and if the DCH has only one link in its active set:
    - act upon the IE "PDSCH code mapping" as specified in subclause 8.6 and;
    - infer that the PDSCH will be transmitted from the cell from which the downlink DPCH is transmitted;
- enter a state according to subclause 8.6.3.3.

If the UE remains in CELL\_DCH state after state transition, the UE shall:

- if the IE "UL DPCH Info" is absent, not change its current UL Physical channel configuration;
- if the IE "DL DPCH Info for each RL" is absent, not change its current DL Physical channel configuration.

If after state transition the UE enters CELL\_FACH state, the UE shall, after the state transition:

- if the IE "Frequency info" is included in the received reconfiguration message:
  - select a suitable UTRA cell according to [4] on that frequency;
- if the IE "Frequency info" is not included in the received reconfiguration message:
  - select a suitable UTRA cell according to [4];
- if the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCCH info" (for TDD), and the UE selects another cell than indicated by this IE:
  - initiate a cell update procedure according to subclause 8.3.1 using the cause "Cell reselection";
  - when the cell update procedure completed successfully:
    - if the UE is in CELL\_PCH or URA\_PCH state:
      - initiate a cell update procedure according to subclause 8.3.1 using the cause "Uplink data transmission";
      - proceed as below;
- start timer T305 using its initial value if timer T305 is not running and if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;
- select PRACH according to subclause 8.6.6.2;
- select Secondary CCPCCH according to subclause 8.6.6.5;
- use the transport format set given in system information;

- if the IE "UTRAN DRX cycle length coefficient" is included in the same message:
- ignore that IE and stop using DRX;
- if the contents of the variable C\_RNTI is empty:
  - perform a cell update procedure according to subclause 8.3.1 using the cause "Cell reselection";
  - when the cell update procedure completed successfully:
    - if the UE is in CELL\_PCH or URA\_PCH state:
      - initiate a cell update procedure according to subclause 8.3.1 using the cause "Uplink data transmission";
      - proceed as below;

The UE shall transmit a response message as specified in subclause 8.2.2.4, setting the information elements as specified below. The UE shall:

- if the received reconfiguration message included the IE "Downlink counter synchronisation info":
  - calculate the START value according to subclause 8.5.9;
  - include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info";
- if the received reconfiguration message did not include the IE "Downlink counter synchronisation info":
  - if the variable START\_VALUE\_TO\_TRANSMIT is set:
    - include and set the IE "START" to the value of that variable;
  - if the variable START\_VALUE\_TO\_TRANSMIT is not set and the IE "New U-RNTI" is included:
    - calculate the START value according to subclause 8.5.9;
    - include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info";
- if the received reconfiguration message contained the IE "Ciphering mode info":
  - include and set the IE "Radio bearer uplink ciphering activation time info" to the value of the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO;
- if the received reconfiguration message contained the IE "Integrity protection mode info" with the IE "Integrity protection mode command" set to "Modify":
  - include and set the IE "Integrity protection activation info" to the value of the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
- if the received reconfiguration message did not contain the IE "Ciphering activation time for DPCH" in IE "Ciphering mode info", and:
  - if prior to this procedure there exists no transparent mode RLC radio bearers, and;
    - at the conclusion of this procedure the UE will be in CELL\_DCH state, and;
    - at the conclusion of this procedure at least one transparent mode RLC radio bearer exists:
      - include the IE "COUNT-C activation time" and specify a CFN value other than the default, "Now", for this IE;
  - if prior to this procedure there exists at least one transparent mode RLC radio bearer, and;
    - at the conclusion of this procedure no transparent mode RLC radio bearers exist;



- include the IE "COUNT-C activation time" in the response message and specify a CFN value other than the default, "Now", for this IE;

- set the IE "RRC transaction identifier" to the value of "RRC transaction identifier" in the entry for the received message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- clear that entry;
- if the variable PDCP\_SN\_INFO is not empty:
  - include the IE "RB with PDCP information list" and set it to the value of the variable PDCP\_SN\_INFO;
- in TDD, if the procedure is used to perform a handover to a cell where timing advance is enabled, and the UE can calculate the timing advance value in the new cell (i.e. in a synchronous TDD network):
  - set the IE "Uplink Timing Advance" to the calculated value;
- if the IE "Integrity protection mode info" was present in the received reconfiguration message:
  - start applying the new integrity protection configuration in the uplink for RB#2 from and including the transmitted response message;

If after state transition the UE enters CELL\_PCH or URA\_PCH state, the UE shall, after the state transition and transmission of the response message:

- if the IE "Frequency info" is included in the received reconfiguration message:
  - select a suitable UTRA cell according to [4] on that frequency;
- if the IE "Frequency info" is not included in the received reconfiguration message:
  - select a suitable UTRA cell according to [4];
- prohibit periodical status transmission in RLC;
- remove any C-RNTI from MAC;
- clear the variable C\_RNTI;
- start timer T305 using its initial value if timer T305 is not running and if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;
- select Secondary CCPCH according to subclause 8.6.6.5;
- if the IE "UTRAN DRX cycle length coefficient" is included in the same message:
  - use the value in the IE "UTRAN DRX Cycle length coefficient" for calculating Paging occasion and PICH Monitoring Occasion as specified in subclause 8.6.3.2;
- if the UE enters CELL\_PCH state, and the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE:
  - initiate a cell update procedure according to subclause 8.3.1 using the cause "cell reselection";
  - when the cell update procedure completed successfully:
    - The procedure ends;
- if the UE enters URA\_PCH state, and after cell selection the criteria for URA update caused by "URA reselection" according to subclause 8.3.1 is fulfilled:
  - initiate a URA update procedure according to subclause 8.3.1 using the cause "URA reselection";
  - when the URA update procedure completed:
    - ~~The~~ procedure ends.

#### 8.2.2.4 Transmission of a response message by the UE, normal case

In case the procedure was triggered by reception of a RADIO BEARER SETUP message, the UE shall:

- ~~— if the UE is not in CELL\_DCH prior to this procedure and will be in CELL\_DCH state at the conclusion of this procedure:~~
  - ~~— include the IE "COUNT-C activation time" in the response message and specify a CFN value other than the default, "Now" for this IE;~~
- transmit a RADIO BEARER SETUP COMPLETE as response message on the uplink DCCH using AM RLC;

In case the procedure was triggered by reception of a RADIO BEARER RECONFIGURATION message, the UE shall:

- ~~— if the UE will be in CELL\_DCH state at the conclusion of this procedure:~~
  - ~~— include the IE "COUNT-C activation time" in the response message and specify a CFN value other than the default, "Now" for this IE;~~
- transmit a RADIO BEARER RECONFIGURATION COMPLETE as response message on the uplink DCCH using AM RLC;

In case the procedure was triggered by reception of a RADIO BEARER RELEASE message, the UE shall:

- ~~— if the UE will be in CELL\_DCH state at the conclusion of this procedure:~~
  - ~~— include the IE "COUNT-C activation time" in the response message and specify a CFN value other than the default, "Now" for this IE;~~
- transmit a RADIO BEARER RELEASE COMPLETE as response message on the uplink DCCH using AM RLC;

In case the procedure was triggered by reception of a TRANSPORT CHANNEL RECONFIGURATION message, the UE shall:

- ~~— if the UE will be in CELL\_DCH state at the conclusion of this procedure:~~
  - ~~— include the IE "COUNT-C activation time" in the response message and specify a CFN value other than the default, "Now" for this IE;~~
- transmit a TRANSPORT CHANNEL RECONFIGURATION COMPLETE as response message on the uplink DCCH using AM RLC;

In case the procedure was triggered by reception of a PHYSICAL CHANNEL RECONFIGURATION message, the UE shall:

- ~~— if the UE will be in CELL\_DCH state at the conclusion of this procedure:~~
  - ~~— include the IE "COUNT-C activation time" in the response message and specify a CFN value other than the default, "Now" for this IE;~~
- transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE as response message on the uplink DCCH using AM RLC;

If the new state is CELL\_DCH or CELL\_FACH, the response message shall be transmitted using the new configuration after the state transition, and the UE shall:

- if the variable PDCP\_SN\_INFO is empty:
  - if the received reconfiguration message contained the IE "Ciphering mode info":
    - when RLC has confirmed the successful transmission of the response message:
      - notify upper layers upon change of the security configuration;
      - perform the actions below;

- if the received reconfiguration message did not contain the IE "Ciphering mode info":
  - when RLC has been requested to transmit the response message:
    - perform the actions below;
- if the variable PDCP\_SN\_INFO is non-empty:
  - when RLC has confirmed the successful transmission of the response message:
    - for each radio bearer in the variable PDCP\_SN\_INFO:
      - if the IE "RB started" in the variable ESTABLISHED\_RABS is set to "started":
        - configure the RLC entity for that radio bearer to "continue";
      - perform the actions below.

If the new state is CELL\_PCH or URA\_PCH, the response message shall be transmitted using the old configuration before the state transition and the UE shall:

- when RLC has confirmed the successful transmission of the response message:
  - for each radio bearer in the variable PDCP\_SN\_INFO:
    - if the IE "RB started" in the variable ESTABLISHED\_RABS is set to "started":
      - configure the RLC entity for that radio bearer to "continue";
    - enter the new state (CELL\_PCH or URA\_PCH, respectively);
    - perform the actions below.

The UE shall:

- set the variable ORDERED\_RECONFIGURATION to FALSE;
- if the received reconfiguration message contained the IE "Ciphering mode info":
  - set the IE "Reconfiguration" in the variable CIPHERING\_STATUS to FALSE; and
  - clear the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO;
- if the received reconfiguration message contained the IE "Integrity protection mode info":
  - set the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to FALSE; and
  - clear the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
- clear the variable PDCP\_SN\_INFO;
- clear the variable START\_VALUE\_TO\_TRANSMIT.

#### 8.2.2.5 Reception of a response message by the UTRAN, normal case

When UTRAN has received

- the RADIO BEARER SETUP COMPLETE message; or
- the RADIO BEARER RECONFIGURATION COMPLETE message; or
- the RADIO BEARER RELEASE COMPLETE message; or
- the TRANSPORT CHANNEL RECONFIGURATION COMPLETE message; or
- the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message;

UTRAN may delete the old configuration.

UTRAN may delete the C-RNTI of the UE if the procedure caused the UE to leave the CELL\_FACH state.

If the IE "UL Timing Advance" is included, UTRAN shall evaluate the timing advance value that the UE has to use in the new cell after handover.

If the IE "START" or the IE "START list" is included, UTRAN should set the START value for each CN domain with the corresponding values as received in this response message. Consequently, UTRAN should then use the START values to initialise the hyper frame numbers, in the same way as specified for the UE in subclause 8.2.2.3, for any new radio bearers that are established.

For radio bearers using RLC-AM or RLC-UM:

- use the old ciphering configuration for received RLC PDUs with RLC sequence number less than the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent by the UE;
- use the new ciphering configuration for received RLC PDUs with RLC sequence number greater than or equal to the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent by the UE;
- if an RLC reset or re-establishment occurs after this response message has been received by UTRAN before the activation time for the new ciphering configuration has been reached, ignore the activation time and apply the new ciphering configuration immediately after the RLC reset or RLC re-establishment;

For radio bearers using RLC-TM:

- use the new ciphering configuration and only begin incrementing the COUNT-C at the CFN as indicated in:
  - the IE "Ciphering activation time for DPCH" in the IE "Ciphering mode info", if included in the message that triggered the radio bearer control procedure, or
  - the IE "COUNT-C activation time", if included in the response message for this procedure.

If the IE "COUNT-C activation time" is included, UTRAN should only begin incrementing the COUNT-C for radio bearers that are mapped on TM-RLC at the CFN indicated in this IE.

The procedure ends on the UTRAN side.

### 8.2.2.6 Unsupported configuration in the UE

If the UTRAN instructs the UE to use a configuration, which it does not support and/or if the received message causes the variable UNSUPPORTED\_CONFIGURATION to be set to TRUE, the UE shall:

- transmit a failure response as specified in subclause 8.2.2.9, setting the information elements as specified below:
  - include the IE "RRC transaction identifier"; and
  - set it to the value of "RRC transaction identifier" in the entry for the received message in the table "Accepted transactions" in the variable TRANSACTIONS; and
  - clear that entry;
  - set the IE "failure cause" to "configuration unsupported";
- set the variable UNSUPPORTED\_CONFIGURATION to FALSE;
- continue with any ongoing processes and procedures as if the reconfiguration message was not received.

The procedure ends.

### 8.2.2.7 Physical channel failure

A physical channel failure occurs in case the criteria defined in subclause 8.5.4 are not fulfilled.

If the received message caused the UE to be in CELL\_DCH state and the UE failed to establish the dedicated physical channel(s) indicated in the received message the UE shall:

- revert to the configuration prior to the reception of the message (old configuration);
- if the old configuration includes dedicated physical channels (CELL\_DCH state) and the UE is unable to revert to the old configuration:
  - initiate a cell update procedure according to subclause 8.3.1, using the cause "radio link failure";
  - after the cell update procedure has completed successfully:
    - proceed as below;
- if the old configuration does not include dedicated physical channels (CELL\_FACH state):
  - select a suitable UTRA cell according to [4];
  - if the UE selects another cell than the cell the UE camped on upon reception of the reconfiguration message:
    - initiate a cell update procedure according to subclause 8.3.1, using the cause "Cell reselection";
    - after the cell update procedure has completed successfully:
      - proceed as below;
- transmit a failure response message as specified in subclause 8.2.2.9, setting the information elements as specified below:
  - include the IE "RRC transaction identifier"; and
  - set it to the value of "RRC transaction identifier" in the entry for the received message in the table "Accepted transactions" in the variable TRANSACTIONS; and
  - clear that entry;
  - set the IE "failure cause" to "physical channel failure";
  - set the variable ORDERED\_RECONFURATION to FALSE;
  - continue with any ongoing processes and procedures as if the reconfiguration message was not received;

The procedure ends.

### 8.2.2.8 Cell re-selection

If the UE performs cell re-selection during the reconfiguration procedure, the UE shall:

- initiate a cell update procedure, as specified in subclause 8.3.1;
- continue with the reconfiguration procedure.

### 8.2.2.9 Transmission of a response message by the UE, failure case

The UE shall:

- in case of reception of a RADIO BEARER SETUP message:
  - if the radio bearer establishment procedure affects several radio bearers:
    - (may) include the identities of the radio bearers for which the procedure would have been successful into the RADIO BEARER SETUP FAILURE message;
  - transmit a RADIO BEARER SETUP FAILURE as response message on the DCCH using AM RLC;
- in case of reception of a RADIO BEARER RECONFIGURATION message:
  - if the radio bearer reconfiguration procedure affects several radio bearers:

- (may) include the identities of the radio bearers for which the procedure would have been successful into the RADIO BEARER RECONFIGURATION FAILURE message;
- transmit a RADIO BEARER RECONFIGURATION FAILURE as response message on the DCCH using AM RLC;
- in case of reception of a RADIO BEARER RELEASE message:
  - if the radio bearer release procedure affects several radio bearers:
    - (may) include the identities of the radio bearers for which the procedure would have been successful into the RADIO BEARER RELEASE FAILURE message;
    - transmit a RADIO BEARER RELEASE FAILURE as response message on the DCCH using AM RLC;
- in case of reception of a TRANSPORT CHANNEL RECONFIGURATION message:
  - transmit a TRANSPORT CHANNEL RECONFIGURATION FAILURE as response message on the DCCH using AM RLC;
- in case of reception of a PHYSICAL CHANNEL RECONFIGURATION message:
  - transmit a PHYSICAL CHANNEL RECONFIGURATION FAILURE as response message on the DCCH using AM RLC;
- when the response message has been submitted to lower layers for transmission:
  - continue with any ongoing processes and procedures as if no reconfiguration attempt had occurred.

#### 8.2.2.10 Reception of a response message by the UTRAN, failure case

When the UTRAN has received

- the RADIO BEARER SETUP FAILURE message; or
- the RADIO BEARER RECONFIGURATION FAILURE message; or
- the RADIO BEARER RELEASE FAILURE message; or
- the TRANSPORT CHANNEL RECONFIGURATION FAILURE message; or
- the PHYSICAL CHANNEL RECONFIGURATION FAILURE message;

the UTRAN may restore the old and delete the new configuration. Upper layers should be notified of the failure.

The procedure ends on the UTRAN side.

#### 8.2.2.11 Invalid configuration

If the variable INVALID\_CONFIGURATION is set to TRUE the UE shall:

- keep the configuration existing before the reception of the message;
- transmit a failure response message as specified in subclause 8.2.2.9, setting the information elements as specified below:
  - include the IE "RRC transaction identifier"; and
    - set it to the value of "RRC transaction identifier" in the entry for the received message in the table "Accepted transactions" in the variable TRANSACTIONS; and
    - clear that entry;
  - set the IE "failure cause" to "invalid configuration";
- set the variable INVALID\_CONFIGURATION to FALSE;

- continue with any ongoing processes and procedures as if the reconfiguration message was not received;

The procedure ends.

### 8.2.2.12 Incompatible simultaneous reconfiguration

If the table "Rejected transactions" in the variable TRANSACTIONS is set due to the received message and the variable PROTOCOL\_ERROR\_REJECT is set to FALSE, the UE shall:

- not apply the configuration contained in the received reconfiguration message;
- transmit a failure response message as specified in subclause 8.2.2.9, setting the information elements as specified below:
  - include the IE "RRC transaction identifier"; and
  - set it to the value of "RRC transaction identifier" in the entry for the received message in the table "Rejected transactions" in the variable TRANSACTIONS; and
  - clear that entry;
  - set the IE "failure cause" to "incompatible simultaneous reconfiguration";
- continue with any ongoing processes and procedures as if the reconfiguration message was not received;

The procedure ends.

### 8.2.2.12a Incompatible simultaneous security reconfiguration

If the variable INCOMPATIBLE\_SECURITY\_RECONFIGURATION is set to TRUE due to the received reconfiguration message, the UE shall:

- transmit a failure response message as specified in subclause 8.2.2.9, setting the information elements as specified below:
  - include the IE "RRC transaction identifier"; and
  - set it to the value of "RRC transaction identifier" in the entry for the received message in the table "Accepted transactions" in the variable TRANSACTIONS; and
  - clear that entry;
  - set the IE "failure cause" to the cause value "incompatible simultaneous reconfiguration";
- set the variable INCOMPATIBLE\_SECURITY\_RECONFIGURATION to FALSE;
- continue with any ongoing processes and procedures as if the reconfiguration message was not received.

The procedure ends.

### 8.2.2.12b Cell update procedure during security reconfiguration

If:

- a cell update procedure according to subclause 8.3.1 is initiated; and
- the received ~~SECURITY MODE CONTROL-reconfiguration~~ message causes either,
  - the IE "Reconfiguration" in the variable CIPHERING\_STATUS to be set to TRUE; and/or
  - the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to be set to TRUE;

the UE shall:

- abort the ongoing integrity and/or ciphering reconfiguration;

- resume data transmission on any suspended radio bearer and signalling radio bearer mapped on RLC-AM or RLC-UM;
- transmit a failure response message as specified in subclause 8.2.2.9, setting the information elements as specified below:
  - include the IE "RRC transaction identifier"; and
  - set it to the value of "RRC transaction identifier" in the entry for the received message in the table "Accepted transactions" in the variable TRANSACTIONS; and
  - clear that entry;
  - set the IE "failure cause" to the cause value "cell update occurred";
  - if the received reconfiguration message contained the IE "Ciphering mode info":
    - set the IE "Reconfiguration" in the variable CIPHERING\_STATUS to FALSE; and
    - clear the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO;
  - if the received reconfiguration message contained the IE "Integrity protection mode info":
    - set the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to FALSE; and
    - clear the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
- continue with any ongoing processes and procedures as if the reconfiguration message was not received.

The procedure ends.

### 8.2.2.13 Invalid received message

If the received reconfiguration message contains a protocol error causing the variable `PROTOCOL_ERROR_REJECT` to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling as follows. The UE shall:

- transmit a failure response message as specified in subclause 8.2.2.9, setting the information elements as specified below:
  - include the IE "RRC transaction identifier"; and
  - set it to the value of "RRC transaction identifier" in the entry for the received message in the table "Rejected transactions" in the variable TRANSACTIONS; and
  - clear that entry;
  - set the IE "failure cause" to the cause value "protocol error";
  - include the IE "Protocol error information" with contents set to the value of the variable `PROTOCOL_ERROR_INFORMATION`.

The procedure ends.

## 8.2.3 Radio bearer release

See subclause 8.2.2 (Reconfiguration procedures).

## 8.2.4 Transport channel reconfiguration

See subclause 8.2.2 (Reconfiguration procedures).

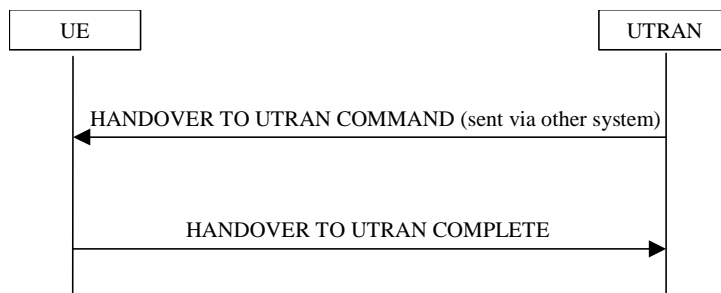


### 8.3.1.5 Reception of an CELL UPDATE/URA UPDATE message by the UTRAN

When the UTRAN receives a CELL UPDATE/URA UPDATE message, it may either:

- in case the procedure was triggered by reception of a CELL UPDATE:
  - update the START value for each CN domain as maintained in UTRAN (refer to subclause 8.5.9) with "START" in the IE "START list" for the CN domain as indicated by "CN domain identity" in the IE "START list";
  - if this procedure was triggered while the UE was not in CELL\_DCH state, then for each CN domain as indicated by "CN domain identity" in the IE "START list":
    - set the 20 MSB of the MAC-d HFN with the corresponding START value in the IE "START list";
    - set the remaining LSB of the MAC-d HFN to zero;
- transmit a CELL UPDATE CONFIRM message on the downlink DCCH or optionally on the CCCH but only if ciphering is not required; and
- optionally include the IE "RLC re-establish indicator" to request a RLC re-establishment in the UE, in which case the corresponding RLC entities should also be re-established in UTRAN; or
- in case the procedure was triggered by reception of a URA UPDATE:
  - transmit a URA UPDATE CONFIRM message to the lower layers for transmission on the downlink CCCH or DCCH in which case the UTRAN should include the IE "URA identity" in the URA UPDATE CONFIRM message in a cell where multiple URA identifiers are broadcast; or
  - initiate an RRC connection release procedure (see subclause 8.1.4) by transmitting an RRC CONNECTION RELEASE message on the downlink CCCH.

### 8.3.6 Inter-RAT handover to UTRAN



**Figure 52: Inter-RAT handover to UTRAN, successful case**

#### 8.3.6.1 General

The purpose of the inter-RAT handover procedure is to, under the control of the network, transfer a connection between the UE and another radio access technology (e.g. GSM) to UTRAN.

#### 8.3.6.2 Initiation

The procedure is initiated when a radio access technology other than UTRAN, e.g. GSM, using system specific procedures, orders the UE to make a handover to UTRAN.

A HANDOVER TO UTRAN COMMAND message is sent to the UE via the radio access technology from which inter-system handover is performed.

In case UTRAN decides to use a predefined or default radio configuration that is stored in the UE, it should include the following information in the HANOVER TO UTRAN COMMAND message.

- the IE "U-RNTI" to be assigned;
- the IE "Predefined configuration identity", to indicate which pre-defined configuration of RB, transport channel and physical channel parameters shall be used; or
- the IE "Default configuration mode" and IE "Default configuration identity", to indicate which default configuration of RB, transport channel and physical channel parameters shall be used;
- PhyCH information elements.

NOTE: When using a predefined or default configuration during handover to UTRAN, UTRAN can only assign values of IEs "U-RNTI" and "scrambling code" that are within the special subranges defined exclusively for this procedure. UTRAN may re-assign other values after completion of the handover procedure.

In case UTRAN does not use a predefined radio configuration that is stored in the UE, it should include the following information in the HANOVER TO UTRAN COMMAND message.

- the IE "U-RNTI" to be assigned;
- the complete set of RB, TrCH and PhyCH information elements to be used.

### 8.3.6.3 Reception of HANOVER TO UTRAN COMMAND message by the UE

The UE shall be able to receive a HANOVER TO UTRAN COMMAND message and perform an inter-RAT handover, even if no prior UE measurements have been performed on the target UTRAN cell and/or frequency.

The UE shall act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following. The UE shall:

- store a U-RNTI value (32 bits), which is derived by the IEs "SRNC identity" (12 bits) and "S-RNTI 2" (10 bits) included in IE "U-RNTI-short". In order to produce a full size U-RNTI value, a full size "S-RNTI" (20 bits) shall be derived by padding the IE "S-RNTI 2" with 10 zero bits in the most significant positions; and
- initialise the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS with the signalling connections that remains after the handover according to the specifications of the source RAT;
- if IE "Specification mode" is set to "Preconfiguration" and IE "Preconfiguration mode" is set to "Predefined configuration":
  - initiate the radio bearer and transport channel configuration in accordance with the predefined parameters identified by the IE "Predefined configuration identity";
  - initiate the physical channels in accordance with the predefined parameters identified by the IE "Predefined radio configuration identity" and the received physical channel information elements;
  - store information about the established radio access bearers and radio bearers according to the IE "Predefined configuration identity"; and
  - set the IE "RAB Info Post" in the variable ESTABLISHED\_RABS and the IE "Re-establishment timer" in the IE "RAB Info" in the variable ESTABLISHED\_RABS to "useT314";
- if IE "Specification mode" is set to "Preconfiguration" and IE "Preconfiguration mode" is set to "Default configuration":
  - initiate the radio bearer and transport channel configuration in accordance with the default parameters identified by the IE "Default configuration mode" and IE "Default configuration identity";
  - initiate the physical channels in accordance with the default parameters identified by the IE "Default configuration mode" and IE "Default configuration identity" and the received physical channel information elements;

NOTE IE "Default configuration mode" specifies whether the FDD or TDD version of the default configuration shall be used

- set the IE "RAB Info Post" in the variable ESTABLISHED\_RABS and the IE "Re-establishment timer" in the IE "RAB Info" in the variable ESTABLISHED\_RABS to "useT314";
- if IE "Specification mode" is set to "Complete specification":
  - initiate the radio bearer, transport channel and physical channel configuration in accordance with the received radio bearer, transport channel and physical channel information elements;
  - perform an open loop estimation to determine the UL transmission power according to subclause 8.5.3;
- if ciphering has been activated and ongoing in the radio access technology from which inter-system handover is performed:
  - for the CN domain as in the IE "CN domain identity" which is included in the IE "RAB info" of the IE "RAB information to setup":
    - set the HFN component of the COUNT-C variable for all radio bearers and signalling radio bearers that use RLC-AM and RLC-UM to the START value as stored in the USIM for that CN domain. The remaining LSBs of the HFN component of COUNT-C shall be set to zero;
    - set the HFN component of the COUNT-C variable for all radio bearers and signalling radio bearers that use the transparent mode of RLC to zero. ~~The remaining LSBs of the HFN component of COUNT-C shall be set to zero.~~ The value of the HFN component of the COUNT-C variable shall not be incremented at each CFN cycle ~~be fixed and not changed~~. The CFN component of the COUNT-C variable is set to the value of the CFN at the activation time of the DPCH as calculated in subclause 8.5.15;
    - set the IE "Status" in the variable CIPHERING\_STATUS to "Started";
    - apply the same ciphering (ciphered/unciphered, algorithm) as prior to inter-RAT handover, unless a change of algorithm is requested by means of the IE "Ciphering algorithm";
    - apply ciphering immediately upon reception of the HANDOVER TO UTRAN COMMAND;
  - ~~apply the same ciphering (ciphered/unciphered, algorithm) as prior to inter-RAT handover, unless a change of algorithm is requested by means of the "Ciphering algorithm".~~

If the UE succeeds in establishing the connection to UTRAN, it shall:

- if the IE "Status" in the variable CIPHERING\_STATUS to "Started" and transparent mode radio bearers have been established by this procedure:
  - include the IE "COUNT-C activation time" in the response message and specify a CFN value other than the default, "Now" for this IE;
  - at the CFN value as indicated in the response message in the IE "COUNT-C activation time":
    - set the HFN component of the COUNT-C variable to the START value as indicated in the IE "START list" of the response message for the relevant CN domain. The remaining LSBs of the HFN component of COUNT-C shall be set to zero;
    - increment the HFN component of the COUNT-C variable by one;
    - the CFN component of the COUNT-C is set to the value of the IE "COUNT-C activation time" of the response message;
    - the HFN component and the CFN component completely initialise the COUNT-C variable;
    - the COUNT-C variable is stepped, as normal, at each CFN value. The HFN component is no longer fixed in value but incremented at each CFN cycle;
- transmit a HANDOVER TO UTRAN COMPLETE message on the uplink DCCH, using the new ciphering configuration, only if ciphering has been started;
- when the HANDOVER TO UTRAN COMPLETE message has been submitted to lower layers for transmission,;

- if the IE "Transport format combination subset" was not included in the HANDOVER TO UTRAN COMMAND message or in the predefined parameters;
  - set the IE "Current TFC subset" in the variable TFS\_SUBSET to "Full transport format combination set";
- set the IE "Status" in the variable CIPHERING\_STATUS to "Not started";
- set the IE "Reconfiguration" in the variable CIPHERING\_STATUS to FALSE;
- set the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO to "Not started";
- set the IE "Historical status" in the variable INTEGRITY\_PROTECTION\_INFO to "Never been active";
- set the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to FALSE;
- set the variable CELL\_UPDATE\_STARTED to FALSE;
- set the variable ORDERED\_RECONFIGURATION to FALSE;
- set the variable FAILURE\_INDICATOR to FALSE;
- set the variable INCOMPATIBLE\_SECURITY\_RECONFIGURATION to FALSE;
- set the variable INVALID\_CONFIGURATION to FALSE;
- set the variable PROTOCOL\_ERROR\_INDICATOR, TFC\_SUBSET to FALSE;
- set the variable PROTOCOL\_ERROR\_REJECT to FALSE;
- set the variable TGSN\_REPORTED to FALSE;
- set the variable UNSUPPORTED\_CONFIGURATION to FALSE;
- clear all optional IEs in all variables, except those optional IEs that are set in this procedure;
- ~~And~~ and the procedure ends.

#### 8.3.6.4 Invalid Handover to UTRAN command message

If the UE receives a HANDOVER TO UTRAN COMMAND message, which contains a protocol error causing the variable PROTOCOL\_ERROR\_REJECT to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling according to the source radio access technology. The UE shall:

- if allowed by the source RAT:
  - transmit an RRC STATUS message to the source radio access technology; and
  - include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL\_ERROR\_INFORMATION;
- Other details may be provided in the specifications related to the source radio access technology.

#### 8.3.6.5 UE fails to perform handover

If the UE does not succeed in establishing the connection to UTRAN, it shall:

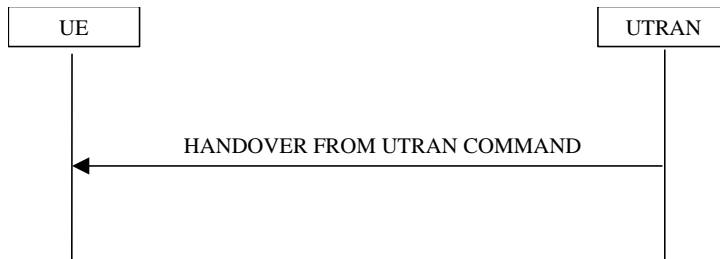
- terminate the procedure including release of the associated resources;
- resume the connection used before the handover; and
- indicate the failure to the other radio access technology.

Upon receiving an indication about the failure from the other radio access technology, UTRAN should release the associated resources and the context information concerning this UE.

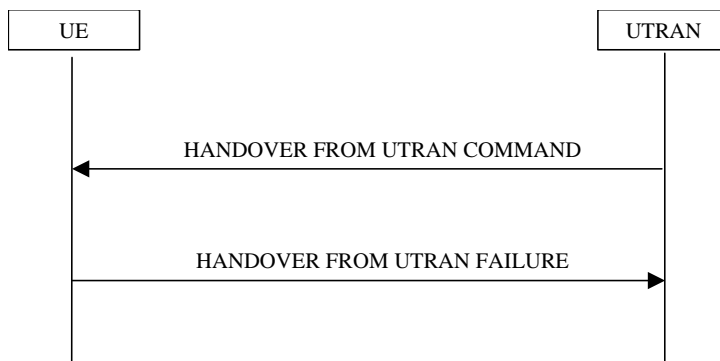
### 8.3.6.6 Reception of message HANDOVER TO UTRAN COMPLETE by the UTRAN

Upon receiving a HANDOVER TO UTRAN COMPLETE message, UTRAN should consider the inter-RAT handover procedure as having been completed successfully and indicate this to the Core Network.

### 8.3.7 Inter-RAT handover from UTRAN



**Figure 53: Inter-RAT handover from UTRAN, successful case**



**Figure 54: Inter-RAT handover from UTRAN, failure case**

#### 8.3.7.1 General

The purpose of the inter-RAT handover procedure is to, under the control of the network, transfer a connection between the UE and UTRAN to another radio access technology (e.g. GSM). This procedure may be used in CELL\_DCH state.

NOTE: This procedure is applicable to CS domain service.

#### 8.3.7.2 Initiation

The procedure is initiated when UTRAN orders a UE in CELL\_DCH state, to make a handover to a radio access technology other than UTRAN, e.g. GSM.

To initiate the procedure, UTRAN sends a HANDOVER FROM UTRAN COMMAND message.

#### 8.3.7.3 Reception of a HANDOVER FROM UTRAN COMMAND message by the UE

The UE shall be able to receive a HANDOVER FROM UTRAN COMMAND message and perform an inter-RAT handover, even if no prior UE measurements have been performed on the target cell.

The UE shall:

- establish the connection to the target radio access technology, by using the contents of the IE "Inter-RAT message". This IE contains a message specified in another standard, as indicated by the IE "System type", and carries information about the candidate/ target cell identifier(s) and radio parameters relevant for the target radio access technology. The correspondence between the value of the IE "System type", the standard to apply and the message contained within IE "Inter RAT message" is shown in the following:

Value of the IE "System type"	Standard to apply	Inter RAT Message
GSM (DCS 1800 band used)	GSM TS 04.18, version 8.5.0 or later	HANDOVER COMMAND
GSM (PCS 1900 band used)	GSM TS 04.18, version 8.5.0 or later	HANDOVER COMMAND
cdma2000	TIA/EIA/IS-2000 or later, TIA/EIA/IS-833 or later, TIA/EIQ/IS-834 or later	

- if the IE "System type" has the value "GSM (DCS 1800 band used)":
  - set the BAND\_INDICATOR [26] to "ARFCN indicates 1800 band";
- if the IE "System type" has the value " GSM (PCS 1900 band used)":
  - set the BAND\_INDICATOR [26] to "ARFCN indicates 1900 band";
- apply the "Inter RAT Message" according to the "standard to apply" in the table above.
- in case one or more IEs "RAB info" is included in the HANDOVER FROM UTRAN COMMAND message:
  - connect upper layer entities corresponding to indicated RABs to the radio resources indicated in the inter-RAT message;

NOTE: Requirements concerning the establishment of the radio connection towards the other radio access technology and the signalling procedure are outside the scope of this specification.

#### 8.3.7.4 Successful completion of the inter-RAT handover

Upon successfully completing the handover, UTRAN should release the radio connection and remove all context information for the concerned UE.

Upon successfully completing the handover, the UE shall:

- if the USIM is present:
  - store the current START value for every CN domain in the USIM [50];
  - if the "START" stored in the USIM [50] for a CN domain is greater than the value "THRESHOLD" of the variable START\_THRESHOLD then:
    - delete the ciphering and integrity keys that are stored in the USIM for that CN domain;
    - inform the deletion of these keys to upper layers;

NOTE: The release of the UMTS radio resources is initiated from the target RAT.

#### 8.3.7.5 UE fails to complete requested handover

If the UE does not succeed in establishing the connection to the target radio access technology, it shall:

- revert back to the UTRA configuration;
- establish the UTRA physical channel(s) used at the time for reception of HANDOVER FROM UTRAN COMMAND;
- if the UE does not succeed to establish the UTRA physical channel(s):
  - select a suitable UTRA cell according to [4];
  - perform a cell update procedure according to subclause 8.3.1 with cause "Radio link failure";

- when the cell update procedure has completed successfully:
  - proceed as below;
- transmit the HANOVER FROM UTRAN FAILURE message setting the information elements as specified below:
  - include the IE "RRC transaction identifier"; and
  - set it to the value of "RRC transaction identifier" in the entry for the HANOVER FROM UTRAN COMMAND message in the table "Accepted transactions" in the variable TRANSACTIONS; and
  - clear that entry;
  - set the IE "Inter-RAT change failure" to "physical channel failure";
- When the HANOVER FROM UTRAN FAILURE message has been submitted to lower layer for transmission:
  - ~~The~~ procedure ends.

### 8.3.7.6 Invalid HANOVER FROM UTRAN COMMAND message

If the IE "Inter-RAT message" received within the HANOVER FROM UTRAN COMMAND message does not include a valid inter RAT handover message in accordance with the protocol specifications for the target RAT, the UE shall perform procedure specific error handling as follows. The UE shall:

- set the IE "failure cause" to the cause value "Inter-RAT protocol error";
- include the IE "Inter-RAT message" in case the target RAT provides further details about the inter RAT protocol error;
- transmit a HANOVER FROM UTRAN FAILURE message on the uplink DCCH using AM RLC;
- when the transmission of the HANOVER FROM UTRAN FAILURE message has been confirmed by RLC:
  - continue with any ongoing processes and procedures as if the invalid HANOVER FROM UTRAN COMMAND message has not been received;
- ~~And~~ the procedure ends.

If the HANOVER FROM UTRAN COMMAND message contains a protocol error causing the variable PROTOCOL\_ERROR\_REJECT to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling as follows. The UE shall:

- set the IE "RRC transaction identifier" in the HANOVER FROM UTRAN FAILURE message to the value of "RRC transaction identifier" in the entry for the HANOVER FROM UTRAN COMMAND message in the table "Rejected transactions" in the variable TRANSACTIONS; and
- clear that entry;
- set the IE "failure cause" to the cause value "protocol error";
- include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL\_ERROR\_INFORMATION;
- transmit a HANOVER FROM UTRAN FAILURE message on the uplink DCCH using AM RLC;
- when the HANOVER FROM UTRAN FAILURE message has been submitted to lower layers for transmission:
  - continue with any ongoing processes and procedures as if the invalid HANOVER FROM UTRAN COMMAND message has not been received;
- ~~And~~ the procedure ends.

### 8.3.7.7 Reception of an HANDOVER FROM UTRAN FAILURE message by UTRAN

Upon receiving an HANDOVER FROM UTRAN FAILURE message, UTRAN may initiate the release the resources in the target radio access technology.

### 8.3.7.8 Unsupported configuration in HANDOVER FROM UTRAN COMMAND message

If the UTRAN instructs the UE to perform a non-supported handover scenario, e.g. multiple RAB or to use a non-supported configuration, the UE shall:

- transmit a HANDOVER FROM UTRAN FAILURE message, setting the information elements as specified below:
  - include the IE "RRC transaction identifier"; and
  - set it to the value of "RRC transaction identifier" in the entry for the HANDOVER FROM UTRAN COMMAND message in the table "Accepted transactions" in the variable TRANSACTIONS; and
  - clear that entry;
  - set the IE "Inter-RAT change failure" to "configuration unacceptable";
  - when the HANDOVER FROM UTRAN FAILURE message has been submitted to lower layers for transmission:
    - resume normal operation as if the invalid HANDOVER FROM UTRAN COMMAND message has not been received;
    - ~~And~~ and the procedure ends.

## 8.5.2 Actions when entering idle mode from connected mode

When entering idle mode from connected mode, the UE shall attempt to select a suitable cell to camp on. The UE shall perform cell selection when leaving connected mode according to [4].

While camping on a cell, the UE shall acquire system information according to the system information procedure in subclause 8.1, perform measurements according to the measurement control procedure specified in subclause 8.4 and, if registered, be prepared to receive paging messages according to the paging procedure in subclause 8.2.

If IE "PLMN identity" within variable SELECTED\_PLMN has the value "GSM-MAP", the UE shall delete any NAS system information received in connected mode, acquire the NAS system information in system information block type 1, and proceed according to subclause 8.6.1.2.

When entering idle mode, the UE shall:

- if the USIM is present:
  - store the current START value for every CN domain ~~shall be stored~~ in the USIM [50];-
  - if the "START" stored in the USIM [50] for a CN domain is greater than the value "THRESHOLD" of the variable START\_THRESHOLD then:
    - delete the ciphering and integrity keys that are stored in the USIM for that CN domain;
    - inform the deletion of these keys to upper layers;

### 8.5.8 Maintenance of Hyper Frame Numbers

The MSBs of both the ciphering sequence numbers (COUNT-C) and integrity sequence numbers (COUNT-I), for the ciphering and integrity protection algorithms, respectively [40], are called the Hyper Frame Numbers (HFN).



For integrity protection, the UE shall maintain COUNT-I as specified in subclause 8.5.10.

The following hyper frame numbers types are defined:

MAC-d HFN 24 MSB of COUNT-C for data sent over RLC TM

RLC UM HFN 25 MSB of COUNT-C for data sent over RLC UM

RLC AM HFN 20 MSB of COUNT-C for data sent over RLC AM

RRC HFN 28 MSB of COUNT-I

For non-transparent mode RLC radio bearers, the UE shall maintain:

- one uplink and one downlink COUNT-C per radio bearer and one uplink and one downlink COUNT-I per signalling radio bearer.

For all transparent mode RLC radio bearers of the same CN domain, the UE shall maintain:

- one COUNT-C, common for all radio bearers in uplink and downlink
- one uplink and one downlink COUNT-I per signalling radio bearer. (Note: In this release of the specification there is only an uplink transparent mode COUNT-I, which is used for RB 0).

COUNT-C and COUNT-I are defined in [40], with the following supplement for COUNT-C: for transparent mode RLC radio bearers with a transmission time interval of x radio frames (x = 2, 4, 8), the MAC PDU is carried by L1 in x consecutive radio frames due to radio frame segmentation. In this case, the CFN of the first segment of the MAC PDU is used as the CFN component of COUNT-C.

The hyper frame numbers (HFN) are used as MSBs of both the ciphering sequence number (COUNT-C) and the integrity sequence number (COUNT-I) for the ciphering and integrity protection algorithms, respectively. For non-transparent mode RLC radio bearers there is an uplink and downlink COUNT-C per radio bearer and an uplink and downlink COUNT-I per signalling radio bearer. For all transparent mode RLC radio bearers of the same CN domain, COUNT-C is the same, and COUNT-C is also the same for uplink and downlink. For transparent mode RLC radio bearers there is an uplink and a downlink COUNT-I per signalling radio bearer. COUNT-C and COUNT-I are defined in [40], with the following supplement for COUNT-C: for transparent mode RLC radio bearers with a transmission time interval of x radio frames (x = 2, 4, 8), the MAC PDU is carried by L1 in x consecutive radio frames due to radio frame segmentation. In this case, the CFN of the first segment of the MAC PDU is used as the CFN component of COUNT-C.

NOTE:—In this release of the specification there is only an uplink transparent mode COUNT-I, which is used for RB 0.

The following hyper frame numbers are defined:

MAC-d HFN 24 bits MSB of COUNT-C for data sent over RLC TM

RLC UM HFN 25 bits MSB of COUNT-C for data sent over RLC UM

RLC AM HFN 20 bits MSB of COUNT-C for data sent over RLC AM

RRC HFN 28 bits MSB of COUNT-I

The START value is used to initialise the 20 most significant bits of all the hyper frame numbers and the remaining bits of the hyper frame numbers are set equal to zero.

### 8.5.9 START value calculation

In connected mode, the START value for CN domain 'X' is calculated as:

Let  $START_X$  = the START value for CN domain 'X' prior to the calculation below:

$START_X' = MSB_{20} ( \text{MAX} \{ \text{COUNT-C, COUNT-I} \mid \text{radio bearers and signalling radio bearers with } CK_X \text{ and } IK_X \} ) + 1.$

- if  $START_X' = \text{the maximum value} = 1048575$  then  $START_X = START_X \ominus 1$ ;

- if the current  $START_X < START_X'$  then  $START_X = START_X'$ , otherwise  $START_X$  is unchanged.

~~The  $START_X$  value is used to initialise the 20 most significant bits of all hyper frame numbers in CN domain 'X'.~~

~~When entering idle mode the current  $START$  value for every CN domain shall be stored in the USIM.~~

## 8.5.10 Integrity protection

~~If the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started" then the UE and UTRAN shall perform integrity-integrity protection (and integrity checking) shall be performed on all RRC messages, with the following exceptions:~~

HANDOVER TO UTRAN COMPLETE  
 PAGING TYPE 1  
 PUSCH CAPACITY REQUEST  
 PHYSICAL SHARED CHANNEL ALLOCATION  
 RRC CONNECTION REQUEST  
 RRC CONNECTION SETUP  
 RRC CONNECTION SETUP COMPLETE  
 RRC CONNECTION REJECT  
 RRC CONNECTION RELEASE (CCCH only)  
 SYSTEM INFORMATION  
 SYSTEM INFORMATION CHANGE INDICATION  
 TRANSPORT FORMAT COMBINATION CONTROL (TM DCCH only)

~~If the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Not started" then integrity protection (and integrity checking) shall not be performed on any RRC message.~~

For each signalling radio bearer, the UE shall use two RRC hyper frame numbers:

- "Uplink RRC HFN";
- "Downlink RRC HFN".

and two message sequence numbers:

- "Uplink RRC Message sequence number";
- "Downlink RRC Message sequence number".

The above information is stored in the variable INTEGRITY\_PROTECTION\_INFO per signalling radio bearer (RB 0-4).

Upon the first activation of integrity protection for an RRC connection, UE and UTRAN initialise the "Uplink RRC Message sequence number" and "Downlink RRC Message sequence number" for all signalling radio bearers as specified in subclauses 8.6.3.5 and 8.5.10.1.

As a general rule, the RRC message sequence number (RRC SN) is incremented for every integrity protected RRC message. In cases when there are exceptions, these are stated for those procedures.

~~As a general rule, The the RRC message sequence number (RRC SN) is incremented for every integrity protected RRC message. In cases when there are exceptions, these are stated for those procedures. If the same RRC message is sent repeatedly (e.g. RRC CONNECTION RELEASE, RRC CONNECTION RELEASE COMPLETE and UE-CAPABILITY INFORMATION) the corresponding RRC SN is not incremented.~~

### 8.5.10.1 Integrity protection in downlink

If the UE receives an RRC message on signalling radio bearer with RB identity n, the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started" and the IE 'Integrity check info' is present the UE shall:

- perform the actions in subclause 8.6.3.5; and
- apply the new integrity protection configuration;
- check the value of the IE "RRC message sequence number" included in the IE "Integrity check info";
  - if the "Downlink RRC Message sequence number" is not present in the variable INTEGRITY\_PROTECTION\_INFO:
    - initialise the "Downlink RRC Message sequence number" in the variable INTEGRITY\_CHECKPROTECTION\_INFO with the value of the IE "RRC message sequence number" included in the IE "Integrity check info" of the received message;
  - if the "Downlink RRC Message sequence number" is present in the variable INTEGRITY\_PROTECTION\_INFO:
    - if the RRC message sequence number is lower than the "Downlink RRC Message sequence number" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO:
      - increment "Downlink RRC HFN" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO with one;
    - if the RRC message sequence number is equal to the "Downlink RRC Message sequence number" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO:
      - discard the message;
- calculate an expected message authentication code in accordance with subclause 8.5.10.3;
- compare the expected message authentication code with the value of the received IE "message authentication code" contained in the IE "Integrity check info";
  - if the expected message authentication code and the received message authentication code are the same, the integrity check is successful:
    - update the "Downlink RRC Message sequence number" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO with the value of the IE "RRC message sequence number" included in the IE "Integrity check info" of the received RRC message;
  - if the calculated expected message authentication code and the received message authentication code differ:
    - if the IE "RRC message sequence number" included in the IE "Integrity check info" is lower than the "Downlink RRC Message sequence number" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO (in this case the "Downlink RRC HFN" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO was incremented by one, as stated above):
      - decrement "Downlink RRC HFN" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO by one;
    - discard the message.

If the UE receives an RRC message on signalling radio bearer with identity n, the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started" and the IE 'Integrity check info' is not present the UE shall:

- discard the message.

### 8.5.10.2 Integrity protection in uplink

Upon transmitting an RRC message using the signalling radio bearer with radio bearer identity n, and the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started" the UE shall:

- increment "Uplink RRC Message sequence number" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO with 1. When "Uplink RRC Message sequence number" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO becomes 0, the UE shall increment "Uplink RRC HFN" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO with 1
- calculate the message authentication code in accordance with subclause 8.5.10.3
- replace the "Message authentication code" in the IE "Integrity check info" in the message with the calculated message authentication code.
- replace the "RRC Message sequence number" in the IE "Integrity check info" in the message with contents set to the new value of the "Uplink RRC Message sequence number" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO

During an ongoing reconfiguration of the integrity protection, UTRAN should, for all signalling radio bearers, apply the old configuration (that is, the configuration that was applied before the reconfiguration) for the integrity protection. In the response message for the procedure ordering the reconfiguration, the UE indicates the activation time, for each signalling radio bearer except RB2, when the new configuration is to be applied in uplink. UTRAN should then start to apply the new configuration according to the activation time for each signalling radio bearer (for RB2 the new configuration is applied starting from reception of the response message).

### 8.5.10.3 Calculation of message authentication code

The UE shall calculate the message authentication code in accordance with [40]. The input parameter MESSAGE [40] for the integrity algorithm shall be constructed by:

- setting the "Message authentication code" in the IE "Integrity check info" in the message to the signalling radio bearer identity
- setting the "RRC Message sequence number" in the IE "Integrity check info" in the message to zero
- encoding the message
- appending RRC padding (if any) as a bitstring to the encoded bitstring as the least significant bits

For usage on an RRC message transmitted or received on the radio bearer with identity n, the UE shall construct the input parameter COUNT-I [40] by appending the following IEs from the IE "Signalling radio bearer specific integrity protection information" for radio bearer n in the variable INTEGRITY\_PROTECTION\_INFO:

- for uplink, "Uplink RRC HFN", as the MSB, and "Uplink RRC Message sequence number", as LSB;
- for downlink, "Downlink RRC HFN", as the MSB, and "Downlink RRC Message sequence number", as LSB.

## 8.5.15 CFN calculation

### 8.5.15.1 Initialisation for CELL\_DCH state after state transition

When the UE receives any of the messages causing the UE to perform a state transition to CELL\_DCH, the UE shall set the CFN in relation to the SFN of the first radio link listed in the IE "Downlink information per radio link list" included in that message according to the following formula:

- for FDD:
 
$$\text{CFN} = ((\text{SFN} * 38400 - \text{DOFF} * 512) \text{ div } 38400) \text{ mod } 256$$
- for TDD:
 
$$\text{CFN} = (\text{SFN} - \text{DOFF}) \text{ mod } 256$$

### 8.5.15.2 Initialisation in CELL\_DCH state at hard handover

When the UE is in CELL\_DCH state and receives any of the messages causing the UE to perform a hard handover, the UE shall check the IE "Timing indication" in that message and:

- if IE "Timing indication" has the value "initialise" (i.e. timing re-initialised hard handover):
  - if IE "CFN-targetSFN frame offset" is not included:
    - read SFN on target cell identified by the first radio link listed in the IE "Downlink information per radio link list" included in that message;
    - set the CFN according to the following formula:
      - for FDD:
        - $CFN = ((SFN * 38400 - DOFF * 512) \text{ div } 38400) \text{ mod } 256$ ;
      - for TDD:
        - $CFN = (SFN - DOFF) \text{ mod } 256$ ;
  - if IE "CFN-targetSFN frame offset" is included in the message causing the UE to perform a timing re-initialised hard handover, CFN shall be calculated according to the following formula:
    - for FDD:
      - $CFN_{new} = (CFN_{old} * 38400 + COFF * 38400 - DOFF * 512) \text{ div } 38400 \text{ mod } 256$
    - for TDD:
      - $CFN_{new} = (CFN_{old} + COFF - DOFF) \text{ mod } 256$
      - where COFF is the value of "CFN-targetSFN frame offset".

NOTE:  $CFN\text{-targetSFN frame offset} = (TargetSFN - CFN) \text{ mod } 256$

- if IE "Timing indication" has the value "maintain" (i.e. timing-maintained hard handover), the UE shall keep CFN with no change due to the hard handover, and only increase CFN (mod 256) by 1 every frame.

### 8.5.15.3 Initialisation for CELL\_FACH

When the UE performs cell selection, re-selection or changes to CELL\_FACH state the UE shall set CFN for all common or shared channels according to:

- $CFN = SFN \text{ mod } 256$

After the initialisation, the CFN in the UE is increased (mod 256) by 1 every frame.

### 8.5.15.4 Initialisation after intersystem handover to UTRAN

Initialisation for CELL\_DCH state after intersystem handover:

- read SFN on target cell and the CFN shall be calculated according to the following formula:
  - for FDD:
    - $CFN = ((SFN * 38400 - DOFF * 512) \text{ div } 38400) \text{ mod } 256$
  - for TDD:
    - $CFN = (SFN - DOFF) \text{ mod } 256$

### 8.6.3.4 Ciphering mode info

The IE "Ciphering mode info" defines the new ciphering configuration. If the IE "Ciphering mode info" is present and if the IE "Reconfiguration" in the variable CIPHERING\_STATUS is set to FALSE, the UE shall check the IE "Ciphering mode command" as part of the IE "Ciphering mode info", and perform the following. The UE shall:

- if the IE "Status" in the variable CIPHERING\_STATUS has the value "Not Started", and if the IE "Ciphering mode command" has the value "stop":
  - ignore this attempt to change the ciphering configuration; and
  - set the variable INVALID\_CONFIGURATION to TRUE;
- else:
  - set the IE "Reconfiguration" in the variable CIPHERING\_STATUS to TRUE;
  - if IE "Ciphering mode command" has the value "start/restart":
    - start or restart ciphering in lower layers for all established radio bearers in the variable ESTABLISHED\_RABS, using the ciphering algorithm (UEA [40]) indicated by the IE "Ciphering algorithm" as part of the new ciphering configuration. For each radio bearer, the value of the IE "RB identity" in the variable ESTABLISHED\_RABS minus one shall be used as the value of BEARER in the ciphering algorithm. The new ciphering configuration shall be applied as specified below;
    - set the IE "Status" in the variable CIPHERING\_STATUS to "Started";
  - if the IE "Ciphering mode command" has the value "stop", the UE shall:
    - stop ciphering and stop incrementing COUNT-C values for all signalling radio bearers and also for transparent RLC mode radio bearers, only. The new ciphering configuration that shall be applied as specified below;
    - set the IE "Status" in the variable CIPHERING\_STATUS to "Not started";
  - in case the IE "Ciphering mode command" has the value "start/restart" or "stop", the new ciphering configuration shall be applied as follows:
    - the (oldest currently used) ciphering configuration shall be stored until activation times have elapsed for the new ciphering configuration to be applied on all signalling radio bearers and radio bearers;
    - if there are pending activation times set for ciphering by a previous procedure changing the ciphering configuration then the ciphering configuration that shall be applied at this pending activation time is as indicated in this procedure;
    - this implies that the UE shall only need to store at most two different ciphering configurations at any given time for all signalling radio bearers and radio bearers; the old and newest ciphering configurations, per CN domain;
  - if the IE "Ciphering activation time for DPCH" is present in the IE "Ciphering mode info":
    - apply the new configuration at that time for radio bearers using RLC-TM. If the IE "Ciphering mode info" is present in a message reconfiguring RB, transport channel or physical channel, the indicated time in IE "Activation time for DPCH" corresponds to a CFN after that reconfiguration;
  - if the IE "Radio bearer downlink ciphering activation time info" is present in the IE "Ciphering mode info":
    - apply the following procedure for each radio bearer using RLC-AM and RLC-UM indicated by the IE "RB identity":
      - suspend data transmission on the radio bearer;
      - select an "RLC send sequence number" at which activation time the new ciphering configuration shall be applied in uplink for that radio bearer according to the following:
        - for each radio bearer and signalling radio bearer that has no pending ciphering activation time as set by a previous procedure changing the security configuration, a suitable value that would ensure a minimised delay in the change to the latest security configuration;

- for each radio bearer and signalling radio bearer that has a pending ciphering activation time as set by a previous procedure changing the ~~security~~ security configuration, set the same value as the pending ciphering activation time;
- this activation time is considered to be elapsed when the selected activation time (as above) is equal to the "RLC send sequence number";
- this implies that the UE shall only need to keep at most two different security configurations; the old and new security configurations, per CN domain;
- store the selected "RLC send sequence number" for that radio bearer in the entry for the radio bearer in the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO, ~~at which time the new ciphering configuration shall be applied~~;
- when the data transmission of that radio bearer is resumed:
  - switch to the new ciphering configuration according to the following:
    - use the old ciphering configuration for the transmitted and received RLC PDUs with RLC sequence number smaller than the corresponding RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent to UTRAN respectively in the received IE "Radio bearer downlink ciphering activation time info" received from UTRAN;
    - use the new ciphering configuration for the transmitted and received RLC PDUs with RLC sequence number greater than or equal to the corresponding RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent to UTRAN respectively in the received IE "Radio bearer downlink ciphering activation time info" received from UTRAN;
    - for a radio bearer using RLC-AM, when the RLC sequence number indicated in the IE "Radio bearer downlink ciphering activation time info" is not included in the RLC transmission window, the UE may release the old ciphering configuration for that radio bearer;
    - if an RLC reset or re-establishment occurs before the activation time for the new ciphering configuration has been reached, ignore the activation time and apply the new ciphering configuration immediately after the RLC reset or RLC re-establishment.

If the IE "Ciphering mode info" is present and if the IE "Reconfiguration" in the variable CIPHERING\_STATUS is set to TRUE, the UE shall:

- ignore this second attempt to change the ciphering configuration; and
- set the variable INCOMPATIBLE\_SECURITY\_RECONFIGURATION to TRUE.

If the IE "Ciphering mode info" is not present, the UE shall not change the ciphering configuration.

### 8.6.3.5 Integrity protection mode info

The IE "Integrity protection mode info" defines the new integrity protection configuration. If the IE "Integrity protection mode info" is present and if the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_STATUS is set to FALSE, the UE shall check the IE "Integrity protection mode command" as part of the IE "Integrity protection mode info", and perform the following. The UE shall:

- if the IE "Integrity protection mode command" has the value "start" and the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started"; or if the IE "Integrity protection mode command" has the value "Modify" and the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Not Started":
  - ignore this attempt to change the integrity protection configuration; and
  - set the variable INVALID\_CONFIGURATION to TRUE;
- else:
  - set the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_STATUS to TRUE;

- if IE "Integrity protection mode command" has the value "start" and the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Not started":
    - if the IE "Historical status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Never been active":
      - initialise the information for all signalling radio bearers in the variable INTEGRITY\_PROTECTION\_INFO according to the following:
        - calculate the START value as specified in subclauses 8.5.9 for the CN domain as indicated in the variable LATEST\_CONFIGURED\_CN\_DOMAIN;
        - set the 20 MSB of the "Uplink RRC HFN" and "Downlink RRC HFN" with the START value as calculated above;
        - set the remaining LSB of the "Uplink RRC HFN" and "Downlink RRC HFN" to zero;
      - set the IE "Uplink RRC Message sequence number" to zero;
      - do not include the IE "Downlink RRC Message sequence number";
    - set the IE "Historical status" in the variable INTEGRITY\_PROTECTION\_INFO to the value "Has been active";
  - set the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO to the value "Started";
  - perform integrity protection on the received message as described in subclause 8.5.10.1;
  - use the algorithm (UIA [40]) indicated by the IE "Integrity protection algorithm" contained in the IE "Integrity protection mode info";
  - use the IE "Integrity protection initialisation number", contained in the IE "Integrity protection mode info" as the value of FRESH [40];
- if IE "Integrity protection mode command" has the value "modify" and the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started":
  - the (oldest currently used) integrity protection configuration shall be stored until activation times have elapsed for the new integrity protection configuration to be applied on all signalling radio bearers;
  - if there are pending activation times set for integrity protection by a previous procedure changing the integrity protection configuration then the integrity protection configuration that shall be applied at this pending activation time is as indicated in this procedure.
  - this implies that the UE shall only need to store at most two different integrity protection configurations at any given time for all signalling radio bearers; the old and newest integrity protection configurations, per CN domain;
- start applying the new integrity protection configuration in the downlink at the RRC sequence number, for each radio bearer n, indicated by the entry for radio bearer n in the "RRC message sequence number list" in the IE "Downlink integrity protection activation info", included in the IE "Integrity protection mode info";
- perform integrity protection on the received message as described in subclause 8.5.10.1;
- if present, use the algorithm indicated by the IE "Integrity protection algorithm" (UIA [40]);
- set the content of the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO according to the following:
  - for each established signalling radio bearer, stored in the variable ESTABLISHED\_RABS:
    - select a value of the RRC sequence number at which (activation) time the new integrity protection configuration shall be applied in uplink for that signalling radio bearer according to the following:



- for each signalling radio bearer that has no pending activation time as set for integrity protection by a previous procedure changing the integrity protection configuration, a suitable value that would ensure a minimised delay in the change to the latest integrity protection configuration;
- for signalling radio bearer that has a pending activation time as set for integrity protection by a previous procedure changing the integrity protection configuration, set the same value as the pending activation time for integrity protection;
- this activation time is considered to be elapsed when the selected activation time (as above) is equal to the next RRC sequence number to be used;
- include a value of the RRC sequence number, when the new integrity protection in uplink is to be applied;
- for RB#0:
  - set the value of the included RRC sequence number to greater than or equal to the current value of the RRC sequence number for RB#0 in the variable INTEGRITY\_PROTECTION\_INFO, plus the value of the constant N302 plus one;
- let m be the radio bearer on which the message containing the IE "integrity protection mode info" was received;
- start applying the new integrity protection configuration in the uplink at the RRC sequence number, for each radio bearer n, except for RB#m2, indicated by the entry for radio bearer n in the "RRC message sequence number list" in the IE "Uplink integrity protection activation info", included in the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
- start applying the new integrity protection configuration in the uplink at the RRC sequence number for RB#m2, as specified for the procedure initiating the integrity protection reconfiguration;
- ~~set the values of the IE "Uplink integrity protection activation info".~~

If the IE "Integrity protection mode info" is present and if the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_STATUS is set to TRUE, the UE shall:

- ignore this second attempt to change the integrity protection configuration; and
- set the variable INCOMPATIBLE\_SECURITY\_RECONFIGURATION to TRUE.

If the IE "Integrity protection mode info" is not present, the UE shall not change the integrity protection configuration.

## 8.6.4 Radio bearer information elements

### 8.6.4.1 Signalling RB information to setup list

If the IE "Signalling RB information to setup list" is included the UE shall:

- use the same START value to initialise the COUNT-C and COUNT-I variables for all the signalling radio bearers in the list;
- for each occurrence of the IE "Signalling RB information to setup":
  - use the value of the IE "RB identity" as the identity of the signalling radio bearer to setup;
  - if the value "STATUS" of the variable "CIPHERING\_STATUS" is "Started":
    - if the IE "Uplink RLC mode" or the IE "Downlink RLC mode" in the IE "RLC info" is set to "AM RLC" or "UM RLC":
      - calculate the START value according to subclause 8.5.9 for the CN domain as indicated in the variable "LATEST\_CONFIGURED\_CN\_DOMAIN";

- initialise the 20 MSB of the hyper frame number component of COUNT-C for this signalling radio bearer with the ~~the~~ START value ~~for~~ for the CN domain as indicated in the variable ~~“LATEST\_CONFIGURED\_CN\_DOMAIN”~~;as calculated above
- set the remaining LSB of the hyper frame number component of COUNT-C for this signalling radio bearer to zero;
- if the IE "Uplink RLC mode" and the IE "Downlink RLC mode" in the IE "RLC info" is set to "TM RLC":
  - if no other transparent mode RLC radio bearers or signalling radio bearers in the variable ~~“ESTABLISHED\_RABS”~~ exist:
    - ~~— calculate the START value according to subclause 8.5.9 for the CN domain as indicated in the IE “CN domain identity” in the IE “RAB info” part of the IE “RAB information to setup”;~~
  - initialise the 20 MSB of the hyper frame number component of COUNT-C for this signalling radio bearer with the START value for the CN domain as indicated in the IE “CN domain identity” in the IE “RAB info” part of the IE “RAB information to setup”;as calculated above;
  - set the remaining LSB of the hyper frame number component of COUNT-C for this signalling radio bearer to zero;
- if at least one transparent mode RLC radio bearers or signalling radio bearers bearers in the variable ~~“ESTABLISHED\_RABS”~~ exist then:
  - ~~— use, for this signalling radio bearer, the COUNT-C for transparent mode radio bearers and signalling radio bearers that is common (refer to subclause 8.5.8), for the CN domain as indicated in the IE “CN domain identity” in the IE “RAB info” part of the IE “RAB information to setup”~~
- if the value “Historical status” of the variable ~~“INTEGRITY\_PROTECTION\_INFO”~~ is “Started”:
  - ~~— calculate the START value according to subclaus 8.5.9 for the CN domain as indicated in the variable LATEST\_CONFIGURED\_CN\_DOMAIN;~~
- initialise the 20 MSB of the hyper frame number component of COUNT-I for this signalling radio bearer with the START value for the CN domain as indicated in the variable ~~LATEST\_CONFIGURED\_CN\_DOMAIN~~as calculated above;
- set the remaining LSB of the hyper frame number component of COUNT-I for this signalling radio bearer to zero;
- perform the actions for the IE "RLC info" as specified in subclause 8.6.4.9, applied for that signalling radio bearer;
- perform the actions for the IE "RB mapping info" as specified in subclause 8.6.4.8, applied for that signalling radio bearer;
- apply a default value of the IE "RB identity" equal to 1 for the first IE "Signalling RB information to setup"; and
- increase the default value by 1 for each occurrence.

#### 8.6.4.2 RAB information for setup

If the IE "RAB information for setup" is included, the procedure is used to establish radio bearers belonging to a radio access bearer, and the UE shall:

- if several IEs "RAB information for setup" are included and the included IEs “CN domain identity” in the IE “RAB info” does not all have the same value:
  - set the variable INVALID\_CONFIGURATION to TRUE;
- if the radio access bearer identified with the IE "RAB info" does not exist in the variable ESTABLISHED\_RABS:
  - create a new entry for the radio access bearer in the variable ESTABLISHED\_RABS;

- store the content of the IE "RAB info" in the entry for the radio access bearer in the variable ESTABLISHED\_RABS;
- indicate the establishment of the radio access bearer to the upper layer entity using the IE "CN domain identity", forwarding the content of the IE "RAB identity";
- calculate the START value only once during this procedure (the same START value shall be used on all new radio bearers created for this radio access bearer) according to subclause 8.5.9 for the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" part of the IE "RAB information to setup";
- store the calculated START value in the variable START\_VALUE\_TO\_TRANSMIT;
- for each radio bearer in the IE "RB information to setup":
  - if the radio bearer identified with the IE "RB identity" does not exist in the variable ESTABLISHED\_RABS for another radio access bearer than the one identified with the IE "RAB info":
    - perform the actions specified in subclause 8.6.4.3;
    - store information about the new radio bearer in the entry for the radio access bearer identified by "RAB info" in the variable ESTABLISHED\_RABS;
  - if the radio bearer identified with the IE "RB identity" does not exist in the variable ESTABLISHED\_RABS for the radio access bearer identified with the IE "RAB info":
    - create a new RAB subflow for the radio access bearer;
    - number the RAB subflow in ascending order, assigning the smallest number to the RAB subflow corresponding to the first radio bearer in the list;
  - if the radio bearer identified with the IE "RB identity" already exists in the variable ESTABLISHED\_RABS for another radio access bearer than the one identified with the IE "RAB info":
    - set the variable INVALID\_CONFIGURATION to TRUE.

#### 8.6.4.2a RAB information to reconfigure

If the IE "RAB information to reconfigure" is included then the UE shall:

- if the entry for the radio access bearer identified by the IE "CN domain identity" together with the IE "RAB Identity" in the variable ESTABLISHED\_RABS already exists:
  - perform the action for the IE "NAS Synchronization Indicator", according to subclause 8.6.4.12;
- else:
  - set the variable INVALID\_CONFIGURATION to TRUE.

#### 8.6.4.3 RB information to setup

If the IE "RB information to setup" is included, the UE shall apply the following actions on the radio bearer identified with the value of the IE "RB identity". The UE shall:

- use the same START value to initialise the hyper frame number components of COUNT-C and COUNT-I variables for all the new radio bearers to setup;
- perform the actions for the IE "PDCP info", if present, according to subclause 8.6.4.10, applied for the radio bearer;
- perform the actions for the IE "RLC info", according to subclause 8.6.4.9, applied for the radio bearer;
- perform the actions for the IE "RB mapping info", according to subclause 8.6.4.8, applied for the radio bearer;
- if the variable CIPHERING\_STATUS is set to "Started"; and

- if the IE "Uplink RLC mode" or the IE "Downlink RLC mode" in the IE "RLC info" is set to "AM RLC" or "UM RLC":
  - ~~— calculate the START value according to subclause 8.5.9 for the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" part of the IE "RAB information to setup";~~
  - ~~initialise the 20 MSB of the hyper frame number component of COUNT-C for this radio bearer with the START value for the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" part of the IE "RAB information to setup"; as calculated above~~
  - ~~set the remaining LSB of the hyper frame number component of COUNT-C for this radio bearer to zero;~~
- if the IE "Uplink RLC mode" and the IE "Downlink RLC mode" in the IE "RLC info" is set to "TM RLC":
  - if no other transparent mode RLC radio bearers exist in the variable ESTABLISHED\_RABS:
    - ~~— calculate the START value according to subclause 8.5.9 for the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" part of the IE "RAB information to setup";~~
    - ~~initialise the 20 MSB of the hyper frame number component of COUNT-C for this radio bearer with the START value for the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" part of the IE "RAB information to setup" as calculated above;~~
    - ~~set the remaining LSB of the hyper frame number component of COUNT-C for this radio bearer to zero;~~
  - if at least one transparent mode RLC radio bearers or signalling radio bearers exist in the variable ESTABLISHED\_RABS:
    - ~~set the MAC-d HFN component of the COUNT-C for this radio bearer with the MAC-d HFN that is common (refer to subclause 8.5.8) for the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" part of the IE "RAB information to setup"~~
    - ~~— calculate the START value according to subclause 8.5.9;~~
    - ~~— store the calculated START value in the variable START\_VALUE\_TO\_TRANSMIT;~~
    - ~~— initialise ciphering on the radio bearer using the calculated START value;~~
- start to perform ciphering on the radio bearer in lower layers, using the value of the IE "RB identity" minus one as the value of BEARER in the ciphering algorithm.

#### 8.6.4.4 RB information to be affected

If the IE "RB information to be affected" is included, the UE shall apply the following actions on the radio bearer identified with the value of the IE "RB identity". The UE shall:

- perform the actions for the IE "RB mapping info", according to subclause 8.6.4.8, applied for the radio bearer.

#### 8.6.4.5 RB information to reconfigure

If the IE "RB information to reconfigure" is included, the UE shall apply the following actions on the radio bearer identified with the value of the IE "RB identity". The UE shall:

- perform the actions for the IE "PDCP info", if present, according to subclause 8.6.4.10, applied for the radio bearer;
- perform the actions for the IE "RLC info", according to subclause 8.6.4.9, applied for the radio bearer;
- perform the actions for the IE "RB mapping info", according to subclause 8.6.4.8, applied for the radio bearer;
- if the IE "PDCP SN info" is included:
  - perform the actions as specified in 8.6.4.11 applied for the radio bearer;
- if the IE "RB stop/continue" is included; and

- if the "RB identity" has a value greater than 2; and
  - if the value of the IE "RB stop/continue" is "stop":
    - configure the RLC entity for the radio bearer to stop;
    - set the IE "RB started" in the variable ESTABLISHED\_RABS to "stopped" for that radio bearer;
  - if the value of the IE "RB stop/continue" is "continue":
    - configure the RLC entity for the radio bearer to continue;
    - set the IE "RB started" in the variable ESTABLISHED\_RABS to "started" for that radio bearer;
- if the IE "RB identity" is set to a value less than 2:
  - set the variable INVALID\_CONFIGURATION to TRUE.

#### 8.6.4.6 RB information to release

If the IE "RB information to release" is included, the UE shall apply the following actions on the radio bearer identified with the value of the IE "RB identity". The UE shall:

- release the entities in lower layers dedicated for that radio bearer;
- if the information about the radio bearer is stored in the variable ESTABLISHED\_RABS:
  - indicate release of the RAB subflow associated with the radio bearer to upper layers;
  - delete the information about the radio bearer from the variable ESTABLISHED\_RABS;
- when all radio bearers belonging to the same radio access bearer have been released:
  - indicate release of the radio access bearer to upper layers providing the "CN domain identity" together with the "RAB identity" stored in the variable ESTABLISHED\_RABS;
  - delete all information about the radio access bearer from the variable ESTABLISHED\_RABS.

#### 8.6.4.7 RB with PDCP information

If the IE "RB with PDCP information" is included, the UE shall apply the following actions on the radio bearer identified with the value of the IE "RB identity". The UE shall:

- for the IE "PDCP SN info":
  - perform the actions as specified in subclause 8.6.4.11.

#### 8.6.4.8 RB mapping info

If the IE "RB mapping info" is included, the UE shall, for each transport channel in each multiplexing option of that RB:

- if a "Transport format set" for that transport channel is included in the same message, and the value (index) of any IE "RLC size index" in the IE "RLC size index list" does not correspond to an "RLC size" in the IE transport format set of that transport channel given in the message; or
- if a "Transport format set" for that transport channel is not included in the same message, and the value (index) of any IE "RLC size index" in the IE "RLC size index list" does not correspond to an "RLC size" in the stored transport format set of that transport channel:
  - keep the previously stored multiplexing options for that RB;
  - set the variable INVALID\_CONFIGURATION to TRUE;
- else:

- delete all previously stored multiplexing options for that radio bearer;
- store each new multiplexing option for that radio bearer;
- select and configure the multiplexing options applicable for the transport channels to be used;
- configure MAC multiplexing according to the selected multiplexing option;
- configure the MAC with the logical channel priorities according to selected multiplexing option;
- if there is no multiplexing option applicable for the transport channels to be used:
  - set the variable INVALID\_CONFIGURATION to TRUE;
- if there is more than one multiplexing option applicable for the transport channels to be used:
  - set the variable INVALID\_CONFIGURATION to TRUE.

In case IE "RB mapping info" includes IE "Downlink RLC logical channel info" but IE "Number of downlink RLC logical channels" is absent, the parameter values are exactly the same as for the corresponding UL logical channels. In case two multiplexing options are specified for the UL, the first options shall be used as default for the DL. As regards the IE "Channel type", the following rule should be applied to derive the DL channel type from the UL channel included in the IE:

Channel used in UL	DL channel type implied by "same as"
DCH	DCH
RACH	FACH
CPCH	FACH
USCH	DSCH

#### 8.6.4.9 RLC Info

If the IE "RLC Info" is included, the UE shall:

- configure the transmitting and receiving RLC entities in the UE for that radio bearer accordingly.

If the IE "Transmission RLC discard" is not included for UM RLC or TM RLC, RLC discard procedure shall not be used for that radio bearer.

#### 8.6.4.10 PDCP Info

If IE "PDCP info" is included, the UE shall:

- configure the PDCP entity for that radio bearer accordingly.

#### 8.6.4.11 PDCP SN Info

If the IE "PDCP SN Info" is included, the UE shall:

- transfer the sequence number to the PDCP entity for the radio bearer;
- configure the RLC entity for the radio bearer to stop;
- include the current PDCP receive sequence number and the radio bearer identity for the radio bearer in the variable PDCP\_SN\_INFO.

#### 8.6.4.12 NAS Synchronisation Indicator

If the IE "NAS Synchronisation Indicator" is present in a message, the UE shall:

- forward the content to upper layers along with the IE "CN domain identity" of the associated RAB stored in the variable ESTABLISHED\_RABS at the CFN indicated in the IE "Activation time" in order to synchronise actions in NAS and AS.

## 10.2.12 HANDOVER TO UTRAN COMMAND

This message is sent to the UE via other system to make a handover to UTRAN.

RLC-SAP: N/A (Sent through a different RAT)

Logical channel: N/A (Sent through a different RAT)

Direction: UTRAN → UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
New U-RNTI	MP		U-RNTI Short 10.3.3.48	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
Ciphering algorithm	OP		Ciphering algorithm 10.3.3.4	
CHOICE specification mode	MP			
>Complete specification				
<b>UE information elements</b>				
<b>RB information elements</b>				
>>Signalling RB information to setup list	MP	1 to <maxSRBs etup>		For each signalling radio bearer established
>>>Signalling RB information to setup	MP		Signalling RB information to setup 10.3.4.24	
>>RAB information to setup list	OP	1 to <maxRABs etup>		For each RAB established
>>>RAB information for setup	MP		RAB information for setup 10.3.4.10	
<b>Uplink transport channels</b>				
>>UL Transport channel information common for all transport channels	MP		UL Transport channel information common for all transport channels 10.3.5.24	
>>Added or Reconfigured TrCH information	MP	1 to <maxTrCH >		
>>>Added or Reconfigured UL TrCH information	MP		Added or Reconfigured UL TrCH information 10.3.5.2	
<b>Downlink transport channels</b>				
>>DL Transport channel information common for all transport channels	MP		DL Transport channel information common for all transport channels 10.3.5.6	
>>Added or Reconfigured TrCH information	MP	1 to <maxTrCH >		
>>>Added or Reconfigured DL TrCH information	MP		Added or Reconfigured DL TrCH information 10.3.5.1	
<b>Uplink radio resources</b>				
>>Uplink DPCH info	MP		Uplink DPCH info 10.3.6.88	
>>CHOICE mode	MP			
>>>FDD				



Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>>>CPCH SET Info	OP		CPCH SET Info 10.3.6.13	
<b>Downlink radio resources</b>				
>>>>Downlink PDSCH information	OP		Downlink PDSCH information 10.3.6.30	
>>>TDD				(no data)
>>Downlink information common for all radio links	MP		Downlink information common for all radio links 10.3.6.24	
>>Downlink information per radio link	MP	1 to <maxRL>		
>>>Downlink information for each radio link	MP		Downlink information for each radio link 10.3.6.27	
>Preconfiguration				
>>CHOICE Preconfiguration mode	MP			
>>>Predefined configuration	MP		Predefined configuration identity 10.3.4.5	
>>>Default configuration				
>>>>Default configuration mode	MP		Enumerated (FDD, TDD)	Indicates whether the FDD or TDD version of the default configuration shall be used
>>>>Default configuration identity	MP		Default configuration identity 10.3.4.0	
>>RAB info	OP		RAB info Post 10.3.4.9	One RAB is established
>>Uplink DPCH info	MP		Uplink DPCH info Post 10.3.6.89	
<b>Downlink radio resources</b>				
>>CHOICE mode				
>>>FDD				
>>>>Downlink information common for all radio links			Downlink information common for all radio links Post 10.3.6.25	
>>>TDD				(no data)
>>Downlink information per radio link	MP	1 to <maxRL>		Send downlink information for each radio link to be set-up. In TDD MaxRL is 1.
>>>Downlink information for each radio link	MP		Downlink information for each radio link Post 10.3.6.28	
Frequency info	MP		Frequency info 10.3.6.36	

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Maximum allowed UL TX power	MP		Maximum allowed UL TX power 10.3.6.39	
CHOICE mode	MP			
>FDD				(no data)
>TDD				
>>Primary CCPCH Tx Power	MP		Primary CCPCH Tx Power 10.3.6.59	

### 10.2.13 HANDOVER TO UTRAN COMPLETE

This message is sent by the UE when a handover to UTRAN has been completed.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
<b><u>UE Information elements</u></b>				
START list	CH	1 to <maxCNdo mains>		START [40] values for all CN domains. The IE is mandatory if it has not been transferred prior to the handover.
>CN domain identity	MP		CN domain identity 10.3.1.1	
>START	MP		START 10.3.3.38	
<b><u>RB Information elements</u></b>				
<u>COUNT-C activation time</u>	<u>OP</u>		<u>Activation time 10.3.3.1</u>	<u>Used for radio bearers mapped on RLC-TM.</u>

### 10.2.23 PHYSICAL CHANNEL RECONFIGURATION COMPLETE

This message is sent from the UE when a physical channel reconfiguration has been done.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
<b>UE information elements</b>				
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36	
Integrity check info	CH		Integrity check info 10.3.3.16	
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.17	
CHOICE mode	MP			
>FDD				(no data)
>TDD				
>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.95	
<b>RB Information elements</b>				
COUNT-C activation time	OP		Activation time 10.3.3.1	Used for radio bearers mapped on RLC-TM. <del>Only applicable if the UE is moving to CELL_DCH state due to this procedure</del>
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.13	
Uplink counter synchronisation info	OP			
>RB with PDCP information list	OP	1 to <maxRBall RABs>		
>>RB with PDCP information	MP		RB with PDCP information 10.3.4.22	
>START list	MP	1 to <maxCNdo mains>		START [40] values for all CN domains.
>>CN domain identity	MP		CN domain identity 10.3.1.1	
>>START	MP		START 10.3.3.38	START value to be used in this CN domain.

## 10.2.28 RADIO BEARER RECONFIGURATION COMPLETE

This message is sent from the UE when a RB and signalling link reconfiguration has been done.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
<b>UE information elements</b>				
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36	
Integrity check info	CH		Integrity check info 10.3.3.16	
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.17	
CHOICE mode	MP			
>FDD				(no data)
>TDD				
>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.95	
<b>RB Information elements</b>				
COUNT-C activation time	OP		Activation time 10.3.3.1	Used for radio bearers mapped on RLC-TM. <del>Only applicable if the UE is moving to CELL_DCH state due to this procedure</del>
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.13	
Uplink counter synchronisation info	OP			
>RB with PDCP information list	OP	1 to <maxRBall RABs>		
>>RB with PDCP information	MP		RB with PDCP information 10.3.4.22	
>START list	MP	1 to <maxCNdo mains>		START [40] values for all CN domains.
>>CN domain identity	MP		CN domain identity 10.3.1.1	
>>START	MP		START 10.3.3.38	START value to be used in this CN domain.

### 10.2.31 RADIO BEARER RELEASE COMPLETE

This message is sent from the UE when radio bearer release has been completed.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
<b>UE information elements</b>				
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36	
Integrity check info	CH		Integrity check info 10.3.3.16	Integrity check info is included if integrity protection is applied
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.17	
CHOICE mode	MP			
>FDD				(no data)
>TDD				
>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.95	This information element shall be present in case of handover procedure if timing advance is enabled. Calculated timing advance value for the new cell after handover in a synchronous TDD network
<b>RB Information elements</b>				
COUNT-C activation time	OP		Activation time 10.3.3.1	Used for radio bearers mapped on RLC-TM. <del>Only applicable if the UE is moving to CELL_DCH state due to this procedure</del>
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.13	
Uplink counter synchronisation info	OP			
>RB with PDCP information list	OP	1 to <maxRBall RABs>		This IE is needed for each RB having PDCP in the case of lossless SRNS relocation
>>RB with PDCP information	MP		RB with PDCP information 10.3.4.22	
>START list	MP	1 to <maxCNdo mains>		START [40] values for all CN domains.
>>CN domain identity	MP		CN domain identity 10.3.1.1	
>>START	MP		START 10.3.3.38	START value to be used in this CN domain.

## 10.2.34 RADIO BEARER SETUP COMPLETE

This message is sent by UE to confirm the establishment of the radio bearer.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
<b>UE information elements</b>				
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36	
Integrity check info	CH		Integrity check info 10.3.3.16	
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.17	
CHOICE mode	OP			
>FDD				(no data)
>TDD				
>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.95	This information element shall be present in case of handover procedure if timing advance is enabled. Calculated timing advance value for the new cell after handover in a synchronous TDD network
START	OP		START 10.3.3.38	This information element is not needed for transparent mode RBs
<b>RB Information elements</b>				
COUNT-C activation time	OP		Activation time 10.3.3.1	Used for radio bearers mapped on RLC-TM. <del>Only applicable if the UE is moving to CELL_DCH state due to this procedure</del>
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.13	
Uplink counter synchronisation info	OP			
>RB with PDCP information list	OP	1 to <maxRBall RABs>		This IE is needed for each RB having PDCP in the case of lossless SRNS relocation
>>RB with PDCP information	MP		RB with PDCP information 10.3.4.22	
>START list	MP	1 to <maxCNdo mains>		START [40] values for all CN domains.
>>CN domain identity	MP		CN domain identity 10.3.1.1	
>>START	MP		START 10.3.3.38	START value to be used in this CN domain.

## 10.2.51 TRANSPORT CHANNEL RECONFIGURATION COMPLETE

This message is sent from the UE when a transport channel reconfiguration has been done.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
<b>UE information elements</b>				
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36	
Integrity check info	CH		Integrity check info 10.3.3.16	
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.17	
CHOICE mode	OP			
>FDD				(no data)
>TDD				
>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.95	
<b>RB Information elements</b>				
COUNT-C activation time	OP		Activation time 10.3.3.1	Used for radio bearers mapped on RLC-TM. <del>Only applicable if the UE is moving to CELL_DCH state due to this procedure</del>
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.13	
Uplink counter synchronisation info	OP			
>RB with PDCP information list	OP	1 to <maxRBall RABs>		
>>RB with PDCP information	MP		RB with PDCP information 10.3.4.22	
>START list	MP	1 to <maxCNdo mains>		START [40] values for all CN domains.
>>CN domain identity	MP		CN domain identity 10.3.1.1	
>>START	MP		START 10.3.3.38	START value to be used in this CN domain.

### 10.3.3.1 Activation time

Activation Time defines the frame number/time at which the operation/changes caused by the related message shall take effect. Values between 0 and 255 indicate the absolute value of CFN (Connection Frame Number) of that frame number/time.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Activation time	MP		Integer(0..255, Now)	CFN [10]

### 10.3.3.4 Cipherng Algorithm

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Cipherng algorithm	MP		Enumerated (UEA0, UEA1)	

### 10.3.3.5 Cipherng mode info

This information element contains the cipherng specific security mode control information.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Cipherng mode command	MP		Enumerated (start/restart, stop)	
Cipherng algorithm	CV- <i>notStop</i>		Cipherng algorithm 10.3.3.4	
Cipherng activation time for DPCH	OP		Activation time 10.3.3.1	Used for radio bearers mapped on RLC-TM. Only applicable if the UE is already in CELL_DCH state
Radio bearer downlink cipherng activation time info	OP		RB activation time info, 10.3.4.13	Used for radio bearers mapped on RLC-AM or RLC-UM

Condition	Explanation
<i>notStop</i>	The IE is mandatory if the IE "Cipherng mode command" has the value "start/restart", otherwise the IE is not needed in the message.

### 10.3.3.16 Integrity check info

The Integrity check info contains the RRC message sequence number needed in the calculation of XMAC-I [40] and the calculated MAC-I.



Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message authentication code	MP		bit string(32)	MAC-I [40] The 27 MSB of the IE shall be set to zero and the 5 LSB of the IE shall be set to the used signalling radio bearer identity when the encoded RRC message is used as the MESSAGE parameter in the integrity protection algorithm.
RRC Message sequence number	MP		Integer (0..15)	The local RRC hyper frame number (RRC HFN) is concatenated with the RRC message sequence number to form the input parameter COUNT-I for the integrity protection algorithm. The IE value shall be set to zero when the encoded RRC message is used as the MESSAGE parameter in the integrity protection algorithm.

### 10.3.3.17 Integrity protection activation info

This IE contains the time, in terms of RRC sequence numbers, when a new integrity protection configuration shall be activated for the signalling radio bearers.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RRC message sequence number list	MP	4 to 5		<p>The RRC sequence number when a new integrity protection configuration shall be applied, for CCCH (=RB0) and signalling radio bearers in the order RB0, RB1, RB2, RB3, RB4.</p> <p><a href="#">The value for RB1 shall be ignored if this IE was included in a RRC message sent on RB1.</a></p> <p>The value for RB2 shall be ignored <a href="#">if this IE was included in a RRC message sent on RB2.</a></p>
>RRC message sequence number	MP		Integer (0..15)	

### 10.3.3.18 Integrity protection Algorithm

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Integrity protection algorithm	MP		Enumerated (UIA1)	

### 10.3.3.19 Integrity protection mode info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Integrity protection mode command	MP		Enumerated(start, modify)	
Downlink integrity protection activation info	CV-modify		Integrity protection activation info 10.3.3.17	
Integrity protection algorithm	OP		Integrity protection algorithm 10.3.3.18	
Integrity protection initialisation number	CV-start		Bitstring(32)	FRESH [40]

Condition	Explanation
Start	The IE is mandatory if the IE "Integrity protection mode command" has the value "start ", otherwise it is not needed in the message.
Modify	The IE is only present if the IE "Integrity protection mode command" has the value "modify"

### 10.3.4.13 RB activation time info

This IE contains the time, in terms of RLC sequence numbers, when a certain configuration shall be activated, for a number of radio bearers.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Radio bearer activation time	OP	1 to <maxRB>		
>RB identity	MP		RB identity 10.3.4.16	
>RLC sequence number	MP		Integer (0..4095)	RLC SN [16] . Used for radio bearers mapped on RLC AM and UM

### 10.3.4.14 RB COUNT-C MSB information

The MSB of the COUNT-C values of the radio bearer.

Information Element/Group name	Needed	Multi	Type and reference	Semantics description
RB identity	MP		RB identity 10.3.4.16	
COUNT-C-MSB-uplink	MP		Integer (0.. $2^{25}-1$ )	25 MSBs from COUNT-C associated to this RB
COUNT-C-MSB-downlink	MP		Integer (0.. $2^{25}-1$ )	25 MSBs from COUNT-C associated to this RB

### 10.3.4.15 RB COUNT-C information

The COUNT-C values of the radio bearer.

Information Element/Group name	Needed	Multi	Type and reference	Semantics description
RB identity	MP		RB identity 10.3.4.16	
COUNT-C-uplink	MP		Integer (0.. 2^32-1)	
COUNT-C-downlink	MP		Integer (0.. 2^32-1)	

### 10.3.4.16 RB identity

An identification number for the radio bearer affected by a certain message.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RB identity	MP		Integer(1..32 )	Values 1-4 shall only be used for signalling radio bearers. The IE value minus one shall be used as BEARER in the ciphering algorithm.

## 13.4.1 CIPHERING\_STATUS

This variable contains information about the current status of ciphering in the UE.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Status	MP		Enumerated( Not started, Started)	
Reconfiguration	MP		Boolean	TRUE means a <a href="#">RRC procedure performing</a> reconfiguration of ciphering is ongoing.

## 13.4.10 INTEGRITY\_PROTECTION\_INFO

This variable contains information about the current status of the integrity protection in the UE.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Historical status	MP		Enumerated(Never been active, Has been active)	
Status	MP		Enumerated(Not started, Started)	
Reconfiguration	MP		Boolean	TRUE means a reconfiguration of integrity protection is ongoing.
Signalling radio bearer specific integrity protection information	MP	1 to <maxSRBset>		Status information for RB#0-4 in that order
>Uplink RRC HFN	MP		Bitstring (28)	
>Downlink RRC HFN	MP		Bitstring (28)	
>Uplink RRC Message sequence number	MP		Integer (0..15)	
>Downlink RRC Message sequence number	OP		Integer (0..15)	

### 13.4.11a LATEST\_CONFIGURED\_CN\_DOMAIN

This variable stores the CN-domain that is latest was most recently configured to be used for ciphering and integrity protection for each RB.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Latest configured CN domain	MP		CN domain identity 10.3.1.1	

### 13.4.22 START\_THRESHOLD

This variable contains information about the maximum allowed value of the START for a CN domain.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
THRESHOLD	OP		Integer (0..1048576)	20 bits

### 13.4.23 START\_VALUE\_TO\_TRANSMIT

This variable contains the value of START for new radio bearer(s) to be transmitted in a response message.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
START	OP		START 10.3.3.38	

## 11.2 PDU definitions

```

-- *****
--
-- HANDOVER TO UTRAN COMPLETE
--
-- *****

HandoverToUTRANComplete ::= SEQUENCE {
  --TABULAR: Integrity protection shall not be performed on this message.
  -- User equipment IEs
  -- TABULAR: the IE below is conditional on history.
  startList          STARTList          OPTIONAL,
  -- Radio bearer IEs
  count-C-ActivationTime ActivationTime OPTIONAL,
  -- Extension mechanism for non- release99 information
  nonCriticalExtensions SEQUENCE {}      OPTIONAL
}

```

## CHANGE REQUEST

⌘ **25.331 CR 817** ⌘ 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  Radio Access Network  Core Network

<b>Title:</b>	⌘ Security clarifications		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 2001-05-30
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ REL-4
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

**Reason for change:** ⌘ These are essential corrections that are needed in order to interpret the specification of security for both UE and UTRAN clearly.

- Summary of change:** ⌘
- Minor editorial corrections
  - Include a TSG T WG3 specification in the reference list that specifies the THRESHOLD value that is stored on the USIM.
  - The Handling of the THRESHOLD as read from the USIM is completely specified according to TSG SA WG3 TS 33.102. The START values for each CN domain are compared with the THRESHOLD at RRC connection release procedure.
  - Handling of START during RRC connection establishment when USIM is present and not present.
  - The hyper frame numbers are initialised for the first time as part of the very first Security mode control procedure for a given RRC connection, for the existing signalling radion bearers, in both UE and UTRAN with the START values as received in the IE "START list" in the RRC CONNECTION SETUP COMPLETE message.
  - Clarification of the actions when new keys are received. The case for TM RBs was missing and is now included. Also, the variable INTEGRITY\_PROTECTION\_INFO is updated upon reception of new keys ie the HFNs are set to zero but the RRC SN is preserved.
  - For TM RBs there exist two IEs that related to the CFN activation time. The first is IE "Cipherring activation time for DPCH" (only included in downlink messages) and the second is the IE "COUNT-C activation time info" (only included in uplink messages). The latter IE is only included in the UL if the former IE is not included in the downlink for the cases as specified in this clarification.
  - A single START value is sent when establishing new radio bearers in RADIO BEARER SETUP COMPLETE. The UE must wait for the L2 ack on the RADIO BEARER SETUP COMPLETE message before initialising and starting the radio bearer, as UTRAN must use (as required) the START value indicated in the RADIO BEARER SETUP COMPLETE message to setup the

new radio bearer. This START value that is sent updates the most recently calculated START value in both UE and UTRAN. This START value is only applicable for RLC AM and UM RBs. The START value to be used for the TM RLC RBs is clarified.

- Text has been included to specify what UTRAN should do on reception of IE "START" and for IE "START list", ie this is to update the mostly recently calculated START values with the values of these IEs.
  - Included actions when UTRAN should change to the new ciphering and integrity protection configuration.
  - When a CELL UPDATE is sent for a UE not in CELL\_DCH state then the MAC-d HFNs for each CN domain need to be updated with the START value as indicated in IE "START list". This is as ciphered TM RBs do not exist when not in CELL\_DCH state.
  - Editorial updates to the hyper frame numbers section
  - Clarified that if the calculated value of START wraps around it shall be set to the maximum START value. This should not really happen so frequently as operators should invoke the authentication procedure to generate new keys frequently enough to avoid this situation. However, for very long connection times, it is possible that the wrap around of the calculated START needs to be handled. It may be good to send an LS to S3 to indicate that they should update the START formula in TS 33.102 for this case.
  - In the MAC-I calculation, it is clarified how the COUNT-I is constructed.
  - It is clarified how the keys used on the SRBs are from the CN domain for which the most recent security negotiation took place. This is now in line with TS 33.102.
  - It is clarified that if during the establishment of one or more RABs for new RBs for one or more CN domains is not allowed, as it is only possible to send a START value for a single CN domain in the RADIO BEARER SETUP COMPLETE message. However, this does not prohibit the reconfiguration of existing RBs from one or more CN domains at the same time.
  - It is clarified that COUNT-Cs are initialised and start incrementing upon completion of the RADIO BEARER SETUP COMPLETE (UE has to wait for L2 ack on the COMPLETE).
- 
- IE "COUNT-C activation time" is now not only included when moving to CELL\_DCH only.
  - Included IE "COUNT-C activation time" in HANDOVER TO UTRAN COMPLETE message. The corresponding procedure text to handle the immediate start of ciphering when going from GSM to UMTS is included in 8.3.6.3.
  - When HO from UTRAN to another RAT, the START values for each CN domain are stored in the USIM.
  - Updated 8.1.12 to include the case when there are pending activation times for security configuration change on one or more radio bearers and/or signalling radio bearers. If activation times are pending then the latest Security mode control should use that activation time, otherwise any suitable activation time can be chosen.
  - The indication provided to upper layers on security configuration change is clarified.
  - Ciphering configuration change may not only happen on RB2 (10.3.3.17).
  - Counter check procedure assumes that the COUNT-C for AM and UM are always available – even if ciphering has not been activated. Therefore, COUNT-C for AM and UM bearers should never be stopped, once started.
- 
- An LS was received from S3 and N1 in response to an LS sent from R2 (R2-010981). The outcome has been that the THRESHOLD check should be done at the RRC connection release (when going to idle mode) as suggested by RAN2 in tdoc (R2-010981). The changes have been updated accordingly in

this Rev 2 of CR 816.

- When we handover from UTRAN to another RAT we need to store the START values in the USIM (8.3.7.4).
- A case was missing in R2-010853 if the UE sent the IE "GSM security capability" in the RRC CONNECTION SETUP COMPLETE and UTRAN did not include this in the SECURITY MODE COMMAND. In this case, the UE shall release the RRC connection.

**Backwards compatibility**

- Addition of IE "COUNT-C activation time" is a not a backwards compatible change. This is however essential to ensure that ciphering can be started immediately when going from GSM to UMTS. Implementations not supporting this change present in this CR will likely get a decoding error resulting in a failed handover attempt to UMTS.
- This CR attempts to clarify the general security procedures according to common understanding and represents no additional functionality. Only, interpretations of the security procedures from earlier versions of the specification that are not aligned with this CR may be backwards incompatible. However, the clarifications in this CR are essential for the correct operation of the security procedures in UTRAN.

**Consequences if not approved:** ☼ The possibility that different UE and UTRAN implementations will interpret the specification of security differently, thereby causing the inevitable loss of the RRC connection.

**Clauses affected:** ☼ 2, 8.1.3.2, 8.1.3.5, 8.1.3.6, 8.1.3.7, 8.1.3.8, 8.1.3.9, 8.1.3.10, 8.1.4.2, 8.1.4.3, 8.1.4.6, 8.1.4.9, 8.1.12.1, 8.1.12.2.1, 8.1.12.2.2, 8.1.12.3, 8.1.12.4a, 8.1.12.4b, 8.1.12.4c (new), 8.1.12.5, 8.1.12.6, 8.1.15, 8.2.2.3, 8.2.2.4, 8.2.2.5, 8.2.2.12b, 8.3.1.5, 8.3.6.3, 8.3.7.4, 8.3.7.5, 8.3.7.6, 8.3.7.8, 8.5.2, 8.5.8, 8.5.9, 8.5.10, 8.5.10.1, 8.5.10.3, 8.6.3.4, 8.6.3.5, 8.6.4.1, 8.6.4.2, 8.6.4.3, 10.2.13, 10.2.23, 10.2.28, 10.2.31, 10.2.34, 10.2.51, 10.3.3.17, 11.2, 13.4.1, 13.4.11a

**Other specs affected:** ☼  Other core specifications ☼  Test specifications  
 O&M Specifications

**Other comments:** ☼

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

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

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



---

## 2 References

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

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

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 25.301: "Radio Interface Protocol Architecture".
- [3] 3GPP TS 25.303: "Interlayer Procedures in Connected Mode".
- [4] 3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode".
- [5] 3GPP TS 24.008: "Mobile radio interface layer 3 specification, Core Network Protocols - Stage 3".
- [6] 3GPP TS 25.103: "RF Parameters in Support of RRM".
- [7] 3GPP TS 25.215: "Physical layer – Measurements (FDD)".
- [8] 3GPP TS 25.225: "Physical layer – Measurements (TDD)".
- [9] 3GPP TS 25.401: "UTRAN overall description".
- [10] 3GPP TS 25.402: "Synchronization in UTRAN, stage 2".
- [11] 3GPP TS 23.003: "Numbering, addressing and identification".
- [12] ICD-GPS-200: "Navstar GPS Space Segment/Navigation User Interface".
- [13] RTCM-SC104: "RTCM Recommended Standards for Differential GNSS Service (v.2.2)".
- [14] 3GPP TR 25.921: "Guidelines and Principles for protocol description and error handling".
- [15] 3GPP TS 25.321: "MAC protocol specification".
- [16] 3GPP TS 25.322: "RLC Protocol Specification".
- [17] 3GPP TS 24.007: "Mobile radio interface signalling layer 3" General Aspects.
- [18] 3GPP TS 25.305: "Stage 2 Functional Specification of Location Services in UTRAN".
- [19] 3GPP TS 25.133: "Requirements for Support of Radio Resource Management (FDD)".
- [20] 3GPP TS 25.123: "Requirements for Support of Radio Resource Management (TDD)".
- [21] 3GPP TS 25.101: "UE Radio Transmission and Reception (FDD)".
- [22] 3GPP TS 25.102: "UE Radio Transmission and Reception (TDD)".
- [23] 3GPP TS 23.060: "General Packet Radio Service (GPRS), Service description, Stage 2".
- [24] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".
- [25] 3GPP TS 23.122: "NAS Functions related to Mobile Station (MS) in idle mode".

- [26] 3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".
- [27] 3GPP TS 25.212: "Multiplexing and channel coding (FDD)".
- [28] 3GPP TS 25.213: "Spreading and modulation (FDD)".
- [29] 3GPP TS 25.214: "Physical layer procedures (FDD)".
- [30] 3GPP TS 25.221: "Physical channels and mapping of transport channels onto physical channels (TDD)".
- [31] 3GPP TS 25.222: "Multiplexing and channel coding (TDD)".
- [32] 3GPP TS 25.223: "Spreading and modulation (TDD)".
- [33] 3GPP TS 25.224: "Physical Layer Procedures (TDD)".
- [34] 3GPP TS 25.302: "Services provided by the physical layer".
- [35] 3GPP TS 25.306 "UE Radio Access Capabilities".
- [36] 3GPP TS 25.323: "Packet Data Convergence Protocol (PDCP) Specification".
- [37] 3GPP TS 25.324: "Broadcast/Multicast Control BMC".
- [38] 3GPP TR 25.922: "Radio resource management strategies".
- [39] 3GPP TR 25.925: "Radio interface for broadcast/multicast services".
- [40] 3GPP TS 33.102: "Security Architecture".
- [41] 3GPP TS 34.108: "Common Test Environments for User Equipment (UE) Conformance Testing".
- [42] 3GPP TS 34.123-2: "User Equipment (UE) conformance specification; Part 2: Implementation Conformance Statement (ICS) proforma specification".
- [43] 3GPP TS 04.18: "Mobile radio interface layer 3 specification, Radio Resource Control Protocol".
- [44] 3GPP TS 04.60: "General Packet Radio Service (GPRS), MS-BSS interface; RLC/MAC".
- [45] 3GPP TS 05.05: "Radio transmission and reception".
- [46] 3GPP TS 05.08: "Radio subsystem link control".
- [47] ITU-T Recommendation X.680, (12/97) "Information Technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".
- [48] ITU-T Recommendation X.681, (12/97) "Information Technology - Abstract Syntax Notation One (ASN.1): Information object specification".
- [49] ITU-T Recommendation X.691, (12/97) "Information technology - ASN.1 encoding rules - Specification of Packed Encoding Rules (PER)".
- [50] 3GPP TS 31.102: "Characteristics of the USIM Application".

### 8.1.3.2 Initiation

The UE shall initiate the procedure when upper layers in the UE requests the establishment of a signalling connection and the UE is in idle mode (no RRC connection exists), as specified in subclause 8.1.8.

Upon initiation of the procedure, the UE shall:

- set the variable `PROTOCOL_ERROR_INDICATOR` to `FALSE`;
- if the USIM is present:

- set the value of "THRESHOLD" in the variable "START\_THRESHOLD" by the 20 MSBs of the value stored in the USIM [50] for the maximum value of START for each CN Domain;
- set the IE "Initial UE identity" in the variable INITIAL\_UE\_IDENTITY according to subclause 8.5.1;
- set the contents of the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;
- set CFN in relation to SFN of current cell according to subclause 8.5.15;
- ~~— delete the ciphering and integrity protection key in the USIM if the START for any CN domain is greater than the value "THRESHOLD" of the variable START\_THRESHOLD. The deletion of the keys shall be informed to upper layers.~~
- perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH;
- submit the RRC CONNECTION REQUEST message for transmission on the uplink CCCH;
- set counter V300 to 1; and
- start timer T300 when the MAC layer indicates success or failure to transmit the message;
- select a Secondary CCPCH according to [4];
- start receiving all FACH transport channels mapped on the selected Secondary CCPCH.

#### 8.1.3.5 Cell re-selection or T300 timeout

- if the UE has not yet received an RRC CONNECTION SETUP message with the value of the IE "Initial UE identity" equal to the value of the variable INITIAL\_UE\_IDENTITY; and
- if cell re-selection or expiry of timer T300 occurs;

the UE shall:

- check the value of V300; and
  - if V300 is equal to or smaller than N300:
    - if cell re-selection occurred:
      - set CFN in relation to SFN of current cell according to subclause 8.5.15;
      - set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;
      - perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13; and
      - apply the given Access Service Class when accessing the RACH;
      - submit a new RRC CONNECTION REQUEST message to lower layers for transmission on the uplink CCCH;
      - increment counter V300;
      - restart timer T300 when the MAC layer indicates success or failure to transmit the message;
  - if V300 is greater than N300:
    - enter idle mode.
    - consider the procedure to be unsuccessful;
    - Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2;

- ~~The~~ procedure ends.

### 8.1.3.6 Reception of an RRC CONNECTION SETUP message by the UE

The UE shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION SETUP message with the value of the variable INITIAL\_UE\_IDENTITY.

If the values are different, the UE shall:

- ignore the rest of the message;

If the values are identical, the UE shall:

- stop timer T300, and act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following;
  - if the UE will be in the CELL\_FACH state at the conclusion of this procedure:
    - if the IE "Frequency info" is included:
      - select a suitable UTRA cell according to [4] on that frequency;
      - select PRACH according to subclause 8.6.6.2;
      - select Secondary CCPCH according to subclause 8.6.6.5;
  - enter a state according to subclause 8.6.3.3;
  - submit an RRC CONNECTION SETUP COMPLETE message to the lower layers on the uplink DCCH after successful state transition per subclause 8.6.3.3, with the contents set as specified below:
    - set the IE "RRC transaction identifier" to
      - the value of "RRC transaction identifier" in the entry for the RRC CONNECTION SETUP message in the table "Accepted transactions" in the variable TRANSACTIONS; and
      - clear that entry.
  - if the USIM is present then:
    - set the "START" for each CN domain in the IE "START list" in the RRC CONNECTION SETUP COMPLETE message with the corresponding START value that is stored in the USIM [50];
    - then, set the START value stored in the USIM [50] for any CN domain to the value "THRESHOLD" of the variable START\_THRESHOLD;
  - if the USIM is not present:
    - set the "START" for each CN domain in the IE "START list" in the RRC CONNECTION SETUP message to zero;
  - calculate START values for each CN domain according to subclause 8.5.9 and include the result in the IE "START list";
  - if the IE "UE radio access FDD capability update requirement" included in the RRC CONNECTION SETUP message has the value TRUE:
    - include its UTRAN-specific FDD capabilities and its UTRAN –specific capabilities common to FDD and TDD in the IE "UE radio access capability";
  - if the IE "UE radio access 3.84Mcps TDD capability update requirement" included in the RRC CONNECTION SETUP message has the value TRUE:
    - include its UTRAN-specific 3.84Mcps TDD capabilities and its UTRAN –specific capabilities common to FDD and TDD in the IE "UE radio access capability";

- if the IE "UE radio access 1.28Mcps TDD capability update requirement" included in the RRC CONNECTION SETUP message has the value TRUE:
  - include its UTRAN-specific 1.28Mcps TDD capabilities and its UTRAN –specific capabilities common to FDD and TDD in the IE "UE radio access capability";
- if the IE "System specific capability update requirement list" is present in the RRC CONNECTION SETUP message:
  - include its inter-RAT capabilities for the requested systems in the IE "UE system specific capability".

When of the RRC CONNECTION SETUP COMPLETE message has been submitted to lower layers for transmission the UE shall:

- if the UE has entered CELL\_FACH state:
  - start timer T305 using its initial value if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;
- update its variable UE\_CAPABILITY\_TRANSFERRED which UE capabilities it has transmitted to the UTRAN;
- if the IE "Transport format combination subset" was not included in the RRC CONNECTION SETUP message:
  - set the IE "Current TFC subset" in the variable TFS\_SUBSET to "Full transport format combination set";
- set the "Status" in the variable CIPHERING\_STATUS to "Not started";
- set the "Reconfiguration" in the variable CIPHERING\_STATUS to FALSE;
- set the "Status" in the variable INTEGRITY\_PROTECTION\_INFO to "Not started";
- set the "Historical status" in the variable INTEGRITY\_PROTECTION\_INFO to "Never been active";
- set the "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to FALSE;
- set the variable CELL\_UPDATE\_STARTED to FALSE;
- set the variable ORDERED\_RECONFIGURATION to FALSE;
- set the variable FAILURE\_INDICATOR to FALSE;
- set the variable INCOMPATIBLE\_SECURITY\_RECONFIGURATION to FALSE;
- set the variable INVALID\_CONFIGURATION to FALSE;
- set the variable PROTOCOL\_ERROR\_INDICATOR to FALSE;
- set the variable PROTOCOL\_ERROR\_REJECT to FALSE;
- set the variable TGSN\_REPORTED to FALSE;
- set the variable UNSUPPORTED\_CONFIGURATION to FALSE;
- clear all optional IEs in all variables, except those optional IEs that are set in this procedure;
- consider the procedure to be successful;

And the procedure ends.

### 8.1.3.7 Physical channel failure or cell re-selection

- If the UE failed to establish, per subclause 8.5.4, the physical channel(s) indicated in the RRC CONNECTION SETUP message; or
- if the UE performs cell re-selection; or

- if the UE will be in the CELL\_FACH state at the conclusion of this procedure; and
  - if the received RRC CONNECTION SETUP message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE; or
  - if the contents of the variable C\_RNTI is empty
- after having received an RRC CONNECTION SETUP message with the value of the IE "Initial UE identity" equal to the value of the variable INITIAL\_UE\_IDENTITY; and
- before the RRC CONNECTION SETUP COMPLETE message is delivered to lower layers for transmission:

the UE shall:

- clear the entry for the RRC CONNECTION SETUP message in the table "Accepted transactions" in the variable TRANSACTIONS;
- check the value of V300, and:
  - if V300 is equal to or smaller than N300:
    - set CFN in relation to SFN of current cell according to subclause 8.5.15;
    - set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;
    - perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH;
    - submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH;
    - increment counter V300; and
    - restart timer T300 when the MAC layer indicates success or failure in transmitting the message;
  - if V300 is greater than N300:
    - enter idle mode;
    - perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;
    - consider the procedure to be successful;
- ~~The~~ the procedure ends.

### 8.1.3.8 Invalid RRC CONNECTION SETUP message, unsupported configuration or invalid configuration

If the UE receives an RRC CONNECTION SETUP message which contains an IE "Initial UE identity" with a value which is identical to the value of the variable INITIAL\_UE\_IDENTITY, but the RRC CONNECTION SETUP message contains a protocol error causing the variable PROTOCOL\_ERROR\_REJECT to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling as follows. The UE shall:

- clear the entry for the RRC CONNECTION SETUP message in the table "Rejected transactions" in the variable TRANSACTIONS and proceed as below;

If the UE receives an RRC CONNECTION SETUP message which contains an IE "Initial UE identity" with a value which is identical to the value of the variable INITIAL\_UE\_IDENTITY; and

- the RRC CONNECTION SETUP message contained a configuration the UE does not support; and/or
- the variable UNSUPPORTED\_CONFIGURATION becomes set to TRUE due to the received RRC CONNECTION SETUP message; and/or
- the variable INVALID\_CONFIGURATION becomes set to TRUE due to the received RRC CONNECTION SETUP message;

the UE shall:

- clear the entry for the RRC CONNECTION SETUP message in the table "Accepted transactions" in the variable TRANSACTIONS and proceed as below;
- if V300 is equal to or smaller than N300:
  - set the variable PROTOCOL\_ERROR\_INDICATOR to TRUE;
  - set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;
  - perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13; and
  - apply the given Access Service Class when accessing the RACH;
  - submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH;
  - increment counter V300; and
  - restart timer T300 when the MAC layer indicates success or failure in transmitting the message;
- if V300 is greater than N300:
  - enter idle mode;.
  - perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;
  - consider the procedure to be successful;
  - ~~The~~ procedure ends.

### 8.1.3.9 Reception of an RRC CONNECTION REJECT message by the UE

When the UE receives an RRC CONNECTION REJECT message on the downlink CCCH, it shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION REJECT message with the value of the variable INITIAL\_UE\_IDENTITY:

If the values are different, the UE shall ignore the rest of the message;

If the values are identical, the UE shall stop timer T300 and:

- if the IE "wait time"  $\leq 0$ , and
- if the IE "frequency info" is present and:
  - if V300 is equal to or smaller than N300:
    - initiate cell selection on the designated UTRA carrier;
    - after having selected and camped on a cell:
      - set CFN in relation to SFN of current cell according to subclause 8.5.15;
      - set the contents of the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;
      - perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH;
      - transmit an RRC CONNECTION REQUEST message on the uplink CCCH;
      - reset counter V300;
      - start timer T300 when the MAC layer indicates success or failure in transmitting the message;
      - disable cell reselection to original carrier until the time stated in the IE "wait time" has elapsed;
  - if a cell selection on the designated carrier fails:

- wait for the time stated in the IE "wait time";
- set CFN in relation to SFN of current cell according to subclause 8.5.15;
- set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;
- perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH;
- then submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH of the original serving cell;
- increment counter V300;
- restart timer T300 when the MAC layer indicates success or failure to transmit the message;
- if V300 is greater than N300:
  - enter idle mode;
  - perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;
  - consider the procedure to be successful;
  - ~~The~~the procedure ends.
- if the IE "inter-RAT info" is present and:
  - if V300 is equal to or smaller than N300:
    - perform cell selection in the designated system;
    - delay cell reselection to the original system until the time stated in the IE " wait time" has elapsed.
    - if cell selection in the designated system fails:
      - wait at least the time stated in the IE "wait time";
      - set CFN in relation to SFN of current cell according to subclause 8.5.15;
      - set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.2.
      - perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH;
      - then submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH;
      - increment counter V300;
      - restart timer T300 when the MAC layer indicates success or failure to transmit the message;
  - if V300 is greater than N300:
    - enter idle mode;
    - perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;
    - consider the procedure to be successful;
    - ~~The~~the procedure ends.
- If neither the IEs "frequency info" nor "inter-RAT info" are present and:
  - if V300 is equal to or smaller than N300:
    - wait at least the time stated in the IE "wait time";
    - set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.2;



- perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH;
- submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH;
- increment counter V300;
- restart timer T300 when the MAC layer indicates success or failure to transmit the message;
- if V300 is greater than N300:
  - enter idle mode;
  - perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;
  - consider the procedure to be successful;
  - ~~The~~the procedure ends.
- if the IE "wait time" = 0:
  - enter idle mode;
  - perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;
  - consider the procedure to be successful;
  - ~~The~~the procedure ends.

#### 8.1.3.10 Invalid RRC CONNECTION REJECT message

If the UE receives an RRC CONNECTION REJECT message which contains an IE "Initial UE identity" with a value which is identical to the value of the IE "Initial UE identity" in the most recent RRC CONNECTION REQUEST message sent by the UE; but the RRC CONNECTION REJECT message contains a protocol error causing the variable PROTOCOL\_ERROR\_REJECT to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling as follows:

The UE shall:

- if the IE "wait time" is  $\leq 0$ , and:
  - if V300 is equal to or smaller than N300:
    - wait for the time stated in the IE "wait time";
    - set the variable PROTOCOL\_ERROR\_INDICATOR to TRUE;
    - set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.3;
    - perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.13, and apply the given Access Service Class when accessing the RACH;
    - submit a new RRC CONNECTION REQUEST message to the lower layers for transmission on the uplink CCCH;
    - increment counter V300;
    - restart timer T300 when the MAC layer indicates success or failure to transmit the message;
  - if V300 is greater than N300:
    - enter idle mode;
    - perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;
    - consider the procedure to be successful;

- The procedure ends.
- if the IE "wait time" is = 0:
  - enter idle mode;
  - perform the actions specified in subclause 8.5.2 when entering idle mode from connected mode;
  - consider the procedure to be successful;
  - ~~The~~the procedure ends.

#### 8.1.4.2 Initiation

When the UE is in state CELL\_DCH or CELL\_FACH, the UTRAN may at anytime initiate an RRC connection release by transmitting an RRC CONNECTION RELEASE message using UM RLC.

When UTRAN transmits an RRC CONNECTION RELEASE message in response to a CELL UPDATE (subclause 8.3.1) or URA UPDATE (subclause 8.3.2) message from the UE, UTRAN should use the downlink CCCH to transmit the message. In all other cases the downlink DCCH should be used.

UTRAN may transmit several RRC CONNECTION RELEASE messages to increase the probability of proper reception of the message by the UE. In such a case, the RRC SN for these repeated messages shall be the same. This shall also apply to the RRC CONNECTION RELEASE COMPLETE message. The number of repeated messages and the interval between the messages is a network option.

#### 8.1.4.3 Reception of an RRC CONNECTION RELEASE message by the UE

The UE shall receive and act on an RRC CONNECTION RELEASE message in states CELL\_DCH and CELL\_FACH. Furthermore this procedure can interrupt any ongoing procedures with the UE in the above listed states.

When the UE receives the first RRC CONNECTION RELEASE message, it shall:

- if the USIM is present, and:
  - if the "START" stored in the USIM [50] for a CN domain is greater than the value "THRESHOLD" of the variable START\_THRESHOLD then:
    - delete the ciphering and integrity keys that are stored in the USIM for that CN domain;
    - inform the deletion of these keys to upper layers;
- in state CELL\_DCH:
  - initialise the counter V308 to zero;
  - set the IE "RRC transaction identifier" in the RRC CONNECTION RELEASE COMPLETE message to the value of "RRC transaction identifier" in the entry for the RRC CONNECTION RELEASE message in the table "Accepted transactions" in the variable TRANSACTIONS; and
  - clear that entry.
  - submit an RRC CONNECTION RELEASE COMPLETE message to the lower layers for transmission using UM RLC on the DCCH to the UTRAN;
  - if the IE "Rplmn information" is present:
    - the UE may:
      - store the IE on the ME together with the PLMN id for which it applies;
    - the UE may then:

- utilise this information, typically indicating where a number of BCCH frequency ranges of a RAT may be expected to be found, during subsequent Rplmn selections of the indicated PLMN;
- start timer T308 when the RRC CONNECTION RELEASE COMPLETE message is sent on the radio interface.
- in state CELL\_FACH:
  - if the RRC CONNECTION RELEASE message was received on the DCCH:
    - set the IE "RRC transaction identifier" in the RRC CONNECTION RELEASE COMPLETE message to the value of "RRC transaction identifier" in the entry for the RRC CONNECTION RELEASE message in the table "Accepted transactions" in the variable TRANSACTIONS; and
    - clear that entry;
    - submit an RRC CONNECTION RELEASE COMPLETE message to the lower layers for transmission using AM RLC on the DCCH to the UTRAN.
    - when the successful transmission of the RRC CONNECTION RELEASE COMPLETE message has been confirmed by the lower layers:
      - release all its radio resources; and
      - indicate the release of the established signalling connections (as stored in the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS) and established radio access bearers (as stored in the variable ESTABLISHED\_RABS) to upper layers; and
      - clear the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS;
      - clear the variable ESTABLISHED\_RABS;
      - pass the value of the IE "Release cause" received in the RRC CONNECTION RELEASE message to upper layers;
      - enter idle mode;
      - perform the actions specified in subclause 8.5.2 when entering idle mode;
  - ~~And~~and the procedure ends.
- if the RRC CONNECTION RELEASE message was received on the CCCH:
  - release all its radio resources;
  - indicate the release of the established signalling connections (as stored in the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS) and established radio access bearers (as stored in the variable ESTABLISHED\_RABS) to the upper layers;
  - clear the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS;
  - clear the variable ESTABLISHED\_RABS;
  - pass the value of the IE "Release cause" received in the RRC CONNECTION RELEASE message to upper layers;
  - enter idle mode;
  - perform the actions specified in subclause 8.5.2 when entering idle mode;
  - ~~And~~and the procedure ends.

#### 8.1.4.6 Expiry of timer T308, unacknowledged mode transmission

When in state CELL\_DCH and the timer T308 expires, the UE shall:

- increment V308 by one;

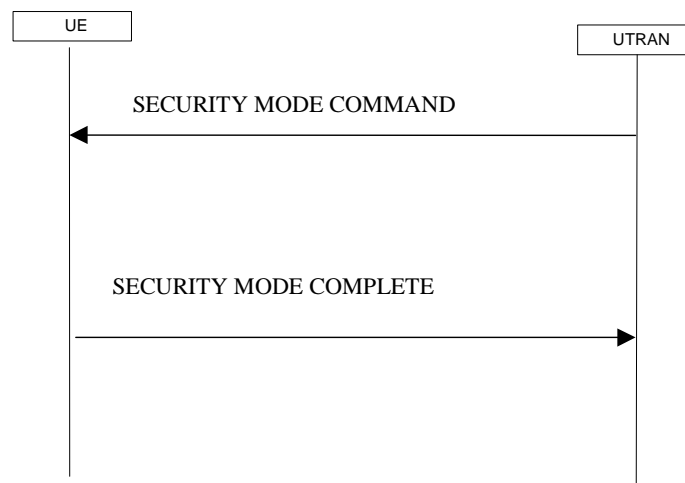
- if V308 is equal to or smaller than N308:
  - retransmit the RRC CONNECTION RELEASE COMPLETE message, without incrementing "Uplink RRC Message sequence number" for RB#1 in the variable INTEGRITY\_PROTECTION\_INFO;
- if V308 is greater than N308:
  - release all its radio resources;
  - indicate the release of the established signalling connections (as stored in the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS) and established radio access bearers (as stored in the variable ESTABLISHED\_RABS) to upper layers;
  - clear the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS;
  - clear the variable ESTABLISHED\_RABS;
  - enter idle mode;
  - perform the actions specified in subclause 8.5.2 when entering idle mode;
- ~~And~~and the procedure ends.

#### 8.1.4.9 Unsuccessful transmission of the RRC CONNECTION RELEASE COMPLETE message, acknowledged mode transmission

When acknowledged mode was used and RLC does not succeed in transmitting the RRC CONNECTION RELEASE COMPLETE message, the UE shall:

- release all its radio resources;
- indicate the release of the established signalling connections (as stored in the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS) and established radio access bearers (as stored in the variable ESTABLISHED\_RABS) to upper layers;
- clear the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS;
- clear the variable ESTABLISHED\_RABS;
- enter idle mode;
- perform the actions specified in subclause 8.5.2 when entering idle mode;
- ~~And~~and the procedure ends.

## 8.1.12 Security mode control



**Figure 18: Security mode control procedure**

### 8.1.12.1 General

The purpose of this procedure is to trigger the stop or start of ciphering or to command the restart of the ciphering with a new ciphering configuration, for all radio bearers and for all signalling radio bearers.

It is also used to start integrity protection or to modify the integrity protection configuration for uplink and downlink all signalling radio bearers.

### 8.1.12.2 Initiation

#### 8.1.12.2.1 Ciphering configuration change

To stop or start/restart ciphering, UTRAN sends a SECURITY MODE COMMAND message on the downlink DCCH in AM RLC using the most recent ciphering configuration. If no such ciphering configuration exists then the SECURITY MODE COMMAND is not ciphered.

Prior to sending the SECURITY MODE COMMAND, for the CN domain indicated in the IE "CN domain identity" in the SECURITY MODE COMMAND, UTRAN should:

- if this is the first SECURITY MODE COMMAND sent for this RRC connection:
  - use the value "START" in the most recently received IE "START list" that belongs to the CN domain as indicated in the IE "CN domain identity" to initialise all hyper frame numbers for all the signalling radio bearers;
  - setting the 20 most significant bits of the hyper frame numbers for all signalling radio bearers to the START for that CN domain;
  - setting the remaining bits of the hyper frame numbers equal to zero;
- suspend all radio bearers using RLC-AM and RLC-UM;
- suspend all signalling radio bearers using RLC-AM and RLC-UM, except the signalling radio bearer used to send the SECURITY MODE COMMAND message on the downlink DCCH in RLC-AM;
- set, for the signalling radio bearer used to send the SECURITY MODE COMMAND, the "RLC send sequence number" in IE "Radio bearer downlink ciphering activation time info" in the IE "Ciphering mode info", at which time the new ciphering configuration shall be applied;
- include "Ciphering activation time for DPCH" in IE "Ciphering mode info" when a DPCH exists and is used for radio bearers using transparent mode RLC;

- set, for each suspended radio bearer and signalling radio bearer that has no pending ciphering activation time set by a previous security mode control procedure, a "RLC send sequence number" in IE "Radio bearer downlink ciphering activation time info" in the IE "Ciphering mode info", at which time the new ciphering configuration shall be applied;
- set, for each suspended radio bearer and signalling radio bearer that has a pending ciphering activation time set by a previous security mode control procedure, the same "RLC send sequence number" in IE "Radio bearer downlink ciphering activation time info" in the IE "Ciphering mode info" from that previous security mode control procedure, at which time the new latest ciphering configuration shall be applied.

While suspended, radio bearers and signalling radio bearers shall not deliver RLC PDUs with sequence number greater than or equal to the number in IE "Radio bearer downlink ciphering activation time info".

When the successful delivery of the SECURITY MODE COMMAND has been confirmed by RLC, UTRAN shall:

- resume all the suspended radio bearers and signalling radio bearers. The old ciphering configuration shall be applied for the transmission of RLC PDUs with RLC sequence number less than the number indicated in the IE "Radio bearer downlink ciphering activation time info", as sent to the UE. The new ciphering configuration shall be applied for the transmission of RLC PDUs with RLC sequence number greater than or equal to the number indicated in IE "Radio bearer downlink ciphering activation time info", sent to the UE.

#### 8.1.12.2.2 Integrity protection configuration change

To start or modify integrity protection, UTRAN sends a SECURITY MODE COMMAND message on the downlink DCCH in AM RLC using the new integrity protection configuration.

When the successful delivery of the SECURITY MODE COMMAND has been confirmed by RLC, UTRAN should:

- for the radio bearers and signalling radio bearers, send an indication to upper layers that the new integrity protection configuration has been activated when the activation time has elapsed;

#### 8.1.12.3 Reception of SECURITY MODE COMMAND message by the UE

Upon reception of the SECURITY MODE COMMAND message, the UE shall perform the actions for the received information elements according to 8.6.

If the IE "Ciphering mode info" and the IE "Integrity protection mode info" are both not included in the SECURITY MODE COMMAND, the UE shall:

- set the variable INVALID\_CONFIGURATION to TRUE.

If the IE "Security capability" is the same as indicated by variable UE\_CAPABILITY\_TRANSFERRED, and the IE "GSM security capability" (if included in the SECURITY MODE COMMAND) is the same as indicated by the variable UE\_CAPABILITY\_TRANSFERRED, the UE shall:

- set the variable LATEST\_CONFIGURED\_CN\_DOMAIN equal to the IE "CN domain identity";
- if prior to the reception of SECURITY MODE COMMAND, the value of the IE "Status" in the variable "CIPHERING\_STATUS" is "Not started" and the value of the IE "Historical status" in the variable "INTEGRITY\_PROTECTION\_INFO" is "Never been active" then:
  - use the value "START" in the most recently sent IE "START list" that belongs to the CN domain as indicated in the IE "CN domain identity" to initialise all hyper frame numbers for all the signalling radio bearers;
  - setting the 20 most significant bits of the hyper frame numbers for all signalling radio bearers to the START for that CN domain;
  - setting the remaining bits of the hyper frame numbers equal to zero.
- suspend all radio bearers and signalling radio bearers (except the signalling radio bearer used to receive the SECURITY MODE COMMAND message on the downlink DCCH in RLC-AM) using RLC-AM or RLC-UM that belong to the CN domain indicated in the IE "CN domain identity", with RLC sequence number greater than

or equal to the number in IE "Radio bearer downlink ciphering activation time info" in the IE "Ciphering mode info";

- set the IE "RRC transaction identifier" in the SECURITY MODE COMPLETE message to the value of "RRC transaction identifier" in the entry for the SECURITY MODE ~~COMMAND CONTROL~~ message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- clear that entry;
- if the SECURITY MODE ~~COMMAND CONTROL~~ message contained the IE "Ciphering mode info":
  - include and set the IE "Radio bearer uplink ciphering activation time info" to the value of the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO, for the respective radio bearer and signalling radio bearer;
- if the SECURITY MODE ~~COMMAND CONTROL~~ message contained the IE "Integrity protection mode info" with the IE "Integrity protection mode command" set to "Modify":
  - include and set the IE "Integrity protection activation info" to the value of the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
- when the radio bearers and signalling radio bearers have been suspended:
  - send a SECURITY MODE COMPLETE message on the uplink DCCH in AM RLC, using the old ciphering configurations;
  - if the IE "Integrity protection mode info" was present in the SECURITY MODE COMMAND message:
    - start applying the new integrity protection configuration in the uplink for RB#2 from and including the transmitted SECURITY MODE COMPLETE message;
- when the successful delivery of the SECURITY MODE COMPLETE message has been confirmed by RLC:
  - resume data transmission on any suspended radio bearer and signalling radio bearer mapped on RLC-AM or RLC-UM;
  - if the SECURITY MODE ~~COMMAND CONTROL~~ message contained the IE "Ciphering mode info":
    - set the IE "Reconfiguration" in the variable CIPHERING\_STATUS to FALSE; and
    - clear the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO;
  - if the SECURITY MODE ~~COMMAND CONTROL~~ message contained the IE "Integrity protection mode info":
    - set the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to FALSE; and
    - clear the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
  - The procedure ends. If a RLC reset or re-establishment occurs after the SECURITY MODE COMPLETE message has been confirmed by RLC, but before the activation time for the new ciphering configuration has been reached, then the activation time shall be ignored and the new ciphering configuration shall be applied immediately after the RLC reset or RLC re-establishment;
  - notify upper layers upon change of the security configuration.

For radio bearers and signalling radio bearers used by the CN indicated in the IE "CN domain identity", the UE shall:

- if a new integrity protection key has been received or a new ciphering key has been received:
  - set the variable LATEST\_CONFIGURED\_CN\_DOMAIN equal to the IE "CN domain identity";
- if a new integrity protection key has been received:
  - in the downlink:
    - use the new key;

- set the IE "Downlink RRC HFN" for all signalling radio bearers in the variable INTEGRITY\_PROTECTION\_INFO\_HFN component of the downlink COUNT-I to zero at when the RRC sequence number in a received RRC message on the particular signalling radio bearer reaches the value for that signalling radio bearer indicated in IE "Downlink integrity protection activation info" included in the IE "Integrity protection mode info";

in the uplink:

- use the new key;
- set the IE "Uplink RRC HFN" for all signalling radio bearers in the variable INTEGRITY\_PROTECTION\_INFO\_HFN component of the uplink COUNT-I to zero at when the RRC sequence number in a transmitted RRC message on the particular signalling radio bearer reaches the value for that signalling radio bearer indicated in IE "Uplink integrity protection activation info";
- if a new ciphering key is available:
  - for radio bearers using RLC-TM:
    - use the new key in uplink and downlink;
    - set the HFN component of the COUNT-C to zero at the CFN as indicated in the IE "Ciphering activation time for DPCH" in the IE "Ciphering mode info";
  - for radio bearers using RLC-AM and RLC-UM:
    - in the downlink:
      - use the new key;
      - set the HFN component of the downlink COUNT-C to zero at the RLC sequence number indicated in IE "Radio bearer downlink ciphering activation time info" in the IE "Ciphering mode info";
    - in the uplink:
      - use the new key;
      - set the HFN component of the uplink COUNT-C to zero at the RLC sequence number indicated in IE "Radio bearer uplink ciphering activation time info".

If the IE "Security capability" is not the same as indicated by the variable UE\_CAPABILITY\_TRANSFERRED, or the IE "GSM security capability" (if included in the SECURITY MODE COMMAND) is not the same as indicated by the variable UE\_CAPABILITY\_TRANSFERRED, or if the IE "GSM security capability" is not included in the SECURITY MODE COMMAND and is included in the variable UE\_CAPABILITY\_TRANSFERRED the UE shall:

- release all its radio resources;
- indicate the release of the established signalling connections (as stored in the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS) and established radio access bearers (as stored in the variable ESTABLISHED\_RABS) to upper layers;
- clear the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS;
- clear the variable ESTABLISHED\_RABS;
- enter idle mode;
- perform actions when entering idle mode as specified in subclause 8.5.2;
- ~~And~~ and the procedure ends.



### 8.1.12.4a Incompatible simultaneous security reconfiguration

If the variable INCOMPATIBLE\_SECURITY\_RECONFIGURATION becomes set to TRUE of the received SECURITY MODE ~~COMMAND CONTROL~~-message, the UE shall:

- transmit a SECURITY MODE FAILURE message on the uplink DCCH using AM RLC, using the ciphering and integrity protection configurations prior to the reception of this SECURITY MODE COMMAND;
- set the IE "RRC transaction identifier" in the SECURITY MODE FAILURE message to the value of "RRC transaction identifier" in the entry for the SECURITY MODE ~~COMMAND CONTROL~~-message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- clear that entry;
- set the IE "failure cause" to the cause value "incompatible simultaneous reconfiguration";
- when the successful delivery of the SECURITY MODE FAILURE message has been confirmed by RLC:
  - set the variable INCOMPATIBLE\_SECURITY\_RECONFIGURATION to FALSE;
  - continue with any ongoing processes and procedures as if the invalid SECURITY MODE COMMAND message has not been received;
- ~~And~~ and the procedure ends.

### 8.1.12.4b Cell update procedure during security reconfiguration

If:

- a cell update procedure according to subclause 8.3.1 is initiated; and
- the received SECURITY MODE ~~COMMAND CONTROL~~-message causes either,
  - the IE "Reconfiguration" in the variable CIPHERING\_STATUS to be set to TRUE; and/or
  - the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to be set to TRUE;

the UE shall:

- abort the ongoing integrity and/or ciphering reconfiguration;
- resume data transmission on any suspended radio bearer and signalling radio bearer mapped on RLC-AM or RLC-UM;
- transmit a SECURITY MODE FAILURE message on the uplink DCCH using AM RLC, using the ciphering and integrity protection configurations prior to the reception of this SECURITY MODE COMMAND;
- set the IE "RRC transaction identifier" in the SECURITY MODE FAILURE message to the value of "RRC transaction identifier" in the entry for the SECURITY MODE ~~COMMAND CONTROL~~-message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- clear that entry;
- set the IE "failure cause" to the cause value "cell update occurred";
- when the successful delivery of the SECURITY MODE FAILURE message has been confirmed by RLC:
  - if the SECURITY MODE ~~COMMAND CONTROL~~-message contained the IE "Ciphering mode info":
    - set the IE "Reconfiguration" in the variable CIPHERING\_STATUS to FALSE; and
    - clear the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO;
  - if the SECURITY MODE ~~COMMAND CONTROL~~-message contained the IE "Integrity protection mode info":
    - set the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to FALSE; and

- clear the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
- continue with any ongoing processes and procedures as if the invalid SECURITY MODE COMMAND message has not been received; and
- ~~The~~the procedure ends.

#### 8.1.12.4c Invalid configuration

If the variable INVALID\_CONFIGURATION is set to TRUE due to the received SECURITY MODE COMMAND message the UE shall:

- transmit a SECURITY MODE COMMAND FAILURE message on the DCCH using AM RLC;
- set the IE "RRC transaction identifier" in the SECURITY MODE FAILURE message to the value of "RRC transaction identifier" in the entry for the SECURITY MODE COMMAND message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- clear that entry;
- set the IE "failure cause" to the cause value "invalid configuration";
- when the successful delivery of the SECURITY MODE FAILURE message has been confirmed by RLC:
  - set the variable INVALID\_CONFIGURATION to FALSE;
  - continue with any ongoing processes and procedures as if the invalid SECURITY MODE COMMAND message has not been received;
- and the procedure ends.

#### 8.1.12.5 Reception of SECURITY MODE COMPLETE message by the UTRAN

UTRAN should apply integrity protection on the received SECURITY MODE COMPLETE message and all subsequent messages with the new integrity protection configuration, if changed. When UTRAN has received a SECURITY MODE COMPLETE message and the integrity protection has successfully been applied, UTRAN shall:

- for radio bearers using RLC-AM or RLC-UM:
  - use the old ciphering configuration for received RLC PDUs with RLC sequence number less than the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent by the UE;
  - use the new ciphering configuration for received RLC PDUs with RLC sequence number greater than or equal to the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent by the UE;
  - if an RLC reset or re-establishment occurs after the SECURITY MODE COMPLETE message has been received by UTRAN before the activation time for the new ciphering configuration has been reached, ignore the activation time and apply the new ciphering configuration immediately after the RLC reset or RLC re-establishment;
- for radio bearers using RLC-TM:
  - use the new ciphering configuration for the received RLC PDUs at the CFN as indicated in the IE "Ciphering activation time for DPCH" in the IE "Ciphering mode info", as included in the SECURITY MODE COMMAND;
- ~~And~~and the procedure ends.

#### 8.1.12.6 Invalid SECURITY MODE COMMAND message

If the SECURITY MODE COMMAND message contains a protocol error causing the variable PROTOCOL\_ERROR\_REJECT to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling as follows:

- transmit a SECURITY MODE FAILURE message on the uplink DCCH using AM RLC;
- set the IE "RRC transaction identifier" in the SECURITY MODE FAILURE message to the value of "RRC transaction identifier" in the entry for the SECURITY MODE CONTROL COMMAND message in the table "Rejected transactions" in the variable TRANSACTIONS; and
- clear that entry;
- set the IE "failure cause" to the cause value "protocol error";
- include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL\_ERROR\_INFORMATION.
- when the successful delivery of the SECURITY MODE FAILURE message has been confirmed by RLC:
  - continue with any ongoing processes and procedures as if the invalid SECURITY MODE COMMAND message has not been received;
- ~~And~~ and the procedure ends.

### 8.1.15 Counter check procedure

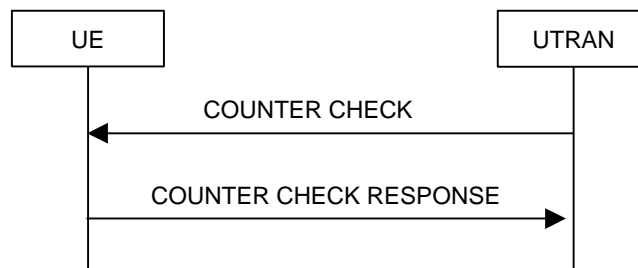


Figure 21: Counter check procedure

### 8.2.2.3 Reception of RADIO BEARER SETUP or RADIO BEARER RECONFIGURATION or RADIO BEARER RELEASE or TRANSPORT CHANNEL RECONFIGURATION or PHYSICAL CHANNEL RECONFIGURATION message by the UE

The UE shall be able to receive any of the following messages:

- RADIO BEARER SETUP message; or
- RADIO BEARER RECONFIGURATION message; or
- RADIO BEARER RELEASE message; or
- TRANSPORT CHANNEL RECONFIGURATION message; or
- PHYSICAL CHANNEL RECONFIGURATION message

and perform a hard handover, even if no prior UE measurements have been performed on the target cell and/or frequency.

If the UE receives:

- a RADIO BEARER SETUP message; or
- a RADIO BEARER RECONFIGURATION message; or
- a RADIO BEARER RELEASE message; or

- a TRANSPORT CHANNEL RECONFIGURATION message; or
- a PHYSICAL CHANNEL RECONFIGURATION message

it shall:

- set the variable ORDERED\_RECONFIGURATION to TRUE;
- may first release the current physical channel configuration and
- then establish a new physical channel configuration and act upon all received information elements as specified in subclause 8.6, unless specified in the following:
  - in FDD, if the IE "PDSCH code mapping" is included but the IE "PDSCH with SHO DCH Info" is not included and if the DCH has only one link in its active set:
    - act upon the IE "PDSCH code mapping" as specified in subclause 8.6 and:
    - infer that the PDSCH will be transmitted from the cell from which the downlink DPCH is transmitted;
- enter a state according to subclause 8.6.3.3.

If the UE remains in CELL\_DCH state after state transition, the UE shall:

- if the IE "UL DPCH Info" is absent, not change its current UL Physical channel configuration;
- if the IE "DL DPCH Info for each RL" is absent, not change its current DL Physical channel configuration.

If after state transition the UE enters CELL\_FACH state, the UE shall, after the state transition:

- if the IE "Frequency info" is included in the received reconfiguration message:
  - select a suitable UTRA cell according to [4] on that frequency;
- if the IE "Frequency info" is not included in the received reconfiguration message:
  - select a suitable UTRA cell according to [4];
- if the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selects another cell than indicated by this IE:
  - initiate a cell update procedure according to subclause 8.3.1 using the cause "Cell reselection";
  - when the cell update procedure completed successfully:
    - if the UE is in CELL\_PCH or URA\_PCH state:
      - initiate a cell update procedure according to subclause 8.3.1 using the cause "Uplink data transmission";
      - proceed as below;
- start timer T305 using its initial value if timer T305 is not running and if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;
- select PRACH according to subclause 8.6.6.2;
- select Secondary CCPCH according to subclause 8.6.6.5;
- use the transport format set given in system information;
- if the IE "UTRAN DRX cycle length coefficient" is included in the same message:
- ignore that IE and stop using DRX;
- if the contents of the variable C\_RNTI is empty:

- perform a cell update procedure according to subclause 8.3.1 using the cause "Cell reselection";
- when the cell update procedure completed successfully:
  - if the UE is in CELL\_PCH or URA\_PCH state:
    - initiate a cell update procedure according to subclause 8.3.1 using the cause "Uplink data transmission";
    - proceed as below;

The UE shall transmit a response message as specified in subclause 8.2.2.4, setting the information elements as specified below. The UE shall:

- if the received reconfiguration message included the IE "Downlink counter synchronisation info":
  - calculate the START value according to subclause 8.5.9;
  - include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info";
- if the received reconfiguration message did not include the IE "Downlink counter synchronisation info":
  - if the variable START\_VALUE\_TO\_TRANSMIT is set:
    - include and set the IE "START" to the value of that variable;
  - if the variable START\_VALUE\_TO\_TRANSMIT is not set and the IE "New U-RNTI" is included:
    - calculate the START value according to subclause 8.5.9;
    - include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info";
- if the received reconfiguration message contained the IE "Ciphering mode info":
  - include and set the IE "Radio bearer uplink ciphering activation time info" to the value of the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO;
- if the received reconfiguration message contained the IE "Integrity protection mode info" with the IE "Integrity protection mode command" set to "Modify":
  - include and set the IE "Integrity protection activation info" to the value of the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
- if the received reconfiguration message did not contain the IE "Ciphering activation time for DPCH" in IE "Ciphering mode info", and;
  - if prior to this procedure there exists no transparent mode RLC radio bearers, and;
    - at the conclusion of this procedure the UE will be in CELL\_DCH state, and;
    - at the conclusion of this procedure at least one transparent mode RLC radio bearer exists:
      - include the IE "COUNT-C activation time" and specify a CFN value other than the default, "Now", for this IE;
  - if prior to this procedure there exists at least one transparent mode RLC radio bearer, and;
    - at the conclusion of this procedure no transparent mode RLC radio bearers exist:
      - include the IE "COUNT-C activation time" in the response message and specify a CFN value other than the default, "Now", for this IE;
- set the IE "RRC transaction identifier" to the value of "RRC transaction identifier" in the entry for the received message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- clear that entry;

- if the variable PDCP\_SN\_INFO is not empty:
  - include the IE "RB with PDCP information list" and set it to the value of the variable PDCP\_SN\_INFO;
- in TDD, if the procedure is used to perform a handover to a cell where timing advance is enabled, and the UE can calculate the timing advance value in the new cell (i.e. in a synchronous TDD network):
  - set the IE "Uplink Timing Advance" to the calculated value;
- if the IE "Integrity protection mode info" was present in the received reconfiguration message:
  - start applying the new integrity protection configuration in the uplink for RB#2 from and including the transmitted response message;

If after state transition the UE enters CELL\_PCH or URA\_PCH state, the UE shall, after the state transition and transmission of the response message:

- if the IE "Frequency info" is included in the received reconfiguration message:
  - select a suitable UTRA cell according to [4] on that frequency;
- if the IE "Frequency info" is not included in the received reconfiguration message:
  - select a suitable UTRA cell according to [4];
- prohibit periodical status transmission in RLC;
- remove any C-RNTI from MAC;
- clear the variable C\_RNTI;
- start timer T305 using its initial value if timer T305 is not running and if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;
- select Secondary CCPCH according to subclause 8.6.6.5;
- if the IE "UTRAN DRX cycle length coefficient" is included in the same message:
  - use the value in the IE "UTRAN DRX Cycle length coefficient" for calculating Paging occasion and PICH Monitoring Occasion as specified in subclause 8.6.3.2;
- if the UE enters CELL\_PCH state, and the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE:
  - initiate a cell update procedure according to subclause 8.3.1 using the cause "cell reselection";
  - when the cell update procedure completed successfully:
    - ~~The~~the procedure ends;
- if the UE enters URA\_PCH state, and after cell selection the criteria for URA update caused by "URA reselection" according to subclause 8.3.1 is fulfilled:
  - initiate a URA update procedure according to subclause 8.3.1 using the cause "URA reselection";
  - when the URA update procedure completed:
    - ~~The~~the procedure ends.

#### 8.2.2.4 Transmission of a response message by the UE, normal case

In case the procedure was triggered by reception of a RADIO BEARER SETUP message, the UE shall:

- ~~if the UE is not in CELL\_DCH prior to this procedure and will be in CELL\_DCH state at the conclusion of this procedure:~~

~~— include the IE "COUNT-C activation time" in the response message and specify a CFN value other than the default, "Now" for this IE;~~

- transmit a RADIO BEARER SETUP COMPLETE as response message on the uplink DCCH using AM RLC;

In case the procedure was triggered by reception of a RADIO BEARER RECONFIGURATION message, the UE shall:

~~— if the UE will be in CELL\_DCH state at the conclusion of this procedure:~~

~~— include the IE "COUNT-C activation time" in the response message and specify a CFN value other than the default, "Now" for this IE;~~

- transmit a RADIO BEARER RECONFIGURATION COMPLETE as response message on the uplink DCCH using AM RLC;

In case the procedure was triggered by reception of a RADIO BEARER RELEASE message, the UE shall:

~~— if the UE will be in CELL\_DCH state at the conclusion of this procedure:~~

~~— include the IE "COUNT-C activation time" in the response message and specify a CFN value other than the default, "Now" for this IE;~~

- transmit a RADIO BEARER RELEASE COMPLETE as response message on the uplink DCCH using AM RLC;

In case the procedure was triggered by reception of a TRANSPORT CHANNEL RECONFIGURATION message, the UE shall:

~~— if the UE will be in CELL\_DCH state at the conclusion of this procedure:~~

~~— include the IE "COUNT-C activation time" in the response message and specify a CFN value other than the default, "Now" for this IE;~~

- transmit a TRANSPORT CHANNEL RECONFIGURATION COMPLETE as response message on the uplink DCCH using AM RLC;

In case the procedure was triggered by reception of a PHYSICAL CHANNEL RECONFIGURATION message, the UE shall:

~~— if the UE will be in CELL\_DCH state at the conclusion of this procedure:~~

~~— include the IE "COUNT-C activation time" in the response message and specify a CFN value other than the default, "Now" for this IE;~~

- transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE as response message on the uplink DCCH using AM RLC;

If the new state is CELL\_DCH or CELL\_FACH, the response message shall be transmitted using the new configuration after the state transition, and the UE shall:

- if the variable PDCP\_SN\_INFO is empty:
  - if the received reconfiguration message contained the IE "Cipherring mode info":
    - when RLC has confirmed the successful transmission of the response message:
      - notify upper layers upon change of the security configuration;
      - perform the actions below;
    - if the received reconfiguration message did not contain the IE "Cipherring mode info":
      - when RLC has been requested to transmit the response message:
        - perform the actions below;
  - if the variable PDCP\_SN\_INFO is non-empty:

- when RLC has confirmed the successful transmission of the response message:
  - for each radio bearer in the variable PDCP\_SN\_INFO:
    - if the IE "RB started" in the variable ESTABLISHED\_RABS is set to "started":
      - configure the RLC entity for that radio bearer to "continue";
  - perform the actions below.

If the new state is CELL\_PCH or URA\_PCH, the response message shall be transmitted using the old configuration before the state transition and the UE shall:

- when RLC has confirmed the successful transmission of the response message:
  - for each radio bearer in the variable PDCP\_SN\_INFO:
    - if the IE "RB started" in the variable ESTABLISHED\_RABS is set to "started":
      - configure the RLC entity for that radio bearer to "continue";
  - enter the new state (CELL\_PCH or URA\_PCH, respectively);
  - perform the actions below.

The UE shall:

- set the variable ORDERED\_RECONFIGURATION to FALSE;
- if the received reconfiguration message contained the IE "Ciphering mode info":
  - set the IE "Reconfiguration" in the variable CIPHERING\_STATUS to FALSE; and
  - clear the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO;
- if the received reconfiguration message contained the IE "Integrity protection mode info":
  - set the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to FALSE; and
  - clear the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
- clear the variable PDCP\_SN\_INFO;
- clear the variable START\_VALUE\_TO\_TRANSMIT.

#### 8.2.2.5 Reception of a response message by the UTRAN, normal case

When UTRAN has received

- the RADIO BEARER SETUP COMPLETE message; or
- the RADIO BEARER RECONFIGURATION COMPLETE message; or
- the RADIO BEARER RELEASE COMPLETE message; or
- the TRANSPORT CHANNEL RECONFIGURATION COMPLETE message; or
- the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message;

UTRAN may delete the old configuration.

UTRAN may delete the C-RNTI of the UE if the procedure caused the UE to leave the CELL\_FACH state.

If the IE "UL Timing Advance" is included, UTRAN shall evaluate the timing advance value that the UE has to use in the new cell after handover.

If the IE "START" or the IE "START list" is included, UTRAN should set the START value for each CN domain with the corresponding values as received in this response message. Consequently, UTRAN should then use the START



values to initialise the hyper frame numbers, in the same way as specified for the UE in subclause 8.2.2.3, for any new radio bearers that are established.

For radio bearers using RLC-AM or RLC-UM:

- use the old ciphering configuration for received RLC PDUs with RLC sequence number less than the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent by the UE;
- use the new ciphering configuration for received RLC PDUs with RLC sequence number greater than or equal to the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent by the UE;
- if an RLC reset or re-establishment occurs after this response message has been received by UTRAN before the activation time for the new ciphering configuration has been reached, ignore the activation time and apply the new ciphering configuration immediately after the RLC reset or RLC re-establishment;

For radio bearers using RLC-TM:

- use the new ciphering configuration and only begin incrementing the COUNT-C at the CFN as indicated in:
  - the IE "Ciphering activation time for DPCH" in the IE "Ciphering mode info", if included in the message that triggered the radio bearer control procedure, or
  - the IE "COUNT-C activation time", if included in the response message for this procedure.

If the IE "COUNT-C activation time" is included, UTRAN should only begin incrementing the COUNT-C for radio bearers that are mapped on TM-RLC at the CFN indicated in this IE.

The procedure ends on the UTRAN side.

### 8.2.2.12b Cell update procedure during security reconfiguration

If:

- a cell update procedure according to subclause 8.3.1 is initiated; and
- the received reconfiguration ~~SECURITY MODE CONTROL~~ message causes either,
  - the IE "Reconfiguration" in the variable CIPHERING\_STATUS to be set to TRUE; and/or
  - the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to be set to TRUE;

the UE shall:

- abort the ongoing integrity and/or ciphering reconfiguration;
- resume data transmission on any suspended radio bearer and signalling radio bearer mapped on RLC-AM or RLC-UM;
- transmit a failure response message as specified in subclause 8.2.2.9, setting the information elements as specified below:
  - include the IE "RRC transaction identifier"; and
  - set it to the value of "RRC transaction identifier" in the entry for the received message in the table "Accepted transactions" in the variable TRANSACTIONS; and
  - clear that entry;
  - set the IE "failure cause" to the cause value "cell update occurred";
  - if the received reconfiguration message contained the IE "Ciphering mode info":
    - set the IE "Reconfiguration" in the variable CIPHERING\_STATUS to FALSE; and

- clear the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO;
- if the received reconfiguration message contained the IE "Integrity protection mode info":
  - set the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to FALSE; and
  - clear the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
- continue with any ongoing processes and procedures as if the reconfiguration message was not received.

The procedure ends.

### 8.3.1.5 Reception of an CELL UPDATE/URA UPDATE message by the UTRAN

When the UTRAN receives a CELL UPDATE/URA UPDATE message, it may either:

- in case the procedure was triggered by reception of a CELL UPDATE:
  - update the START value for each CN domain as maintained in UTRAN (refer to subclause 8.5.9) with "START" in the IE "START list" for the CN domain as indicated by "CN domain identity" in the IE "START list";
  - if this procedure was triggered while the UE was not in CELL\_DCH state, then for each CN domain as indicated by "CN domain identity" in the IE "START list":
    - set the 20 MSB of the MAC-d HFN with the corresponding START value in the IE "START list";
    - set the remaining LSB of the MAC-d HFN to zero;
  - transmit a CELL UPDATE CONFIRM message on the downlink DCCH or optionally on the CCCH but only if ciphering is not required; and
  - optionally include the IE "RLC re-establish indicator" to request a RLC re-establishment in the UE, in which case the corresponding RLC entities should also be re-established in UTRAN; or
- in case the procedure was triggered by reception of a URA UPDATE:
  - transmit a URA UPDATE CONFIRM message to the lower layers for transmission on the downlink CCCH or DCCH in which case the UTRAN should include the IE "URA identity" in the URA UPDATE CONFIRM message in a cell where multiple URA identifiers are broadcast; or
  - initiate an RRC connection release procedure (see subclause 8.1.4) by transmitting an RRC CONNECTION RELEASE message on the downlink CCCH.

### 8.3.6.3 Reception of HANDOVER TO UTRAN COMMAND message by the UE

The UE shall be able to receive a HANDOVER TO UTRAN COMMAND message and perform an inter-RAT handover, even if no prior UE measurements have been performed on the target UTRAN cell and/or frequency.

The UE shall act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following. The UE shall:

- store a U-RNTI value (32 bits), which is derived by the IEs "SRNC identity" (12 bits) and "S-RNTI 2" (10 bits) included in IE "U-RNTI-short". In order to produce a full size U-RNTI value, a full size "S-RNTI" (20 bits) shall be derived by padding the IE "S-RNTI 2" with 10 zero bits in the most significant positions; and
- initialise the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS with the signalling connections that remains after the handover according to the specifications of the source RAT;
- if IE "Specification mode" is set to "Preconfiguration" and IE "Preconfiguration mode" is set to "Predefined configuration":
  - initiate the radio bearer and transport channel configuration in accordance with the predefined parameters identified by the IE "Predefined configuration identity";

- initiate the physical channels in accordance with the predefined parameters identified by the IE "Predefined radio configuration identity" and the received physical channel information elements;
- store information about the established radio access bearers and radio bearers according to the IE "Predefined configuration identity"; and
- set the IE "RAB Info Post" in the variable ESTABLISHED\_RABS and the IE "Re-establishment timer" in the IE "RAB Info" in the variable ESTABLISHED\_RABS to "useT314";
- if IE "Specification mode" is set to "Preconfiguration" and IE "Preconfiguration mode" is set to "Default configuration":
  - initiate the radio bearer and transport channel configuration in accordance with the default parameters identified by the IE "Default configuration mode" and IE "Default configuration identity";
  - initiate the physical channels in accordance with the default parameters identified by the IE "Default configuration mode" and IE "Default configuration identity" and the received physical channel information elements;

NOTE IE "Default configuration mode" specifies whether the FDD or TDD version of the default configuration shall be used

- set the IE "RAB Info Post" in the variable ESTABLISHED\_RABS and the IE "Re-establishment timer" in the IE "RAB Info" in the variable ESTABLISHED\_RABS to "useT314";
- if IE "Specification mode" is set to "Complete specification":
  - initiate the radio bearer, transport channel and physical channel configuration in accordance with the received radio bearer, transport channel and physical channel information elements;
- perform an open loop estimation to determine the UL transmission power according to subclause 8.5.3;
- if ciphering has been activated and ongoing in the radio access technology from which inter- system handover is performed:
  - for the CN domain as in the IE "CN domain identity" which is included in the IE "RAB info" of the IE "RAB information to setup":
    - set the HFN component of the COUNT-C variable for all radio bearers and signalling radio bearers that use RLC-AM and RLC-UM to the START value as stored in the USIM for that CN domain. The remaining LSBs of the HFN component of COUNT-C shall be set to zero;
    - set the HFN component of the COUNT-C variable for all radio bearers and signalling radio bearers that use the transparent mode of RLC to zero. The value of the HFN component of the COUNT-C variable shall not be incremented at each CFN cycle. The CFN component of the COUNT-C variable is set to the value of the CFN as calculated in subclause 8.5.15;
    - set the IE "Status" in the variable CIPHERING\_STATUS to "Started";
    - apply the same ciphering (ciphered/unciphered, algorithm) as prior to inter-RAT handover, unless a change of algorithm is requested by means of the IE "Ciphering algorithm";
    - apply ciphering immediately upon reception of the HANDOVER TO UTRAN COMMAND;
  - ~~apply the same ciphering (ciphered/unciphered, algorithm) as prior to inter-RAT handover, unless a change of algorithm is requested by means of the "Ciphering algorithm".~~

If the UE succeeds in establishing the connection to UTRAN, it shall:

- if the IE "Status" in the variable CIPHERING\_STATUS to "Started" and transparent mode radio bearers have been established by this procedure:
  - include the IE "COUNT-C activation time" in the response message and specify a CFN value other than the default, "Now" for this IE;

- at the CFN value as indicated in the response message in the IE "COUNT-C activation time":
  - set the HFN component of the COUNT-C variable to the START value as indicated in the IE "START list" of the response message for the relevant CN domain. The remaining LSBs of the HFN component of COUNT-C shall be set to zero:
  - increment the HFN component of the COUNT-C variable by one;
  - the CFN component of the COUNT-C is set to the value of the IE "COUNT-C activation time" of the response message;
  - the HFN component and the CFN component completely initialise the COUNT-C variable;
  - the COUNT-C variable is stepped, as normal, at each CFN value. The HFN component is no longer fixed in value but incremented at each CFN cycle;
- transmit a HANDOVER TO UTRAN COMPLETE message on the uplink DCCH, using the new ciphering configuration, only if ciphering has been started;
- when the HANDOVER TO UTRAN COMPLETE message has been submitted to lower layers for transmission,;
  - if the IE "Transport format combination subset" was not included in the HANDOVER TO UTRAN COMMAND message or in the predefined parameters;
    - set the IE "Current TFC subset" in the variable TFS\_SUBSET to "Full transport format combination set";
  - set the IE "Status" in the variable CIPHERING\_STATUS to "Not started";
  - set the IE "Reconfiguration" in the variable CIPHERING\_STATUS to FALSE;
  - set the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO to "Not started";
  - set the IE "Historical status" in the variable INTEGRITY\_PROTECTION\_INFO to "Never been active";
  - set the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to FALSE;
  - set the variable CELL\_UPDATE\_STARTED to FALSE;
  - set the variable ORDERED\_RECONFIGURATION to FALSE;
  - set the variable FAILURE\_INDICATOR to FALSE;
  - set the variable INCOMPATIBLE\_SECURITY\_RECONFIGURATION to FALSE;
  - set the variable INVALID\_CONFIGURATION to FALSE;
  - set the variable PROTOCOL\_ERROR\_INDICATOR, TFC\_SUBSET to FALSE;
  - set the variable PROTOCOL\_ERROR\_REJECT to FALSE;
  - set the variable TGSN\_REPORTED to FALSE;
  - set the variable UNSUPPORTED\_CONFIGURATION to FALSE;
  - clear all optional IEs in all variables, except those optional IEs that are set in this procedure;
- ~~And~~ and the procedure ends.

#### 8.3.7.4 Successful completion of the inter-RAT handover

Upon successfully completing the handover, UTRAN should release the radio connection and remove all context information for the concerned UE.

Upon successfully completing the handover, the UE shall:

- if the USIM is present:
  - store the current START value for every CN domain in the USIM [50];
  - if the "START" stored in the USIM [50] for a CN domain is greater than the value "THRESHOLD" of the variable START\_THRESHOLD then:
    - delete the ciphering and integrity keys that are stored in the USIM for that CN domain;
    - inform the deletion of these keys to upper layers;

NOTE: The release of the UMTS radio resources is initiated from the target RAT.

### 8.3.7.5 UE fails to complete requested handover

If the UE does not succeed in establishing the connection to the target radio access technology, it shall:

- revert back to the UTRA configuration;
- establish the UTRA physical channel(s) used at the time for reception of HANDOVER FROM UTRAN COMMAND;
- if the UE does not succeed to establish the UTRA physical channel(s):
  - select a suitable UTRA cell according to [4];
  - perform a cell update procedure according to subclause 8.3.1 with cause "Radio link failure";
  - when the cell update procedure has completed successfully:
    - proceed as below;
- transmit the HANDOVER FROM UTRAN FAILURE message setting the information elements as specified below:
  - include the IE "RRC transaction identifier"; and
  - set it to the value of "RRC transaction identifier" in the entry for the HANDOVER FROM UTRAN COMMAND message in the table "Accepted transactions" in the variable TRANSACTIONS; and
  - clear that entry;
  - set the IE "Inter-RAT change failure" to "physical channel failure";
- When the HANDOVER FROM UTRAN FAILURE message has been submitted to lower layer for transmission:
  - ~~The~~ the procedure ends.

### 8.3.7.6 Invalid HANDOVER FROM UTRAN COMMAND message

If the IE "Inter-RAT message" received within the HANDOVER FROM UTRAN COMMAND message does not include a valid inter RAT handover message in accordance with the protocol specifications for the target RAT, the UE shall perform procedure specific error handling as follows. The UE shall:

- set the IE "failure cause" to the cause value "Inter-RAT protocol error";
- include the IE "Inter-RAT message" in case the target RAT provides further details about the inter RAT protocol error;
- transmit a HANDOVER FROM UTRAN FAILURE message on the uplink DCCH using AM RLC;
- when the transmission of the HANDOVER FROM UTRAN FAILURE message has been confirmed by RLC:
  - continue with any ongoing processes and procedures as if the invalid HANDOVER FROM UTRAN COMMAND message has not been received;

- ~~And~~and the procedure ends.

If the HANDOVER FROM UTRAN COMMAND message contains a protocol error causing the variable PROTOCOL\_ERROR\_REJECT to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling as follows. The UE shall:

- set the IE "RRC transaction identifier" in the HANDOVER FROM UTRAN FAILURE message to the value of "RRC transaction identifier" in the entry for the HANDOVER FROM UTRAN COMMAND message in the table "Rejected transactions" in the variable TRANSACTIONS; and
- clear that entry;
- set the IE "failure cause" to the cause value "protocol error";
- include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL\_ERROR\_INFORMATION;
- transmit a HANDOVER FROM UTRAN FAILURE message on the uplink DCCH using AM RLC;
- when the HANDOVER FROM UTRAN FAILURE message has been submitted to lower layers for transmission:
  - continue with any ongoing processes and procedures as if the invalid HANDOVER FROM UTRAN COMMAND message has not been received;
- ~~And~~and the procedure ends.

#### 8.3.7.8 Unsupported configuration in HANDOVER FROM UTRAN COMMAND message

If the UTRAN instructs the UE to perform a non-supported handover scenario, e.g. multiple RAB or to use a non-supported configuration, the UE shall:

- transmit a HANDOVER FROM UTRAN FAILURE message, setting the information elements as specified below:
  - include the IE "RRC transaction identifier"; and
  - set it to the value of "RRC transaction identifier" in the entry for the HANDOVER FROM UTRAN COMMAND message in the table "Accepted transactions" in the variable TRANSACTIONS; and
  - clear that entry;
  - set the IE "Inter-RAT change failure" to "configuration unacceptable";
  - when the HANDOVER FROM UTRAN FAILURE message has been submitted to lower layers for transmission:
    - resume normal operation as if the invalid HANDOVER FROM UTRAN COMMAND message has not been received;
- ~~And~~and the procedure ends.

### 8.5.2 Actions when entering idle mode from connected mode

When entering idle mode from connected mode, the UE shall attempt to select a suitable cell to camp on. The UE shall perform cell selection when leaving connected mode according to [4].

While camping on a cell, the UE shall acquire system information according to the system information procedure in subclause 8.1, perform measurements according to the measurement control procedure specified in subclause 8.4 and, if registered, be prepared to receive paging messages according to the paging procedure in subclause 8.2.

If IE "PLMN identity" within variable SELECTED\_PLMN has the value "GSM-MAP", the UE shall delete any NAS system information received in connected mode, acquire the NAS system information in system information block type 1, and proceed according to subclause 8.6.1.2.

~~When entering idle mode, the UE shall: the current START value for every CN domain shall be stored in the USIM.~~

- ~~- if the USIM is present:~~
  - ~~- store the current START value for every CN domain in the USIM [50];~~
  - ~~- if the "START" stored in the USIM [50] for a CN domain is greater than the value "THRESHOLD" of the variable START\_THRESHOLD then:~~
    - ~~- delete the ciphering and integrity keys that are stored in the USIM for that CN domain;~~
    - ~~- inform the deletion of these keys to upper layers;~~

## 8.5.8 Maintenance of Hyper Frame Numbers

The MSBs of both the ciphering sequence numbers (COUNT-C) and integrity sequence numbers (COUNT-I), for the ciphering and integrity protection algorithms, respectively [40], are called the Hyper Frame Numbers (HFN).

For integrity protection, the UE shall maintain COUNT-I as specified in subclause 8.5.10.

The following hyper frame numbers types are defined:

- MAC-d HFN    24 MSB of COUNT-C for data sent over RLC TM
- RLC UM HFN   25 MSB of COUNT-C for data sent over RLC UM
- RLC AM HFN   20 MSB of COUNT-C for data sent over RLC AM
- RRC HFN        28 MSB of COUNT-I

For non-transparent mode RLC radio bearers, the UE shall maintain:

- ~~- one uplink and one downlink COUNT-C per radio bearer and one uplink and one downlink COUNT-I per signalling radio bearer.~~

For all transparent mode RLC radio bearers of the same CN domain, the UE shall maintain:

- ~~- one COUNT-C, common for all radio bearers in uplink and downlink~~
- ~~- one uplink and one downlink COUNT-I per signalling radio bearer. (Note: In this release of the specification there is only an uplink transparent mode COUNT-I, which is used for RB 0).~~

COUNT-C and COUNT-I are defined in [40], with the following supplement for COUNT-C: for transparent mode RLC radio bearers with a transmission time interval of x radio frames (x = 2, 4, 8), the MAC PDU is carried by L1 in x consecutive radio frames due to radio frame segmentation. In this case, the CFN of the first segment of the MAC PDU is used as the CFN component of COUNT-C.

~~The hyper frame numbers (HFN) are used as MSBs of both the ciphering sequence number (COUNT-C) and the integrity sequence number (COUNT-I) for the ciphering and integrity protection algorithms, respectively. For non-transparent mode RLC radio bearers there is an uplink and downlink COUNT-C per radio bearer and an uplink and downlink COUNT-I per signalling radio bearer. For all transparent mode RLC radio bearers of the same CN domain, COUNT-C is the same, and COUNT-C is also the same for uplink and downlink. For transparent mode RLC radio bearers there is an uplink and a downlink COUNT-I per signalling radio bearer. COUNT-C and COUNT-I are defined in [40], with the following supplement for COUNT-C: for transparent mode RLC radio bearers with a transmission time interval of x radio frames (x = 2, 4, 8), the MAC PDU is carried by L1 in x consecutive radio frames due to radio frame segmentation. In this case, the CFN of the first segment of the MAC PDU is used as the CFN component of COUNT-C.~~

~~NOTE:—In this release of the specification there is only an uplink transparent mode COUNT-I, which is used for RB 0.~~

The following hyper frame numbers are defined:

MAC-d HFN — 24 bits — MSB of COUNT-C for data sent over RLC-TM

RLC-UM HFN — 25 bits — MSB of COUNT-C for data sent over RLC-UM

RLC-AM HFN — 20 bits — MSB of COUNT-C for data sent over RLC-AM

RRC HFN — 28 bits — MSB of COUNT-I

The START value is used to initialise the 20 most significant bits of all the hyper frame numbers and the remaining bits of the hyper frame numbers are set equal to zero.

### 8.5.9 START value calculation

In connected mode, the START value for CN domain 'X' is calculated as:

Let  $START_X$  = the START value for CN domain 'X' prior to the calculation below:

$START_X' = MSB_{20} ( MAX \{ COUNT-C, COUNT-I \mid \text{radio bearers and signalling radio bearers with } CK_X \text{ and } IK_X \} ) + 1.$

- if  $START_X' =$  the maximum value = 1048575 then  $START_X = START_X'$ ;

- if the current  $START_X < START_X'$  then  $START_X = START_X'$ , otherwise  $START_X$  is unchanged.

The  $START_X$  value is used to initialise the 20 most significant bits of all hyper frame numbers in CN domain 'X'.

~~When entering idle mode the current START value for every CN domain shall be stored in the USIM.~~

### 8.5.10 Integrity protection

If the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started" then the UE and UTRAN shall perform integrity protection (and integrity checking) on all RRC messages, with the following exceptions:

~~Integrity protection shall be performed on all RRC messages, with the following exceptions:~~

~~HANDOVER TO UTRAN COMPLETE~~

~~PAGING TYPE 1~~

~~PUSCH CAPACITY REQUEST~~

~~PHYSICAL SHARED CHANNEL ALLOCATION~~

~~RRC CONNECTION REQUEST~~

~~RRC CONNECTION SETUP~~

~~RRC CONNECTION SETUP COMPLETE~~

~~RRC CONNECTION REJECT~~

~~RRC CONNECTION RELEASE (CCCH only)~~

~~SYSTEM INFORMATION~~

~~SYSTEM INFORMATION CHANGE INDICATION~~

~~TRANSPORT FORMAT COMBINATION CONTROL (TM DCCH only)~~

If the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Not started" then integrity protection (and integrity checking) shall not be performed on any RRC message.

For each signalling radio bearer, the UE shall use two RRC hyper frame numbers:

- "Uplink RRC HFN";
- "Downlink RRC HFN".



and two message sequence numbers:

- "Uplink RRC Message sequence number";
- "Downlink RRC Message sequence number".

The above information is stored in the variable INTEGRITY\_PROTECTION\_INFO per signalling radio bearer (RB 0-4).

Upon the first activation of integrity protection for an RRC connection, UE and UTRAN initialise the "Uplink RRC Message sequence number" and "Downlink RRC Message sequence number" for all signalling radio bearers as specified in subclauses 8.6.3.5 and 8.5.10.1.

As a general rule, the RRC message sequence number (RRC SN) is incremented for every integrity protected RRC message. In cases when there are exceptions, these are stated for those procedures.

~~The RRC message sequence number (RRC SN) is incremented for every integrity protected RRC message. If the same RRC message is sent repeatedly (e.g. RRC CONNECTION RELEASE, RRC CONNECTION RELEASE COMPLETE and UE CAPABILITY INFORMATION) the corresponding RRC SN is not incremented.~~

### 8.5.10.1 Integrity protection in downlink

If the UE receives an RRC message on signalling radio bearer with RB identity n, the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started" and the IE 'Integrity check info' is present the UE shall:

- perform the actions in subclause 8.6.3.5; and
- apply the new integrity protection configuration;
- check the value of the IE "RRC message sequence number" included in the IE "Integrity check info";
  - if the "Downlink RRC Message sequence number" is not present in the variable INTEGRITY\_PROTECTION\_INFO:
    - initialise the "Downlink RRC Message sequence number" in the variable INTEGRITY\_PROTECTION\_CHECK\_INFO with the value of the IE "RRC message sequence number" included in the IE "Integrity check info" of the received message;
  - if the "Downlink RRC Message sequence number" is present in the variable INTEGRITY\_PROTECTION\_INFO:
    - if the RRC message sequence number is lower than the "Downlink RRC Message sequence number" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO:
      - increment "Downlink RRC HFN" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO with one;
    - if the RRC message sequence number is equal to the "Downlink RRC Message sequence number" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO:
      - discard the message;
- calculate an expected message authentication code in accordance with subclause 8.5.10.3;
- compare the expected message authentication code with the value of the received IE "message authentication code" contained in the IE "Integrity check info";
  - if the expected message authentication code and the received message authentication code are the same, the integrity check is successful:
    - update the "Downlink RRC Message sequence number" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO with the value of the IE "RRC message sequence number" included in the IE "Integrity check info" of the received RRC message;
  - if the calculated expected message authentication code and the received message authentication code differ:

- if the IE "RRC message sequence number" included in the IE "Integrity check info" is lower than the "Downlink RRC Message sequence number" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO (in this case the "Downlink RRC HFN" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO was incremented by one, as stated above):
  - decrement "Downlink RRC HFN" for RB#n in the variable INTEGRITY\_PROTECTION\_INFO by one;
- discard the message.

If the UE receives an RRC message on signalling radio bearer with identity n, the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started" and the IE 'Integrity check info' is not present the UE shall:

- discard the message.

### 8.5.10.3 Calculation of message authentication code

The UE shall calculate the message authentication code in accordance with [40]. The input parameter MESSAGE [40] for the integrity algorithm shall be constructed by:

- setting the "Message authentication code" in the IE "Integrity check info" in the message to the signalling radio bearer identity
- setting the "RRC Message sequence number" in the IE "Integrity check info" in the message to zero
- encoding the message
- appending RRC padding (if any) as a bitstring to the encoded bitstring as the least significant bits

For usage on an RRC message transmitted or received on the radio bearer with identity n, the UE shall construct the input parameter COUNT-I [40] by appending the following IEs from the IE "Signalling radio bearer specific integrity protection information" for radio bearer n in the variable INTEGRITY\_PROTECTION\_INFO:

- for uplink, "Uplink RRC HFN", as the MSB, and "Uplink RRC Message sequence number", as LSB;
- for downlink, "Downlink RRC HFN", as the MSB, and "Downlink RRC Message sequence number", as LSB.

### 8.6.3.4 Cipherng mode info

The IE "Cipherng mode info" defines the new cipherng configuration. If the IE "Cipherng mode info" is present and if the IE "Reconfiguration" in the variable CIPHERING\_STATUS is set to FALSE, the UE shall check the IE "Cipherng mode command" as part of the IE "Cipherng mode info", and perform the following. The UE shall:

- if the IE "Status" in the variable CIPHERING\_STATUS has the value "Not Started", and if the IE "Cipherng mode command" has the value "stop":
  - ignore this attempt to change the cipherng configuration; and
  - set the variable INVALID\_CONFIGURATION to TRUE;
- else:
  - set the IE "Reconfiguration" in the variable CIPHERING\_STATUS to TRUE;
  - if IE "Cipherng mode command" has the value "start/restart":
    - start or restart cipherng in lower layers for all established radio bearers in the variable ESTABLISHED\_RABS, using the cipherng algorithm (UEA [40]) indicated by the IE "Cipherng algorithm" as part of the new cipherng configuration. For each radio bearer, the value of the IE "RB identity" in the variable ESTABLISHED\_RABS minus one shall be used as the value of BEARER in the cipherng algorithm. The new cipherng configuration shall be applied as specified below;
    - set the IE "Status" in the variable CIPHERING\_STATUS to "Started";

- if the IE "Ciphering mode command" has the value "stop", the UE shall:
  - ~~stop ciphering and stop incrementing COUNT-C values for all signalling radio bearers and also for transparent RLC mode radio bearers, only at the new ciphering configuration that shall be applied as specified below;~~~~stop ciphering. The new ciphering configuration shall be applied as specified below;~~
  - set the IE "Status" in the variable CIPHERING\_STATUS to "Not started";
- in case the IE "Ciphering mode command" has the value "start/restart" or "stop", the new ciphering configuration shall be applied as follows:
  - the (oldest currently used) ciphering configuration shall be stored until activation times have elapsed for the new ciphering configuration to be applied on all signalling radio bearers and radio bearers;
  - if there are pending activation times set for ciphering by a previous procedure changing the ciphering configuration then the ciphering configuration that shall be applied at this pending activation time is as indicated in this procedure;
  - this implies that the UE shall only need to store at most two different ciphering configurations at any given time for all signalling radio bearers and radio bearers; the old and newest ciphering configurations, per CN domain;
  - if the IE "Ciphering activation time for DPCH" is present in the IE "Ciphering mode info":
    - apply the new configuration at that time for radio bearers using RLC-TM. If the IE "Ciphering mode info" is present in a message reconfiguring RB, transport channel or physical channel, the indicated time in IE "Activation time for DPCH" corresponds to a CFN after that reconfiguration;
  - if the IE "Radio bearer downlink ciphering activation time info" is present in the IE "Ciphering mode info":
    - apply the following procedure for each radio bearer using RLC-AM and RLC-UM indicated by the IE "RB identity":
      - suspend data transmission on the radio bearer;
      - select an "RLC send sequence number" at which (activation) time the new ciphering configuration shall be applied in uplink for that radio bearer according to the following:
        - for each radio bearer and signalling radio bearer that has no pending ciphering activation time as set by a previous procedure changing the security configuration, a suitable value that would ensure a minimised delay in the change to the latest security configuration;
        - for each radio bearer and signalling radio bearer that has a pending ciphering activation time as set by a previous procedure changing the security configuration, set the same value as the pending ciphering activation time;
        - this activation time is considered to be elapsed when the selected activation time (as above) is equal to the "RLC send sequence number";
      - store the selected "RLC send sequence number" for that radio bearer in the entry for the radio bearer in the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO~~store the "RLC send sequence number" for that radio bearer in the variable~~  
RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO, at which time the new ciphering configuration shall be applied;
    - when the data transmission of that radio bearer is resumed:
      - switch to the new ciphering configuration according to the following:
      - use the old ciphering configuration for the transmitted and received RLC PDUs with RLC sequence number smaller than the corresponding RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent to UTRAN respectively in the received IE "Radio bearer downlink ciphering activation time info" received from UTRAN;

- use the new ciphering configuration for the transmitted and received RLC PDUs with RLC sequence number greater than or equal to the corresponding RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent to UTRAN respectively in the received IE "Radio bearer downlink ciphering activation time info" received from UTRAN;
- for a radio bearer using RLC-AM, when the RLC sequence number indicated in the IE "Radio bearer downlink ciphering activation time info" is not included in the RLC transmission window, the UE may release the old ciphering configuration for that radio bearer;
- if an RLC reset or re-establishment occurs before the activation time for the new ciphering configuration has been reached, ignore the activation time and apply the new ciphering configuration immediately after the RLC reset or RLC re-establishment.

If the IE "Ciphering mode info" is present and if the IE "Reconfiguration" in the variable CIPHERING\_STATUS is set to TRUE, the UE shall:

- ignore this second attempt to change the ciphering configuration; and
- set the variable INCOMPATIBLE\_SECURITY\_RECONFIGURATION to TRUE.

If the IE "Ciphering mode info" is not present, the UE shall not change the ciphering configuration.

### 8.6.3.5 Integrity protection mode info

The IE "Integrity protection mode info" defines the new integrity protection configuration. If the IE "Integrity protection mode info" is present and if the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_STATUS is set to FALSE, the UE shall check the IE "Integrity protection mode command" as part of the IE "Integrity protection mode info", and perform the following. The UE shall:

- if the IE "Integrity protection mode command" has the value "start" and the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started"; or if the IE "Integrity protection mode command" has the value "Modify" and the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Not Started":
  - ignore this attempt to change the integrity protection configuration; and
  - set the variable INVALID\_CONFIGURATION to TRUE;
- else:
  - set the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_STATUS to TRUE;
  - if IE "Integrity protection mode command" has the value "start" and the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Not started":
    - if the IE "Historical status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Never been active":
      - initialise the information for all signalling radio bearers in the variable INTEGRITY\_PROTECTION\_INFO according to the following:
        - calculate the START value as specified in subclauses 8.5.9 for the CN domain as indicated in the variable LATEST\_CONFIGURED\_CN\_DOMAIN;
        - set the 20 MSB of the "Uplink RRC HFN" and "Downlink RRC HFN" with the START value as calculated above;
        - set the remaining LSB of the "Uplink RRC HFN" and "Downlink RRC HFN" to zero;
      - set the IE "Uplink RRC Message sequence number" to zero;
      - do not include the IE "Downlink RRC Message sequence number";
    - set the IE "Historical status" in the variable INTEGRITY\_PROTECTION\_INFO to the value "Has been active";

- set the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO to the value "Started";
- perform integrity protection on the received message as described in subclause 8.5.10.1;
- use the algorithm (UIA [40]) indicated by the IE "Integrity protection algorithm" contained in the IE "Integrity protection mode info";
- use the IE "Integrity protection initialisation number", contained in the IE "Integrity protection mode info" as the value of FRESH [40];
- if IE "Integrity protection mode command" has the value "modify" and the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started":
  - the (oldest currently used) integrity protection configuration shall be stored until activation times have elapsed for the new integrity protection configuration to be applied on all signalling radio bearers;
  - if there are pending activation times set for integrity protection by a previous procedure changing the integrity protection configuration then the integrity protection configuration that shall be applied at this pending activation time is as indicated in this procedure.
  - this implies that the UE shall only need to store at most two different integrity protection configurations at any given time for all signalling radio bearers; the old and newest integrity protection configurations, per CN domain;
  - start applying the new integrity protection configuration in the downlink at the RRC sequence number, for each radio bearer n, indicated by the entry for radio bearer n in the "RRC message sequence number list" in the IE "Downlink integrity protection activation info", included in the IE "Integrity protection mode info";
  - perform integrity protection on the received message as described in subclause 8.5.10.1;
  - if present, use the algorithm indicated by the IE "Integrity protection algorithm" (UIA [40]);
  - set the content of the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO according to the following:
    - for each established signalling radio bearer, stored in the variable ESTABLISHED\_RABS:
      - select a value of the RRC sequence number at which (activation) time the new integrity protection configuration shall be applied in uplink for that signalling radio bearer according to the following:
        - for each signalling radio bearer that has no pending activation time as set for integrity protection by a previous procedure changing the integrity protection configuration, a suitable value that would ensure a minimised delay in the change to the latest integrity protection configuration;
        - for signalling radio bearer that has a pending activation time as set for integrity protection by a previous procedure changing the integrity protection configuration, set the same value as the pending activation time for integrity protection;
        - this activation time is considered to be elapsed when the selected activation time (as above) is equal to the next RRC sequence number to be used;
        - ~~include a value of the RRC sequence number, when the new integrity protection in uplink is to be applied;~~
    - for RB#0:
      - set the value of the included RRC sequence number to greater than or equal to the current value of the RRC sequence number for RB#0 in the variable INTEGRITY\_PROTECTION\_INFO, plus the value of the constant N302 plus one;
  - let m be the radio bearer on which the message containing the IE "integrity protection mode info" was received;
  - start applying the new integrity protection configuration in the uplink at the RRC sequence number, for each radio bearer n, except for RB#2m, indicated by the entry for radio bearer n in the "RRC message

sequence number list" in the IE "Uplink integrity protection activation info", included in the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;

- start applying the new integrity protection configuration in the uplink at the RRC sequence number for RB#2m, as specified for the procedure initiating the integrity protection reconfiguration;
- ~~— set the values of the IE "Uplink integrity protection activation info".~~

If the IE "Integrity protection mode info" is present and if the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_STATUS is set to TRUE, the UE shall:

- ignore this second attempt to change the integrity protection configuration; and
- set the variable INCOMPATIBLE\_SECURITY\_RECONFIGURATION to TRUE.

If the IE "Integrity protection mode info" is not present, the UE shall not change the integrity protection configuration.

## 8.6.4 Radio bearer information elements

### 8.6.4.1 Signalling RB information to setup list

If the IE "Signalling RB information to setup list" is included the UE shall:

- use the same START value to initialise the COUNT-C and COUNT-I variables for all the signalling radio bearers in the list;
- for each occurrence of the IE "Signalling RB information to setup":
  - use the value of the IE "RB identity" as the identity of the signalling radio bearer to setup;
  - if the value "STATUS" of the variable "CIPHERING STATUS" is "Started":
    - if the IE "Uplink RLC mode" or the IE "Downlink RLC mode" in the IE "RLC info" is set to "AM RLC" or "UM RLC":
      - initialise the 20 MSB of the hyper frame number component of COUNT-C for this signalling radio bearer with the START value for the CN domain as indicated in the variable "LATEST\_CONFIGURED\_CN\_DOMAIN";
      - set the remaining LSB of the hyper frame number component of COUNT-C for this signalling radio bearer to zero;
    - if the IE "Uplink RLC mode" and the IE "Downlink RLC mode" in the IE "RLC info" is set to "TM RLC":
      - if no other transparent mode RLC radio bearers or signalling radio bearers in the variable "ESTABLISHED\_RABS" exist:
        - initialise the 20 MSB of the hyper frame number component of COUNT-C for this signalling radio bearer with the START value for the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" part of the IE "RAB information to setup";;
        - set the remaining LSB of the hyper frame number component of COUNT-C for this signalling radio bearer to zero;
      - if at least one transparent mode RLC radio bearers or signalling radio bearers bearers in the variable "ESTABLISHED\_RABS" exist then:
        - use, for this signalling radio bearer, the COUNT-C for transparent mode radio bearers and signalling radio bearers that is common (refer to subclause 8.5.8), for the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" part of the IE "RAB information to setup"
  - if the value "Historical status" of the variable "INTEGRITY PROTECTION INFO" is "Started":

- initialise the 20 MSB of the hyper frame number component of COUNT-I for this signalling radio bearer with the START value for the CN domain as indicated in the variable LATEST\_CONFIGURED\_CN\_DOMAIN;
- set the remaining LSB of the hyper frame number component of COUNT-I for this signalling radio bearer to zero;
- perform the actions for the IE "RLC info" as specified in subclause 8.6.4.9, applied for that signalling radio bearer;
- perform the actions for the IE "RB mapping info" as specified in subclause 8.6.4.8, applied for that signalling radio bearer;
- apply a default value of the IE "RB identity" equal to 1 for the first IE "Signalling RB information to setup"; and
- increase the default value by 1 for each occurrence.

### 8.6.4.2 RAB information for setup

If the IE "RAB information for setup" is included, the procedure is used to establish radio bearers belonging to a radio access bearer, and the UE shall:

- if several IEs "RAB information for setup" are included and the included IEs "CN domain identity" in the IE "RAB info" does not all have the same value:
  - set the variable INVALID\_CONFIGURATION to TRUE;
- if the radio access bearer identified with the IE "RAB info" does not exist in the variable ESTABLISHED\_RABS:
  - create a new entry for the radio access bearer in the variable ESTABLISHED\_RABS;
  - store the content of the IE "RAB info" in the entry for the radio access bearer in the variable ESTABLISHED\_RABS;
  - indicate the establishment of the radio access bearer to the upper layer entity using the IE "CN domain identity", forwarding the content of the IE "RAB identity";
- calculate the START value only once during this procedure (the same START value shall be used on all new radio bearers created for this radio access bearer) according to subclause 8.5.9 for the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" part of the IE "RAB information to setup";
- store the calculated START value in the variable START\_VALUE\_TO\_TRANSMIT;
- for each radio bearer in the IE "RB information to setup":
  - if the radio bearer identified with the IE "RB identity" does not exist in the variable ESTABLISHED\_RABS for another radio access bearer than the one identified with the IE "RAB info":
    - perform the actions specified in subclause 8.6.4.3;
    - store information about the new radio bearer in the entry for the radio access bearer identified by "RAB info" in the variable ESTABLISHED\_RABS;
  - if the radio bearer identified with the IE "RB identity" does not exist in the variable ESTABLISHED\_RABS for the radio access bearer identified with the IE "RAB info":
    - create a new RAB subflow for the radio access bearer;
    - number the RAB subflow in ascending order, assigning the smallest number to the RAB subflow corresponding to the first radio bearer in the list;
  - if the radio bearer identified with the IE "RB identity" already exists in the variable ESTABLISHED\_RABS for another radio access bearer than the one identified with the IE "RAB info":
    - set the variable INVALID\_CONFIGURATION to TRUE.

### 8.6.4.3 RB information to setup

If the IE "RB information to setup" is included, the UE shall apply the following actions on the radio bearer identified with the value of the IE "RB identity". The UE shall:

- use the same START value to initialise the hyper frame number components of COUNT-C and COUNT-I variables for all the new radio bearers to setup;
- perform the actions for the IE "PDCP info", if present, according to subclause 8.6.4.10, applied for the radio bearer;
- perform the actions for the IE "RLC info", according to subclause 8.6.4.9, applied for the radio bearer;
- perform the actions for the IE "RB mapping info", according to subclause 8.6.4.8, applied for the radio bearer;
- if the variable CIPHERING\_STATUS is set to "Started"; and
  - if the IE "Uplink RLC mode" or the IE "Downlink RLC mode" in the IE "RLC info" is set to "AM RLC" or "UM RLC":
    - initialise the 20 MSB of the hyper frame number component of COUNT-C for this radio bearer with the the START value for the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" part of the IE "RAB information to setup";
    - set the remaining LSB of the hyper frame number component of COUNT-C for this radio bearer to zero;
  - if the IE "Uplink RLC mode" and the IE "Downlink RLC mode" in the IE "RLC info" is set to "TM RLC":
    - if no other transparent mode RLC radio bearers exist in the variable ESTABLISHED\_RABS:
      - initialise the 20 MSB of the hyper frame number component of COUNT-C for this radio bearer with the START value for the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" part of the IE "RAB information to setup";
      - set the remaining LSB of the hyper frame number component of COUNT-C for this radio bearer to zero;
    - if at least one transparent mode RLC radio bearers or signalling radio bearers exist in the variable ESTABLISHED\_RABS:
      - set the MAC-d HFN component of the COUNT-C for this radio bearer with the MAC-d HFN that is common (refer to subclause 8.5.8) for the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" part of the IE "RAB information to setup"
      - calculate the START value according to subclause 8.5.9;
      - store the calculated START value in the variable START\_VALUE\_TO\_TRANSMIT;
      - initialise cipherring on the radio bearer using the calculated START value;
- start to perform cipherring on the radio bearer in lower layers, using the value of the IE "RB identity" minus one as the value of BEARER in the cipherring algorithm.

## 10.2.13 HANDOVER TO UTRAN COMPLETE

This message is sent by the UE when a handover to UTRAN has been completed.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN



Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
<b><u>UE Information elements</u></b>				
START list	CH	1 to <maxCNdo mains>		START [40] values for all CN domains. The IE is mandatory if it has not been transferred prior to the handover.
>CN domain identity	MP		CN domain identity 10.3.1.1	
>START	MP		START 10.3.3.38	
<b><u>RB Information elements</u></b>				
<u>COUNT-C activation time</u>	<u>OP</u>		<u>Activation time</u> <u>10.3.3.1</u>	<u>Used for radio bearers mapped on RLC-TM.</u>

### 10.2.23 PHYSICAL CHANNEL RECONFIGURATION COMPLETE

This message is sent from the UE when a physical channel reconfiguration has been done.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
Message Type	MP		Message Type		
<b>UE information elements</b>					
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36		
Integrity check info	CH		Integrity check info 10.3.3.16		
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.17		
CHOICE mode	MP				
>FDD				(no data)	
>TDD					
>>CHOICE TDD option	MP				REL-4
>>>3.84 Mcps TDD	MP				REL-4
>>>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.95		
>>>1.28 Mcps TDD				(no data)	REL-4
<b>RB Information elements</b>					
COUNT-C activation time	OP		Activation time 10.3.3.1	Used for radio bearers mapped on RLC-TM. Only applicable if the UE is moving to CELL_DCH state due to this procedure	
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.13		
Uplink counter synchronisation info	OP				
>RB with PDCP information list	OP	1 to <maxRBall RABs>			
>>RB with PDCP information	MP		RB with PDCP information 10.3.4.22		
>START list	MP	1 to <maxCNdo mains>		START [40] values for all CN domains.	
>>CN domain identity	MP		CN domain identity 10.3.1.1		
>>>START	MP		START 10.3.3.38	START value to be used in this CN domain.	

## 10.2.28 RADIO BEARER RECONFIGURATION COMPLETE

This message is sent from the UE when a RB and signalling link reconfiguration has been done.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
Message Type	MP		Message Type		
<b>UE information elements</b>					
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36		
Integrity check info	CH		Integrity check info 10.3.3.16		
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.17		
CHOICE mode	MP				
>FDD				(no data)	
>TDD					
>>CHOICE TDD option	MP				REL-4
>>>3.84 Mcps TDD					REL-4
>>>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.95		
>>>1.28 Mcps TDD				(no data)	REL-4
<b>RB Information elements</b>					
COUNT-C activation time	OP		Activation time 10.3.3.1	Used for radio bearers mapped on RLC-TM. Only applicable if the UE is moving to CELL_DCH state due to this procedure	
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.13		
Uplink counter synchronisation info	OP				
>RB with PDCP information list	OP	1 to <maxRBall RABs>			
>>RB with PDCP information	MP		RB with PDCP information 10.3.4.22		
>START list	MP	1 to <maxCNdo mains>		START [40] values for all CN domains.	
>>CN domain identity	MP		CN domain identity 10.3.1.1		
>>>START	MP		START 10.3.3.38	START value to be used in this CN domain.	

## 10.2.31 RADIO BEARER RELEASE COMPLETE

This message is sent from the UE when radio bearer release has been completed.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
Message Type	MP		Message Type		
<b>UE information elements</b>					
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36		
Integrity check info	CH		Integrity check info 10.3.3.16	Integrity check info is included if integrity protection is applied	
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.17		
CHOICE mode	MP			(no data)	
>FDD					
>TDD					
>>CHOICE TDD option	MP				REL-4
>>>3.84 Mcps TDD					REL-4
>>>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.95	This information element shall be present in case of handover procedure if timing advance is enabled. Calculated timing advance value for the new cell after handover in a synchronous TDD network	
>>>>1.28 Mcps TDD				(no data)	REL-4
<b>RB Information elements</b>					
COUNT-C activation time	OP		Activation time 10.3.3.1	Used for radio bearers mapped on RLC-TM. Only applicable if the UE is moving to CELL_DCH state due to this procedure	
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.13		
Uplink counter synchronisation info	OP				
>RB with PDCP information list	OP	1 to <maxRBall RABs>		This IE is needed for each RB having PDCP in the case of lossless SRNS relocation	
>>RB with PDCP information	MP		RB with PDCP information 10.3.4.22		
>START list	MP	1 to <maxCNdo mains>		START [40] values for all CN domains.	
>>CN domain identity	MP		CN domain identity		

			10.3.1.1		
>>START	MP		START 10.3.3.38	START value to be used in this CN domain.	

## 10.2.34 RADIO BEARER SETUP COMPLETE

This message is sent by UE to confirm the establishment of the radio bearer.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
Message Type	MP		Message Type		
<b>UE information elements</b>					
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36		
Integrity check info	CH		Integrity check info 10.3.3.16		
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.17		
CHOICE mode	OP				
>FDD				(no data)	
>TDD					
>>CHOICE TDD option	MP				REL-4
>>>3.84 Mcps TDD					REL-4
>>>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.95	This information element shall be present in case of handover procedure if timing advance is enabled. Calculated timing advance value for the new cell after handover in a synchronous TDD network	
>>>1.28 Mcps TDD				(No data)	REL-4
START	OP		START 10.3.3.38	This information element is not needed for transparent mode RBs	
<b>RB Information elements</b>					
COUNT-C activation time	OP		Activation time 10.3.3.1	Used for radio bearers mapped on RLC-TM. Only applicable if the UE is moving to CELL_DCH state due to this procedure	
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.13		
Uplink counter synchronisation info	OP				
>RB with PDCP information list	OP	1 to <maxRBall RABs>		This IE is needed for each RB having PDCP in the case of lossless SRNS relocation	
>>RB with PDCP information	MP		RB with PDCP information 10.3.4.22		
>START list	MP	1 to		START [40]	

		<maxCNdo mains>		values for all CN domains.	
>>CN domain identity	MP		CN domain identity 10.3.1.1		
>>START	MP		START 10.3.3.38	START value to be used in this CN domain.	

## 10.2.51 TRANSPORT CHANNEL RECONFIGURATION COMPLETE

This message is sent from the UE when a transport channel reconfiguration has been done.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN



Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
Message Type	MP		Message Type		
<b>UE information elements</b>					
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36		
Integrity check info	CH		Integrity check info 10.3.3.16		
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.17		
CHOICE mode	OP				
>FDD				(no data)	
>TDD					
>>CHOICE TDD option	MP				REL-4
>>>3.84 Mcps TDD					REL-4
>>>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.95		
>>>1.28 Mcps TDD				(no data)	REL-4
<b>RB Information elements</b>					
COUNT-C activation time	OP		Activation time 10.3.3.1	Used for radio bearers mapped on RLC-TM. Only applicable if the UE is moving to CELL_DCH state due to this procedure	
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.13		
Uplink counter synchronisation info	OP				
>RB with PDCP information list	OP	1 to <maxRBall RABs>			
>>RB with PDCP information	MP		RB with PDCP information 10.3.4.22		
>START list	MP	1 to <maxCNdo mains>		START [40] values for all CN domains.	
>>CN domain identity	MP		CN domain identity 10.3.1.1		
>>>START	MP		START 10.3.3.38	START value to be used in this CN domain.	

### 10.3.3.17 Integrity protection activation info

This IE contains the time, in terms of RRC sequence numbers, when a new integrity protection configuration shall be activated for the signalling radio bearers.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RRC message sequence number list	MP	4 to 5		The RRC sequence number when a new integrity protection configuration shall be applied, for CCCH (=RB0) and signalling radio bearers in the order RB0, RB1, RB2, RB3, RB4.  <u>The value for RB1 shall be ignored if this IE was included in a RRC message sent on RB1.</u>  <u>The value for RB2 shall be ignored if this IE was included in a RRC message sent on RB2.</u>
>RRC message sequence number	MP		Integer (0..15)	

### 13.4.1 CIPHERING\_STATUS

This variable contains information about the current status of ciphering in the UE.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Status	MP		Enumerated(Not started, Started)	
Reconfiguration	MP		Boolean	TRUE means a <u>RRC procedure performing reconfiguration of ciphering is ongoing.</u>

### 13.4.11a LATEST\_CONFIGURED\_CN\_DOMAIN

This variable stores the CN-domain that was most recently is latest-configured to be used for ciphering and integrity protection ~~for each RB.~~

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Latest configured CN domain	MP		CN domain identity 10.3.1.1	

## 11.2 PDU definitions

```
-- *****
--
-- HANDBOVER TO UTRAN COMPLETE
--
-- *****
```

```
HandoverToUTRANComplete ::= SEQUENCE {
  --TABULAR: Integrity protection shall not be performed on this message.
  -- User equipment IEs
  -- TABULAR: the IE below is conditional on history.
  startList STARTList OPTIONAL,
  -- Radio bearer IEs
  count-C-ActivationTime ActivationTime OPTIONAL,
  -- Extension mechanism for non- release99 information
```

```
    nonCriticalExtensions          SEQUENCE {} OPTIONAL  
}
```

## CHANGE REQUEST

⌘ **25.331 CR 818** ⌘ ev **r1** ⌘ Current version: **3.6.0** ⌘

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

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

<b>Title:</b>	⌘ Corrections to UE Positioning		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ May 29, 2001
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ R99
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

<b>Reason for change:</b>	⌘ Information elements needed for UE Positioning to work is missing. There are also some inconsistencies between tabular and ASN.1, and a few existing IE definitions need to be clarified and/or corrected
<b>Summary of change:</b>	⌘ <ol style="list-style-type: none"> <li>1. 10.3.7.88 and 10.3.7.96 includes the relation between GPS time and Node B SFN. However the identity of the corresponding cell was missing and has therefore been added to the IE's.</li> <li>2. 10.3.7.106 The field SFN-SFN relative time difference was expressed modulo 256 frames. However for IPDL operation the full frame number (0 ... 4095) is needed. The new field was split into a SFN field and a sub-SFN field.</li> <li>3. 10.3.7.106 Changed values in the Search Window Size. With the current definition, the search window concept would only work for small cells. The search window is important for efficient and reliable OTDOA operation.</li> <li>4. 10.3.7.111 Previously the field Accuray was expressed as percentage, which does not make any sense. Replaced with a 7-bit uncertainty code which is aligned with ASN.1</li> <li>5. ASN.1 for UE-Positioning-OTDOA-NeighbourCellInfo was aligned with tabular. Two optional/mandatory indications were incorrect.</li> <li>6. 10.3.7.88a The Satellites list related data loop index aligned with ASN.1</li> <li>7. Editorial corrections to 10.3.7.101, 10.3.7.103, 10.3.7.105, 10.3.7.106, 10.3.7.108</li> <li>Changes agreed at RAN2#21</li> <li>8. Corrected the cell identifiers for TDD (1 above)</li> <li>9. Added the cell identities in 10.3.7.93 and 10.3.7.109 for the GPS time/Node B SFN relationship.</li> <li>10. Deleted the reference cell identity field in 10.3.7.99 and replaced this with a cell identity in 10.3.7.105 (and the inclusion of cell IDs in 10.3.7.93 and 10.3.7.109).</li> <li>11. Changed the type of the Accuracy field in 10.3.7.111 from Integer to bitstring(7) to align with ASN.1.</li> </ol>

<b>Consequences if not approved:</b>	⌘ 1. The UE will not be able to get a reliable association between SFN and NodeB, hence making precise timing assistance practically impossible to use. 2. IPDL operation will be degraded since the UE will only know when reference cell is idle.  Backward compatibility: Changes 1, 2, 8-10 are not backwards compatible but affect only UE Positioning. Changes 3-4, 11 introduce no new fields, only interpretation changed.
--------------------------------------	---

<b>Clauses affected:</b>	⌘ 10.3.7.88, 10.3.7.88a, 10.3.7.93, 10.3.7.96, 10.3.7.99, 10.3.7.101, 10.3.7.103, 10.3.7.105, 10.3.7.106, 10.3.7.108, 10.3.7.109, 10.3.7.111, 11		
<b>Other specs affected:</b>	<table border="0"> <tr> <td style="vertical-align: top;">           ⌘ <input type="checkbox"/> Other core specifications  <input type="checkbox"/> Test specifications  <input type="checkbox"/> O&amp;M Specifications         </td> <td style="vertical-align: top; padding-left: 20px;">           ⌘ <input type="checkbox"/> </td> </tr> </table>	⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘ <input type="checkbox"/>
⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘ <input type="checkbox"/>		
<b>Other comments:</b>	⌘ <input type="checkbox"/>		

**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](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.

### 10.3.7.88 UE positioning GPS acquisition assistance

This IE contains parameters that enable fast acquisition of the GPS signals in UE-assisted GPS positioning.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
CHOICE Reference Time				
>UTRAN reference time				GPS Time of Week counted in microseconds, given as GPS TOW in milliseconds and GPS TOW remainder in microseconds, UTRAN reference time = 1000 * GPS TOW msec + GPS TOW rem usec
>>GPS TOW msec	MP		Integer(0..6.048*10 <sup>8</sup> -1)	GPS Time of Week in milliseconds (rounded down to the nearest millisecond unit)
>>GPS TOW rem usec	MP		Integer(0..999)	GPS Time of Week in microseconds MOD 1000.
>>>CHOICE MODE				
>>>>FDD				
>>>>>Primary CPICH Info	OP		<a href="#">Primary CPICH Info 10.3.6.60</a>	<a href="#">Identifies the reference cell for the GPS TOW-SFN relationship</a>
>>>>>TDD				
>>>>>>cell parameters id and channel id	OP		<a href="#">Cell parameters id 10.3.6.9</a> and <a href="#">Channel Identity info 10.3.6.8a</a>	<a href="#">Identifies the reference cell for the GPS TOW-SFN relationship</a>
>>SFN	MP		Integer(0..4095)	
>GPS reference time only				
>>GPS TOW msec	MP		Integer(0..6.048*10 <sup>8</sup> -1)	GPS Time of Week in milliseconds (rounded down to the nearest millisecond unit).
Satellite information	MP	1 to <maxSat>		
>SatID	MP		Integer (0..63)	
>Doppler (0 <sup>th</sup> order term)	MP		Real(-5.120..5.1175 by step of 2.5)	Hz
>Extra Doppler	OP			
>>Doppler (1 <sup>st</sup> order term)	MP		Real (-1..0.5 by step of 0.023)	Scaling factor 1/42
>>Doppler Uncertainty	MP		Enumerated (12.5,25,50,100,200)	Hz
>Code Phase	MP		Integer(0..1022)	Chips, specifies the centre of the search window
>Integer Code Phase	MP		Integer(0..19)	1023 chip segments
>GPS Bit number	MP		Integer(0..3)	Specifies GPS bit number (20 1023 chip segments)
>Code Phase Search Window	MP		Integer(1023,1,2,3,4,6,8,12,16,24,32,48,64,96,128,	Specifies the width of the search window.

>Azimuth and Elevation	OP		192)	
>>Azimuth	MP		Real(0..348.75 by step of 11.25)	Degrees
>>Elevation	MP		Real(0..78.75 by step of 11.25)	Degrees

<b>CHOICE Reference time</b>	<b>Condition under which the given reference time is chosen</b>
UTRAN reference time	The reference time is relating GPS time to UTRAN time (SFN)
GPS reference time only	The time gives the time for which the location estimate is valid

### 10.3.7.88a UE positioning GPS Additional Assistance Data Request

<b>Information Element/Group name</b>	<b>Need</b>	<b>Multi</b>	<b>Type and Reference</b>	<b>Semantics description</b>
Almanac	MP		Boolean	TRUE means requested
UTC Model	MP		Boolean	TRUE means requested
Ionospheric model	MP		Boolean	TRUE means requested
Navigation Model	MP		Boolean	TRUE means requested
DGPS Corrections	MP		Boolean	TRUE means requested
Reference Location	MP		Boolean	TRUE means requested
Reference Time	MP		Boolean	TRUE means requested
Acquisition Assistance	MP		Boolean	TRUE means requested
Real-Time Integrity	MP		Boolean	TRUE means requested
Navigation Model Additional data	CV- <i>Navigation Model</i>			this IE is present only if "Navigation Model" is set to TRUE otherwise it is absent
>GPS Week	MP		Integer (0..1023)	
>GPS_Toe	MP		Integer (0..167)	GPS time of ephemeris in hours of the latest ephemeris set contained by the UE
>T-Toe limit	MP		Integer (0..10)	ephemeris age tolerance of the UE to UTRAN in hours
>Satellites list related data	MP	0 to <maxSat>-1		
>>SatID	MP		Integer (0..63)	
>>IODE	MP		Integer (0..239)	Issue of Data Ephemeris for SatID

### 10.3.7.93 UE positioning GPS measured results



Information Element/Group name	Need	Multi	Type and Reference	Semantics description
<a href="#">CHOICE MODE</a>				
<a href="#">&gt;FDD</a>				
<a href="#">&gt;&gt;Primary CPICH Info</a>	<a href="#">OP</a>		<a href="#">Primary CPICH Info 10.3.6.60</a>	<a href="#">Identifies the reference cell for the GPS TOW-SFN relationship</a>
<a href="#">&gt;TDD</a>				
<a href="#">&gt;&gt;cell parameters id</a>	<a href="#">OP</a>		<a href="#">Cell parameters id 10.3.6.9</a>	<a href="#">Identifies the reference cell for the GPS TOW-SFN relationship</a>
Reference SFN	OP		Integer(0..4095)	The SFN for which the location is valid
GPS TOW msec	MP		Integer(0..6.048*10 <sup>8</sup> -1)	GPS Time of Week in milliseconds (rounded down to the nearest millisecond unit). This time is the GPS TOW measured by the UE. If the Reference SFN field is present it is the ms flank closest to the beginning of that frame. GPS Time of Week in microseconds = 1000 * GPS TOW msec + GPS TOW rem usec
GPS TOW rem usec	CV- capability and request		Integer(0..999)	GPS Time of Week in microseconds MOD 1000.
Measurement Parameters	MP	1 to <maxSat>		
>Satellite ID	MP		Enumerated(0..63)	
>C/N <sub>0</sub>	MP		Integer(0..63)	the estimate of the carrier-to-noise ratio of the received signal from the particular satellite used in the measurement. It is given in whole dBs. Typical levels observed by UE-based GPS units will be in the range of 20 – 50 dB.
>Doppler	MP		Integer(-32768..32768)	Hz, scale factor 0.2.
>Whole GPS Chips	MP		Integer(0..1023)	Unit in GPS chips
>Fractional GPS Chips	MP		Integer(0..(2 <sup>10</sup> -1))	Scale factor 2 <sup>-10</sup>
>Multipath Indicator	MP		Enumerated(NM, low, medium, high)	See note 1
>Pseudorange RMS Error	MP		Enumerated(range index 0..range index 63)	See note 2

Condition	Explanation
<i>Capability and request</i>	This field is included only if the UE has this capability <i>and</i> if it was requested in the UE positioning reporting quantity

NOTE 1: The following table gives the mapping of the multipath indicator field.

Value	Multipath Indication
NM	Not measured
Low	MP error < 5m
Medium	5m < MP error < 43m
High	MP error > 43m

NOTE 2: The following table gives the bitmapping of the Pseudorange RMS Error field.

Range Index	Mantissa	Exponent	Floating-Point value, $x_i$	Pseudorange value, P
0	000	000	0.5	$P < 0.5$
1	001	000	0.5625	$0.5 \leq P < 0.5625$
I	X	Y	$0.5 * (1 + x/8) * 2^y$	$x_{i-1} \leq P < x_i$
62	110	111	112	$104 \leq P < 112$
63	111	111	--	$112 \leq P$

### 10.3.7.96 UE positioning GPS reference time

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
GPS Week	MP		Integer(0..1023)	
GPS TOW msec	MP		Integer(0..6.048*10 <sup>8</sup> -1)	GPS Time of Week in milliseconds (rounded down to the nearest millisecond unit).
GPS TOW rem usec	OP		Integer(0..999)	GPS Time of Week in microseconds MOD 1000. GPS Time of Week in microseconds = 1000 * GPS TOW msec + GPS TOW rem usec
<u>&gt;&gt;CHOICE MODE</u>				
<u>&gt;&gt;&gt;FDD</u>				
<u>&gt;&gt;&gt;&gt;Primary CPICH Info</u>	<u>OP</u>		<u>Primary CPICH Info 10.3.6.60</u>	<u>Identifies the reference cell for the GPS TOW-SFN relationship</u>
<u>&gt;&gt;&gt;TDD</u>				
<u>&gt;&gt;&gt;&gt;cell parameters id and channel id</u>	<u>OP</u>		<u>Cell parameters id 10.3.6.9 and Channel Identity info 10.3.6.8a</u>	<u>Identifies the reference cell for the GPS TOW-SFN relationship</u>
SFN	OP		Integer(0..4095)	The SFN which the GPS TOW time stamps. SFN and GPS TOW msec and GPS TOW rem usec are included if relation GPS TOW/SFN is known to at least 10 μs.
SFN-TOW Uncertainty	OP		Enumerated (lessThan10, moreThan10)	This field indicates the uncertainty of the relation GPS TOW/SFN. lessThan10 means the relation is accurate to at least 10 ms.
Node B Clock Drift	OP		Real(-0.1..0.1 by step of 0.0125)	μsec/sec (ppm)
GPS TOW Assist	OP	1 to <maxSat>		
>SatID	MP		Enumerated(0..63)	
>TLM Message	MP		Bit string(14)	
>Anti-Spoof	MP		Boolean	
>Alert	MP		Boolean	
>TLM Reserved	MP		Bit string(2)	

### 10.3.7.99 UE positioning measured results

Information Element/Group name	Need	Multi	Type and reference	Semantics description
--------------------------------	------	-------	--------------------	-----------------------

UE positioning Multiple Sets	OP		UE positioning Multiple Sets 10.3.7.102	If this IE is absent, a single measurement set is included.
<del>UE positioning reference cell Identity</del>	<del>OP</del>		<del>Primary CPICH Info 10.3.6.60</del>	
UE positioning OTDOA measured results	OP		UE positioning OTDOA measured results 10.3.7.105	
UE positioning Position estimate info	OP		UE positioning Position estimate info 10.3.7.109	
UE positioning GPS measured results	OP		UE positioning GPS measured results 10.3.7.93	
UE positioning error	OP		UE positioning error 10.3.7.87	Included if UE positioning error occurred

### 10.3.7.101 UE positioning measurement event results

This IE contains the measurement event results that are reported to UTRAN for UE positioning measurements.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
CHOICE Event ID	MP			
>7a				
>>UE positioning Position <u>estimate info</u>	MP		UE positioning Position <u>estimate info</u> 10.3.7.109	
>7b				
>>UE positioning OTDOA measurement	MP		UE positioning OTDOA measurement 10.3.7.105	
>7c				
>>UE positioning GPS measurement	MP		UE positioning GPS measurement 10.3.7.93	

### 10.3.7.103 UE positioning OTDOA assistance data

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
UE positioning OTDOA reference cell info	OP		UE positioning OTDOA <a href="#">reference</a> cell info 10.3.7.108	
UE positioning OTDOA neighbour cell list	OP	1 to <maxCellMEas>		
UE positioning OTDOA neighbour cell info	OP		UE positioning OTDOA neighbour cell info 10.3.7.106	

### 10.3.7.105 UE positioning OTDOA measurement

The purpose of the OTDOA Measurement Information element is to provide OTDOA measurements of signals sent from the reference and neighbour cells.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
SFN	MP		Integer(0..4095)	SFN during which the last measurement was performed
<a href="#">CHOICE mode</a>				
<a href="#">&gt;FDD</a>				
<a href="#">&gt;&gt;Reference cell id</a>	<a href="#">MP</a>		<a href="#">Primary CPICH info 10.3.6.60</a>	
<a href="#">&gt;&gt;UE Rx-Tx time difference type 2</a>	MP		UE Rx-Tx time difference type 2 10.3.7.84	
<a href="#">&gt;TDD</a>				
<a href="#">&gt;&gt; Reference cell id</a>	<a href="#">MP</a>		<a href="#">Cell parameters ID 10.3.6.9</a>	
UE positioning OTDOA quality type	MP		UE positioning OTDOA quality type 10.3.7.107	
Neighbours	MP	0 to <maxCellMEas>		
<a href="#">&gt;CHOICE mode</a>				
<a href="#">&gt;&gt;FDD</a>				
<a href="#">&gt;&gt;&gt;Neighbour Identity</a>	MD		Primary CPICH info 10.3.6.60	Default value is the same as in the first set of multiple sets.
<a href="#">&gt;&gt;TDD</a>				
<a href="#">&gt;&gt;&gt;Cell and Channel ID</a>	MD		Cell and Channel Identity info 10.3.6.8a	Default value is the same as in the first set of multiple sets.
<a href="#">&gt;UE positioning OTDOA quality type</a>	MP		UE positioning OTDOA quality type 10.3.7.107	Quality of the <a href="#">measurement OTDOA</a> from the neighbour cell.
<a href="#">&gt;SFN-SFN observed time difference <a href="#">type 2</a></a>	MP		SFN-SFN observed time difference 10.3.7.63	Gives the timing relative to the reference cell. Only type 2 is allowed. <a href="#">Type 2 means that only the slot timing is accounted for</a>
<a href="#">&gt;UE Rx-Tx time difference type 2</a>	OP		UE Rx-Tx time difference type 2 10.3.7.84	Included if the neighbour is in the active set

### 10.3.7.106 UE positioning OTDOA neighbour cell info

This IE gives approximate cell timing in order to decrease the search window, [as well as the cell locations and fine cell timing for UE based OTDOA](#).

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
<b>CHOICE mode</b>				
>FDD				
>>Primary CPICH info	MP		Primary CPICH info 10.3.6.60	
>TDD				
>>cell and channel ID	MP		Cell and Channel Identity info 10.3.6.8a	Identifies the channel to be measured on.
Frequency info	MD		Frequency info 10.3.6.36	Default value is the existing value of frequency information
IPDL parameters	<i>CV-IPDLs</i>		UE positioning IPDL parameters 10.3.7.98	
<u>SFN offset</u>	<u>CV-IPDLs</u>		<u>Integer(0 .. 4095)</u>	<u>Define Tref as the time of beginning of system frame number SFNref of the reference cell. Define Tnc as the beginning of a frame from the neighbor cell occurring immediately after the time Tref. Let the corresponding system frame number be SFNnc. Then SFNnc = SFNref-SFN offset modulo 4096.</u>
SFN-SFN relative time difference	MP		Integer(0..983039938399)	Gives the relative timing compared to the reference cell. Equal to $\lfloor (Tnc - Tref) / (3.84 \cdot 10^6) \rfloor$ where $\lfloor () \rfloor$ denotes rounding to the nearest lower integer. in chips.
SFN-SFN drift	OP		Real(0,+0.33,+0.66,+1,+1.33,+1.66,+2,+2.5,+3,+4,+5,+7,+9,+11,+13,+15,-0.33,-0.66,-1,-1.33,-1.66,-2,-2.5,-3,-4,-5,-7,-9,-11,-13,-15)	meters/sec
Search Window Size	MP		Integer( <del>10, 20, 30, 40, 50, 60, 70, 80, 160, 320, 640, 1280, infinity</del> )	in chips. <u>If the value is X then the expected SFN-SFN observed time difference is in the range [RTD-X, RTD+X] where RTD is the value of the field SFN-SFN relative time difference.</u> Infinity means <u>that the uncertainty is larger than 1280 chips.</u> <u>more</u>

CHOICE PositioningMode				
>UE based				
>>Cell Position	MD			Default is the same as previous cell
>>>Relative North	MP		Integer(-20000..20000)	Seconds, scale factor 0.03. Relative position compared to reference cell.
>>>Relative East	MP		Integer(-20000..20000)	Seconds, scale factor 0.03. Relative position compared to reference cell.
>>>Relative Altitude	OP		Integer(-4000..4000)	Relative altitude in meters compared to ref. cell.
>>Fine SFN-SFN	MP		Real(0..0.9375 in steps of 0.0625)	Gives finer resolution
>>Round Trip Time	OP		Real(876.00 .. 2923.875) in steps of 0.0625	In chips. Included if cell is in active set.
>UE assisted				(no data)

Condition	Explanation
<i>IPDLs</i>	This IE is present only if IPDLs are applied.

### 10.3.7.108 UE positioning OTDOA reference cell info

This IE defines the cell used for time references in all OTDOA measurements.



Information Element/Group name	Need	Multi	Type and Reference	Semantics description
SFN	OP		Integer (0..4095)	Time stamp (SFN of Reference Cell) of the SFN-SFN <u>relative observed</u> time differences and SFN-SFN drift rates. Included if any SFN-SFN drift value is included <u>in IE UE positioning OTDOA neighbor cell info.</u>
CHOICE mode				
>FDD				
>>Primary CPICH info	MP		Primary CPICH info 10.3.6.60	
>TDD				
>>cell and channel ID	MP		Cell and Channel Identity info 10.3.6.8a	Identifies the channel to be measured on.
Frequency info	MD		Frequency info 10.3.6.36	Default value is the existing value of frequency information.
CHOICE PositioningMode				
>UE based				
>>CHOICE <i>Cell Position</i>				The position of the antenna that defines the cell. Used for the UE based method.
>>>Ellipsoid point	OP		Ellipsoid point 10.3.8.4a	
>>>Ellipsoid point with altitude	OP		Ellipsoid point with altitude 10.3.8.4b	
>>Round Trip Time	OP		Real(876.00 .. 2923.875) in steps of 0.0625	In chips.
>UE assisted				(no data)
IPDL parameters	OP		UE positioning IPDL parameters 10.3.7.98	If this element is not included there are no idle periods present

### 10.3.7.109 UE positioning position estimate info

The purpose of this IE is to provide the position estimate from the UE to the network, if the UE is capable of determining its own position.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
<u>CHOICE MODE</u>				
>FDD				
>>Primary CPICH Info	OP		<a href="#">Primary CPICH Info 10.3.6.60</a>	<a href="#">Identifies the reference cell for the GPS TOW-SFN relationship</a>
>TDD				
>>cell parameters id	OP		<a href="#">Cell parameters id 10.3.6.9</a>	<a href="#">Identifies the reference cell for the GPS TOW-SFN relationship</a>
Reference SFN	MP		Integer(0..4095)	The SFN for which the location is valid
GPS TOW msec	CV- Capability and request		Integer(0..6.048*10 <sup>8</sup> -1)	GPS Time of Week in milliseconds (rounded down to the nearest millisecond unit). This time-stamps the beginning of the frame defined in Reference SFN GPS Time of Week in microseconds = 1000 * GPS TOW msec + GPS TOW rem usec
GPS TOW rem usec	CV- Capability and request		Integer(0..999)	GPS Time of Week in microseconds MOD 1000.
CHOICE <i>Position estimate</i>	MP			
>Ellipsoid Point			Ellipsoid Point; 10.3.8.4a	
>Ellipsoid point with uncertainty circle			Ellipsoid point with uncertainty circle 10.3.8.4d	
>Ellipsoid point with uncertainty ellipse			Ellipsoid point with uncertainty ellipse 10.3.8.4e	
>Ellipsoid point with altitude			Ellipsoid point with altitude 10.3.8.4b	
>Ellipsoid point with altitude and uncertainty ellipsoid			Ellipsoid point with altitude and uncertainty ellipsoid 10.3.8.4c	

Condition	Explanation
<i>Capability and request</i>	This field is included only if the UE has this capability <i>and</i> if it was requested in the UE positioning reporting quantity and if the method was UE-based GPS

### 10.3.7.111 UE positioning reporting quantity

The purpose of the element is to express the allowed/required location method(s), and to provide information required QoS.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Method Type	MP		Enumerated(UE assisted, UE based, UE based is preferred but UE assisted is allowed, UE assisted is preferred but UE based is allowed)	
Positioning Methods	MP		Enumerated(OTDOA, GPS, OTDOA or GPS)	
Response Time	MP		Integer(1,2,4, 8, 16, 32, 64, 128)	in seconds
Accuracy	CV- MethodType		<a href="#">Bitstring(7)</a> <a href="#">Integer(0..12700)</a>	<a href="#">The uncertainty is derived from the "uncertainty code" k by <math>r = 10 * (1.1^k - 1)</math> in percentage</a>
GPS timing of Cell wanted	MP		Boolean	If true the SRNC wants the UE to report the SFN-GPS timing of the reference cell. This is however optional in the UE.
Multiple Sets	MP		Boolean	TRUE indicates that the UE is requested to send multiple <i>OTDOA/GPS Measurement Information Sets</i> . UE is expected to include the current measurement set.
Additional Assistance Data Request	MP		Boolean	TRUE indicates that the UE is requested to send the IE "Additional assistance Data Request" when the IE "UE positioning Error" is present in the UE positioning measured results.
Environment Characterisation	OP		Enumerated(possibly heavy multipath and NLOS conditions, no or light multipath and usually LOS conditions, not defined or mixed environment)	

Method Type	Condition	Explanation
		The IE is optional if the IE "Method Type" is 'UE assisted'; otherwise it is mandatory

```
-- *****
--
-- MEASUREMENT INFORMATION ELEMENTS (10.3.7)
--
-- *****
```

```
OTDOA-SearchWindowSize ::= ENUMERATED {
    c120, c240, c380, c4160, c5320,
    c66400, c71280, moreThan128070 }
```

```
SFN-SFN-RelTimeDifference1 ::= SEQUENCE {
    sfn-Offset INTEGER (0 .. 4095)
    sfn-sfn-Reltimedifference INTEGER (0..383999830399)}
```

```
UE-Positioning-GPS-Measurement ::= SEQUENCE {
    modeSpecificInfo CHOICE {
        fdd SEQUENCE {
            referenceIdentity PrimaryCPICH-Info OPTIONAL
        },
        tdd SEQUENCE {
            referenceIdentity CellParametersID OPTIONAL
        }
    },
    referenceSFN ReferenceSFN OPTIONAL,
    gps-TOW-lmsec GPS-TOW-lmsec,
    gps-TOW-rem-usec GPS-TOW-rem-usec OPTIONAL,
    gps-MeasurementParamList GPS-MeasurementParamList
}
```

```
UE-Positioning-GPS-ReferenceTime ::= SEQUENCE {
    gps-Week INTEGER (0..1023),
    gps-tow-lmsec GPS-TOW-lmsec,
    gps-tow-rem-usec GPS-TOW-rem-usec OPTIONAL,
    modeSpecificInfo CHOICE {
        fdd SEQUENCE {
            referenceIdentity PrimaryCPICH-Info OPTIONAL
        },
        tdd SEQUENCE {
            referenceAndChannelIdentity CellParametersIDAndChannelIdentity
            OPTIONAL
        }
    },
    sfn INTEGER (0..4095),
    sfn-tow-Uncertainty SFN-TOW-Uncertainty OPTIONAL,
    nodeBClockDrift NodeB-ClockDrift OPTIONAL,
    gps-TOW-AssistList GPS-TOW-AssistList OPTIONAL
}
```

```
UE-Positioning-MeasuredResults ::= SEQUENCE {
    ue-positioning-MultipleSets UE-Positioning-MultipleSets OPTIONAL,
    ue-positioning-ReferenceCellIdentity PrimaryCPICH-Info
    OPTIONAL,
    ue-positioning-OTDOA-Measurement UE-Positioning-OTDOA-Measurement OPTIONAL
    ue-positioning-PositionEstimateInfo UE-Positioning-PositionEstimateInfo
    ue-positioning-GPS-Measurement UE-Positioning-GPS-Measurement OPTIONAL
    ue-positioning-Error UE-Positioning-Error OPTIONAL
}
```

```
UE-Positioning-OTDOA-Measurement ::= SEQUENCE {
    sfn INTEGER (0..4095),
    modeSpecificInfo CHOICE {
        fdd SEQUENCE {
            referenceCellIdentity PrimaryCPICH-Info,
            ue-RX-TX-TimeDifferenceType2 UE-RX-TX-TimeDifferenceType2,
        }
    }
}
```

```

    tdd SEQUENCE {
      referenceCellIdentity CellParametersID
    }
  }

  qualityChoice CHOICE {
    std-10 ReferenceQuality10,
    std-50 ReferenceQuality50,
    cpich-EcN0 CPICH-Ec-N0-OTDOA,
    defaultQuality ReferenceQuality
  },
  neighbourList NeighbourList OPTIONAL
}
UE-Positioning-OTDOA-NeighbourCellInfo ::= SEQUENCE {
  modeSpecificInfo CHOICE {
    fdd SEQUENCE {
      primaryCPICH-Info PrimaryCPICH-Info
    },
    tdd SEQUENCE {
      cellAndChannelIdentity CellAndChannelIdentity
    }
  },
  frequencyInfo FrequencyInfo OPTIONAL,
  ue-positioning-IPDL-Parameters UE-Positioning-IPDL-Parameters OPTIONAL,
  sfn-SFN-RelTimeDifference SFN-SFN-RelTimeDifference,
  sfn-SFN-Drift INTEGER (0..30) OPTIONAL,
  searchWindowSize OTDOA-SearchWindowSize,
  positioningMode CHOICE {
    ueBased SEQUENCE {
      relativeNorth INTEGER (-20000..20000)
    } OPTIONAL,
    relativeEast INTEGER (-20000..20000)
  } OPTIONAL,
    relativeAltitude INTEGER (-4000..4000)
  } OPTIONAL,
    fineSFN-SFN FineSFN-SFN OPTIONAL,
    roundTripTime INTEGER (0..32765)
  } OPTIONAL,
  ueAssisted SEQUENCE {}
}

UE-Positioning-PositionEstimateInfo ::= SEQUENCE {
  modeSpecificInfo CHOICE {
    fdd SEQUENCE {
      referenceIdentity PrimaryCPICH-Info OPTIONAL
    },
    tdd SEQUENCE {
      referenceIdentity CellParametersID OPTIONAL
    }
  },
  referenceSFN ReferenceSFN,
  gps-tow-lmsec GPS-TOW-lmsec OPTIONAL,
  gps-tow-rem-usec GPS-TOW-rem-usec OPTIONAL,
  positionEstimate PositionEstimate
}

UTRAN-ReferenceTime ::= SEQUENCE {
  gps-tow-lmsec GPS-TOW-lmsec,
  gps-tow-rem-usec GPS-TOW-rem-usec,
  modeSpecificInfo CHOICE {
    fdd SEQUENCE {
      referenceIdentity PrimaryCPICH-Info OPTIONAL
    },
    tdd SEQUENCE {
      referenceAndChannelIdentity CellParametersIDAndChannelIdentity
    }
  } OPTIONAL
}

```

```
} sfn
```

```
INTEGER (0..4095)
```

## CHANGE REQUEST

⌘ **25.331 CR 819** ⌘ 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  Radio Access Network  Core Network

<b>Title:</b>	⌘ Corrections to UE Positioning		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ May 29, 2001
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ REL-4
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		REL-4 (Release 4)
			REL-5 (Release 5)

<b>Reason for change:</b>	⌘ Information elements needed for UE Positioning to work is missing. There are also some inconsistencies between tabular and ASN.1, and a few existing IE definitions need to be clarified and/or corrected
<b>Summary of change:</b>	⌘ <ol style="list-style-type: none"> <li>1. 10.3.7.88 and 10.3.7.96 includes the relation between GPS time and Node B SFN. However the identity of the corresponding cell was missing and has therefore been added to the IE's.</li> <li>2. 10.3.7.106 The field SFN-SFN relative time difference was expressed modulo 256 frames. However for IPDL operation the full frame number (0 ... 4095) is needed. The new field was split into a SFN field and a sub-SFN field.</li> <li>3. 10.3.7.106 Changed values in the Search Window Size. With the current definition, the search window concept would only work for small cells. The search window is important for efficient and reliable OTDOA operation.</li> <li>4. 10.3.7.111 Previously the field Accuray was expressed as percentage, which does not make any sense. Replaced with a 7-bit uncertainty code which is aligned with ASN.1</li> <li>5. ASN.1 for UE-Positioning-OTDOA-NeighbourCellInfo was aligned with tabular. Two optional/mandatory indications were incorrect.</li> <li>6. 10.3.7.88a The Satellites list related data loop index aligned with ASN.1</li> <li>7. Editorial corrections to 10.3.7.101, 10.3.7.103, 10.3.7.105, 10.3.7.106, 10.3.7.108</li> <li>Changes agreed at RAN2#21</li> <li>8. Corrected the cell identifiers for TDD (1 above)</li> <li>9. Added the cell identities in 10.3.7.93 and 10.3.7.109 for the GPS time/Node B SFN relationship.</li> <li>10. Deleted the reference cell identity field in 10.3.7.99 and replaced this with a cell identity in 10.3.7.105 (and the inclusion of cell IDs in 10.3.7.93 and 10.3.7.109).</li> <li>11. Changed the type of the Accuracy field in 10.3.7.111 from Integer to bitstring(7) to align with ASN.1.</li> </ol>



<b>Consequences if not approved:</b>	⌘ 1. The UE will not be able to get a reliable association between SFN and NodeB, hence making precise timing assistance practically impossible to use. 2. IPDL operation will be degraded since the UE will only know when reference cell is idle.  Backward compatibility: Changes 1, 2, 8-10 are not backwards compatible but affect only UE Positioning. Changes 3-4, 11 introduce no new fields, only interpretation changed.
--------------------------------------	---

<b>Clauses affected:</b>	⌘ 10.3.7.88, 10.3.7.88a, 10.3.7.93, 10.3.7.96, 10.3.7.99, 10.3.7.101, 10.3.7.103, 10.3.7.105, 10.3.7.106, 10.3.7.108, 10.3.7.109, 10.3.7.111, 11		
<b>Other specs affected:</b>	<table border="0"> <tr> <td style="vertical-align: top;">           ⌘ <input type="checkbox"/> Other core specifications  <input type="checkbox"/> Test specifications  <input type="checkbox"/> O&amp;M Specifications         </td> <td style="vertical-align: top; padding-left: 20px;">           ⌘ <input type="checkbox"/> </td> </tr> </table>	⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘ <input type="checkbox"/>
⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘ <input type="checkbox"/>		
<b>Other comments:</b>	⌘ <input type="checkbox"/>		

**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](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.

### 10.3.7.88 UE positioning GPS acquisition assistance

This IE contains parameters that enable fast acquisition of the GPS signals in UE-assisted GPS positioning.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
CHOICE Reference Time				
>UTRAN reference time				GPS Time of Week counted in microseconds, given as GPS TOW in milliseconds and GPS TOW remainder in microseconds, UTRAN reference time = 1000 * GPS TOW msec + GPS TOW rem usec
>>GPS TOW msec	MP		Integer(0..6.048*10 <sup>8</sup> -1)	GPS Time of Week in milliseconds (rounded down to the nearest millisecond unit)
>>GPS TOW rem usec	MP		Integer(0..999)	GPS Time of Week in microseconds MOD 1000.
>>>CHOICE MODE				
>>>>FDD				
>>>>>Primary CPICH Info	OP		<a href="#">Primary CPICH Info 10.3.6.60</a>	<a href="#">Identifies the reference cell for the GPS TOW-SFN relationship</a>
>>>>>TDD				
>>>>>>cell parameters id and channel id	OP		<a href="#">Cell parameters id 10.3.6.9</a> and <a href="#">Channel Identity info 10.3.6.8a</a>	<a href="#">Identifies the reference cell for the GPS TOW-SFN relationship</a>
>>SFN	MP		Integer(0..4095)	
>GPS reference time only				
>>GPS TOW msec	MP		Integer(0..6.048*10 <sup>8</sup> -1)	GPS Time of Week in milliseconds (rounded down to the nearest millisecond unit).
Satellite information	MP	1 to <maxSat>		
>SatID	MP		Integer (0..63)	
>Doppler (0 <sup>th</sup> order term)	MP		Real(-5.120..5.1175 by step of 2.5)	Hz
>Extra Doppler	OP			
>>Doppler (1 <sup>st</sup> order term)	MP		Real (-1..0.5 by step of 0.023)	Scaling factor 1/42
>>Doppler Uncertainty	MP		Enumerated (12.5,25,50,100,200)	Hz
>Code Phase	MP		Integer(0..1022)	Chips, specifies the centre of the search window
>Integer Code Phase	MP		Integer(0..19)	1023 chip segments
>GPS Bit number	MP		Integer(0..3)	Specifies GPS bit number (20 1023 chip segments)
>Code Phase Search Window	MP		Integer(1023,1,2,3,4,6,8,12,16,24,32,48,64,96,128,	Specifies the width of the search window.

>Azimuth and Elevation	OP		192)	
>>Azimuth	MP		Real(0..348.75 by step of 11.25)	Degrees
>>Elevation	MP		Real(0..78.75 by step of 11.25)	Degrees

<b>CHOICE Reference time</b>	<b>Condition under which the given reference time is chosen</b>
UTRAN reference time	The reference time is relating GPS time to UTRAN time (SFN)
GPS reference time only	The time gives the time for which the location estimate is valid

### 10.3.7.88a UE positioning GPS Additional Assistance Data Request

<b>Information Element/Group name</b>	<b>Need</b>	<b>Multi</b>	<b>Type and Reference</b>	<b>Semantics description</b>
Almanac	MP		Boolean	TRUE means requested
UTC Model	MP		Boolean	TRUE means requested
Ionospheric model	MP		Boolean	TRUE means requested
Navigation Model	MP		Boolean	TRUE means requested
DGPS Corrections	MP		Boolean	TRUE means requested
Reference Location	MP		Boolean	TRUE means requested
Reference Time	MP		Boolean	TRUE means requested
Acquisition Assistance	MP		Boolean	TRUE means requested
Real-Time Integrity	MP		Boolean	TRUE means requested
Navigation Model Additional data	CV- <i>Navigation Model</i>			this IE is present only if "Navigation Model" is set to TRUE otherwise it is absent
>GPS Week	MP		Integer (0..1023)	
>GPS_Toe	MP		Integer (0..167)	GPS time of ephemeris in hours of the latest ephemeris set contained by the UE
>T-Toe limit	MP		Integer (0..10)	ephemeris age tolerance of the UE to UTRAN in hours
>Satellites list related data	MP	0 to <maxSat>-1		
>>SatID	MP		Integer (0..63)	
>>IODE	MP		Integer (0..239)	Issue of Data Ephemeris for SatID

### 10.3.7.93 UE positioning GPS measured results

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
<a href="#">CHOICE MODE</a>				
<a href="#">&gt;FDD</a>				
<a href="#">&gt;&gt;Primary CPICH Info</a>	<a href="#">OP</a>		<a href="#">Primary CPICH Info 10.3.6.60</a>	<a href="#">Identifies the reference cell for the GPS TOW-SFN relationship</a>
<a href="#">&gt;TDD</a>				
<a href="#">&gt;&gt;cell parameters id</a>	<a href="#">OP</a>		<a href="#">Cell parameters id 10.3.6.9</a>	<a href="#">Identifies the reference cell for the GPS TOW-SFN relationship</a>
Reference SFN	OP		Integer(0..4095)	The SFN for which the location is valid
GPS TOW msec	MP		Integer(0..6.048*10 <sup>8</sup> -1)	GPS Time of Week in milliseconds (rounded down to the nearest millisecond unit). This time is the GPS TOW measured by the UE. If the Reference SFN field is present it is the ms flank closest to the beginning of that frame. GPS Time of Week in microseconds = 1000 * GPS TOW msec + GPS TOW rem usec
GPS TOW rem usec	CV- capability and request		Integer(0..999)	GPS Time of Week in microseconds MOD 1000.
Measurement Parameters	MP	1 to <maxSat>		
>Satellite ID	MP		Enumerated(0..63)	
>C/N <sub>0</sub>	MP		Integer(0..63)	the estimate of the carrier-to-noise ratio of the received signal from the particular satellite used in the measurement. It is given in whole dBs. Typical levels observed by UE-based GPS units will be in the range of 20 – 50 dB.
>Doppler	MP		Integer(-32768..32768)	Hz, scale factor 0.2.
>Whole GPS Chips	MP		Integer(0..1023)	Unit in GPS chips
>Fractional GPS Chips	MP		Integer(0..(2 <sup>10</sup> -1))	Scale factor 2 <sup>-10</sup>
>Multipath Indicator	MP		Enumerated(NM, low, medium, high)	See note 1
>Pseudorange RMS Error	MP		Enumerated(range index 0..range index 63)	See note 2

Condition	Explanation
<i>Capability and request</i>	This field is included only if the UE has this capability <i>and</i> if it was requested in the UE positioning reporting quantity

NOTE 1: The following table gives the mapping of the multipath indicator field.

Value	Multipath Indication
NM	Not measured
Low	MP error < 5m
Medium	5m < MP error < 43m
High	MP error > 43m

NOTE 2: The following table gives the bitmapping of the Pseudorange RMS Error field.

Range Index	Mantissa	Exponent	Floating-Point value, $x_i$	Pseudorange value, P
0	000	000	0.5	$P < 0.5$
1	001	000	0.5625	$0.5 \leq P < 0.5625$
I	X	Y	$0.5 * (1 + x/8) * 2^y$	$x_{i-1} \leq P < x_i$
62	110	111	112	$104 \leq P < 112$
63	111	111	--	$112 \leq P$

### 10.3.7.96 UE positioning GPS reference time

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
GPS Week	MP		Integer(0..1023)	
GPS TOW msec	MP		Integer(0..6.048*10 <sup>8</sup> -1)	GPS Time of Week in milliseconds (rounded down to the nearest millisecond unit).
GPS TOW rem usec	OP		Integer(0..999)	GPS Time of Week in microseconds MOD 1000. GPS Time of Week in microseconds = 1000 * GPS TOW msec + GPS TOW rem usec
<u>&gt;&gt;CHOICE MODE</u>				
<u>&gt;&gt;&gt;FDD</u>				
<u>&gt;&gt;&gt;&gt;Primary CPICH Info</u>	<u>OP</u>		<u>Primary CPICH Info 10.3.6.60</u>	<u>Identifies the reference cell for the GPS TOW-SFN relationship</u>
<u>&gt;&gt;&gt;TDD</u>				
<u>&gt;&gt;&gt;&gt;cell parameters id and channel id</u>	<u>OP</u>		<u>Cell parameters id 10.3.6.9 and Channel Identity info 10.3.6.8a</u>	<u>Identifies the reference cell for the GPS TOW-SFN relationship</u>
SFN	OP		Integer(0..4095)	The SFN which the GPS TOW time stamps. SFN and GPS TOW msec and GPS TOW rem usec are included if relation GPS TOW/SFN is known to at least 10 μs.
SFN-TOW Uncertainty	OP		Enumerated (lessThan10, moreThan10)	This field indicates the uncertainty of the relation GPS TOW/SFN. lessThan10 means the relation is accurate to at least 10 ms.
Node B Clock Drift	OP		Real(-0.1..0.1 by step of 0.0125)	μsec/sec (ppm)
GPS TOW Assist	OP	1 to <maxSat>		
>SatID	MP		Enumerated(0..63)	
>TLM Message	MP		Bit string(14)	
>Anti-Spoof	MP		Boolean	
>Alert	MP		Boolean	
>TLM Reserved	MP		Bit string(2)	

### 10.3.7.99 UE positioning measured results

Information Element/Group name	Need	Multi	Type and reference	Semantics description
--------------------------------	------	-------	--------------------	-----------------------

UE positioning Multiple Sets	OP		UE positioning Multiple Sets 10.3.7.102	If this IE is absent, a single measurement set is included.
<del>UE positioning reference cell Identity</del>	<del>OP</del>		<del>Primary CPICH Info 10.3.6.60</del>	
UE positioning OTDOA measured results	OP		UE positioning OTDOA measured results 10.3.7.105	
UE positioning Position estimate info	OP		UE positioning Position estimate info 10.3.7.109	
UE positioning GPS measured results	OP		UE positioning GPS measured results 10.3.7.93	
UE positioning error	OP		UE positioning error 10.3.7.87	Included if UE positioning error occurred

### 10.3.7.101 UE positioning measurement event results

This IE contains the measurement event results that are reported to UTRAN for UE positioning measurements.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
CHOICE Event ID	MP			
>7a				
>>UE positioning Position <u>estimate info</u>	MP		UE positioning Position <u>estimate info</u> 10.3.7.109	
>7b				
>>UE positioning OTDOA measurement	MP		UE positioning OTDOA measurement 10.3.7.105	
>7c				
>>UE positioning GPS measurement	MP		UE positioning GPS measurement 10.3.7.93	



### 10.3.7.103 UE positioning OTDOA assistance data

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
UE positioning OTDOA reference cell info	OP		UE positioning OTDOA <a href="#">reference</a> cell info 10.3.7.108	
UE positioning OTDOA neighbour cell list	OP	1 to <maxCellMEas>		
UE positioning OTDOA neighbour cell info	OP		UE positioning OTDOA neighbour cell info 10.3.7.106	

### 10.3.7.105 UE positioning OTDOA measurement

The purpose of the OTDOA Measurement Information element is to provide OTDOA measurements of signals sent from the reference and neighbour cells.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
SFN	MP		Integer(0..4095)	SFN during which the last measurement was performed
<a href="#">CHOICE mode</a>				
<a href="#">&gt;FDD</a>				
<a href="#">&gt;&gt;Reference cell id</a>	<a href="#">MP</a>		<a href="#">Primary CPICH info 10.3.6.60</a>	
<a href="#">&gt;&gt;UE Rx-Tx time difference type 2</a>	MP		UE Rx-Tx time difference type 2 10.3.7.84	
<a href="#">&gt;TDD</a>				
<a href="#">&gt;&gt; Reference cell id</a>	<a href="#">MP</a>		<a href="#">Cell parameters ID 10.3.6.9</a>	
UE positioning OTDOA quality type	MP		UE positioning OTDOA quality type 10.3.7.107	
Neighbours	MP	0 to <maxCellMEas>		
<a href="#">&gt;CHOICE mode</a>				
<a href="#">&gt;&gt;FDD</a>				
<a href="#">&gt;&gt;&gt;Neighbour Identity</a>	MD		Primary CPICH info 10.3.6.60	Default value is the same as in the first set of multiple sets.
<a href="#">&gt;&gt;TDD</a>				
<a href="#">&gt;&gt;&gt;Cell and Channel ID</a>	MD		Cell and Channel Identity info 10.3.6.8a	Default value is the same as in the first set of multiple sets.
<a href="#">&gt;UE positioning OTDOA quality type</a>	MP		UE positioning OTDOA quality type 10.3.7.107	Quality of the <a href="#">measurement OTDOA</a> from the neighbour cell.
<a href="#">&gt;SFN-SFN observed time difference <a href="#">type 2</a></a>	MP		SFN-SFN observed time difference 10.3.7.63	Gives the timing relative to the reference cell. Only type 2 is allowed. <a href="#">Type 2 means that only the slot timing is accounted for</a>
<a href="#">&gt;UE Rx-Tx time difference type 2</a>	OP		UE Rx-Tx time difference type 2 10.3.7.84	Included if the neighbour is in the active set

### 10.3.7.106 UE positioning OTDOA neighbour cell info

This IE gives approximate cell timing in order to decrease the search window, [as well as the cell locations and fine cell timing for UE based OTDOA](#).

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
<b>CHOICE mode</b>				
>FDD				
>>Primary CPICH info	MP		Primary CPICH info 10.3.6.60	
>TDD				
>>cell and channel ID	MP		Cell and Channel Identity info 10.3.6.8a	Identifies the channel to be measured on.
Frequency info	MD		Frequency info 10.3.6.36	Default value is the existing value of frequency information
IPDL parameters	<i>CV-IPDLs</i>		UE positioning IPDL parameters 10.3.7.98	
<u>SFN offset</u>	<u>CV-IPDLs</u>		<u>Integer(0 .. 4095)</u>	<u>Define Tref as the time of beginning of system frame number SFNref of the reference cell. Define Tnc as the beginning of a frame from the neighbor cell occurring immediately after the time Tref. Let the corresponding system frame number be SFNnc. Then SFNnc = SFNref-SFN offset modulo 4096.</u>
SFN-SFN relative time difference	MP		Integer(0..983039938399)	Gives the relative timing compared to the reference cell. Equal to $\lfloor (Tnc - Tref) / (3.84 * 10^6) \rfloor$ where $\lfloor () \rfloor$ denotes rounding to the nearest lower integer. in chips.
SFN-SFN drift	OP		Real(0,+0.33,+0.66,+1,+1.33,+1.66,+2,+2.5,+3,+4,+5,+7,+9,+11,+13,+15,-0.33,-0.66,-1,-1.33,-1.66,-2,-2.5,-3,-4,-5,-7,-9,-11,-13,-15)	meters/sec
Search Window Size	MP		Integer( <del>10, 20, 30, 40, 50, 60, 70, 80, 160, 320, 640, 1280, infinity</del> )	in chips. <u>If the value is X then the expected SFN-SFN observed time difference is in the range [RTD-X, RTD+X] where RTD is the value of the field SFN-SFN relative time difference.</u> Infinity means <u>that the uncertainty is larger than 1280 chips.</u> <u>more</u>

CHOICE PositioningMode				
>UE based				
>>Cell Position	MD			Default is the same as previous cell
>>>Relative North	MP		Integer(-20000..20000)	Seconds, scale factor 0.03. Relative position compared to reference cell.
>>>Relative East	MP		Integer(-20000..20000)	Seconds, scale factor 0.03. Relative position compared to reference cell.
>>>Relative Altitude	OP		Integer(-4000..4000)	Relative altitude in meters compared to ref. cell.
>>Fine SFN-SFN	MP		Real(0..0.9375 in steps of 0.0625)	Gives finer resolution
>>Round Trip Time	OP		Real(876.00 .. 2923.875) in steps of 0.0625	In chips. Included if cell is in active set.
>UE assisted				(no data)

Condition	Explanation
<i>IPDLs</i>	This IE is present only if IPDLs are applied.

### 10.3.7.108 UE positioning OTDOA reference cell info

This IE defines the cell used for time references in all OTDOA measurements.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
SFN	OP		Integer (0..4095)	Time stamp (SFN of Reference Cell) of the SFN-SFN <u>relative observed</u> time differences and SFN-SFN drift rates. Included if any SFN-SFN drift value is included <u>in IE UE positioning OTDOA neighbor cell info.</u>
CHOICE mode				
>FDD				
>>Primary CPICH info	MP		Primary CPICH info 10.3.6.60	
>TDD				
>>cell and channel ID	MP		Cell and Channel Identity info 10.3.6.8a	Identifies the channel to be measured on.
Frequency info	MD		Frequency info 10.3.6.36	Default value is the existing value of frequency information.
CHOICE PositioningMode				
>UE based				
>>CHOICE <i>Cell Position</i>				The position of the antenna that defines the cell. Used for the UE based method.
>>>Ellipsoid point	OP		Ellipsoid point 10.3.8.4a	
>>>Ellipsoid point with altitude	OP		Ellipsoid point with altitude 10.3.8.4b	
>>Round Trip Time	OP		Real(876.00 .. 2923.875) in steps of 0.0625	In chips.
>UE assisted				(no data)
IPDL parameters	OP		UE positioning IPDL parameters 10.3.7.98	If this element is not included there are no idle periods present

### 10.3.7.109 UE positioning position estimate info

The purpose of this IE is to provide the position estimate from the UE to the network, if the UE is capable of determining its own position.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
<u>CHOICE MODE</u>				
>FDD				
>>Primary CPICH Info	OP		<a href="#">Primary CPICH Info 10.3.6.60</a>	<a href="#">Identifies the reference cell for the GPS TOW-SFN relationship</a>
>TDD				
>>cell parameters id	OP		<a href="#">Cell parameters id 10.3.6.9</a>	<a href="#">Identifies the reference cell for the GPS TOW-SFN relationship</a>
Reference SFN	MP		Integer(0..4095)	The SFN for which the location is valid
GPS TOW msec	CV- Capability and request		Integer(0..6.048*10 <sup>8</sup> -1)	GPS Time of Week in milliseconds (rounded down to the nearest millisecond unit). This time-stamps the beginning of the frame defined in Reference SFN GPS Time of Week in microseconds = 1000 * GPS TOW msec + GPS TOW rem usec
GPS TOW rem usec	CV- Capability and request		Integer(0..999)	GPS Time of Week in microseconds MOD 1000.
CHOICE <i>Position estimate</i>	MP			
>Ellipsoid Point			Ellipsoid Point; 10.3.8.4a	
>Ellipsoid point with uncertainty circle			Ellipsoid point with uncertainty circle 10.3.8.4d	
>Ellipsoid point with uncertainty ellipse			Ellipsoid point with uncertainty ellipse 10.3.8.4e	
>Ellipsoid point with altitude			Ellipsoid point with altitude 10.3.8.4b	
>Ellipsoid point with altitude and uncertainty ellipsoid			Ellipsoid point with altitude and uncertainty ellipsoid 10.3.8.4c	

Condition	Explanation
<i>Capability and request</i>	This field is included only if the UE has this capability <i>and</i> if it was requested in the UE positioning reporting quantity and if the method was UE-based GPS

### 10.3.7.111 UE positioning reporting quantity

The purpose of the element is to express the allowed/required location method(s), and to provide information required QoS.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Method Type	MP		Enumerated(UE assisted, UE based, UE based is preferred but UE assisted is allowed, UE assisted is preferred but UE based is allowed)	
Positioning Methods	MP		Enumerated(OTDOA, GPS, OTDOA or GPS)	
Response Time	MP		Integer(1,2,4, 8, 16, 32, 64, 128)	in seconds
Accuracy	CV- MethodType		<a href="#">Bitstring(7)</a> <a href="#">Integer(0..12700)</a>	<a href="#">The uncertainty is derived from the "uncertainty code" k by <math>r = 10 * (1.1^k - 1)</math> in percentage</a>
GPS timing of Cell wanted	MP		Boolean	If true the SRNC wants the UE to report the SFN-GPS timing of the reference cell. This is however optional in the UE.
Multiple Sets	MP		Boolean	TRUE indicates that the UE is requested to send multiple <i>OTDOA/GPS Measurement Information Sets</i> . UE is expected to include the current measurement set.
Additional Assistance Data Request	MP		Boolean	TRUE indicates that the UE is requested to send the IE "Additional assistance Data Request" when the IE "UE positioning Error" is present in the UE positioning measured results.
Environment Characterisation	OP		Enumerated(possibly heavy multipath and NLOS conditions, no or light multipath and usually LOS conditions, not defined or mixed environment)	



Method Type	Condition	Explanation
		The IE is optional if the IE "Method Type" is 'UE assisted'; otherwise it is mandatory

```
-- *****
--
-- MEASUREMENT INFORMATION ELEMENTS (10.3.7)
--
-- *****
```

```
OTDOA-SearchWindowSize ::= ENUMERATED {
    c120, c240, c380, c4160, c5320,
    c66400, c71280, moreThan128070 }
```

```
SFN-SFN-RelTimeDifference1 ::= SEQUENCE {
    sfn-Offset INTEGER (0 .. 4095)
    sfn-sfn-Reltimedifference INTEGER (0..383999830399)}
```

```
UE-Positioning-GPS-Measurement ::= SEQUENCE {
    modeSpecificInfo CHOICE {
        fdd SEQUENCE {
            referenceIdentity PrimaryCPICH-Info OPTIONAL
        },
        tdd SEQUENCE {
            referenceIdentity CellParametersID OPTIONAL
        }
    },
    referenceSFN ReferenceSFN OPTIONAL,
    gps-TOW-lmsec GPS-TOW-lmsec,
    gps-TOW-rem-usec GPS-TOW-rem-usec OPTIONAL,
    gps-MeasurementParamList GPS-MeasurementParamList
}
```

```
UE-Positioning-GPS-ReferenceTime ::= SEQUENCE {
    gps-Week INTEGER (0..1023),
    gps-tow-lmsec GPS-TOW-lmsec,
    gps-tow-rem-usec GPS-TOW-rem-usec OPTIONAL,
    modeSpecificInfo CHOICE {
        fdd SEQUENCE {
            referenceIdentity PrimaryCPICH-Info OPTIONAL
        },
        tdd SEQUENCE {
            referenceAndChannelIdentity CellParametersIDAndChannelIdentity
            OPTIONAL
        }
    },
    sfn INTEGER (0..4095),
    sfn-tow-Uncertainty SFN-TOW-Uncertainty OPTIONAL,
    nodeBClockDrift NodeB-ClockDrift OPTIONAL,
    gps-TOW-AssistList GPS-TOW-AssistList OPTIONAL
}
```

```
UE-Positioning-MeasuredResults ::= SEQUENCE {
    ue-positioning-MultipleSets UE-Positioning-MultipleSets OPTIONAL,
    ue-positioning-ReferenceCellIdentity PrimaryCPICH-Info
    OPTIONAL,
    ue-positioning-OTDOA-Measurement UE-Positioning-OTDOA-Measurement OPTIONAL
    ue-positioning-PositionEstimateInfo UE-Positioning-PositionEstimateInfo
    ue-positioning-GPS-Measurement UE-Positioning-GPS-Measurement OPTIONAL
    ue-positioning-Error UE-Positioning-Error OPTIONAL
}
```

```
UE-Positioning-OTDOA-Measurement ::= SEQUENCE {
    sfn INTEGER (0..4095),
    modeSpecificInfo CHOICE {
        fdd SEQUENCE {
            referenceCellIdentity PrimaryCPICH-Info,
            ue-RX-TX-TimeDifferenceType2 UE-RX-TX-TimeDifferenceType2,
        }
    }
}
```

```

    tdd SEQUENCE {
      referenceCellIdentity CellParametersID
    }
  }

  qualityChoice CHOICE {
    std-10 ReferenceQuality10,
    std-50 ReferenceQuality50,
    cpich-EcN0 CPICH-Ec-N0-OTDOA,
    defaultQuality ReferenceQuality
  },
  neighbourList NeighbourList OPTIONAL
}
UE-Positioning-OTDOA-NeighbourCellInfo ::= SEQUENCE {
  modeSpecificInfo CHOICE {
    fdd SEQUENCE {
      primaryCPICH-Info PrimaryCPICH-Info
    },
    tdd SEQUENCE {
      cellAndChannelIdentity CellAndChannelIdentity
    }
  },
  frequencyInfo FrequencyInfo OPTIONAL,
  ue-positioning-IPDL-Parameters UE-Positioning-IPDL-Parameters OPTIONAL,
  sfn-SFN-RelTimeDifference SFN-SFN-RelTimeDifference,
  sfn-SFN-Drift INTEGER (0..30) OPTIONAL,
  searchWindowSize OTDOA-SearchWindowSize,
  positioningMode CHOICE {
    ueBased SEQUENCE {
      relativeNorth INTEGER (-20000..20000)
    } OPTIONAL,
    relativeEast INTEGER (-20000..20000)
  } OPTIONAL,
    relativeAltitude INTEGER (-4000..4000)
  } OPTIONAL,
    fineSFN-SFN FineSFN-SFN OPTIONAL,
    roundTripTime INTEGER (0..32765)
  } OPTIONAL,
  ueAssisted SEQUENCE {}
}

UE-Positioning-PositionEstimateInfo ::= SEQUENCE {
  modeSpecificInfo CHOICE {
    fdd SEQUENCE {
      referenceIdentity PrimaryCPICH-Info OPTIONAL
    },
    tdd SEQUENCE {
      referenceIdentity CellParametersID OPTIONAL
    }
  },
  referenceSFN ReferenceSFN,
  gps-tow-lmsec GPS-TOW-lmsec OPTIONAL,
  gps-tow-rem-usec GPS-TOW-rem-usec OPTIONAL,
  positionEstimate PositionEstimate
}

UTRAN-ReferenceTime ::= SEQUENCE {
  gps-tow-lmsec GPS-TOW-lmsec,
  gps-tow-rem-usec GPS-TOW-rem-usec,
  modeSpecificInfo CHOICE {
    fdd SEQUENCE {
      referenceIdentity PrimaryCPICH-Info OPTIONAL
    },
    tdd SEQUENCE {
      referenceAndChannelIdentity CellParametersIDAndChannelIdentity
    }
  } OPTIONAL
}

```

```
} sfn
```

```
INTEGER (0..4095)
```

## CHANGE REQUEST

⌘ **25.331 CR 824** ⌘ ev **r1** ⌘ Current version: **3.6.0** ⌘

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

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

<b>Title:</b>	⌘ Definition of DPCH numbering		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 15/05/2001
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ R99
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

<b>Reason for change:</b>	⌘ The IE "Downlink DPCH info for each RL" includes a list of DPCH channelisation codes. In the case of multiple codes, the physical layer specifications require that the codes are numbered in order to correctly perform the physical channel mapping. Currently the RRC spec does not define this numbering of the DPCH codes.
<b>Summary of change:</b>	⌘ Text is added into the tabular description of the IE to specify that the DPCH numbering is equivalent to the order that the codes are received in the message.  Backward compatibility: Correction to a function where the specification was not sufficiently explicit. Would not affect implementations behaving as indicated in the CR, would affect implementations supporting the corrected functionality otherwise.
<b>Consequences if not approved:</b>	⌘ Some UEs may use a different methods to number DPCHs and will not operate correctly when using multicode.

<b>Clauses affected:</b>	⌘ 10.3.6.21		
<b>Other specs affected:</b>	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	
<b>Other comments:</b>	⌘		

**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](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. ☞

## 10.3.6.21 Downlink DPCH info for each RL

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE <i>mode</i>	MP			
>FDD				
>>Primary CPICH usage for channel estimation	MP		Primary CPICH usage for channel estimation 10.3.6.62	
>>DPCH frame offset	MP		Integer(0..38144 by step of 256)	Offset (in number of chips) between the beginning of the P-CCPCH frame and the beginning of the DPCH frame This is called $\tau_{DPCH,n}$ in [26]
>>Secondary CPICH info	OP		Secondary CPICH info 10.3.6.73	
>>DL channelisation code	MP	1 to <maxDPC H-DLchan>		<a href="#">For the purpose of physical channel mapping [27] the DPCHs are numbered, starting from DPCH number 1, according to the order that they are contained in this IE. SF of the channelisation code of the data part for each DPCH</a>
>>>Secondary scrambling code	MD		Secondary scrambling code 10.3.6.74	Default is the same scrambling code as for the Primary CPICH
>>>Spreading factorCHOICE Spreading factor	MP		Integer(4, 8, 16, 32, 64, 128, 256, 512)	Defined in CHOICE SF512-AndCodenum with "code number" in ASN.1
>>>Code number	MP		Integer(0..Spreading factor - 1)	
>>>Scrambling code change	CH SF/2		Enumerated (code change, no code change)	Indicates whether the alternative scrambling code is used for compressed mode method 'SF/2'.
>>TPC combination index	MP		TPC combination index 10.3.6.85	
>>SSDT Cell Identity	OP		SSDT Cell Identity 10.3.6.76	
>>Closed loop timing adjustment mode	CH TxDiversity Mode		Integer(1, 2)	It is present if current TX Diversity Mode in UE is "closed loop mode 1" or "closed loop mode 2". Value in slots
>TDD				
>>DL CCTrCh List	MP	1..<maxCC TrCH>		
>>>TFCS ID	MD		Integer(1..8)	Identity of this CCTrCh. Default value is 1
>>>Time info	MP		Time Info 10.3.6.83	
>>>Downlink DPCH timeslots and codes	MD		Downlink Timeslots and Codes 10.3.6.32	Default is to use the old timeslots and codes.
>>>UL CCTrCH TPC List	MD	1..<maxCC TrCH>		UL CCTrCH identities for TPC commands associated

Information Element/Group name	Need	Multi	Type and reference	Semantics description
				with this DL CCTrCH. Default is previous list or all defined UL CCTrCHs
>>>>UL TPC TFCS Identity	MP		Transport Format Combination Set Identity 10.3.5.21	

Condition	Explanation
<i>SF/2</i>	The information element is mandatory if the UE has an active compressed mode pattern sequence, which is using compressed mode method "SF/2". Otherwise the IE is not needed.
<i>TxDiversity Mode</i>	This IE is present if current TX Diversity Mode in UE is "closed loop mode 1" or "closed loop mode 2". Otherwise the IE is not needed.

CR-Form-v4

## CHANGE REQUEST

⌘ **25.331 CR 824** ⌘ 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  Radio Access Network  Core Network

<b>Title:</b>	⌘ Definition of DPCH numbering		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 25/05/2001
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ REL-4
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .	Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)	

<b>Reason for change:</b>	⌘ The IE "Downlink DPCH info for each RL" includes a list of DPCH channelisation codes. In the case of multiple codes, the physical layer specifications require that the codes are numbered in order to correctly perform the physical channel mapping. Currently the RRC spec does not define this numbering of the DPCH codes.
<b>Summary of change:</b>	⌘ Text is added into the tabular description of the IE to specify that the DPCH numbering is equivalent to the order that the codes are received in the message.
<b>Consequences if not approved:</b>	⌘ Some UEs may use a different methods to number DPCHs and ill not operate correctly when using multicode.

<b>Clauses affected:</b>	⌘ 10.3.6.21		
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	
<b>Other comments:</b>	⌘		

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

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

## 10.3.6.21 Downlink DPCH info for each RL

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE <i>mode</i>	MP			
>FDD				
>>Primary CPICH usage for channel estimation	MP		Primary CPICH usage for channel estimation 10.3.6.62	
>>DPCH frame offset	MP		Integer(0..38144 by step of 256)	Offset (in number of chips) between the beginning of the P-CCPCH frame and the beginning of the DPCH frame This is called $\tau_{DPCH,n}$ in [26]
>>Secondary CPICH info	OP		Secondary CPICH info 10.3.6.73	
>>DL channelisation code	MP	1 to <maxDPC H-DLchan>		<u>For the purpose of physical channel mapping [27] the DPCHs are numbered, starting from DPCH number 1, according to the order that they are contained in this IE. SF of the channelisation code of the data part for each DPCH</u>
>>>Secondary scrambling code	MD		Secondary scrambling code 10.3.6.74	Default is the same scrambling code as for the Primary CPICH
>>>Spreading factorCHOICE-Spreading factor	MP		Integer(4, 8, 16, 32, 64, 128, 256, 512)	Defined in CHOICE SF512-AndCodenum with "code number" in ASN.1
>>>Code number	MP		Integer(0..Spreading factor - 1)	
>>>Scrambling code change	CH SF/2		Enumerated (code change, no code change)	Indicates whether the alternative scrambling code is used for compressed mode method 'SF/2'.
>>TPC combination index	MP		TPC combination index 10.3.6.85	
>>SSDT Cell Identity	OP		SSDT Cell Identity 10.3.6.76	
>>Closed loop timing adjustment mode	CH TxDiversity Mode		Integer(1, 2)	It is present if current TX Diversity Mode in UE is "closed loop mode 1" or "closed loop mode 2". Value in slots
>TDD				
>>DL CCTrCh List	MP	1..<maxCC TrCH>		
>>>TFCS ID	MD		Integer(1..8)	Identity of this CCTrCh. Default value is 1
>>>Time info	MP		Time Info 10.3.6.83	
>>>Downlink DPCH timeslots and codes	MD		Downlink Timeslots and Codes 10.3.6.32	Default is to use the old timeslots and codes.
>>>UL CCTrCH TPC List	MD	1..<maxCC TrCH>		UL CCTrCH identities for TPC commands associated

Information Element/Group name	Need	Multi	Type and reference	Semantics description
				with this DL CCTrCH. Default is previous list or all defined UL CCTrCHs
>>>>UL TPC TFCS Identity	MP		Transport Format Combination Set Identity 10.3.5.21	

Condition	Explanation
<i>SF/2</i>	The information element is mandatory if the UE has an active compressed mode pattern sequence, which is using compressed mode method "SF/2". Otherwise the IE is not needed.
<i>TxDiversity Mode</i>	This IE is present if current TX Diversity Mode in UE is "closed loop mode 1" or "closed loop mode 2". Otherwise the IE is not needed.

## CHANGE REQUEST

⌘ **25.331 CR 826** ⌘ ev **r4** ⌘ Current version: **3.6.0** ⌘

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

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

<b>Title:</b>	⌘ Corrections to System Information Procedure		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ May 21, 2001
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ R99
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Use <u>one</u> of the following releases: <b>2</b> (GSM Phase 2) <b>R96</b> (Release 1996) <b>R97</b> (Release 1997) <b>R98</b> (Release 1998) <b>R99</b> (Release 1999) <b>REL-4</b> (Release 4) <b>REL-5</b> (Release 5)

**Reason for change:** ⌘

1. It is incorrectly stated that the UE is forced to read the system information only as per Table 8.1.1 while in other places the text seems to suggest an indirect specification as to when the system information is read.
2. The meaning of the square brackets in column 2 of Table 8.1.1 is not clear.
3. Square brackets remain around the value of 320 ms for the case of the expiration timer for SIB 7 suggesting that no conclusion has been reached. #20 ms seems to be an unnecessary restriction on the minimum value that a network may use.
4. In Table 8.1.1 it is not stated that if SIB 12 is not transmitted, SIB 11 should be read by connected mode UEs.
5. It is not clear what are the allowed sequences of valid segments that a UE can read and put together to create a system information block.
6. It is not clear what is meant by the UE reading "ALL" the segments in case the index of a segment being read is larger than the SEG\_COUNT as indicated in the scheduling information.
7. The UE may store information for later stored cell reselection - however this is prohibited by the text in the present version by requiring all information to be considered as invalid after switch off.
8. It is not clear what the UE is to do in the case of SIBs with multiple occurrences which occur unexpectedly. Other SIBs may be stored however but this cannot apply to the case of SIBs with multiple occurrences.
9. Since MIB\_REP is an undefined parameter the equation for the error case of not locating the MIB is incorrect.
10. With the current text, a UE could camp on a cell but never be able to access any

service from the cell if it doesn't support ANSI-41. The text does not consider the case where SIB13 is broadcast but not SIB 1 and it only supports GSM-MAP.

11. Text on actions to be taken when SIBs are not found is located in the individual sections for the appropriate SIBs which deal only with the treatment of the information in a particular SIB.

12. The text relevant to the treatment of SIBs for multiple occurrences is written in many places taking only SIB 16 into account instead of other SIBs such as SIB 15.2 also.

13. There is a reference to the Page indicator in case of SIB 1 which is not consistent with the paging process as defined in TS 25.304.

14. There is an unnecessary limitation on a U Backwards Compatibility - This may not be backwards compatible for those UEs not behaving as above. E that is able to receive the service in cell S-CCPCH while still making inter-frequency/inter-RAT measurements or inter-frequency/inter-RAT cell re-selection evaluation by prohibiting such an action.

15. Numerous minor editorial corrections.

16. Equivalent PLMN value tag

17. When a cell is considered as barred due to a critical SIB that is missing, the UE may still initiate an emergency call in the cell according to the definition in 25.304. As a missing critical SIB is an error case rather than a normal cell barring situation, UE should not be permitted to make emergency calls. (It should be noted that without the critical SIBs the UE is missing configuration information necessary to make an access. Therefore it is unlikely that any March 01 implementation would attempt an emergency call on such a cell). (Changes highlighted in yellow).

**Summary of change: %**

1. It is clarified that Table 8.1.1 does not restrict when the UE may read system information as long as it reads the appropriate information prior to the execution of a procedure requiring it. IN case of System Information Block type 10, the UE is required to read it only in CELL\_DCH.

Backwards Compatibility - This is backwards compatible from all perspectives. UEs not behaving as such would be needlessly limiting the system performance.

2. The meaning of the square brackets in column 2 of Table 8.1.1 is clarified.

Backwards Compatibility - This is backwards compatible from all perspectives.

~~3. The square brackets around the 320 ms value for the range of the SIB 7 expiration timer are removed. The value of 320 ms is replaced with 80 ms in order to permit a flexible enough range for various implementations. It should be noted that this is the minimum value; implementations can assign higher values than 80 ms using the SIB\_REP parameter.~~

~~Backwards Compatibility - This is backwards compatible from all perspectives.~~

4.3. If SIB 12 is not transmitted, SIB 11 should be read by connected mode UEs. This is similar to what is already specified in Table 8.1.1 for SIB 4 and SIB 6.

Backwards Compatibility - This is backwards compatible from all perspectives for those UEs correctly implementing this per the relevant clauses in 8.4.

5.4. It is clarified that the only valid sequence when reading system information is an ascending sequence starting with the First segment of the system information block.

Backwards Compatibility - This may not be backwards compatible for UEs not implementing this in this fashion.

6.5. It is clarified what is meant by the UE reading "ALL" the segments in case the index of a segment being read is larger than the SEG\_COUNT as indicated in the

scheduling information.

Backwards Compatibility - This is backwards compatible from all perspectives.

7.6. It is clarified that some information may be stored by the UE or in the USIM for later use in stored cell re-selection.

Backwards Compatibility - This is backwards compatible from all perspectives. Ues not behaving as above lose some functionality.

8.7. SIBs with multiple occurrences (SIB 16, SIB 15.2 and SIB 15.3) have an additional multiple occurrence identifier (Predefined configuration identity or SIB occurrence identity), which appear only in the scheduling information and does not appear with the actual SYSTEM INFORMATION message. Therefore in case of unexpected occurrence of these SIBs, the occurrence identifier will not be known. It is clarified that the relevant data received in the SYSTEM INFORMATION message is therefore ignored, when there is no possibility to know the occurrence identifier.

Backwards Compatibility - This may not be backwards compatible for Ues not implementing this in this fashion - any other approach would not lead to a consistent UE behavior.

9.8. Since MIB\_REP is an undefined parameter the equation for the error case of not locating the MIB is re-written.

Backwards Compatibility - This is backwards compatible from all perspectives.

10.9. It is clarified that if the UE only supports GSM-MAP but finds a cell that broadcasts System Information Block type 13 but not System Information Block type 1 it shall consider the cell barred.

Backwards Compatibility - This may not be backwards compatible for those Ues not behaving as above.

11.10. Text on actions to be taken when SIBs are not found is moved to the appropriate location in 8.1.1.5 as opposed to the individual sections for the appropriate SIBs which deal only with the treatment of the information in a particular SIB.

Backwards Compatibility - This is backwards compatible from all perspectives.

12.11. It is clarified in a number of places that some of the text relevant to the case of SIB 16 for which multiple occurrences are possible is also relevant for the case of SIBs having multiple occurrences such as SIB15.2.

Backwards Compatibility - This may not be backwards compatible for those Ues not behaving as above.

13.12. The reference of the Page indicator in case of SIB 1 has been removed consistent with the paging process as defined in TS 25.304.

Backwards Compatibility - This is backwards compatible from all perspectives.

14.13. It is clarified that if the IE "FACH Measurement Occasion Info" is not present then based on the UE's capabilities to receive the S-CCPCH of the serving cell while making inter-frequency/inter-RAT measurements or inter-frequency/inter-RAT cell re-selection evaluation.

Backwards Compatibility - This is not backwards compatible.

14. All miscellaneous modifications are editorial in nature and therefore backwards compatible.

16. An extra requirement is added that the UE shall not make emergency calls when the cell is barred due to a missing critical SIB.

17. Name of 'Cell reserved for Solsa use' IE has been changed to 'Cell reservation extension'. A requirement is added that if this IE is set to reserved the UE shall treat the cell as barred (as in the case of a missing SIB). This requirement is moved from 25.304 but is functionally unchanged.

*Backward compatibility: Correction to a function where the specification was not sufficiently explicit. Would not affect implementations behaving like indicated in the CR, otherwise would affect implementations supporting the corrected functionality.*

**Consequences if not approved:**

- ⌘
1. Inconsistent UE implementations
  2. Incorrect UE implementations.
  3. Un-necessary restrictions on UE abilities to make measurements.

**Clauses affected:**

- ⌘ 8.1.1.1.2, 8.1.1.1.3, 8.1.1.1.4, 8.1.1.3, 8.1.1.4, 8.1.1.5, 8.1.1.6, 8.1.1.6.1, 8.1.1.6.3, 8.1.1.6.4, 8.1.1.6.5, 8.1.1.6.7, 8.1.1.6.11, 8.1.1.6.13, 8.1.1.6.15, 8.1.1.6.15.1, 8.1.1.6.15.2, 8.1.1.6.15.3, 8.1.1.6.15.4, 8.1.1.6.16, 8.1.1.6.18, 8.1.1.7, 8.1.1.7.1, 8.1.1.7.3, 10.3.2.1, 11

**Other specs affected:**

- ⌘  Other core specifications ⌘   
 Test specifications  
 O&M Specifications

**Other comments:**

⌘

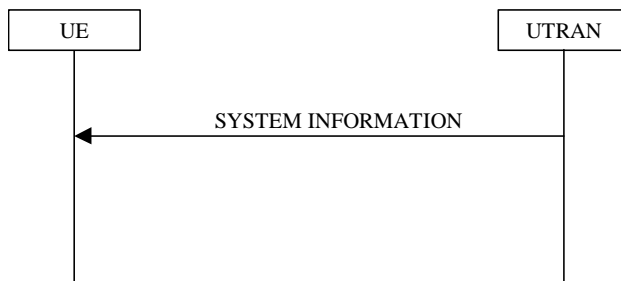
**How to create CRs using this form:**

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

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

## 8.1 RRC Connection Management Procedures

### 8.1.1 Broadcast of system information



**Figure 6: Broadcast of system information**

#### 8.1.1.1 General

The purpose of this procedure is to broadcast system information from the UTRAN to UEs in a cell.

##### 8.1.1.1.1 System information structure

The system information elements are broadcast in *system information blocks*. A system information block groups together system information elements of the same nature. Different system information blocks may have different characteristics, e.g. regarding their repetition rate and the requirements on UEs to re-read the system information blocks.

The system information is organised as a tree. A *master information block* gives references and scheduling information to a number of system information blocks in a cell. The system information blocks contain the actual system information. The master information block may optionally also contain reference and scheduling information to one or two *scheduling blocks*, which give references and scheduling information for additional system information blocks. Scheduling information for a system information block may only be included in either the master information block or one of the scheduling blocks.

For all system information blocks except System Information Block types 15.2, 15.3 and 16, the content is the same in each occurrence for system information blocks using value tag. System Information Block types 15.2, 15.3 and 16 may occur more than once with different content. In this case scheduling information is provided for each such occurrence of the system information block. System information blocks that do not use value tag may have different content for each occurrence.

##### 8.1.1.1.2 System information blocks

Table 8.1.1 specifies all system information blocks and their characteristics.

The *area scope column* in table 8.1.1 specifies the area where a system information block's value tag is valid. If the area scope is *cell*, the UE shall consider the system information block to be valid only in the cell in which it was read. If system information blocks have been previously stored for this cell, the UE shall check whether the value tag for the system information block in the entered cell is different compared to the stored value tag. If the area scope is *PLMN*, the UE shall check the value tag for the system information block when a new cell is selected. If the value tag for the system information block in the new cell is different compared to the value tag for the system information block stored in the UE, the UE shall re-read the system information block.

For System information block types 15.2, 15.3 and 16, which may have multiple occurrences, each occurrence has its own independent value tag. The UE shall re-read a particular occurrence if the value tag of this occurrence has changed compared to that stored in the UE.

The *UE mode/state column when block is valid* in Table 8.1.1 specifies in which UE mode or UE state the IEs in a system information block shall be regarded as valid by the UE. In other words, the indicated system information block



becomes invalid upon change to a mode/state that is not included in this column. In some cases, the states are inserted in brackets to indicate that the validity is dependent on the broadcast of the associated System Information Blocks by the network as explained in the relevant procedure section.

The *UE mode/state column when block is read* in Table 8.1.1 specifies in which UE mode or UE state the IEs in a system information block ~~shall be~~ may be read by the UE. The UE shall have the necessary information prior to execution of any procedure requiring information to be obtained from the appropriate system information block. The requirements on the UE in terms of when to read the system information may therefore be derived from the procedure specifications that specify which IEs are required in the different UE modes/states in conjunction with the different performance requirements that are specified. System Information Block 10 shall only be read by the UE while in CELL\_DCH.

NOTE 1 There are a number of system information blocks that include the same IEs while the UE mode/state in which the information is valid differs. This approach is intended to allow the use of different IE values in different UE mode/states.

~~NOTE 2 The requirements concerning when a UE shall read system information blocks are specified indirectly; these requirements may be derived from the procedure specifications that specify which IEs are required in the different UE modes/states in conjunction with the different performance requirements that are specified.~~

The *Scheduling information* column in Table 8.1.1 specifies the position and repetition period for the SIB.

The *modification of system information* column in Table 8.1.1 specifies the update mechanisms applicable for a certain system information block. For system information blocks with a value tag, the UE shall update the information according to subclause 8.1.1.7.1 or 8.1.1.7.2. For system information blocks with an expiration timer, the UE shall, when the timer expires, perform an update of the information according to subclause 8.1.1.7.4.

**Table 8.1.1: Specification of system information block characteristics**

System information block	Area scope	UE mode/state when block is valid	UE mode/state when block is read	Scheduling information	Modification of system information	Additional comment
Master information block	Cell	Idle mode, CELL_FACH, CELL_PCH, URA_PCH	Idle mode, CELL_FACH, CELL_PCH, URA_PCH	SIB_POS = 0 SIB_REP = 8 (FDD) SIB_REP = 8, 16, 32 (TDD) SIB_OFF=2	Value tag	
Scheduling block 1	Cell	Idle mode, CELL_FACH, CELL_PCH, URA_PCH	Idle mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information" in MIB	Value tag	
Scheduling block 2	Cell	Idle mode, CELL_FACH, CELL_PCH, URA_PCH	Idle mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information" in MIB	Value tag	
System information block type 1	PLMN	Idle mode, CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH	Idle	Specified by the IE "Scheduling information"	Value tag	
System information block type 2	Cell	URA_PCH	URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 3	Cell	Idle mode, (CELL_FACH, CELL_PCH, URA_PCH)	Idle mode, (CELL_FACH, CELL_PCH, URA_PCH)	Specified by the IE "Scheduling information"	Value tag	
System information block type 4	Cell	CELL_FACH, CELL_PCH, URA_PCH	CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	If System information block type 4 is not broadcast in a cell, the connected mode UE shall <b>read-apply information in System information block type 3 in connected mode.</b>
System information block type 5	Cell	Idle mode, (CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH (TDD only))	Idle mode, (CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH (TDD only))	Specified by the IE "Scheduling information"	Value tag	

System information block type 6	Cell	CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH (TDD only)	CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH (TDD only)	Specified by the IE "Scheduling information"	Value tag	<p>If system information block type 6 is not broadcast in a cell, the connected mode UE shall read System information block type 5.</p> <p>If some of the optional IEs are not included in System information block type 6, the UE shall read the corresponding IEs in System information block type 5</p> <p>In TDD mode system information block 6 shall only be read in CELL_DCH if required for open loop power control as specified in subclause 8.5.7 and/or if shared transport channels are assigned to the UE. If in these cases system information block type 6 is not broadcast the UE shall read system information block type 5.</p>
System information block type 7	Cell	Idle mode, CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH (TDD only)	Idle mode, CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH (TDD only)	Specified by the IE "Scheduling information"	Expiration timer = MAX([320 ms], SIB_REP * ExpirationTimeFactor)	In TDD mode system information block type 7 shall only be read in CELL_DCH if shared transport channels are assigned to the UE.
System information block type 8	Cell	CELL_FACH, CELL_PCH, URA_PCH	CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 9	Cell	CELL_FACH, CELL_PCH, URA_PCH	CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Expiration timer = SIB_REP	
System information block type 10	Cell	CELL_DCH	CELL_DCH	Specified by the IE "Scheduling information"	Expiration timer = SIB_REP	
System information block type 11	Cell	Idle mode (CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH)	Idle mode (CELL_FACH, CELL_PCH, URA_PCH)	Specified by the IE "Scheduling information"	Value tag	

System information block type 12	Cell	CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH	CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	<a href="#">If system information block type 12 is not broadcast in a cell, the connected mode UE shall read System information block type 11.</a> If some of the optional IEs are not included in System information block type 12, the UE shall read the corresponding IEs in System information block type 11.
System information block type 13	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 13.1	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 13.2	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 13.3	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 13.4	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 14	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH	Specified by the IE "Scheduling information"	Expiration timer = MAX([320 ms], SIB_REP * ExpirationTimeFactor)	This system information block is used in TDD mode only. System information block type 14 shall only be read in CELL_DCH if required for open loop power control as specified in subclause 8.5.7.
System information block type 15	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 15.1	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 15.2	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	For this system information block there may be multiple occurrences
System information block type 15.3	PLMN	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	For this system information block there may be multiple occurrences
System information block type 15.4	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	

System information block type 16	PLMN	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	For this system information block there may be multiple occurrences
System information block type 17	Cell	CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH	CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH	Specified by the IE "Scheduling information"	Expiration timer = SIB_REP	This system information block is used in TDD mode only. System information block type 17 shall only be read if shared transport channels are assigned to the UE.
System Information Block type 18	Cell	Idle mode, CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH	Idle mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	

The UE shall acquire all system information blocks except system information block type 10 on BCH. System Information Block type 10 shall be acquired on the FACH and only by UEs with support for simultaneous reception of one SCCPCH and one DPCH. If System Information Block type 10 is not broadcast in a cell, the DRAC procedures do not apply in this cell. System Information Block type 10 is used in FDD mode only.

#### 8.1.1.1.3 Segmentation and concatenation of system information blocks

A generic SYSTEM INFORMATION message is used to convey the system information blocks on the BCCH. A given BCCH may be mapped onto either a BCH or a FACH transport channel according to subclause 8.1.1.1.2. The size of the SYSTEM INFORMATION message shall fit the size of a BCH or a FACH transport block.

The RRC layer in UTRAN performs segmentation and concatenation of encoded system information blocks. If the encoded system information block is larger than the size of a SYSTEM INFORMATION message, it will be segmented and transmitted in several messages. If the encoded system information block is smaller than a SYSTEM INFORMATION message, UTRAN may concatenate ~~one or several (parts of)~~ several system information blocks, or the first segment or the last segment into the same message as specified in the remainder of this clause.

Four different segment types are defined:

- First segment;
- Subsequent segment;
- Last segment;
- Complete.

Each of the types - *First*, *Subsequent* and *Last segment* - is used to transfer segments of a master information block, scheduling block or a system information block. The segment type, *Complete*, is used to transfer a complete master information block, complete scheduling block or a complete system information block.

Each segment consists of a header and a data field. The data field carries the encoded system information elements. The header contains the following parameters:

- The number of segments in the system information block (SEG\_COUNT). This parameter is only included in the header if the segment type is "First segment".
- SIB type. The SIB type uniquely identifies the master information block, scheduling block or a system information block.
- Segment index. This parameter is only included in the header if the segment type is "Subsequent segment" or "Last segment".

UTRAN may combine one or several segments of variable length in the same SYSTEM INFORMATION message. The following combinations are allowed:

1. No segment;

2. First segment;
3. Subsequent segment;
4. Last segment;
5. Last segment + First segment;
6. Last segment + one or several Complete;
7. Last segment + one or several Complete + First segment;
8. One or several Complete;
9. One or several Complete + First segment;
10. One Complete of size 215 to 226;
11. Last segment of size 215 to 222.

The "No segment" combination is used when there is no master information block, scheduling block or system information block scheduled for a specific BCH transport block.

UEs are not required to support the reception of multiple occurrences of **a-the same** system information block type within one SYSTEM INFORMATION message.

NOTE: Since the SIB type is the same for each occurrence of the system information block, the UE does not know the order in which the occurrences, scheduled for this SYSTEM INFORMATION message, appear. Therefore, the UE is unable to determine which scheduling information, e.g., value tag relates to which occurrence of the system information block.

#### 8.1.1.1.4 Re-assembly of segments

The RRC layer in the UE shall perform re-assembly of segments. All segments belonging to the same master information block, scheduling block or system information block shall be assembled in ascending order with respect to the segment index. When all segments of the master information block, scheduling block or a system information block have been received, the UE shall perform decoding of the complete master information block, scheduling block or system information block. For System Information Block type 16 which may have multiple occurrences, each occurrence shall be re-assembled independently.

The UE shall discard system information blocks of which segments were missing, of which segments were received out of sequence and/or for which duplicate segments were received. [The only valid sequence is an ascending one with the sequence starting with the First Segment of the associated System Information Block.](#)

If the UE receives a Subsequent segment or Last segment where the index in IE "Segment index" is larger than the number of segments stated in IE "SEG\_COUNT" in the scheduling information for that scheduling block or system information block,

- the UE may
  - read all the segments to create a system information block [as defined by the scheduling information read by the UE](#);
  - store the content of the system information block with a value tag set to the value NULL; and
  - consider the content of the scheduling block or system information block as valid,
    - until it receives the same type of scheduling block or system information block in a position according to its scheduling information or
    - at most for 6 hours after reception.
- and the UE shall:
  - **re-read** scheduling information for that scheduling block or system information block.

If the UE receives a Subsequent segment or Last segment where the index in IE "Segment index" is larger than the number of segments stated in IE "SEG\_COUNT" in the First segment, the UE shall

- discard all segments for that master information block, scheduling block or system information block and
- re-read the scheduling information for that system information block.
- then re-read all segments for that system information block.

#### 8.1.1.1.5 Scheduling of system information

Scheduling of system information blocks is performed by the RRC layer in UTRAN. If segmentation is used, it should be possible to schedule each segment separately.

To allow the mixing of system information blocks with short repetition period and system information blocks with segmentation over many frames, UTRAN may multiplex segments from different system information blocks. Multiplexing and de-multiplexing is performed by the RRC layer.

The scheduling of each system information block broadcast on a BCH transport channel is defined by the following parameters:

- the number of segments (SEG\_COUNT);
- the repetition period (SIB\_REP). The same value applies to all segments;
- the position (phase) of the first segment within one cycle of the Cell System Frame Number (SIB\_POS(0)). Since system information blocks are repeated with period SIB\_REP, the value of SIB\_POS(i),  $i = 0, 1, 2, \dots, \text{SEG\_COUNT}-1$  must be less than SIB\_REP for all segments;
- the offset of the subsequent segments in ascending index order (SIB\_OFF(i),  $i = 1, 2, \dots, \text{SEG\_COUNT}-1$ ). The position of the subsequent segments is calculated using the following:  $\text{SIB\_POS}(i) = \text{SIB\_POS}(i-1) + \text{SIB\_OFF}(i)$ .

The scheduling is based on the Cell System Frame Number (SFN). The SFN of a frame at which a particular segment,  $i$ , with  $i = 0, 1, 2, \dots, \text{SEG\_COUNT}-1$  of a system information block occurs, fulfils the following relation:

$$\text{SFN mod SIB\_REP} = \text{SIB\_POS}(i)$$

In FDD and TDD the scheduling of the master information block is fixed as defined in Table 8.1.1. For TDD, UTRAN may apply one of the values allowed for the master information block's repetition period. The value that UTRAN is using in TDD is not signalled; UEs have to determine it by trial and error.

#### 8.1.1.2 Initiation

The system information is continuously broadcast on a regular basis in accordance with the scheduling defined for each system information block.

#### 8.1.1.3 Reception of SYSTEM INFORMATION messages by the UE

The UE shall read SYSTEM INFORMATION messages broadcast on a BCH transport channel in idle mode and in the connected mode in states CELL\_FACH, CELL\_PCH, URA\_PCH and CELL\_DCH (TDD only). In addition, UEs which support simultaneous reception of one SCCPCH and one DPCH shall read system information on a FACH transport channel when in CELL\_DCH state.

In idle mode and connected mode different combinations of system information blocks are valid. The UE shall acquire the system information blocks that are needed according to Table 8.1.1.

The UE may store system information blocks with cell or PLMN area scope (including their value tag [if applicable](#)) for different cells and different PLMNs, to be used if the UE returns to these cells.

The UE shall consider all stored system information blocks as invalid after it has been switched off. [Some information obtained from system information may be stored by the UE or in the USIM for use in a stored information cell selection.](#)

When selecting a new cell within the currently used PLMN, the UE shall consider all current system information blocks with area scope cell to be invalid. If the UE has stored valid system information blocks for the newly selected cell, the UE may set those as current system information blocks.

After selecting a new PLMN, the UE shall consider all current system information blocks to be invalid. If the UE has previously stored valid system information blocks for the selected cell of the new PLMN, the UE may set those as current system information blocks. Upon selection of a new PLMN the UE shall store all information elements specified within variable `SELECTED_PLMN` for the new PLMN within this variable.

#### 8.1.1.4 Reception of SYSTEM INFORMATION messages broadcast on a FACH transport channel

System information block type 10 may be broadcast on FACH, as specified in [subclause 8.1.1.2](#).

When reading system information blocks on FACH, the UE shall perform the actions as defined in subclause 8.1.1.6.

#### 8.1.1.5 Actions upon reception of the Master Information Block and Scheduling Block(s)

When selecting a new cell, the UE shall read the master information block. The UE may use the pre-defined scheduling information to locate the master information block in the cell.

Upon reception of the master information block, the UE shall:

- if the "PLMN type" in the variable `SELECTED_PLMN` has the value "GSM-MAP" and the IE "PLMN Type" has the value "GSM-MAP" or "GSM-MAP and ANSI-41",:
  - check the IE "PLMN identity" in the master information block and verify that it is the selected PLMN, stored as "PLMN identity" in the variable `SELECTED_PLMN`.
- if the "PLMN type" in the variable `SELECTED_PLMN` has the value "ANSI-41" and the IE "PLMN Type" has the value "ANSI-41" or "GSM-MAP and ANSI-41",:
  - store the ANSI-41 Information elements contained in the master information block and perform initial process for ANSI-41.
- compare the value tag in the master information block with the value tag stored for this cell and this PLMN in the variable `VALUE_TAG`.
- if the value tags differ, or if no IEs for the master information block are stored:
  - store the value tag into the variable `VALUE_TAG` for the master information block;
  - read and store scheduling information included in the master information block;
- if the value tags are the same the UE may use stored system information blocks and scheduling blocks using value tag that were stored ~~in~~ for this cell and this PLMN as valid system information.

For all system information blocks or scheduling blocks that are supported by the UE referenced in the master information block or the scheduling blocks, the UE shall perform the following actions:

- for all system information blocks with area scope "`PLMN`" that use value tags:
  - compare the value tag read in scheduling information for that system information block with the value stored within the variable `VALUE_TAG` for that system information block;
  - if the value tags differ, or if no IEs for the corresponding system information block are stored,:
    - store the value tag read in scheduling information for that system information block into the variable `VALUE_TAG`;
    - read and store the IEs of that system information block.
- if the value tags are the same the UE may use stored system information blocks using value tag that were stored in this PLMN as valid system information.



- for all system information blocks or scheduling blocks with area scope cell that use value tags:
  - compare the value tag read in scheduling information for that system information block or scheduling block with the value stored within the variable VALUE\_TAG for that system information block or scheduling block;
  - if the value tags differ, or if no IEs for the corresponding system information block or scheduling block are stored,
    - store the value tag read in scheduling information for that system information block or scheduling block into the variable VALUE\_TAG;
    - read and store the IEs of that system information block or scheduling block;
  - if the value tags are the same the UE may use stored system information blocks using value tags that were stored ~~in-for~~ this cell and this PLMN as valid system information.
- for system information blocks ~~of type 16,~~ which may have multiple occurrences:
  - compare the value tag and the configuration ~~or multiple occurrence~~ identity for the occurrence of the system information blocks read in scheduling information with the value tag and configuration ~~or multiple occurrence~~ identity stored within the variable VALUE\_TAG;
    - if the value tags differ, or if no IEs from the occurrence with that configuration ~~or multiple occurrence~~ identity of the system information block are stored,
      - store the value tag read in scheduling information for that system information block and the occurrence with that configuration ~~or multiple occurrence~~ identity into the variable VALUE\_TAG;
      - read and store the IEs of that system information block.
    - if the value tags and the configuration ~~or multiple occurrence~~ identity are ~~the same identical to those stored~~ the UE may use stored occurrences of system information blocks ~~using value tag and configuration identity~~ that were stored ~~in-for~~ this cell and this PLMN as valid system information.

For system information blocks, not supported by the UE, but referenced either in the master information block or in the scheduling blocks, the UE may

- skip reading this system information block;
- skip monitoring changes to this system information block

If the UE:

- receives a scheduling block at a position different from its position according to the scheduling information for the scheduling block; or
- receives a scheduling block for which scheduling information has not been received

the UE may:

- store the content of the scheduling block with a value tag set to the value NULL; and
- consider the content of the scheduling block as valid until it receives the same type of scheduling block in a position according to its scheduling information or at most for 6 hours after reception.

If the UE does not find a scheduling block in a position where it should be according to its scheduling information, but a transport block with correct CRC was found at that position, the UE shall read the scheduling information for this scheduling block.

If the UE does not find the master information block in a position fulfilling

~~(~~  $\text{SFN mod } 32(\text{MIB\_SIB\_REP} * 4) = 0$ ), ~~(~~ but a transport block with correct CRC was found at that position), the UE shall,

- consider the master information block as not found; ~~and~~.
- consider the cell to be barred according to [4]; ~~and~~
- consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE " $T_{\text{barred}}$ "; ~~and~~.

~~not initiate emergency calls in the cell.~~

NOTE : This permits a different repetition for the MIB in later releases for FDD. In TDD it allows for a variable SIB\_REP in R99 and future releases.

If in idle mode and system information block type 1 is not scheduled on BCH, and system information block type 13 is not scheduled on BCH the UE shall:

- consider the cell to be barred according to [4]; ~~and~~
- consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE " $T_{\text{barred}}$ "; ~~and~~

~~not initiate emergency calls in the cell.~~

If the UE only supports GSM-MAP but finds a cell that broadcasts System Information Block type 13 but not System Information Block type 1 it shall consider the cell barred.

If in idle mode and if

- system information block type 1 is not scheduled on BCH; and
- the "PLMN Type" in the variable SELECTED\_PLMN has the value "GSM-MAP"; and
- the IE "PLMN type" in the Master Information Block has the value "GSM-MAP" or "GSM-MAP and ANSI-41";

the UE shall:

- indicate to upper layers that no CN system information is available.

If in idle mode and System Information Block type 3 is not scheduled on BCH the UE shall:

- consider the cell to be barred according to [4]; and
- consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE " $T_{\text{barred}}$ "; ~~and~~.

~~not initiate emergency calls in the cell.~~

If in connected mode and System Information Block type 3 is not scheduled on BCH, and System Information Block type 4 is not scheduled on BCH the UE shall:

- consider the cell to be barred according to [4]; and
- consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE " $T_{\text{barred}}$ "; ~~and~~.

~~not initiate emergency calls in the cell.~~

If in idle mode and System Information Block type 5 is not scheduled on BCH or System Information Block type 5 is scheduled but AICH info or PICH info is not present, the UE shall:

- consider the cell to be barred according to [4]; and
- consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE " $T_{\text{barred}}$ "; ~~and~~.

~~not initiate emergency calls in the cell.~~

If in connected mode and System Information Block type 5 is not scheduled on BCH, and System Information Block type 6 is not scheduled on BCH, or any of System Information Block type 5 or type 6 is scheduled but IE "AICH info" or IE "PICH info" is not present, the UE shall:

- consider the cell to be barred according to [4]; and
- consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>"; and;
- **not initiate emergency calls in the cell.**

If System Information Block type 7 is not scheduled on BCH the UE shall:

- consider the cell to be barred according to [4]; and
- consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>"; and;
- **not initiate emergency calls in the cell.**

### 8.1.1.6 Actions upon reception of system information blocks

The UE may use the scheduling information included within the master information block and the scheduling blocks to locate each system information block to be acquired.

The UE should only expect one occurrence of the scheduling information for a system information block in the master information block and any of the scheduling blocks except for System Information Block type 16, System Information Block type 15.2 and System Information Block type 15.3, which may have multiple occurrences. However, to enable future introduction of new system information blocks, the UE shall also be able to receive system information blocks other than the ones indicated within the scheduling information. The UE may ignore contents of such system information block.

If the UE

- receives a system information block in a position according to the scheduling information for the system information block; and
- this system information block uses a value tag or
- this system information block uses a value tag and configuration or multiple occurrence identity according to the system information block type

the UE shall:

- store the content of the system information block together with the value of its value tag or the values of configuration and multiple occurrence identity and the associated value tag in the scheduling information for the system information block; and
- consider the content of the system information block valid until, ~~if-used,~~ the value tag in the scheduling information for the system information block is changed or at most for 6 hours after reception.

If the UE

- receives a system information block in a position according to the scheduling information for the system information block; and
- this system information block does not use a value tag according to the system information block type

the UE shall:

- store the content of the system information block; and
- start an expiration timer using a value as defined in Table 8.1.1 for that system information block type; and

- consider the content of the system information block valid until, the expiration timer expires.

If the UE

- receives a system information block at a position different from its position according to the scheduling information for the system information block; or
- receives a system information block for which scheduling information has not been received; and
- this system information block uses a value tag ~~according to the system information block type~~

the UE may:

- store the content of the system information block with a value tag set to the value NULL; and
- consider the content of the system information block as valid until it receives the same type of system information block in a position according to its scheduling information or at most for 6 hours after reception.

If the UE

- receives a system information block with multiple occurrences at a position different from its position according to the scheduling information for the system information block; or
- receives a system information block with multiple occurrences for which scheduling information has not been received; and
- this system information block uses a value tag and configuration or multiple occurrence identity

the UE shall

- ignore this information.

If the UE does not find a system information block in a position where it should be according to its scheduling information, but a transport block with correct CRC was found at that position, the UE shall read the scheduling information for this system information block.

The UE shall act upon all received information elements as specified in subclause 8.6 unless specified otherwise in the following subclauses.

#### 8.1.1.6.1 System Information Block type 1

If in idle mode, the UE should store all relevant IEs included in this system information block if the "PLMN Type" in the variable SELECTED\_PLMN has the value "GSM-MAP" and the IE "PLMN type" in the Master Information Block has the value "GSM-MAP" or "GSM-MAP and ANSI-41". The UE shall also:

- forward the content of the IE "CN common GSM-MAP NAS system information" to upper layers;
- for the IE "CN domain system information list":
  - for each IE "CN domain system information" that is present:
    - forward the content of the IE "CN domain specific NAS system information" and the IE "CN domain identity" to upper layers;
    - use the IE "CN domain specific DRX cycle length coefficient" to calculate frame number for the Paging Occasions and ~~Page indicator~~ as specified in [4];
  - if an IE "CN domain system information" is not present for a particular CN domain:
    - indicate to upper layers that no CN system information is available for that CN domain;
- use the values in the IE "UE Timers and constants in idle mode" for the relevant timers and counters.

If in connected mode the UE shall not use the values of the IEs in this system information block except for the timers and constant values given by the IE "UE timers and constants in connected mode".

If in idle mode and system information block type 1 is not scheduled on BCH, and system information block type 13 is not scheduled on BCH the UE shall:

~~If the UE only supports GSM-MAP but finds a cell that broadcasts SIB13 but not SIB1 it s consider the cell barred:~~

- ~~— consider the cell to be barred according to [4]. The UE shall consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>".~~

~~If in idle mode and if~~

- ~~— system information block type 1 is not scheduled on BCH; and~~
- ~~— the "PLMN Type" in the variable SELECTED\_PLMN has the value "GSM-MAP"; and~~
- ~~— the IE "PLMN type" in the Master Information Block has the value "GSM-MAP" or "GSM-MAP and ANSI-41";~~

~~the UE shall:~~

- ~~— indicate to upper layers that no CN system information is available.~~

#### 8.1.1.6.2 System Information Block type 2

If in connected mode the UE should store all relevant Ies included in this system information block. The UE shall:

- if in state URA\_PCH, start to perform URA updates using the information in the IE "URA identity".

If in idle mode, the UE shall not use the values of the Ies in this system information block.

#### 8.1.1.6.3 System Information Block type 3

The UE should store all relevant Ies included in this system information block. The UE shall:

- ~~—~~ if in connected mode, and System Information Block 4 is indicated as used in the cell:
- ~~—~~ read and act on information sent in that block.

**If the value of the IE "Cell Reservation Extension" is set to "reserved".**

- **consider the cell to be barred according to [4]; and**
- **consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>"; and**
- **not initiate emergency calls in the cell**

~~If in idle mode and System Information Block type 3 is not scheduled on BCH the UE shall:~~

- ~~— consider the cell to be barred according to [4]; and~~
- ~~— consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>".~~

~~If in connected mode and System Information Block type 3 is not scheduled on BCH, and System Information Block type 4 is not scheduled on BCH the UE shall:~~

- ~~— consider the cell to be barred according to [4]; and~~
- ~~— consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>".~~

#### 8.1.1.6.4 System Information Block type 4

If in connected mode, the UE should store all relevant Ies included in this system information block.

If in idle mode, the UE shall not use the values of the Ies included in this system information block.

If the value of the IE "Cell Reservation Extension" is set to "reserved".

- consider the cell to be barred according to [4]; and

- consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>"; and

- not initiate emergency calls in the cell

#### 8.1.1.6.5 System Information Block type 5

The UE should store all relevant IEs included in this system information block. The UE shall:

- if in connected mode, and System Information Block type 6 is indicated as used in the cell:
  - read and act on information sent in System Information Block type 6.
- replace the TFS of the RACH with the one stored in the UE if any;
- let the physical channel(s) of type PRACH given by the IE(s) "PRACH info" be the default in uplink for the PRACH if UE is in CELL\_FACH state;
- start to receive the physical channel of type AICH using the parameters given by the IE "AICH info" (FDD only) when given allocated PRACH is used;
- replace the TFS of the FACH/PCH with the one stored in the UE if any;
- select a Secondary CCPCH as specified in subclause 8.6, and start to receive the physical channel of type PICH associated with the PCH carried by the selected Secondary CCPCH using the parameters given by the IE "PICH info" if UE is in Idle mode or in CELL\_PCH or URA\_PCH state;
- start to monitor its paging occasions on the selected PICH if UE is in Idle mode or in CELL\_PCH or URA\_PCH state;
- start to receive the selected physical channel of type Secondary CCPCH using the parameters given by the IE(s) "Secondary CCPCH info" if UE is in CELL\_FACH state;
- in TDD<sub>F, S</sub> use the IE "TDD open loop power control" as defined in subclause 8.5.7 when allocated PRACH is used;
- in TDD<sub>F, S</sub> if the IE "PDSCH system information" and/or the IE "PUSCH system information" is included, store each of the configurations given there with the associated identity given in the IE "PDSCH Identity" and/or "PUSCH Identity" respectively. For every configuration, for which the IE "SFN Time info" is included, the information shall be stored for the duration given there.

~~If in idle mode and System Information Block type 5 is not scheduled on BCH or System Information Block type 5 is scheduled but AICH info or PICH info is not present, the UE shall: (move to 8.1.1.5)~~

~~— consider the cell to be barred according to [4]; and~~

~~— consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>".~~

~~If in connected mode and System Information Block type 5 is not scheduled on BCH, and System Information Block type 6 is not scheduled on BCH, or any of System Information Block type 5 or type 6 is scheduled but IE "AICH info" or IE "PICH info" is not present, the UE shall: (move to 8.1.1.5)~~

~~— consider the cell to be barred according to [4]; and~~

~~— consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>".~~

#### 8.1.1.6.6 System Information Block type 6

If in connected mode, the UE should store all relevant IEs included in this system information block. The UE shall:

- replace the TFS of the RACH with the one stored in the UE if any;
- let the physical channel(s) of type PRACH given by the IE(s) "PRACH info" be the default in uplink if UE is in CELL\_FACH state. If the IE "PRACH info" is not included, the UE shall read the corresponding IE(s) in System Information Block type 5 and use that information to configure the PRACH;
- start to receive the physical channel of type AICH using the parameters given by the IE "AICH info" when associated PRACH is used. If the IE "AICH info" is not included, the UE shall read the corresponding IE in System Information Block type 5 and use that information (FDD only);
- replace the TFS of the FACH/PCH with the one stored in the UE if any;
- select a Secondary CCPCH as specified in subclause 8.6, and start to receive the physical channel of type PICH associated with the PCH carried by the selected Secondary CCPCH using the parameters given by the IE "PICH info" if the UE is in CELL\_PCH or URA\_PCH state. If the IE "PICH info" is not included, the UE shall read the corresponding IE in System Information Block type 5 and use that information;
- start to monitor its paging occasions on the selected PICH if the UE is in CELL\_PCH or URA\_PCH state;
- start to receive the selected physical channel of type Secondary CCPCH using the parameters given by the IE(s) "Secondary CCPCH info" if the UE is in CELL\_FACH state. If the IE "Secondary CCPCH info" is not included, the UE shall read the corresponding IE(s) in System Information Block type 5 and use that information;
- in TDD: use the IE "TDD open loop power control" as defined in subclause 8.5.7;
- in TDD: if the IE "PDSCH system information" and/or the IE "PUSCH system information" is included, store each of the configurations given there with the associated identity given in the IE "PDSCH Identity" and/or "PUSCH Identity" respectively. For every configuration, for which the IE "SFN Time info" is included, the information shall be stored for the duration given there.

If in idle mode, the UE shall not use the values of the IEs in this system information block.

#### 8.1.1.6.7 System Information Block type 7

The UE should store all relevant IEs included in this system information block.

~~If System Information Block type 7 is not scheduled on BCH the UE shall:~~

- ~~—consider the cell to be barred according to [4]; and~~
- ~~—consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE " $T_{\text{barred}}$ ".~~

#### 8.1.1.6.8 System Information Block type 8

This system information block type is used only in FDD.

If in connected mode, the UE should store all relevant IEs included in this system information block.

If in idle mode, the UE shall not use the values of the IEs in this system information block.

#### 8.1.1.6.9 System Information Block type 9

This system information block type is used only in FDD.

If in connected mode, the UE should store all relevant IEs included in the system information block. The UE shall:

- start a timer set to the value given by the repetition period (SIB\_REP) for that system information block

If in idle mode, the UE shall not use the values of the IEs in this system information block.

#### 8.1.1.6.10 System Information Block type 10

This system information block type is used only in FDD.

If in state CELL\_DCH, the UE should store all relevant IEs included in this system information block. The UE shall:

- start a timer set to the value given by the repetition period (SIB\_REP) for that system information block;
- perform actions defined in subclause 14.8.

If in idle mode, state CELL\_FACH, state CELL\_PCH or state URA\_PCH, the UE shall not use the values of the IEs in this system information block.

#### 8.1.1.6.11 System Information Block type 11

The UE should store all relevant IEs included in this system information block. The UE shall:

- if in connected mode, and System Information Block type 12 is indicated as used in the cell:
  - read and act on information sent in System Information Block type 12;
- for each measurement type:
  - start a measurement using the set of IEs specified for that measurement type;
  - associate each measurement with the identity number given by the IE "Measurement identity";
  - **clear the variable CELL\_INFO\_LIST;**
  - act upon the received IE "Intra-frequency/Inter-frequency/Inter-RAT cell info list" as described in subclause 8.6.7.3;
- if included, store the IE "Intra-frequency reporting quantity" and the IE "Intra-frequency measurement reporting criteria" or "Periodical reporting criteria" in order to activate reporting when state CELL\_DCH is entered;
- If IE "Use of HCS" is set to "used", indicating that HCS is used, do the following:
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Intra-frequency cell info list", use the default values specified for the IE "HCS neighbouring cell information" for that cell;
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Intra-frequency cell info list", for **that cell** use the same parameter values as used for the preceding IE "Intra-frequency cell info list";
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-frequency cell info list", use the default values specified for the IE "HCS neighbouring cell information" for that cell;
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-frequency cell info list", for that cell use the same parameter values as used for the preceding IE "Inter-frequency cell info list";
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-RAT Cell info list", use the default values specified for the IE "HCS neighbouring cell information" for that cell;
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-RAT cell info list", for that cell use the same parameter values as used for the preceding IE "Inter-RAT cell info list";
- If IE "FACH measurement occasion info" is included:
  - act as specified in subclause 8.6.7
- else:
  - ~~may neither~~ perform inter-frequency/inter-RAT measurements ~~nor~~ inter-frequency/inter-RAT cell re-selection evaluation, ~~independent of UE measurement capabilities if the UE capabilities permit such measurements while simultaneously receiving the S-CCPCH of the serving cell.~~



### 8.1.1.6.12 System Information Block type 12

If in connected mode, the UE should store all relevant IEs included in this system information block. The UE shall:

- for each measurement type:
  - start (or continue) a measurement using the set of IEs specified for that measurement type;
- act upon the received IE "Intra-frequency/Inter-frequency/Inter-RAT cell info list" as described in subclause 8.6.7.3;
- if any of the IEs "Intra-frequency measurement quantity", "Intra-frequency reporting quantity for RACH reporting", "Maximum number of reported cells on RACH" or "Reporting information for state CELL\_DCH" are not included in the system information block, read the corresponding IE(s) in system information block type 11 and use that information for the intra-frequency measurement;
- if included in this system information block or in System Information Block type 11, store the IE "Intra-frequency reporting quantity" and the IE "Intra-frequency measurement reporting criteria" or "Periodical reporting criteria" in order to activate reporting when state CELL\_DCH is entered;
- if the IE "Inter-frequency measurement quantity" is not included in the system information block, read the corresponding IE in System Information Block type 11 and use that information for the inter-frequency measurement;
- if the IE "Inter-RAT measurement quantity" is not included in the system information block, read the corresponding IE in System Information Block type 11 and use that information for the inter-RAT measurement;
- if in state CELL\_FACH, start traffic volume measurement reporting as specified in the IE "Traffic volume reporting quantity";
- associate each measurement with the identity number given by the IE "Measurement identity";
- If IE "Use of HCS" is set to "used", indicating that HCS is used, do the following:
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Intra-frequency cell info list", use the default values specified for the IE "HCS neighbouring cell information" for that cell;
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Intra-frequency cell info list", for that cell use the same parameter values as used for the preceding IE "Intra-frequency cell info list";
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-frequency cell info list", use the default values specified for the IE "HCS neighbouring cell information" for that cell;
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-frequency cell info list", for that cell use the same parameter values as used for the preceding IE "Inter-frequency cell info list";
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-RAT cell info list", use the default values specified for the IE "HCS neighbouring cell information" for that cell;
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-RAT cell info list", for that cell use the same parameter values as used for the preceding IE "Inter-RAT cell info list".
- If IE "FACH measurement occasion info" is included:
  - act as specified in subclause 8.6.7
- else:
  - perform neither inter-frequency/inter-RAT measurements nor inter-frequency/inter-RAT cell re-selection evaluation, independent of UE measurement capabilities.

If in idle mode, the UE shall not use the values of the IEs in this system information block.

### 8.1.1.6.13 System Information Block type 13

If in idle or connected mode, the UE should store all relevant IEs included in this system information block except for the IEs "CN domain specific DRX cycle length coefficient", "UE timers and constants in idle mode" and "Capability update requirement" which shall be stored only in the idle mode case. The UE shall read System Information Block type 13 and the associated System Information Block types 13.1, 13.2, 13.3 and 13.4 only when the "PLMN Type" in the variable SELECTED\_PLMN has the value "ANSI-41" and the IE "PLMN type" in the Master Information Block has the value "ANSI-41" or "GSM-MAP and ANSI-41". The UE shall also:

- forward the content of the IE "CN domain specific NAS system information" to the non-access stratum entity indicated by the IE "CN domain identity";
- use the IE "CN domain specific DRX cycle length coefficient" to calculate frame number for the Paging Occasions and Page indicator as specified in [4].

Refer to TIA/EIA/IS-2000.5-4 IS-2000-... for information on how to act actions on information contained in System Information Block types 13.1, 13.2, 13.3 and 13.4.

### 8.1.1.6.14 System Information Block type 14

This system information block type is used only in TDD.

The UE should store all relevant IEs included in this system information block. The UE shall:

- use the IE "UL Timeslot Interference" to calculate PRACH, DPCH and PUSCH transmit power for TDD uplink open loop power control as defined in subclause 8.5.7.

### 8.1.1.6.15 System Information Block type 15

If the UE is in idle or connected mode, and supports GPS location services and/or OTDOA location services it should store all relevant IEs included in this system information block. The UE shall:

- if the IE "Cipher GPS Data Indicator" is included, and the UE has a full or reduced complexity GPS receiver functionality (the UE will know that the broadcast GPS data is ciphered in accordance with the Data Assistance Ciphering Algorithm detailed in [18]),
  - store the parameters contained within this IE (see 10.3.7.86 for details), and use them to decipher the broadcast UE positioning GPS information contained within the System Information Block types 15.1, 15.2 and 15.3;
- use IE "Reference Location" as a priori knowledge of the approximate location of the UE;
- if the IE "NODE B Clock Drift" is included:
  - use it as an estimate of the drift rate of the NODE B clock relative to GPS time;
- if the IE "NODE B Clock Drift" is not included:
  - assume the value 0;
- if SFN is included:
  - use it as the relationship between GPS time and air-interface timing of the NODE B transmission in the serving cell;
- use "Reference GPS TOW" as GPS Time of Week which is the start of the frame with SFN=0;

#### 8.1.1.6.15.1 System Information Block type 15.1

The UE should store all the relevant IEs included in this system information block . The UE shall:

- use "Status/Health" to indicate/determine the status of the differential corrections;
- act on IE group "DGPS information" in a similar manner as specified in [13] except that the scale factors for PRC and RRC are different. In addition, the IE group DGPS information also includes Delta PRC2 and Delta RRC2. Delta PRC2 is the difference in the pseudorange correction between the satellite's ephemeris identified by

IODE and the previous ephemeris two issues ago IODE-2. Delta RRC2 is the difference in the pseudorange rate-of-change correction between the satellite's ephemeris identified by IODE and IODE-2. These two additional IEs can extend the life of the raw ephemeris data up to 6 hours.

#### 8.1.1.6.15.2 System Information Block type 15.2

For System Information Block type 15.2 multiple occurrences may be used; **one occurrence for each set of one satellite data specified in 10.2.48.8.18.2**. To identify the different occurrences, the scheduling information for System Information Block type 15.2 includes IE "SIB occurrence identity and value tag". The UE should store all the relevant IEs included in this system information block . The UE shall:

- compare for each occurrence the value tag of the stored occurrence, if any, with the occurrence value tag included in the IE "SIB occurrence identity and value tag" for the occurrence of the SIB with the same occurrence identity;
- in case the UE has no SIB occurrence stored with the same identity or in case the occurrence value tag is different:
  - store the occurrence information together with its identity and value tag for later use;
- in case an occurrence with the same identity **but different value tag** was stored:
  - overwrite this one with the new occurrence read via system information for later use;
- interpret IE "Transmission TOW" as a very coarse estimate of the current time, i.e., the approximate GPS time-of-week when the message is broadcast;
- interpret IE "SatID" as the satellite ID of the data from which this message was obtained;
- act on the rest of the IEs in a **similar** manner **similar to that as** specified in [12]. In addition, the UE can utilise these IEs for GPS time dissemination and sensitivity improvement.

The IE "Transmission TOW" may be different each time a particular SIB occurrence is transmitted. The UTRAN should not increment the value tag of the SIB occurrence if the IE "Transmission TOW" is the only IE that is changed. **Each occurrence of this SIB contains information for one satellite as shown in the table of Subclause 10.2.48.8.18.2.**

The UE may not need to receive all occurrences before it can use the information **from any one occurrence**.

#### 8.1.1.6.15.3 System Information Block type 15.3

For System Information Block type 15.3 multiple occurrences may be used; **one occurrence for each set of satellite data specified in 10.2.48.8.18.3**. To identify the different occurrences, the scheduling information for System Information Block type 15.3 includes IE "SIB occurrence identity and value tag". The UE should store all the relevant IEs included in this system information block . The UE shall:

- compare for each occurrence the value tag of the stored occurrence, if any, with the occurrence value tag included in the IE "SIB occurrence identity and value tag" for the occurrence of the SIB with the same occurrence identity;
- in case the UE has no SIB occurrence stored with the same identity or in case the occurrence value tag is different:
  - store the occurrence information together with its identity and value tag for later use;
- in case a occurrence with the same identity **but different value tag** was stored:
  - overwrite this one with the new occurrence read via system information for later use;
- interpret IE "Transmission TOW" as a very coarse estimate of the current time, i.e., the approximate GPS time-of-week when the message is broadcast;
- interpret IE "SatMask" as the satellites that contain the pages being broadcast in this message;
- interpret IE "LSB TOW" as the least significant 8 bits of the TOW ([12]);

- interpret IE "Data ID" as the Data ID field contained in the indicated subframe, word 3, most significant 2 bits, as defined by [12];
- act on the rest of the IEs in a similar manner as specified in [12]. In addition, the UE can utilise these IEs including non-information bits for GPS time dissemination and sensitivity improvement.

The IE "Transmission TOW" may be different each time a particular SIB occurrence is transmitted. The UTRAN should not increment the value tag of the SIB occurrence if the IE "Transmission TOW" is the only IE that is changed. One SIB occurrence value tag is assigned to the table of Subclause 10.2.48.8.18.3.

The UE may not need to receive all occurrences before it can use the information [for any one occurrence](#).

#### 8.1.1.6.15.4 System Information Block type 15.4

If the UE is in idle or connected mode, and supports [the OTDOA UE positioning method location services](#) the UE shall store all relevant IEs included in this system information block\_ ([refer to 10.3.7.104 for details](#)).

#### 8.1.1.6.16 System Information Block type 16

For System Information Block type 16 multiple occurrences may be used; one occurrence for each predefined configuration. To identify the different predefined configurations, the scheduling information for System Information Block type 16 includes IE "Predefined configuration identity and value tag" ~~instead of the commonly used IE "PLMN Value tag"~~.

The UE should store all relevant IEs included in this system information block. The UE shall:

- compare for each predefined configuration the value tag of the stored predefined configuration, ~~if any~~, with the preconfiguration value tag included in the IE "Predefined configuration identity and value tag" for the occurrence of the SIB with the same predefined configuration identity;
- in case the UE has no predefined configuration stored with the same identity or in case the predefined configuration value tag is different:
  - store the predefined configuration information together with its identity and value tag for later use e.g. during handover to UTRAN;
  - in case a predefined configuration with the same identity [but different value tag](#) was stored, ~~wrong indentation~~
  - overwrite this one with the new configuration read via system information for later use e.g. during handover to UTRAN. ~~(change indentation)~~

The above handling applies regardless of whether the [previously](#) stored predefined configuration information has been obtained via UTRA or via another RAT.

The UE is not required to complete reading of all occurrences of System Information Block type 16 before initiating RRC connection establishment.

#### 8.1.1.6.17 System Information Block type 17

This system information block type is used only for TDD.

If in connected mode, the UE should store all relevant IEs included in this system information block. The UE shall:

- if the IE "PDSCH system information" and/or the IE "PUSCH system information" is included, store each of the configurations given there with the associated identity given in the IE "PDSCH Identity" and/or "PUSCH Identity" respectively. This information shall become invalid after the time specified by the repetition period (SIB\_REP) for this system information block.

If in idle mode, the UE shall not use the values of the IEs in this system information block.

### 8.1.1.6.18 System Information Block type 18

If the System Information Block type 18 is present, a UE **may** obtain knowledge of the PLMN identity of the neighbour cells to be considered for cell reselection, and **may** behave as specified in this subclause and in subclause 8.5.14a.

The UE should store all the relevant IEs included in this system information block.

A UE in idle mode shall act according to the following rules:

- any PLMN list of a given type (IEs "PLMNs of intra-frequency cells list", "PLMNs of inter-frequency cells list", "PLMNs of inter-RAT cell lists") included in the IE "Idle mode PLMN identities" is paired ~~to~~ **with** the list of cells of the same type derived from System Information Block type 11;
- the PLMN identity located at a given rank in the PLMN list is ~~the one~~ **that** of the cell with the same ranking in the paired list of cells, the cells being considered in the increasing order of their associated identities ("Intra-frequency cell id", "Inter-frequency cell id", "Inter-RAT cell id");
- if the number of identities in a PLMN list exceeds the number of neighbour cells in the paired list (**if any**), the extra PLMN identities are considered as unnecessary and ignored;
- if the number of identities in a PLMN list (**if any**) is lower than the number of neighbour cells in the paired list, the missing PLMN identities are replaced by the last PLMN identity in the list if present, otherwise by the identity of the selected PLMN.

A UE in connected mode shall act in the same manner as a UE in idle mode with the following modifications:

- the PLMN lists to be considered are the ones included, when present, in the IE "Connected mode PLMN identities"; otherwise, the UE shall use, in place of any missing list, the corresponding one in the IE "Idle mode PLMN identities";
- the paired lists of cells are the ones derived from System Information Block type 11, and System Information Block type 12 if present.

### 8.1.1.7 Modification of system information

~~The UE shall consider all stored system information blocks as invalid after it has been switched off.~~ For System Information Block type 16 that may have multiple occurrences, the UE shall handle each occurrence independently as specified in the previous; that is each occurrence is handled as a separate system information block.

NOTE: It should be noted that for the proper operation of the BCCH Modification Information sent on a PCH, the System Information should not be changed more frequently than can be accommodated by mobile stations operating at the maximum DRX cycle length supported by the UTRAN.

#### 8.1.1.7.1 Modification of system information blocks using a value tag

Upon modifications of system information blocks using value tags, UTRAN should notify the new value tag for the master information block in the IE "BCCH modification info", transmitted in the following way:

- To reach UEs in idle mode, CELL\_PCH state and URA\_PCH state, the IE "BCCH modification info" is contained in a PAGING TYPE 1 message transmitted on the PCCH in all paging occasions in the cell;
- To reach UEs in CELL\_FACH state, the IE "BCCH modification info" is contained in a SYSTEM INFORMATION CHANGE INDICATION message transmitted on the BCCH mapped on at least one FACH on every Secondary CCPCH in the cell.

Upon reception of a PAGING TYPE 1 message or a SYSTEM INFORMATION CHANGE INDICATION message ~~the~~ containing the IE "BCCH modification info" containing the IE "MIB value tag" but not containing the IE "BCCH modification time", the UE shall perform actions as specified in subclause 8.1.1.7.3.

If the IE "BCCH modification time" is included the UE shall perform actions as specified in subclause 8.1.1.7.2.

### 8.1.1.7.2 Synchronised modification of system information blocks

For modification of some system information elements, e.g. reconfiguration of the channels, it is important for the UE to know exactly when a change occurs. In such cases, the UTRAN should notify the SFN when the change will occur as well as the new value tag for the master information block in the IE "BCCH modification info" transmitted in the following way:

- To reach UEs in idle mode, CELL\_PCH state and URA\_PCH state, the IE "BCCH modification info" is contained in a PAGING TYPE 1 message transmitted on the PCCH in all paging occasions in the cell;
- To reach UEs in CELL\_FACH state, the IE "BCCH modification info" is contained in a SYSTEM INFORMATION CHANGE INDICATION message transmitted on the BCCH mapped on at least one FACH on every Secondary CCPCH in the cell.

Upon reception of a PAGING TYPE 1 message or a SYSTEM INFORMATION CHANGE INDICATION message containing the IE "BCCH modification info" containing the IE "MIB value tag" and containing the "IE BCCH modification time", the UE shall:

- perform the actions as specified in subclause 8.1.1.7.3 at the time, indicated in the IE "BCCH Modification Information".

### 8.1.1.7.3 Actions upon system information change

The UE shall:

- compare the value of IE "MIB value tag" in the IE "BCCH modification info" with the value tag stored for the master information block in variable VALUE\_TAG.
- if the value tags differ:
  - read the master information block on BCH;
  - if the value tag of the master information block in the system information is the same as the value in IE "MIB value tag" in "BCCH modification info" **but different from the value tag stored in the variable VALUE\_TAG**:
    - perform actions as specified in subclause 8.1.1.5;
  - if the value tag of the master information block in the system information is the same as the value tag stored in the variable VALUE\_TAG:
    - for the next occurrence of the master information block:
      - perform actions as specified in subclause 8.1.1.7.3 again;
  - if the value tag of the master information block in the system information is different from the value tag stored in the variable VALUE\_TAG, and is different from the value in IE "MIB value tag" in "BCCH modification info":
    - perform actions as specified in subclause 8.1.1.5;
    - if  $(VTMIB - VTMI) \bmod 8 < 4$ , where VTCI is the value tag in the IE "MIB value tag" in "BCCH modification info" and VTMIB is the value tag of the master information block in the system information:
      - for the next occurrence of the master information block:
        - perform actions as specified in subclause 8.1.1.7.3 again.

### 8.1.1.7.4 Actions upon expiry of a system information expiry timer

When the expiry timer of a system information block not using a value tag expires

the UE shall:

- consider the content of the system information block invalid;

- re-acquire the system information block again before the content can be used;

the UE may:

- postpone reading the system information block until the content is needed.

### 10.3.2.1 Cell Access Restriction

Indicates the restrictions to cell access.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Cell Barred	MP		Enumerated( not barred, barred)	
Intra-frequency cell re-selection indicator	<i>CV-Barred</i>		Enumerated( not allowed, allowed)	
T <sub>barred</sub>	<i>CV-Barred</i>		Integer (10,20,40,80,160,320,640,1280)	[4]
Cell Reserved for operator use	MP		Enumerated( reserved, not reserved)	
Cell Reservation for SoLSA exclusive use Extension	MP		Enumerated( reserved, not reserved)	
Access Class Barred list	MD	maxAC		Default is no access class barred is applied. The first instance of the parameter corresponds to Access Class 0, the second to Access Class 1 and so on up to Access Class 15. UE reads this IE of its access class stored in SIM.
>Access Class Barred	MP		Enumerated( not barred, barred)	

Condition	Explanation
<i>Barred</i>	Presence is mandatory if the IE "Cell Barred" has the value "Barred"; otherwise the element is not needed in the message.



```

-- *****
--
--      UTRAN MOBILITY INFORMATION ELEMENTS (10.3.2)
--
-- *****

AccessClassBarred ::=
    ENUMERATED {
        barred, notBarred }

AccessClassBarredList ::=
    SEQUENCE (SIZE (maxAC)) OF
        AccessClassBarred

AllowedIndicator ::=
    ENUMERATED {
        allowed, notAllowed }

CellAccessRestriction ::=
    SEQUENCE {
        cellBarred                CellBarred,
        cellReservedForOperatorUse ReservedIndicator,
        cellReservedExtensionForSGLSA ReservedIndicator,
        accessClassBarredList     AccessClassBarredList OPTIONAL
    }

CellBarred ::=
    CHOICE {
        barred
            SEQUENCE {
                intraFreqCellReselectionInd AllowedIndicator,
                t-Barred                    T-Barred
            },
        notBarred NULL
    }

```

## CHANGE REQUEST

⌘ **25.331 CR 827** ⌘ 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  Radio Access Network  Core Network

<b>Title:</b>	⌘ Corrections to System Information Procedure		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ May 25, 2001
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ REL-4
Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:	
F (correction)		2 (GSM Phase 2)	
A (corresponds to a correction in an earlier release)		R96 (Release 1996)	
B (addition of feature),		R97 (Release 1997)	
C (functional modification of feature)		R98 (Release 1998)	
D (editorial modification)		R99 (Release 1999)	
Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		REL-4 (Release 4)	
		REL-5 (Release 5)	

**Reason for change:** ⌘

1. It is incorrectly stated that the UE is forced to read the system information only as per Table 8.1.1 while in other places the text seems to suggest an indirect specification as to when the system information is read.
2. The meaning of the square brackets in column 2 of Table 8.1.1 is not clear.
3. Square brackets remain around the value of 320 ms for the case of the expiration timer for SIB 7 suggesting that no conclusion has been reached. #20 ms seems to be an unnecessary restriction on the minimum value that a network may use.
4. In Table 8.1.1 it is not stated that if SIB 12 is not transmitted, SIB 11 should be read by connected mode UEs.
5. It is not clear what are the allowed sequences of valid segments that a UE can read and put together to create a system information block.
6. It is not clear what is meant by the UE reading "ALL" the segments in case the index of a segment being read is larger than the SEG\_COUNT as indicated in the scheduling information.
7. The UE may store information for later stored cell reselection - however this is prohibited by the text in the present version by requiring all information to be considered as invalid after switch off.
8. It is not clear what the UE is to do in the case of SIBs with multiple occurrences which occur unexpectedly. Other SIBs may be stored however but this cannot apply to the case of SIBs with multiple occurrences.
9. Since MIB\_REP is an undefined parameter the equation for the error case of not locating the MIB is incorrect.
10. With the current text, a UE could camp on a cell but never be able to access any

service from the cell if it doesn't support ANSI-41. The text does not consider the case where SIB13 is broadcast but not SIB 1 and it only supports GSM-MAP.

11. Text on actions to be taken when SIBs are not found is located in the individual sections for the appropriate SIBs which deal only with the treatment of the information in a particular SIB.

12. The text relevant to the treatment of SIBs for multiple occurrences is written in many places taking only SIB 16 into account instead of other SIBs such as SIB 15.2 also.

13. There is a reference to the Page indicator in case of SIB 1 which is not consistent with the paging process as defined in TS 25.304.

14. There is an unnecessary limitation on a U Backwards Compatibility - This may not be backwards compatible for those UEs not behaving as above. E that is able to receive the service in cell S-CCPCH while still making inter-frequency/inter-RAT measurements or inter-frequency/inter-RAT cell re-selection evaluation by prohibiting such an action.

15. Numerous minor editorial corrections.

16. Equivalent PLMN value tag

17. When a cell is considered as barred due to a critical SIB that is missing, the UE may still initiate an emergency call in the cell according to the definition in 25.304. As a missing critical SIB is an error case rather than a normal cell barring situation, UE should not be permitted to make emergency calls. (It should be noted that without the critical SIBs the UE is missing configuration information necessary to make an access. Therefore it is unlikely that any March 01 implementation would attempt an emergency call on such a cell). (Changes highlighted in yellow).

**Summary of change: %**

1. It is clarified that Table 8.1.1 does not restrict when the UE may read system information as long as it reads the appropriate information prior to the execution of a procedure requiring it. IN case of System Information Block type 10, the UE is required to read it only in CELL\_DCH.
2. The meaning of the square brackets in column 2 of Table 8.1.1 is clarified.
3. -
4. If SIB 12 is not transmitted, SIB 11 should be read by connected mode UEs. This is similar to what is already specified in Table 8.1.1 for SIB 4 and SIB 6.
5. It is clarified that the only valid sequence when reading system information is an ascending sequence starting with the First segment of the system information block.
6. It is clarified what is meant by the UE reading "ALL" the segments in case the index of a segment being read is larger than the SEG\_COUNT as indicated in the scheduling information.
7. It is clarified that some information may be stored by the UE or in the USIM for later use in stored cell re-selection.
8. SIBs with multiple occurrences (SIB 16, SIB 15.2 and SIB 15.3) have an additional multiple occurrence identifier (Predefined configuration identity or SIB occurrence identity), which appear only in the scheduling information and does not appear with the actual SYSTEM INFORMATION message. Therefore in case of unexpected occurrence of these SIBs, the occurrence identifier will not be known. It is clarified that the relevant data received in the SYSTEM INFORMATION message is therefore ignored, when there is no possibility to know the occurrence identifier.
9. Since MIB\_REP is an undefined parameter the equation for the error case of not locating the MIB is re-written.
10. It is clarified that if the UE only supports GSM-MAP but finds a cell that broadcasts System Information Block type 13 but not System Information Block type 1 it shall

consider the cell barred.

11. Text on actions to be taken when SIBs are not found is moved to the appropriate location in 8.1.1.5 as opposed to the individual sections for the appropriate SIBs which deal only with the treatment of the information in a particular SIB.
12. It is clarified in a number of places that some of the text relevant to the case of SIB 16 for which multiple occurrences are possible is also relevant for the case of SIBs having multiple occurrences such as SIB 15.2.
13. The reference of the Page indicator in case of SIB 1 has been removed consistent with the paging process as defined in TS 25.304.
14. It is clarified that if the IE "FACH Measurement Occasion Info" is not present then based on the UE's capabilities to receive the S-CCPCH of the serving cell while making inter-frequency/inter-RAT measurements or inter-frequency/inter-RAT cell re-selection evaluation.

15. All miscellaneous modifications are editorial in nature.

16. An extra requirement is added that the UE shall not make emergency calls when the cell is barred due to a missing critical SIB.

17. Name of 'Cell reserved for Solsa use' IE has been changed to 'Cell reservation extension'. A requirement is added that if this IE is set to reserved the UE shall treat the cell as barred (as in the case of a missing SIB). This requirement is moved from 25.304 but is functionally unchanged.

**Consequences if not approved:**

- ⌘
1. Inconsistent UE implementations
  2. Incorrect UE implementations.
  3. Un-necessary restrictions on UE abilities to make measurements.

**Clauses affected:**

- ⌘ 8.1.1.1.2, 8.1.1.1.3, 8.1.1.1.4, 8.1.1.3, 8.1.1.4, 8.1.1.5, 8.1.1.6, 8.1.1.6.1, 8.1.1.6.3, 8.1.1.6.4, 8.1.1.6.5, 8.1.1.6.7, 8.1.1.6.11, 8.1.1.6.13, 8.1.1.6.15, 8.1.1.6.15.1, 8.1.1.6.15.2, 8.1.1.6.15.3, 8.1.1.6.15.4, 8.1.1.6.16, 8.1.1.6.18, 8.1.1.7, 8.1.1.7.1, 8.1.1.7.3, 10.3.2.1, 11

**Other specs affected:**

- ⌘  Other core specifications ⌘   
 Test specifications  
 O&M Specifications

**Other comments:** ⌘

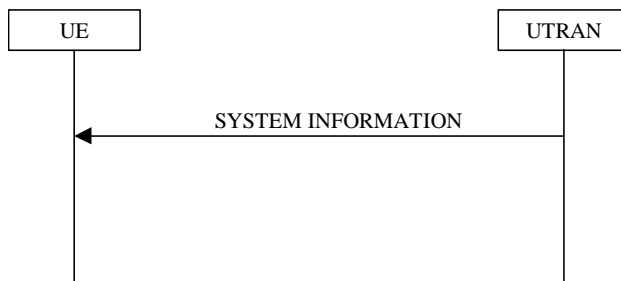
### How to create CRs using this form:

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

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

## 8.1 RRC Connection Management Procedures

### 8.1.1 Broadcast of system information



**Figure 6: Broadcast of system information**

#### 8.1.1.1 General

The purpose of this procedure is to broadcast system information from the UTRAN to UEs in a cell.

##### 8.1.1.1.1 System information structure

The system information elements are broadcast in *system information blocks*. A system information block groups together system information elements of the same nature. Different system information blocks may have different characteristics, e.g. regarding their repetition rate and the requirements on UEs to re-read the system information blocks.

The system information is organised as a tree. A *master information block* gives references and scheduling information to a number of system information blocks in a cell. The system information blocks contain the actual system information. The master information block may optionally also contain reference and scheduling information to one or two *scheduling blocks*, which give references and scheduling information for additional system information blocks. Scheduling information for a system information block may only be included in either the master information block or one of the scheduling blocks.

For all system information blocks except System Information Block types 15.2, 15.3 and 16, the content is the same in each occurrence for system information blocks using value tag. System Information Block types 15.2, 15.3 and 16 may occur more than once with different content. In this case scheduling information is provided for each such occurrence of the system information block. System information blocks that do not use value tag may have different content for each occurrence.

##### 8.1.1.1.2 System information blocks

Table 8.1.1 specifies all system information blocks and their characteristics.

The *area scope column* in table 8.1.1 specifies the area where a system information block's value tag is valid. If the area scope is *cell*, the UE shall consider the system information block to be valid only in the cell in which it was read. If system information blocks have been previously stored for this cell, the UE shall check whether the value tag for the system information block in the entered cell is different compared to the stored value tag. If the area scope is *PLMN*, the UE shall check the value tag for the system information block when a new cell is selected. If the value tag for the system information block in the new cell is different compared to the value tag for the system information block stored in the UE, the UE shall re-read the system information block.

For System information block types 15.2, 15.3 and 16, which may have multiple occurrences, each occurrence has its own independent value tag. The UE shall re-read a particular occurrence if the value tag of this occurrence has changed compared to that stored in the UE.

The *UE mode/state column when block is valid* in Table 8.1.1 specifies in which UE mode or UE state the IEs in a system information block shall be regarded as valid by the UE. In other words, the indicated system information block

becomes invalid upon change to a mode/state that is not included in this column. In some cases, the states are inserted in brackets to indicate that the validity is dependent on the broadcast of the associated System Information Blocks by the network as explained in the relevant procedure section.

The *UE mode/state column when block is read* in Table 8.1.1 specifies in which UE mode or UE state the IEs in a system information block ~~shall be~~ may be read by the UE. The UE shall have the necessary information prior to execution of any procedure requiring information to be obtained from the appropriate system information block. The requirements on the UE in terms of when to read the system information may therefore be derived from the procedure specifications that specify which IEs are required in the different UE modes/states in conjunction with the different performance requirements that are specified. System Information Block 10 shall only be read by the UE while in CELL\_DCH.

NOTE 1 There are a number of system information blocks that include the same IEs while the UE mode/state in which the information is valid differs. This approach is intended to allow the use of different IE values in different UE mode/states.

~~NOTE 2 The requirements concerning when a UE shall read system information blocks are specified indirectly; these requirements may be derived from the procedure specifications that specify which IEs are required in the different UE modes/states in conjunction with the different performance requirements that are specified.~~

The *Scheduling information* column in Table 8.1.1 specifies the position and repetition period for the SIB.

The *modification of system information* column in Table 8.1.1 specifies the update mechanisms applicable for a certain system information block. For system information blocks with a value tag, the UE shall update the information according to subclause 8.1.1.7.1 or 8.1.1.7.2. For system information blocks with an expiration timer, the UE shall, when the timer expires, perform an update of the information according to subclause 8.1.1.7.4.

**Table 8.1.1: Specification of system information block characteristics**

System information block	Area scope	UE mode/state when block is valid	UE mode/state when block is read	Scheduling information	Modification of system information	Additional comment
Master information block	Cell	Idle mode, CELL_FACH, CELL_PCH, URA_PCH	Idle mode, CELL_FACH, CELL_PCH, URA_PCH	SIB_POS = 0 SIB_REP = 8 (FDD) SIB_REP = 8, 16, 32 (TDD) SIB_OFF=2	Value tag	
Scheduling block 1	Cell	Idle mode, CELL_FACH, CELL_PCH, URA_PCH	Idle mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information" in MIB	Value tag	
Scheduling block 2	Cell	Idle mode, CELL_FACH, CELL_PCH, URA_PCH	Idle mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information" in MIB	Value tag	
System information block type 1	PLMN	Idle mode, CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH	Idle	Specified by the IE "Scheduling information"	Value tag	
System information block type 2	Cell	URA_PCH	URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 3	Cell	Idle mode, (CELL_FACH, CELL_PCH, URA_PCH)	Idle mode, (CELL_FACH, CELL_PCH, URA_PCH)	Specified by the IE "Scheduling information"	Value tag	
System information block type 4	Cell	CELL_FACH, CELL_PCH, URA_PCH	CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	If System information block type 4 is not broadcast in a cell, the connected mode UE shall <b>read-apply information in System information block type 3 in connected mode.</b>
System information block type 5	Cell	Idle mode, (CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH (TDD only))	Idle mode, (CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH (TDD only))	Specified by the IE "Scheduling information"	Value tag	

System information block type 6	Cell	CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH (TDD only)	CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH (TDD only)	Specified by the IE "Scheduling information"	Value tag	<p>If system information block type 6 is not broadcast in a cell, the connected mode UE shall read System information block type 5.</p> <p>If some of the optional IEs are not included in System information block type 6, the UE shall read the corresponding IEs in System information block type 5</p> <p>In TDD mode system information block 6 shall only be read in CELL_DCH if required for open loop power control as specified in subclause 8.5.7 and/or if shared transport channels are assigned to the UE. If in these cases system information block type 6 is not broadcast the UE shall read system information block type 5.</p>
System information block type 7	Cell	Idle mode, CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH (TDD only)	Idle mode, CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH (TDD only)	Specified by the IE "Scheduling information"	Expiration timer = MAX([320 ms], SIB_REP * ExpirationTimeFactor)	In TDD mode system information block type 7 shall only be read in CELL_DCH if shared transport channels are assigned to the UE.
System information block type 8	Cell	CELL_FACH, CELL_PCH, URA_PCH	CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 9	Cell	CELL_FACH, CELL_PCH, URA_PCH	CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Expiration timer = SIB_REP	
System information block type 10	Cell	CELL_DCH	CELL_DCH	Specified by the IE "Scheduling information"	Expiration timer = SIB_REP	
System information block type 11	Cell	Idle mode (CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH)	Idle mode (CELL_FACH, CELL_PCH, URA_PCH)	Specified by the IE "Scheduling information"	Value tag	



System information block type 12	Cell	CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH	CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	<a href="#">If system information block type 12 is not broadcast in a cell, the connected mode UE shall read System information block type 11.</a> If some of the optional IEs are not included in System information block type 12, the UE shall read the corresponding IEs in System information block type 11.
System information block type 13	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 13.1	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 13.2	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 13.3	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 13.4	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 14	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH	Specified by the IE "Scheduling information"	Expiration timer = MAX([320 ms], SIB_REP * ExpirationTimeFactor)	This system information block is used in TDD mode only. System information block type 14 shall only be read in CELL_DCH if required for open loop power control as specified in subclause 8.5.7.
System information block type 15	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 15.1	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 15.2	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	For this system information block there may be multiple occurrences
System information block type 15.3	PLMN	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	For this system information block there may be multiple occurrences
System information block type 15.4	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	

System information block type 16	PLMN	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	For this system information block there may be multiple occurrences
System information block type 17	Cell	CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH	CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH	Specified by the IE "Scheduling information"	Expiration timer = SIB_REP	This system information block is used in TDD mode only. System information block type 17 shall only be read if shared transport channels are assigned to the UE.
System Information Block type 18	Cell	Idle mode, CELL_FACH, CELL_PCH, URA_PCH, CELL_DCH	Idle mode, CELL_FACH, CELL_PCH, URA_PCH	Specified by the IE "Scheduling information"	Value tag	

The UE shall acquire all system information blocks except system information block type 10 on BCH. System Information Block type 10 shall be acquired on the FACH and only by UEs with support for simultaneous reception of one SCCPCH and one DPCH. If System Information Block type 10 is not broadcast in a cell, the DRAC procedures do not apply in this cell. System Information Block type 10 is used in FDD mode only.

#### 8.1.1.1.3 Segmentation and concatenation of system information blocks

A generic SYSTEM INFORMATION message is used to convey the system information blocks on the BCCH. A given BCCH may be mapped onto either a BCH or a FACH transport channel according to subclause 8.1.1.1.2. The size of the SYSTEM INFORMATION message shall fit the size of a BCH or a FACH transport block.

The RRC layer in UTRAN performs segmentation and concatenation of encoded system information blocks. If the encoded system information block is larger than the size of a SYSTEM INFORMATION message, it will be segmented and transmitted in several messages. If the encoded system information block is smaller than a SYSTEM INFORMATION message, UTRAN may concatenate one or several (parts of) several system information blocks, or the first segment or the last segment into the same message as specified in the remainder of this clause.

Four different segment types are defined:

- First segment;
- Subsequent segment;
- Last segment;
- Complete.

Each of the types - *First*, *Subsequent* and *Last segment* - is used to transfer segments of a master information block, scheduling block or a system information block. The segment type, *Complete*, is used to transfer a complete master information block, complete scheduling block or a complete system information block.

Each segment consists of a header and a data field. The data field carries the encoded system information elements. The header contains the following parameters:

- The number of segments in the system information block (SEG\_COUNT). This parameter is only included in the header if the segment type is "First segment".
- SIB type. The SIB type uniquely identifies the master information block, scheduling block or a system information block.
- Segment index. This parameter is only included in the header if the segment type is "Subsequent segment" or "Last segment".

UTRAN may combine one or several segments of variable length in the same SYSTEM INFORMATION message. The following combinations are allowed:

1. No segment;

2. First segment;
3. Subsequent segment;
4. Last segment;
5. Last segment + First segment;
6. Last segment + one or several Complete;
7. Last segment + one or several Complete + First segment;
8. One or several Complete;
9. One or several Complete + First segment;
10. One Complete of size 215 to 226;
11. Last segment of size 215 to 222.

The "No segment" combination is used when there is no master information block, scheduling block or system information block scheduled for a specific BCH transport block.

UEs are not required to support the reception of multiple occurrences of **a the same** system information block type within one SYSTEM INFORMATION message.

NOTE: Since the SIB type is the same for each occurrence of the system information block, the UE does not know the order in which the occurrences, scheduled for this SYSTEM INFORMATION message, appear. Therefore, the UE is unable to determine which scheduling information, e.g., value tag relates to which occurrence of the system information block.

#### 8.1.1.1.4 Re-assembly of segments

The RRC layer in the UE shall perform re-assembly of segments. All segments belonging to the same master information block, scheduling block or system information block shall be assembled in ascending order with respect to the segment index. When all segments of the master information block, scheduling block or a system information block have been received, the UE shall perform decoding of the complete master information block, scheduling block or system information block. For System Information Block type 16 which may have multiple occurrences, each occurrence shall be re-assembled independently.

The UE shall discard system information blocks of which segments were missing, of which segments were received out of sequence and/or for which duplicate segments were received. [The only valid sequence is an ascending one with the sequence starting with the First Segment of the associated System Information Block.](#)

If the UE receives a Subsequent segment or Last segment where the index in IE "Segment index" is larger than the number of segments stated in IE "SEG\_COUNT" in the scheduling information for that scheduling block or system information block,

- the UE may
  - read all the segments to create a system information block [as defined by the scheduling information read by the UE](#);
  - store the content of the system information block with a value tag set to the value NULL; and
  - consider the content of the scheduling block or system information block as valid,
    - until it receives the same type of scheduling block or system information block in a position according to its scheduling information or
    - at most for 6 hours after reception.
- and the UE shall:
  - **re**-read scheduling information for that scheduling block or system information block.

If the UE receives a Subsequent segment or Last segment where the index in IE "Segment index" is larger than the number of segments stated in IE "SEG\_COUNT" in the First segment, the UE shall

- discard all segments for that master information block, scheduling block or system information block and
- re-read the scheduling information for that system information block.
- then re-read all segments for that system information block.

#### 8.1.1.1.5 Scheduling of system information

Scheduling of system information blocks is performed by the RRC layer in UTRAN. If segmentation is used, it should be possible to schedule each segment separately.

To allow the mixing of system information blocks with short repetition period and system information blocks with segmentation over many frames, UTRAN may multiplex segments from different system information blocks. Multiplexing and de-multiplexing is performed by the RRC layer.

The scheduling of each system information block broadcast on a BCH transport channel is defined by the following parameters:

- the number of segments (SEG\_COUNT);
- the repetition period (SIB\_REP). The same value applies to all segments;
- the position (phase) of the first segment within one cycle of the Cell System Frame Number (SIB\_POS(0)). Since system information blocks are repeated with period SIB\_REP, the value of SIB\_POS(i),  $i = 0, 1, 2, \dots, \text{SEG\_COUNT}-1$  must be less than SIB\_REP for all segments;
- the offset of the subsequent segments in ascending index order (SIB\_OFF(i),  $i = 1, 2, \dots, \text{SEG\_COUNT}-1$ ). The position of the subsequent segments is calculated using the following:  $\text{SIB\_POS}(i) = \text{SIB\_POS}(i-1) + \text{SIB\_OFF}(i)$ .

The scheduling is based on the Cell System Frame Number (SFN). The SFN of a frame at which a particular segment,  $i$ , with  $i = 0, 1, 2, \dots, \text{SEG\_COUNT}-1$  of a system information block occurs, fulfils the following relation:

$$\text{SFN mod SIB\_REP} = \text{SIB\_POS}(i)$$

In FDD and TDD the scheduling of the master information block is fixed as defined in Table 8.1.1. For TDD, UTRAN may apply one of the values allowed for the master information block's repetition period. The value that UTRAN is using in TDD is not signalled; UEs have to determine it by trial and error.

#### 8.1.1.2 Initiation

The system information is continuously broadcast on a regular basis in accordance with the scheduling defined for each system information block.

#### 8.1.1.3 Reception of SYSTEM INFORMATION messages by the UE

The UE shall read SYSTEM INFORMATION messages broadcast on a BCH transport channel in idle mode and in the connected mode in states CELL\_FACH, CELL\_PCH, URA\_PCH and CELL\_DCH (TDD only). In addition, UEs which support simultaneous reception of one SCCPCH and one DPCH shall read system information on a FACH transport channel when in CELL\_DCH state.

In idle mode and connected mode different combinations of system information blocks are valid. The UE shall acquire the system information blocks that are needed according to Table 8.1.1.

The UE may store system information blocks with cell or PLMN area scope (including their value tag [if applicable](#)) for different cells and different PLMNs, to be used if the UE returns to these cells.

The UE shall consider all stored system information blocks as invalid after it has been switched off. [Some information obtained from system information may be stored by the UE or in the USIM for use in a stored information cell selection.](#)

When selecting a new cell within the currently used PLMN, the UE shall consider all current system information blocks with area scope cell to be invalid. If the UE has stored valid system information blocks for the newly selected cell, the UE may set those as current system information blocks.

After selecting a new PLMN, the UE shall consider all current system information blocks to be invalid. If the UE has previously stored valid system information blocks for the selected cell of the new PLMN, the UE may set those as current system information blocks. Upon selection of a new PLMN the UE shall store all information elements specified within variable SELECTED\_PLMN for the new PLMN within this variable.

#### 8.1.1.4 Reception of SYSTEM INFORMATION messages broadcast on a FACH transport channel

System information block type 10 may be broadcast on FACH, as specified in [subclause 8.1.1.2](#).

When reading system information blocks on FACH, the UE shall perform the actions as defined in subclause 8.1.1.6.

#### 8.1.1.5 Actions upon reception of the Master Information Block and Scheduling Block(s)

When selecting a new cell, the UE shall read the master information block. The UE may use the pre-defined scheduling information to locate the master information block in the cell.

Upon reception of the master information block, the UE shall:

- if the "PLMN type" in the variable SELECTED\_PLMN has the value "GSM-MAP" and the IE "PLMN Type" has the value "GSM-MAP" or "GSM-MAP and ANSI-41",:
  - check the IE "PLMN identity" in the master information block and verify that it is the selected PLMN, stored as "PLMN identity" in the variable SELECTED\_PLMN.
- if the "PLMN type" in the variable SELECTED\_PLMN has the value "ANSI-41" and the IE "PLMN Type" has the value "ANSI-41" or "GSM-MAP and ANSI-41",:
  - store the ANSI-41 Information elements contained in the master information block and perform initial process for ANSI-41.
- compare the value tag in the master information block with the value tag stored for this cell and this PLMN in the variable VALUE\_TAG.
- if the value tags differ, or if no IEs for the master information block are stored:
  - store the value tag into the variable VALUE\_TAG for the master information block;
  - read and store scheduling information included in the master information block;
- if the value tags are the same the UE may use stored system information blocks and scheduling blocks using value tag that were stored ~~in~~ for this cell and this PLMN as valid system information.

For all system information blocks or scheduling blocks that are supported by the UE referenced in the master information block or the scheduling blocks, the UE shall perform the following actions:

- for all system information blocks with area scope "PLMN" that use value tags:
  - compare the value tag read in scheduling information for that system information block with the value stored within the variable VALUE\_TAG for that system information block;
  - if the value tags differ, or if no IEs for the corresponding system information block are stored,:
    - store the value tag read in scheduling information for that system information block into the variable VALUE\_TAG;
    - read and store the IEs of that system information block.
- if the value tags are the same the UE may use stored system information blocks using value tag that were stored in this PLMN as valid system information.

- for all system information blocks or scheduling blocks with area scope cell that use value tags:
  - compare the value tag read in scheduling information for that system information block or scheduling block with the value stored within the variable VALUE\_TAG for that system information block or scheduling block;
  - if the value tags differ, or if no IEs for the corresponding system information block or scheduling block are stored,
    - store the value tag read in scheduling information for that system information block or scheduling block into the variable VALUE\_TAG;
    - read and store the IEs of that system information block or scheduling block;
  - if the value tags are the same the UE may use stored system information blocks using value tags that were stored ~~in-for~~ this cell and this PLMN as valid system information.
- for system information blocks ~~of type 16,~~ which may have multiple occurrences:
  - compare the value tag and the configuration ~~or multiple occurrence~~ identity for the occurrence of the system information blocks read in scheduling information with the value tag and configuration ~~or multiple occurrence~~ identity stored within the variable VALUE\_TAG;
    - if the value tags differ, or if no IEs from the occurrence with that configuration ~~or multiple occurrence~~ identity of the system information block are stored,
      - store the value tag read in scheduling information for that system information block and the occurrence with that configuration ~~or multiple occurrence~~ identity into the variable VALUE\_TAG;
      - read and store the IEs of that system information block.
    - if the value tags and the configuration ~~or multiple occurrence~~ identity are ~~the same identical to those stored~~ the UE may use stored occurrences of system information blocks ~~using value tag and configuration identity~~ that were stored ~~in-for~~ this cell and this PLMN as valid system information.

For system information blocks, not supported by the UE, but referenced either in the master information block or in the scheduling blocks, the UE may

- skip reading this system information block;
- skip monitoring changes to this system information block

If the UE:

- receives a scheduling block at a position different from its position according to the scheduling information for the scheduling block; or
- receives a scheduling block for which scheduling information has not been received

the UE may:

- store the content of the scheduling block with a value tag set to the value NULL; and
- consider the content of the scheduling block as valid until it receives the same type of scheduling block in a position according to its scheduling information or at most for 6 hours after reception.

If the UE does not find a scheduling block in a position where it should be according to its scheduling information, but a transport block with correct CRC was found at that position, the UE shall read the scheduling information for this scheduling block.

If the UE does not find the master information block in a position fulfilling

~~(~~  $\text{SFN mod } 32(\text{MIB\_SIB\_REP} * 4) = 0$ ), ~~(~~ but a transport block with correct CRC was found at that position), the UE shall,

- consider the master information block as not found; ~~and~~.
- consider the cell to be barred according to [4]; ~~and~~
- consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE " $T_{\text{barred}}$ "; ~~and~~.

~~not initiate emergency calls in the cell.~~

NOTE : This permits a different repetition for the MIB in later releases for FDD. In TDD it allows for a variable SIB\_REP in R99 and future releases.

If in idle mode and system information block type 1 is not scheduled on BCH, and system information block type 13 is not scheduled on BCH the UE shall:

- consider the cell to be barred according to [4]; ~~and~~.
- consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE " $T_{\text{barred}}$ "; ~~and~~.

~~not initiate emergency calls in the cell.~~

If the UE only supports GSM-MAP but finds a cell that broadcasts System Information Block type 13 but not System Information Block type 1 it shall consider the cell barred.

If in idle mode and if

- system information block type 1 is not scheduled on BCH; and
- the "PLMN Type" in the variable SELECTED\_PLMN has the value "GSM-MAP"; and
- the IE "PLMN type" in the Master Information Block has the value "GSM-MAP" or "GSM-MAP and ANSI-41";

the UE shall:

- indicate to upper layers that no CN system information is available.

If in idle mode and System Information Block type 3 is not scheduled on BCH the UE shall:

- consider the cell to be barred according to [4]; and
- consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE " $T_{\text{barred}}$ "; ~~and~~.

~~not initiate emergency calls in the cell.~~

If in connected mode and System Information Block type 3 is not scheduled on BCH, and System Information Block type 4 is not scheduled on BCH the UE shall:

- consider the cell to be barred according to [4]; and
- consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE " $T_{\text{barred}}$ "; ~~and~~.

~~not initiate emergency calls in the cell.~~

If in idle mode and System Information Block type 5 is not scheduled on BCH or System Information Block type 5 is scheduled but AICH info or PICH info is not present, the UE shall:

- consider the cell to be barred according to [4]; and
- consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE " $T_{\text{barred}}$ "; ~~and~~.

~~not initiate emergency calls in the cell.~~

If in connected mode and System Information Block type 5 is not scheduled on BCH, and System Information Block type 6 is not scheduled on BCH, or any of System Information Block type 5 or type 6 is scheduled but IE "AICH info" or IE "PICH info" is not present, the UE shall:

- consider the cell to be barred according to [4]; and
- consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>"; and;
- **not initiate emergency calls in the cell.**

If System Information Block type 7 is not scheduled on BCH the UE shall:

- consider the cell to be barred according to [4]; and
- consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>"; and;
- **not initiate emergency calls in the cell.**

### 8.1.1.6 Actions upon reception of system information blocks

The UE may use the scheduling information included within the master information block and the scheduling blocks to locate each system information block to be acquired.

The UE should only expect one occurrence of the scheduling information for a system information block in the master information block and any of the scheduling blocks except for System Information Block type 16, System Information Block type 15.2 and System Information Block type 15.3, which may have multiple occurrences. However, to enable future introduction of new system information blocks, the UE shall also be able to receive system information blocks other than the ones indicated within the scheduling information. The UE may ignore contents of such system information block.

If the UE

- receives a system information block in a position according to the scheduling information for the system information block; and
- this system information block uses a value tag or
- this system information block uses a value tag and configuration or multiple occurrence identity according to the system information block type

the UE shall:

- store the content of the system information block together with the value of its value tag or the values of configuration and multiple occurrence identity and the associated value tag in the scheduling information for the system information block; and
- consider the content of the system information block valid until, ~~if used,~~ the value tag in the scheduling information for the system information block is changed or at most for 6 hours after reception.

If the UE

- receives a system information block in a position according to the scheduling information for the system information block; and
- this system information block does not use a value tag according to the system information block type

the UE shall:

- store the content of the system information block; and
- start an expiration timer using a value as defined in Table 8.1.1 for that system information block type; and



- consider the content of the system information block valid until, the expiration timer expires.

If the UE

- receives a system information block at a position different from its position according to the scheduling information for the system information block; or
- receives a system information block for which scheduling information has not been received; and
- this system information block uses a value tag ~~according to the system information block type~~

the UE may:

- store the content of the system information block with a value tag set to the value NULL; and
- consider the content of the system information block as valid until it receives the same type of system information block in a position according to its scheduling information or at most for 6 hours after reception.

If the UE

- receives a system information block with multiple occurrences at a position different from its position according to the scheduling information for the system information block; or
- receives a system information block with multiple occurrences for which scheduling information has not been received; and
- this system information block uses a value tag and configuration or multiple occurrence identity

the UE shall

- ignore this information.

If the UE does not find a system information block in a position where it should be according to its scheduling information, but a transport block with correct CRC was found at that position, the UE shall read the scheduling information for this system information block.

The UE shall act upon all received information elements as specified in subclause 8.6 unless specified otherwise in the following subclauses.

#### 8.1.1.6.1 System Information Block type 1

If in idle mode, the UE should store all relevant IEs included in this system information block if the "PLMN Type" in the variable SELECTED\_PLMN has the value "GSM-MAP" and the IE "PLMN type" in the Master Information Block has the value "GSM-MAP" or "GSM-MAP and ANSI-41". The UE shall also:

- forward the content of the IE "CN common GSM-MAP NAS system information" to upper layers;
- for the IE "CN domain system information list":
  - for each IE "CN domain system information" that is present:
    - forward the content of the IE "CN domain specific NAS system information" and the IE "CN domain identity" to upper layers;
    - use the IE "CN domain specific DRX cycle length coefficient" to calculate frame number for the Paging Occasions and ~~Page indicator~~ as specified in [4];
  - if an IE "CN domain system information" is not present for a particular CN domain:
    - indicate to upper layers that no CN system information is available for that CN domain;
- use the values in the IE "UE Timers and constants in idle mode" for the relevant timers and counters.

If in connected mode the UE shall not use the values of the IEs in this system information block except for the timers and constant values given by the IE "UE timers and constants in connected mode".

If in idle mode and system information block type 1 is not scheduled on BCH, and system information block type 13 is not scheduled on BCH the UE shall:

~~If the UE only supports GSM-MAP but finds a cell that broadcasts SIB13 but not SIB1 it s consider the cell barred.~~

- ~~— consider the cell to be barred according to [4]. The UE shall consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>".~~

If in idle mode and if

- ~~— system information block type 1 is not scheduled on BCH; and~~
- ~~— the "PLMN Type" in the variable SELECTED\_PLMN has the value "GSM-MAP"; and~~
- ~~— the IE "PLMN type" in the Master Information Block has the value "GSM-MAP" or "GSM-MAP and ANSI-41";~~

the UE shall:

- ~~— indicate to upper layers that no CN system information is available.~~

#### 8.1.1.6.2 System Information Block type 2

If in connected mode the UE should store all relevant Ies included in this system information block. The UE shall:

- if in state URA\_PCH, start to perform URA updates using the information in the IE "URA identity".

If in idle mode, the UE shall not use the values of the Ies in this system information block.

#### 8.1.1.6.3 System Information Block type 3

The UE should store all relevant Ies included in this system information block. The UE shall:

- ~~—~~ if in connected mode, and System Information Block 4 is indicated as used in the cell:
- ~~—~~ read and act on information sent in that block.

**If the value of the IE "Cell Reservation Extension" is set to "reserved".**

- **consider the cell to be barred according to [4]; and.**
- **consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>"; and**
- **not initiate emergency calls in the cell.**

If in idle mode and System Information Block type 3 is not scheduled on BCH the UE shall:

- ~~— consider the cell to be barred according to [4]; and~~
- ~~— consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>".~~

If in connected mode and System Information Block type 3 is not scheduled on BCH, and System Information Block type 4 is not scheduled on BCH the UE shall:

- ~~— consider the cell to be barred according to [4]; and~~
- ~~— consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>".~~

#### 8.1.1.6.4 System Information Block type 4

If in connected mode, the UE should store all relevant Ies included in this system information block.

If in idle mode, the UE shall not use the values of the Ies included in this system information block.

If the value of the IE "Cell Reservation Extension" is set to "reserved".

- consider the cell to be barred according to [4]; and.

- consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>"; and.

- not initiate emergency calls in the cell.

#### 8.1.1.6.5 System Information Block type 5

The UE should store all relevant IEs included in this system information block. The UE shall:

- if in connected mode, and System Information Block type 6 is indicated as used in the cell:
  - read and act on information sent in System Information Block type 6.
- replace the TFS of the RACH with the one stored in the UE if any;
- let the physical channel(s) of type PRACH given by the IE(s) "PRACH info" be the default in uplink for the PRACH if UE is in CELL\_FACH state;
- start to receive the physical channel of type AICH using the parameters given by the IE "AICH info" (FDD only) when given allocated PRACH is used;
- replace the TFS of the FACH/PCH with the one stored in the UE if any;
- select a Secondary CCPCH as specified in subclause 8.6, and start to receive the physical channel of type PICH associated with the PCH carried by the selected Secondary CCPCH using the parameters given by the IE "PICH info" if UE is in Idle mode or in CELL\_PCH or URA\_PCH state;
- start to monitor its paging occasions on the selected PICH if UE is in Idle mode or in CELL\_PCH or URA\_PCH state;
- start to receive the selected physical channel of type Secondary CCPCH using the parameters given by the IE(s) "Secondary CCPCH info" if UE is in CELL\_FACH state;
- in TDD<sub>F, S</sub> use the IE "TDD open loop power control" as defined in subclause 8.5.7 when allocated PRACH is used;
- in TDD<sub>F, S</sub> if the IE "PDSCH system information" and/or the IE "PUSCH system information" is included, store each of the configurations given there with the associated identity given in the IE "PDSCH Identity" and/or "PUSCH Identity" respectively. For every configuration, for which the IE "SFN Time info" is included, the information shall be stored for the duration given there.

~~If in idle mode and System Information Block type 5 is not scheduled on BCH or System Information Block type 5 is scheduled but AICH info or PICH info is not present, the UE shall: (move to 8.1.1.5)~~

~~— consider the cell to be barred according to [4]; and~~

~~— consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>".~~

~~If in connected mode and System Information Block type 5 is not scheduled on BCH, and System Information Block type 6 is not scheduled on BCH, or any of System Information Block type 5 or type 6 is scheduled but IE "AICH info" or IE "PICH info" is not present, the UE shall: (move to 8.1.1.5)~~

~~— consider the cell to be barred according to [4]; and~~

~~— consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE "T<sub>barred</sub>".~~

#### 8.1.1.6.6 System Information Block type 6

If in connected mode, the UE should store all relevant IEs included in this system information block. The UE shall:

- replace the TFS of the RACH with the one stored in the UE if any;
- let the physical channel(s) of type PRACH given by the IE(s) "PRACH info" be the default in uplink if UE is in CELL\_FACH state. If the IE "PRACH info" is not included, the UE shall read the corresponding IE(s) in System Information Block type 5 and use that information to configure the PRACH;
- start to receive the physical channel of type AICH using the parameters given by the IE "AICH info" when associated PRACH is used. If the IE "AICH info" is not included, the UE shall read the corresponding IE in System Information Block type 5 and use that information (FDD only);
- replace the TFS of the FACH/PCH with the one stored in the UE if any;
- select a Secondary CCPCH as specified in subclause 8.6, and start to receive the physical channel of type PICH associated with the PCH carried by the selected Secondary CCPCH using the parameters given by the IE "PICH info" if the UE is in CELL\_PCH or URA\_PCH state. If the IE "PICH info" is not included, the UE shall read the corresponding IE in System Information Block type 5 and use that information;
- start to monitor its paging occasions on the selected PICH if the UE is in CELL\_PCH or URA\_PCH state;
- start to receive the selected physical channel of type Secondary CCPCH using the parameters given by the IE(s) "Secondary CCPCH info" if the UE is in CELL\_FACH state. If the IE "Secondary CCPCH info" is not included, the UE shall read the corresponding IE(s) in System Information Block type 5 and use that information;
- in TDD: use the IE "TDD open loop power control" as defined in subclause 8.5.7;
- in TDD: if the IE "PDSCH system information" and/or the IE "PUSCH system information" is included, store each of the configurations given there with the associated identity given in the IE "PDSCH Identity" and/or "PUSCH Identity" respectively. For every configuration, for which the IE "SFN Time info" is included, the information shall be stored for the duration given there.

If in idle mode, the UE shall not use the values of the IEs in this system information block.

#### 8.1.1.6.7 System Information Block type 7

The UE should store all relevant IEs included in this system information block.

~~If System Information Block type 7 is not scheduled on BCH the UE shall:~~

- ~~—consider the cell to be barred according to [4]; and~~
- ~~—consider the barred cell as using the value "allowed" in the IE "Intra-frequency cell re-selection indicator", and the maximum value in the IE " $T_{\text{barred}}$ ".~~

#### 8.1.1.6.8 System Information Block type 8

This system information block type is used only in FDD.

If in connected mode, the UE should store all relevant IEs included in this system information block.

If in idle mode, the UE shall not use the values of the IEs in this system information block.

#### 8.1.1.6.9 System Information Block type 9

This system information block type is used only in FDD.

If in connected mode, the UE should store all relevant IEs included in the system information block. The UE shall:

- start a timer set to the value given by the repetition period (SIB\_REP) for that system information block

If in idle mode, the UE shall not use the values of the IEs in this system information block.

#### 8.1.1.6.10 System Information Block type 10

This system information block type is used only in FDD.

If in state CELL\_DCH, the UE should store all relevant IEs included in this system information block. The UE shall:

- start a timer set to the value given by the repetition period (SIB\_REP) for that system information block;
- perform actions defined in subclause 14.8.

If in idle mode, state CELL\_FACH, state CELL\_PCH or state URA\_PCH, the UE shall not use the values of the IEs in this system information block.

#### 8.1.1.6.11 System Information Block type 11

The UE should store all relevant IEs included in this system information block. The UE shall:

- if in connected mode, and System Information Block type 12 is indicated as used in the cell:
  - read and act on information sent in System Information Block type 12;
- for each measurement type:
  - start a measurement using the set of IEs specified for that measurement type;
  - associate each measurement with the identity number given by the IE "Measurement identity";
  - clear the variable CELL\_INFO\_LIST;
- act upon the received IE "Intra-frequency/Inter-frequency/Inter-RAT cell info list" as described in subclause 8.6.7.3;
- if included, store the IE "Intra-frequency reporting quantity" and the IE "Intra-frequency measurement reporting criteria" or "Periodical reporting criteria" in order to activate reporting when state CELL\_DCH is entered;
- If IE "Use of HCS" is set to "used", indicating that HCS is used, do the following:
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Intra-frequency cell info list", use the default values specified for the IE "HCS neighbouring cell information" for that cell;
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Intra-frequency cell info list", for that cell use the same parameter values as used for the preceding IE "Intra-frequency cell info list";
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-frequency cell info list", use the default values specified for the IE "HCS neighbouring cell information" for that cell;
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-frequency cell info list", for that cell use the same parameter values as used for the preceding IE "Inter-frequency cell info list";
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-RAT Cell info list", use the default values specified for the IE "HCS neighbouring cell information" for that cell;
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-RAT cell info list", for that cell use the same parameter values as used for the preceding IE "Inter-RAT cell info list";
- If IE "FACH measurement occasion info" is included:
  - act as specified in subclause 8.6.7
- else:
  - ~~may neither~~ perform inter-frequency/inter-RAT measurements nor inter-frequency/inter-RAT cell re-selection evaluation, ~~independent of UE measurement capabilities if the UE capabilities permit such measurements while simultaneously receiving the S-CCPCH of the serving cell.~~

### 8.1.1.6.12 System Information Block type 12

If in connected mode, the UE should store all relevant IEs included in this system information block. The UE shall:

- for each measurement type:
  - start (or continue) a measurement using the set of IEs specified for that measurement type;
- act upon the received IE "Intra-frequency/Inter-frequency/Inter-RAT cell info list" as described in subclause 8.6.7.3;
- if any of the IEs "Intra-frequency measurement quantity", "Intra-frequency reporting quantity for RACH reporting", "Maximum number of reported cells on RACH" or "Reporting information for state CELL\_DCH" are not included in the system information block, read the corresponding IE(s) in system information block type 11 and use that information for the intra-frequency measurement;
- if included in this system information block or in System Information Block type 11, store the IE "Intra-frequency reporting quantity" and the IE "Intra-frequency measurement reporting criteria" or "Periodical reporting criteria" in order to activate reporting when state CELL\_DCH is entered;
- if the IE "Inter-frequency measurement quantity" is not included in the system information block, read the corresponding IE in System Information Block type 11 and use that information for the inter-frequency measurement;
- if the IE "Inter-RAT measurement quantity" is not included in the system information block, read the corresponding IE in System Information Block type 11 and use that information for the inter-RAT measurement;
- if in state CELL\_FACH, start traffic volume measurement reporting as specified in the IE "Traffic volume reporting quantity";
- associate each measurement with the identity number given by the IE "Measurement identity";
- If IE "Use of HCS" is set to "used", indicating that HCS is used, do the following:
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Intra-frequency cell info list", use the default values specified for the IE "HCS neighbouring cell information" for that cell;
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Intra-frequency cell info list", for that cell use the same parameter values as used for the preceding IE "Intra-frequency cell info list";
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-frequency cell info list", use the default values specified for the IE "HCS neighbouring cell information" for that cell;
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-frequency cell info list", for that cell use the same parameter values as used for the preceding IE "Inter-frequency cell info list";
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-RAT cell info list", use the default values specified for the IE "HCS neighbouring cell information" for that cell;
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-RAT cell info list", for that cell use the same parameter values as used for the preceding IE "Inter-RAT cell info list".
- If IE "FACH measurement occasion info" is included:
  - act as specified in subclause 8.6.7
- else:
  - perform neither inter-frequency/inter-RAT measurements nor inter-frequency/inter-RAT cell re-selection evaluation, independent of UE measurement capabilities.

If in idle mode, the UE shall not use the values of the IEs in this system information block.

### 8.1.1.6.13 System Information Block type 13

If in idle or connected mode, the UE should store all relevant IEs included in this system information block except for the IEs "CN domain specific DRX cycle length coefficient", "UE timers and constants in idle mode" and "Capability update requirement" which shall be stored only in the idle mode case. The UE shall read System Information Block type 13 and the associated System Information Block types 13.1, 13.2, 13.3 and 13.4 only when the "PLMN Type" in the variable SELECTED\_PLMN has the value "ANSI-41" and the IE "PLMN type" in the Master Information Block has the value "ANSI-41" or "GSM-MAP and ANSI-41". The UE shall also:

- forward the content of the IE "CN domain specific NAS system information" to the non-access stratum entity indicated by the IE "CN domain identity";
- use the IE "CN domain specific DRX cycle length coefficient" to calculate frame number for the Paging Occasions and Page indicator as specified in [4].

Refer to TIA/EIA/IS-2000.5-4 IS-2000-... for information on how to act actions on information contained in System Information Block types 13.1, 13.2, 13.3 and 13.4.

### 8.1.1.6.14 System Information Block type 14

This system information block type is used only in TDD.

The UE should store all relevant IEs included in this system information block. The UE shall:

- use the IE "UL Timeslot Interference" to calculate PRACH, DPCH and PUSCH transmit power for TDD uplink open loop power control as defined in subclause 8.5.7.

### 8.1.1.6.15 System Information Block type 15

If the UE is in idle or connected mode, and supports GPS location services and/or OTDOA location services it should store all relevant IEs included in this system information block. The UE shall:

- if the IE "Cipher GPS Data Indicator" is included, and the UE has a full or reduced complexity GPS receiver functionality (the UE will know that the broadcast GPS data is ciphered in accordance with the Data Assistance Ciphering Algorithm detailed in [18]),
  - store the parameters contained within this IE (see 10.3.7.86 for details), and use them to decipher the broadcast UE positioning GPS information contained within the System Information Block types 15.1, 15.2 and 15.3;
- use IE "Reference Location" as a priori knowledge of the approximate location of the UE;
- if the IE "NODE B Clock Drift" is included:
  - use it as an estimate of the drift rate of the NODE B clock relative to GPS time;
- if the IE "NODE B Clock Drift" is not included:
  - assume the value 0;
- if SFN is included:
  - use it as the relationship between GPS time and air-interface timing of the NODE B transmission in the serving cell;
- use "Reference GPS TOW" as GPS Time of Week which is the start of the frame with SFN=0;

#### 8.1.1.6.15.1 System Information Block type 15.1

The UE should store all the relevant IEs included in this system information block . The UE shall:

- use "Status/Health" to indicate/determine the status of the differential corrections;
- act on IE group "DGPS information" in a similar manner as specified in [13] except that the scale factors for PRC and RRC are different. In addition, the IE group DGPS information also includes Delta PRC2 and Delta RRC2. Delta PRC2 is the difference in the pseudorange correction between the satellite's ephemeris identified by

IODE and the previous ephemeris two issues ago IODE-2. Delta RRC2 is the difference in the pseudorange rate-of-change correction between the satellite's ephemeris identified by IODE and IODE-2. These two additional IEs can extend the life of the raw ephemeris data up to 6 hours.

#### 8.1.1.6.15.2 System Information Block type 15.2

For System Information Block type 15.2 multiple occurrences may be used; **one occurrence for each set of one satellite data specified in 10.2.48.8.18.2**. To identify the different occurrences, the scheduling information for System Information Block type 15.2 includes IE "SIB occurrence identity and value tag". The UE should store all the relevant IEs included in this system information block. The UE shall:

- compare for each occurrence the value tag of the stored occurrence, if any, with the occurrence value tag included in the IE "SIB occurrence identity and value tag" for the occurrence of the SIB with the same occurrence identity;
- in case the UE has no SIB occurrence stored with the same identity or in case the occurrence value tag is different:
  - store the occurrence information together with its identity and value tag for later use;
- in case an occurrence with the same identity **but different value tag** was stored:
  - overwrite this one with the new occurrence read via system information for later use;
- interpret IE "Transmission TOW" as a very coarse estimate of the current time, i.e., the approximate GPS time-of-week when the message is broadcast;
- interpret IE "SatID" as the satellite ID of the data from which this message was obtained;
- act on the rest of the IEs in a **similar** manner **similar to that as** specified in [12]. In addition, the UE can utilise these IEs for GPS time dissemination and sensitivity improvement.

The IE "Transmission TOW" may be different each time a particular SIB occurrence is transmitted. The UTRAN should not increment the value tag of the SIB occurrence if the IE "Transmission TOW" is the only IE that is changed. **Each occurrence of this SIB contains information for one satellite as shown in the table of Subclause 10.2.48.8.18.2.**

The UE may not need to receive all occurrences before it can use the information **from any one occurrence**.

#### 8.1.1.6.15.3 System Information Block type 15.3

For System Information Block type 15.3 multiple occurrences may be used; **one occurrence for each set of satellite data specified in 10.2.48.8.18.3**. To identify the different occurrences, the scheduling information for System Information Block type 15.3 includes IE "SIB occurrence identity and value tag". The UE should store all the relevant IEs included in this system information block. The UE shall:

- compare for each occurrence the value tag of the stored occurrence, if any, with the occurrence value tag included in the IE "SIB occurrence identity and value tag" for the occurrence of the SIB with the same occurrence identity;
- in case the UE has no SIB occurrence stored with the same identity or in case the occurrence value tag is different:
  - store the occurrence information together with its identity and value tag for later use;
- in case a occurrence with the same identity **but different value tag** was stored:
  - overwrite this one with the new occurrence read via system information for later use;
- interpret IE "Transmission TOW" as a very coarse estimate of the current time, i.e., the approximate GPS time-of-week when the message is broadcast;
- interpret IE "SatMask" as the satellites that contain the pages being broadcast in this message;
- interpret IE "LSB TOW" as the least significant 8 bits of the TOW ([12]);



- interpret IE "Data ID" as the Data ID field contained in the indicated subframe, word 3, most significant 2 bits, as defined by [12];
- act on the rest of the IEs in a similar manner as specified in [12]. In addition, the UE can utilise these IEs including non-information bits for GPS time dissemination and sensitivity improvement.

The IE "Transmission TOW" may be different each time a particular SIB occurrence is transmitted. The UTRAN should not increment the value tag of the SIB occurrence if the IE "Transmission TOW" is the only IE that is changed. One SIB occurrence value tag is assigned to the table of Subclause 10.2.48.8.18.3.

The UE may not need to receive all occurrences before it can use the information [for any one occurrence](#).

#### 8.1.1.6.15.4 System Information Block type 15.4

If the UE is in idle or connected mode, and supports [the OTDOA UE positioning method location services](#) the UE shall store all relevant IEs included in this system information block\_ ([refer to 10.3.7.104 for details](#)).

#### 8.1.1.6.16 System Information Block type 16

For System Information Block type 16 multiple occurrences may be used; one occurrence for each predefined configuration. To identify the different predefined configurations, the scheduling information for System Information Block type 16 includes IE "Predefined configuration identity and value tag" ~~instead of the commonly used IE "PLMN-Value tag"~~.

The UE should store all relevant IEs included in this system information block. The UE shall:

- compare for each predefined configuration the value tag of the stored predefined configuration, ~~if any~~, with the preconfiguration value tag included in the IE "Predefined configuration identity and value tag" for the occurrence of the SIB with the same predefined configuration identity;
- in case the UE has no predefined configuration stored with the same identity or in case the predefined configuration value tag is different:
  - store the predefined configuration information together with its identity and value tag for later use e.g. during handover to UTRAN;
  - in case a predefined configuration with the same identity [but different value tag](#) was stored, ~~wrong indentation~~
  - overwrite this one with the new configuration read via system information for later use e.g. during handover to UTRAN. ~~(change indentation)~~

The above handling applies regardless of whether the [previously](#) stored predefined configuration information has been obtained via UTRA or via another RAT.

The UE is not required to complete reading of all occurrences of System Information Block type 16 before initiating RRC connection establishment.

#### 8.1.1.6.17 System Information Block type 17

This system information block type is used only for TDD.

If in connected mode, the UE should store all relevant IEs included in this system information block. The UE shall:

- if the IE "PDSCH system information" and/or the IE "PUSCH system information" is included, store each of the configurations given there with the associated identity given in the IE "PDSCH Identity" and/or "PUSCH Identity" respectively. This information shall become invalid after the time specified by the repetition period (SIB\_REP) for this system information block.

If in idle mode, the UE shall not use the values of the IEs in this system information block.

### 8.1.1.6.18 System Information Block type 18

If the System Information Block type 18 is present, a UE **may** obtain knowledge of the PLMN identity of the neighbour cells to be considered for cell reselection, and **may** behave as specified in this subclause and in subclause 8.5.14a.

The UE should store all the relevant IEs included in this system information block.

A UE in idle mode shall act according to the following rules:

- any PLMN list of a given type (IEs "PLMNs of intra-frequency cells list", "PLMNs of inter-frequency cells list", "PLMNs of inter-RAT cell lists") included in the IE "Idle mode PLMN identities" is paired ~~to~~ **with** the list of cells of the same type derived from System Information Block type 11;
- the PLMN identity located at a given rank in the PLMN list is ~~the one~~ **that** of the cell with the same ranking in the paired list of cells, the cells being considered in the increasing order of their associated identities ("Intra-frequency cell id", "Inter-frequency cell id", "Inter-RAT cell id");
- if the number of identities in a PLMN list exceeds the number of neighbour cells in the paired list (**if any**), the extra PLMN identities are considered as unnecessary and ignored;
- if the number of identities in a PLMN list (**if any**) is lower than the number of neighbour cells in the paired list, the missing PLMN identities are replaced by the last PLMN identity in the list if present, otherwise by the identity of the selected PLMN.

A UE in connected mode shall act in the same manner as a UE in idle mode with the following modifications:

- the PLMN lists to be considered are the ones included, when present, in the IE "Connected mode PLMN identities"; otherwise, the UE shall use, in place of any missing list, the corresponding one in the IE "Idle mode PLMN identities";
- the paired lists of cells are the ones derived from System Information Block type 11, and System Information Block type 12 if present.

### 8.1.1.7 Modification of system information

~~The UE shall consider all stored system information blocks as invalid after it has been switched off.~~ For System Information Block type 16 that may have multiple occurrences, the UE shall handle each occurrence independently as specified in the previous; that is each occurrence is handled as a separate system information block.

NOTE: It should be noted that for the proper operation of the BCCH Modification Information sent on a PCH, the System Information should not be changed more frequently than can be accommodated by mobile stations operating at the maximum DRX cycle length supported by the UTRAN.

#### 8.1.1.7.1 Modification of system information blocks using a value tag

Upon modifications of system information blocks using value tags, UTRAN should notify the new value tag for the master information block in the IE "BCCH modification info", transmitted in the following way:

- To reach UEs in idle mode, CELL\_PCH state and URA\_PCH state, the IE "BCCH modification info" is contained in a PAGING TYPE 1 message transmitted on the PCCH in all paging occasions in the cell;
- To reach UEs in CELL\_FACH state, the IE "BCCH modification info" is contained in a SYSTEM INFORMATION CHANGE INDICATION message transmitted on the BCCH mapped on at least one FACH on every Secondary CCPCH in the cell.

Upon reception of a PAGING TYPE 1 message or a SYSTEM INFORMATION CHANGE INDICATION message ~~the~~ containing the IE "BCCH modification info" containing the IE "MIB value tag" but not containing the IE "BCCH modification time", the UE shall perform actions as specified in subclause 8.1.1.7.3.

If the IE "BCCH modification time" is included the UE shall perform actions as specified in subclause 8.1.1.7.2.

### 8.1.1.7.2 Synchronised modification of system information blocks

For modification of some system information elements, e.g. reconfiguration of the channels, it is important for the UE to know exactly when a change occurs. In such cases, the UTRAN should notify the SFN when the change will occur as well as the new value tag for the master information block in the IE "BCCH modification info" transmitted in the following way:

- To reach UEs in idle mode, CELL\_PCH state and URA\_PCH state, the IE "BCCH modification info" is contained in a PAGING TYPE 1 message transmitted on the PCCH in all paging occasions in the cell;
- To reach UEs in CELL\_FACH state, the IE "BCCH modification info" is contained in a SYSTEM INFORMATION CHANGE INDICATION message transmitted on the BCCH mapped on at least one FACH on every Secondary CCPCH in the cell.

Upon reception of a PAGING TYPE 1 message or a SYSTEM INFORMATION CHANGE INDICATION message containing the IE "BCCH modification info" containing the IE "MIB value tag" and containing the "IE BCCH modification time", the UE shall:

- perform the actions as specified in subclause 8.1.1.7.3 at the time, indicated in the IE "BCCH Modification Information".

### 8.1.1.7.3 Actions upon system information change

The UE shall:

- compare the value of IE "MIB value tag" in the IE "BCCH modification info" with the value tag stored for the master information block in variable VALUE\_TAG.
- if the value tags differ:
  - read the master information block on BCH;
  - if the value tag of the master information block in the system information is the same as the value in IE "MIB value tag" in "BCCH modification info" but different from the value tag stored in the variable VALUE\_TAG:
    - perform actions as specified in subclause 8.1.1.5;
  - if the value tag of the master information block in the system information is the same as the value tag stored in the variable VALUE\_TAG:
    - for the next occurrence of the master information block:
      - perform actions as specified in subclause 8.1.1.7.3 again;
  - if the value tag of the master information block in the system information is different from the value tag stored in the variable VALUE\_TAG, and is different from the value in IE "MIB value tag" in "BCCH modification info":
    - perform actions as specified in subclause 8.1.1.5;
    - if  $(VTMIB - VTMI) \bmod 8 < 4$ , where VTCI is the value tag in the IE "MIB value tag" in "BCCH modification info" and VTMIB is the value tag of the master information block in the system information:
      - for the next occurrence of the master information block:
        - perform actions as specified in subclause 8.1.1.7.3 again.

### 8.1.1.7.4 Actions upon expiry of a system information expiry timer

When the expiry timer of a system information block not using a value tag expires

the UE shall:

- consider the content of the system information block invalid;

- re-acquire the system information block again before the content can be used;

the UE may:

- postpone reading the system information block until the content is needed.

### 10.3.2.1 Cell Access Restriction

Indicates the restrictions to cell access.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Cell Barred	MP		Enumerated( not barred, barred)	
Intra-frequency cell re-selection indicator	<i>CV-Barred</i>		Enumerated( not allowed, allowed)	
T <sub>barred</sub>	<i>CV-Barred</i>		Integer (10,20,40,80 ,160,320,640 ,1280)	[4]
Cell Reserved for operator use	MP		Enumerated( reserved, not reserved)	
Cell Reservation for SoLSA exclusive use Extension	MP		Enumerated( reserved, not reserved)	
Access Class Barred list	MD	maxAC		Default is no access class barred is applied. The first instance of the parameter corresponds to Access Class 0, the second to Access Class 1 and so on up to Access Class 15. UE reads this IE of its access class stored in SIM.
>Access Class Barred	MP		Enumerated( not barred, barred)	

Condition	Explanation
<i>Barred</i>	Presence is mandatory if the IE "Cell Barred" has the value "Barred"; otherwise the element is not needed in the message.

```

-- *****
--
--      UTRAN MOBILITY INFORMATION ELEMENTS (10.3.2)
--
-- *****

AccessClassBarred ::=
    ENUMERATED {
        barred, notBarred }

AccessClassBarredList ::=
    SEQUENCE (SIZE (maxAC)) OF
        AccessClassBarred

AllowedIndicator ::=
    ENUMERATED {
        allowed, notAllowed }

CellAccessRestriction ::=
    SEQUENCE {
        cellBarred                CellBarred,
        cellReservedForOperatorUse ReservedIndicator,
        cellReservedExtensionForSGLSA ReservedIndicator,
        accessClassBarredList     AccessClassBarredList OPTIONAL
    }

CellBarred ::=
    CHOICE {
        barred
            SEQUENCE {
                intraFreqCellReselectionInd AllowedIndicator,
                t-Barred                    T-Barred
            },
        notBarred NULL
    }

```

## CHANGE REQUEST

⌘ **25.331 CR 828** ⌘ ev **r1** ⌘ Current version: **3.6.0** ⌘

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

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

<b>Title:</b>	⌘ Relation between DOFF and DPCH Frame Offset		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ May 21, 2001
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ R99
	<p>Use <u>one</u> of the following categories:</p> <p><b>F</b> (correction)</p> <p><b>A</b> (corresponds to a correction in an earlier release)</p> <p><b>B</b> (addition of feature),</p> <p><b>C</b> (functional modification of feature)</p> <p><b>D</b> (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>		<p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2)</p> <p>R96 (Release 1996)</p> <p>R97 (Release 1997)</p> <p>R98 (Release 1998)</p> <p>R99 (Release 1999)</p> <p>REL-4 (Release 4)</p> <p>REL-5 (Release 5)</p>

<b>Reason for change:</b>	⌘ There is a known relation between DOFF and DPCH Frame Offset. Since these IEs may be included in the same message, it is appropriate to clearly specify this relation and the corresponding behaviour of UTRAN and UE.
<b>Summary of change:</b>	<p>⌘ UTRAN should set "Default DPCH Offset Value" and "DPCH frame offset" with non conflicting values. In particular the following relation should always apply: Entering CELL_DCH (1 RL) <math>(\text{Default DPCH Offset Value} * 512) \bmod 38400 = \text{DPCH frame offset} * 256</math></p> <p>Entering CELL_DCH (Several RLs) <math>(\text{Default DPCH Offset Value} * 512) \bmod 38400 = \text{DPCH frame offset}_j * 256</math> j: reference radio link (first radio link listed in the message)</p> <p>CELL_DCH state (timing-maintained hard handover, i.e. IE "Timing indication" has the value "maintain") UTRAN should include in the reconfiguration message the same value of "Default DPCH Offset Value" as the one currently being used by the UE. Note: The first radio link listed in the message may not be the reference radio link.</p> <p>CELL_DCH state (timing re-initialised hard handover, i.e. IE "Timing indication" has the value "initialise") <math>(\text{Default DPCH Offset Value} * 512) \bmod 38400 = \text{DPCH frame offset}_j * 256</math> <u>Where Default DPCH Offset Value is the transmitted one or the implicit one, if not transmitted.</u> j: reference radio link (first radio link listed in the message)</p> <p>If UE receives a message where the above conditions are not respected, the UE shall set the variable INVALID_CONFIGURATION to true.</p> <p><b>Bacward Compatibility Analysis:</b></p>

		The Change is Backward compatible	
		Correction to a function where procedural text was missing.	
		The proposed changes would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.	
<b>Consequences if not approved:</b>	⌘	Different UTRAN/UE implementations may erroneously interpret existing requirements.	
<b>Clauses affected:</b>	⌘	8.3.5.1.2, 8.3.5.2.2, 8.6.6.14	
<b>Other specs affected:</b>	⌘	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘
<b>Other comments:</b>	⌘	CELL_DCH state (soft handover) UE shall maintain the same value of "Default DPCH Offset Value" as before the ACTIVE SET UPDATE message is received. Note: "Default DPCH Offset Value" is not transmitted in the ACTIVE SET UPDATE message and therefore no clarification is deemed necessary.	

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



## 8.3.5 Hard handover

### 8.3.5.1 Timing re-initialised hard handover

#### 8.3.5.1.1 General

The purpose of the timing re-initialised hard handover procedure is to remove all the RL(s) in the active set and establish new RL(s) along with a change in the UL transmission timing and the CFN in the UE according to the SFN of the target cell.(see subclause 8.5.15).

This procedure is initiated when UTRAN does not know the target SFN timing before hard handover.

#### 8.3.5.1.2 Initiation

Timing re-initialised hard handover initiated by the UTRAN is normally performed by using the procedure "Physical channel reconfiguration" (subclause 8.2.6), but may also be performed by using either one of the following procedures:

- "radio bearer establishment" (subclause 8.2.1);
- "Radio bearer reconfiguration" (subclause 8.2.2);
- "Radio bearer release" (subclause 8.2.3); or
- "Transport channel reconfiguration" (subclause 8.2.4).

If IE "Timing indication" has the value "initialise", UE shall execute the Timing Re-initialised hard handover procedure by following the procedure indicated in the subclause relevant to the procedure chosen by the UTRAN.

- If the IE "Default DPCH Offset Value" is included,
  - UTRAN should set "Default DPCH Offset Value" and "DPCH frame offset" respecting the following relation
    - $(\text{Default DPCH Offset Value} * 512) \bmod 38400 = \text{DPCH frame offset}_j * 256$
    - where  $j$  indicates the first radio link listed in the message and the IE values used are the Actual Values of the IEs as defined in section 11.
  - If the UE receives a message where the above relation between "Default DPCH Offset Value" and "DPCH frame offset" is not respected, the UE shall set the variable INVALID\_CONFIGURATION to true.
- if the IE "Default DPCH Offset Value" is not included:
  - UE shall use the previously received value stored in variable DOFF. If there is no previously received value stored in DOFF, the UE should use the value 0.
  - UTRAN should set "DPCH frame offset" respecting the following relation
    - If UTRAN has previously sent Default DPCH Offset Value to the UE
      - $(\text{previously sent Default DPCH Offset Value}) \bmod 38400 = \text{DPCH frame offset}_j$
      - where  $j$  indicates the first radio link listed in the message and the IE values used are the Actual Values of the IEs as defined in section 11.
    - If UTRAN has not previously sent Default DPCH Offset Value to the UE
      - $\text{DPCH frame offset}_j = 0$
      - where  $j$  indicates the first radio link listed in the message
  - If the UE receives a message where the above relations are not respected, the UE shall set the variable INVALID\_CONFIGURATION to true.

## 8.3.5.2 Timing-maintained hard handover

### 8.3.5.2.1 General

The purpose of the Timing-maintained hard handover procedure is to remove all the RL(s) in the active set and establish new RL(s) while maintaining the UL transmission timing and the CFN in the UE.

This procedure can be initiated only if UTRAN knows the target SFN timing before hard handover. The target SFN timing can be known by UTRAN in the following 2 cases:

- UE reads SFN when measuring "Cell synchronisation information" and sends it to the UTRAN in MEASUREMENT REPORT message.
- UTRAN internally knows the time difference between the cells.

### 8.3.5.2.2 Initiation

Timing-maintained hard handover initiated by the network is normally performed by using the procedure "Physical channel reconfiguration" (subclause 8.2.6), but may also be performed by using either one of the following procedures:

- "radio bearer establishment" (subclause 8.2.1);
- "Radio bearer reconfiguration" (subclause 8.2.2);
- "Radio bearer release" (subclause 8.2.3); or
- "Transport channel reconfiguration" (subclause 8.2.4).

If IE "Timing indication" has the value "maintain", UE shall initiate the Timing-maintained hard handover procedure by following the procedure indicated in the subclause relevant to the procedure chosen by the UTRAN.

- If the IE "Default DPCH Offset Value" is included,
  - UTRAN should include the same value of IE "Default DPCH Offset Value" as the one currently being used by the UE.
  - Note: The first radio link listed in the message may not be the reference radio link.
  - If the UE receives a message where the value of IE "Default DPCH Offset Value" is not the same as the one currently being used by the UE, the UE shall set the variable INVALID\_CONFIGURATION to true.

[...]

### 8.2.2.3 Reception of RADIO BEARER SETUP or RADIO BEARER RECONFIGURATION or RADIO BEARER RELEASE or TRANSPORT CHANNEL RECONFIGURATION or PHYSICAL CHANNEL RECONFIGURATION message by the UE

The UE shall be able to receive any of the following messages:

- RADIO BEARER SETUP message; or
- RADIO BEARER RECONFIGURATION message; or
- RADIO BEARER RELEASE message; or
- TRANSPORT CHANNEL RECONFIGURATION message; or
- PHYSICAL CHANNEL RECONFIGURATION message

and perform a hard handover, even if no prior UE measurements have been performed on the target cell and/or frequency.

If the UE receives:

- a RADIO BEARER SETUP message; or
- a RADIO BEARER RECONFIGURATION message; or
- a RADIO BEARER RELEASE message; or
- a TRANSPORT CHANNEL RECONFIGURATION message; or
- a PHYSICAL CHANNEL RECONFIGURATION message

it shall:

- set the variable ORDERED\_RECONFIGURATION to TRUE;
- may first release the current physical channel configuration and
- then establish a new physical channel configuration and act upon all received information elements as specified in subclause 8.6, unless specified in the following:
  - in FDD, if the IE "PDSCH code mapping" is included but the IE "PDSCH with SHO DCH Info" is not included and if the DCH has only one link in its active set:
    - act upon the IE "PDSCH code mapping" as specified in subclause 8.6 and:
    - infer that the PDSCH will be transmitted from the cell from which the downlink DPCH is transmitted;
- enter a state according to subclause 8.6.3.3.

If the UE remains in CELL\_DCH state after state transition, the UE shall:

- if the IE "UL DPCH Info" is absent, not change its current UL Physical channel configuration;
- if the IE "DL DPCH Info for each RL" is absent, not change its current DL Physical channel configuration.

If after state transition the UE enters CELL\_FACH state, the UE shall, after the state transition:

- if the IE "Frequency info" is included in the received reconfiguration message:
  - select a suitable UTRA cell according to [4] on that frequency;
- if the IE "Frequency info" is not included in the received reconfiguration message:
  - select a suitable UTRA cell according to [4];
- if the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selects another cell than indicated by this IE:
  - initiate a cell update procedure according to subclause 8.3.1 using the cause "Cell reselection";
  - when the cell update procedure completed successfully:
    - if the UE is in CELL\_PCH or URA\_PCH state:
      - initiate a cell update procedure according to subclause 8.3.1 using the cause "Uplink data transmission";
      - proceed as below;
- start timer T305 using its initial value if timer T305 is not running and if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;
- select PRACH according to subclause 8.6.6.2;
- select Secondary CCPCH according to subclause 8.6.6.5;
- use the transport format set given in system information;

- if the IE "UTRAN DRX cycle length coefficient" is included in the same message:
- ignore that IE and stop using DRX;
- if the contents of the variable C\_RNTI is empty:
  - perform a cell update procedure according to subclause 8.3.1 using the cause "Cell reselection";
  - when the cell update procedure completed successfully:
    - if the UE is in CELL\_PCH or URA\_PCH state:
      - initiate a cell update procedure according to subclause 8.3.1 using the cause "Uplink data transmission";
      - proceed as below;

The UE shall transmit a response message as specified in subclause 8.2.2.4, setting the information elements as specified below. The UE shall:

- if the received reconfiguration message included the IE "Downlink counter synchronisation info":
  - calculate the START value according to subclause 8.5.9;
  - include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info";
- if the received reconfiguration message did not include the IE "Downlink counter synchronisation info":
  - if the variable START\_VALUE\_TO\_TRANSMIT is set:
    - include and set the IE "START" to the value of that variable;
  - if the variable START\_VALUE\_TO\_TRANSMIT is not set and the IE "New U-RNTI" is included:
    - calculate the START value according to subclause 8.5.9;
    - include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info";
- if the received reconfiguration message contained the IE "Ciphering mode info":
  - include and set the IE "Radio bearer uplink ciphering activation time info" to the value of the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO;
- if the received reconfiguration message contained the IE "Integrity protection mode info" with the IE "Integrity protection mode command" set to "Modify":
  - include and set the IE "Integrity protection activation info" to the value of the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
- set the IE "RRC transaction identifier" to the value of "RRC transaction identifier" in the entry for the received message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- clear that entry;
- if the variable PDCP\_SN\_INFO is not empty:
  - include the IE "RB with PDCP information list" and set it to the value of the variable PDCP\_SN\_INFO;
- in TDD, if the procedure is used to perform a handover to a cell where timing advance is enabled, and the UE can calculate the timing advance value in the new cell (i.e. in a synchronous TDD network):
  - set the IE "Uplink Timing Advance" to the calculated value;
- if the IE "Integrity protection mode info" was present in the received reconfiguration message:

- start applying the new integrity protection configuration in the uplink for RB#2 from and including the transmitted response message;

If after state transition the UE enters CELL\_PCH or URA\_PCH state, the UE shall, after the state transition and transmission of the response message:

- if the IE "Frequency info" is included in the received reconfiguration message:
  - select a suitable UTRA cell according to [4] on that frequency;
- if the IE "Frequency info" is not included in the received reconfiguration message:
  - select a suitable UTRA cell according to [4];
- prohibit periodical status transmission in RLC;
- remove any C-RNTI from MAC;
- clear the variable C\_RNTI;
- start timer T305 using its initial value if timer T305 is not running and if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;
- select Secondary CCPCH according to subclause 8.6.6.5;
- if the IE "UTRAN DRX cycle length coefficient" is included in the same message:
  - use the value in the IE "UTRAN DRX Cycle length coefficient" for calculating Paging occasion and PICH Monitoring Occasion as specified in subclause 8.6.3.2;
- if the UE enters CELL\_PCH state, and the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE:
  - initiate a cell update procedure according to subclause 8.3.1 using the cause "cell reselection";
  - when the cell update procedure completed successfully:
    - The procedure ends;
- if the UE enters URA\_PCH state, and after cell selection the criteria for URA update caused by "URA reselection" according to subclause 8.3.1 is fulfilled:
  - initiate a URA update procedure according to subclause 8.3.1 using the cause "URA reselection";
  - when the URA update procedure completed:
    - The procedure ends.

[...]

#### 8.6.6.14 DPCH frame offset

If "DPCH frame offset" is included in a message that instructs the UE to enter CELL\_DCH state:

- if only one Radio Link is included in the message, UTRAN should set "Default DPCH Offset Value" and "DPCH frame offset" respecting the following relation:
  - $(\text{Default DPCH Offset Value} * 512) \bmod 38400 = \text{DPCH frame offset} * 256$
  - where the IE values used are the Actual Values of the IEs as defined in section 11
- if more than one Radio Link are included in the message, UTRAN should set "Default DPCH Offset Value" and "DPCH frame offset" respecting the following relation:
  - $(\text{Default DPCH Offset Value} * 512) \bmod 38400 = \text{DPCH frame offset}_i * 256$

- where  $j$  indicates the first radio link listed in the message and the IE values used are the Actual Values of the IEs as defined in section 11
- If the UE receives a message where the above relation between "Default DPCH Offset Value" and "DPCH frame offset" is not respected, the UE shall set the variable INVALID\_CONFIGURATION to true.

If the IE "DPCH frame offset" is included the UE shall:

- use its value to determine the beginning of the DPCH frame.

[...]

#### 8.6.6.21 Default DPCH Offset Value

The UE shall:

- if the IE "Default DPCH Offset Value" is included:
  - use its value to determine Frame Offset and Chip Offset from the SFN timing in a cell;
- if the IE "Default DPCH Offset Value" is not included:
  - use the previously received value stored in variable DOFF. If there is no previously received value stored in DOFF, the UE should use the value 0.

After transition from CELL\_DCH state to other states, the UE shall:

- erase the value stored in variable DOFF.

## CHANGE REQUEST

⌘ **25.331 CR 829** ⌘ 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  Radio Access Network  Core Network

<b>Title:</b>	⌘ Relation between DOFF and DPCH Frame Offset		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ May 23, 2001
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ REL-4
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

<b>Reason for change:</b>	⌘ There is a known relation between DOFF and DPCH Frame Offset. Since these IEs may be included in the same message, it is appropriate to clearly specify this relation and the corresponding behaviour of UTRAN and UE.
<b>Summary of change:</b>	⌘ UTRAN should set "Default DPCH Offset Value" and "DPCH frame offset" with non conflicting values. In particular the following relation should always apply: Entering CELL_DCH (1 RL) (Default DPCH Offset Value*512) mod 38400 = DPCH frame offset*256  Entering CELL_DCH (Several RLs) (Default DPCH Offset Value*512) mod 38400 = DPCH frame offset_j*256 j: reference radio link (first radio link listed in the message)  CELL_DCH state (timing-maintained hard handover, i.e. IE "Timing indication" has the value "maintain") UTRAN should include in the reconfiguration message the same value of "Default DPCH Offset Value" as the one currently being used by the UE. Note: The first radio link listed in the message may not be the reference radio link.  CELL_DCH state (timing re-initialised hard handover, i.e. IE "Timing indication" has the value "initialise") (Default DPCH Offset Value*512) mod 38400 = DPCH frame offset_j*256 <u>Where Default DPCH Offset Value is the transmitted one or the implicit one, if not transmitted.</u> j: reference radio link (first radio link listed in the message)  If UE receives a message where the above conditions are not respected, the UE shall set the variable INVALID_CONFIGURATION to true.  <b>Bacward Compatibility Analysis:</b>

		The Change is Backward compatible	
		Correction to a function where procedural text was missing.	
		The proposed changes would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.	
<b>Consequences if not approved:</b>	⌘	Different UTRAN/UE implementations may erroneously interpret existing requirements.	
<b>Clauses affected:</b>	⌘	8.3.5.1.2, 8.3.5.2.2, 8.6.6.14	
<b>Other specs affected:</b>	⌘	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘
<b>Other comments:</b>	⌘	CELL_DCH state (soft handover) UE shall maintain the same value of "Default DPCH Offset Value" as before the ACTIVE SET UPDATE message is received. Note: "Default DPCH Offset Value" is not transmitted in the ACTIVE SET UPDATE message and therefore no clarification is deemed necessary.	

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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.



## 8.3.5 Hard handover

### 8.3.5.1 Timing re-initialised hard handover

#### 8.3.5.1.1 General

The purpose of the timing re-initialised hard handover procedure is to remove all the RL(s) in the active set and establish new RL(s) along with a change in the UL transmission timing and the CFN in the UE according to the SFN of the target cell.(see subclause 8.5.15).

This procedure is initiated when UTRAN does not know the target SFN timing before hard handover.

#### 8.3.5.1.2 Initiation

Timing re-initialised hard handover initiated by the UTRAN is normally performed by using the procedure "Physical channel reconfiguration" (subclause 8.2.6), but may also be performed by using either one of the following procedures:

- "radio bearer establishment" (subclause 8.2.1);
- "Radio bearer reconfiguration" (subclause 8.2.2);
- "Radio bearer release" (subclause 8.2.3); or
- "Transport channel reconfiguration" (subclause 8.2.4).

If IE "Timing indication" has the value "initialise", UE shall execute the Timing Re-initialised hard handover procedure by following the procedure indicated in the subclause relevant to the procedure chosen by the UTRAN.

- If the IE "Default DPCH Offset Value" is included,
  - UTRAN should set "Default DPCH Offset Value" and "DPCH frame offset" respecting the following relation
    - $(\text{Default DPCH Offset Value} \times 512) \bmod 38400 = \text{DPCH frame offset}_j \times 256$
    - where  $j$  indicates the first radio link listed in the message and the IE values used are the Actual Values of the IEs as defined in section 11.
  - If the UE receives a message where the above relation between "Default DPCH Offset Value" and "DPCH frame offset" is not respected, the UE shall set the variable INVALID\_CONFIGURATION to true.
- if the IE "Default DPCH Offset Value" is not included:
  - UE shall use the previously received value stored in variable DOFF. If there is no previously received value stored in DOFF, the UE should use the value 0.
  - UTRAN should set "DPCH frame offset" respecting the following relation
    - If UTRAN has previously sent Default DPCH Offset Value to the UE
      - $(\text{previously sent Default DPCH Offset Value}) \bmod 38400 = \text{DPCH frame offset}_j$
      - where  $j$  indicates the first radio link listed in the message and the IE values used are the Actual Values of the IEs as defined in section 11.
    - If UTRAN has not previously sent Default DPCH Offset Value to the UE
      - $\text{DPCH frame offset}_j = 0$
      - where  $j$  indicates the first radio link listed in the message
  - If the UE receives a message where the above relations are not respected, the UE shall set the variable INVALID\_CONFIGURATION to true.

## 8.3.5.2 Timing-maintained hard handover

### 8.3.5.2.1 General

The purpose of the Timing-maintained hard handover procedure is to remove all the RL(s) in the active set and establish new RL(s) while maintaining the UL transmission timing and the CFN in the UE.

This procedure can be initiated only if UTRAN knows the target SFN timing before hard handover. The target SFN timing can be known by UTRAN in the following 2 cases:

- UE reads SFN when measuring "Cell synchronisation information" and sends it to the UTRAN in MEASUREMENT REPORT message.
- UTRAN internally knows the time difference between the cells.

### 8.3.5.2.2 Initiation

Timing-maintained hard handover initiated by the network is normally performed by using the procedure "Physical channel reconfiguration" (subclause 8.2.6), but may also be performed by using either one of the following procedures:

- "radio bearer establishment" (subclause 8.2.1);
- "Radio bearer reconfiguration" (subclause 8.2.2);
- "Radio bearer release" (subclause 8.2.3); or
- "Transport channel reconfiguration" (subclause 8.2.4).

If IE "Timing indication" has the value "maintain", UE shall initiate the Timing-maintained hard handover procedure by following the procedure indicated in the subclause relevant to the procedure chosen by the UTRAN.

- If the IE "Default DPCH Offset Value" is included,
  - UTRAN should include the same value of IE "Default DPCH Offset Value" as the one currently being used by the UE.
  - Note: The first radio link listed in the message may not be the reference radio link.
  - If the UE receives a message where the value of IE "Default DPCH Offset Value" is not the same as the one currently being used by the UE, the UE shall set the variable INVALID\_CONFIGURATION to true.

[...]

### 8.2.2.3 Reception of RADIO BEARER SETUP or RADIO BEARER RECONFIGURATION or RADIO BEARER RELEASE or TRANSPORT CHANNEL RECONFIGURATION or PHYSICAL CHANNEL RECONFIGURATION message by the UE

The UE shall be able to receive any of the following messages:

- RADIO BEARER SETUP message; or
- RADIO BEARER RECONFIGURATION message; or
- RADIO BEARER RELEASE message; or
- TRANSPORT CHANNEL RECONFIGURATION message; or
- PHYSICAL CHANNEL RECONFIGURATION message

and perform a hard handover, even if no prior UE measurements have been performed on the target cell and/or frequency.

If the UE receives:

- a RADIO BEARER SETUP message; or
- a RADIO BEARER RECONFIGURATION message; or
- a RADIO BEARER RELEASE message; or
- a TRANSPORT CHANNEL RECONFIGURATION message; or
- a PHYSICAL CHANNEL RECONFIGURATION message

it shall:

- set the variable ORDERED\_RECONFIGURATION to TRUE;
- may first release the current physical channel configuration and
- then establish a new physical channel configuration and act upon all received information elements as specified in subclause 8.6, unless specified in the following:
  - in FDD, if the IE "PDSCH code mapping" is included but the IE "PDSCH with SHO DCH Info" is not included and if the DCH has only one link in its active set:
    - act upon the IE "PDSCH code mapping" as specified in subclause 8.6 and:
    - infer that the PDSCH will be transmitted from the cell from which the downlink DPCH is transmitted;
- enter a state according to subclause 8.6.3.3.

If the UE remains in CELL\_DCH state after state transition, the UE shall:

- if the IE "UL DPCH Info" is absent, not change its current UL Physical channel configuration;
- if the IE "DL DPCH Info for each RL" is absent, not change its current DL Physical channel configuration.

If after state transition the UE enters CELL\_FACH state, the UE shall, after the state transition:

- if the IE "Frequency info" is included in the received reconfiguration message:
  - select a suitable UTRA cell according to [4] on that frequency;
- if the IE "Frequency info" is not included in the received reconfiguration message:
  - select a suitable UTRA cell according to [4];
- if the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selects another cell than indicated by this IE:
  - initiate a cell update procedure according to subclause 8.3.1 using the cause "Cell reselection";
  - when the cell update procedure completed successfully:
    - if the UE is in CELL\_PCH or URA\_PCH state:
      - initiate a cell update procedure according to subclause 8.3.1 using the cause "Uplink data transmission";
      - proceed as below;
- start timer T305 using its initial value if timer T305 is not running and if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;
- select PRACH according to subclause 8.6.6.2;
- select Secondary CCPCH according to subclause 8.6.6.5;
- use the transport format set given in system information;

- if the IE "UTRAN DRX cycle length coefficient" is included in the same message:
- ignore that IE and stop using DRX;
- if the contents of the variable C\_RNTI is empty:
  - perform a cell update procedure according to subclause 8.3.1 using the cause "Cell reselection";
  - when the cell update procedure completed successfully:
    - if the UE is in CELL\_PCH or URA\_PCH state:
      - initiate a cell update procedure according to subclause 8.3.1 using the cause "Uplink data transmission";
      - proceed as below;

The UE shall transmit a response message as specified in subclause 8.2.2.4, setting the information elements as specified below. The UE shall:

- if the received reconfiguration message included the IE "Downlink counter synchronisation info":
  - calculate the START value according to subclause 8.5.9;
  - include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info";
- if the received reconfiguration message did not include the IE "Downlink counter synchronisation info":
  - if the variable START\_VALUE\_TO\_TRANSMIT is set:
    - include and set the IE "START" to the value of that variable;
  - if the variable START\_VALUE\_TO\_TRANSMIT is not set and the IE "New U-RNTI" is included:
    - calculate the START value according to subclause 8.5.9;
    - include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info";
- if the received reconfiguration message contained the IE "Ciphering mode info":
  - include and set the IE "Radio bearer uplink ciphering activation time info" to the value of the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO;
- if the received reconfiguration message contained the IE "Integrity protection mode info" with the IE "Integrity protection mode command" set to "Modify":
  - include and set the IE "Integrity protection activation info" to the value of the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
- set the IE "RRC transaction identifier" to the value of "RRC transaction identifier" in the entry for the received message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- clear that entry;
- if the variable PDCP\_SN\_INFO is not empty:
  - include the IE "RB with PDCP information list" and set it to the value of the variable PDCP\_SN\_INFO;
- in TDD, if the procedure is used to perform a handover to a cell where timing advance is enabled, and the UE can calculate the timing advance value in the new cell (i.e. in a synchronous TDD network):
  - set the IE "Uplink Timing Advance" to the calculated value;
- if the IE "Integrity protection mode info" was present in the received reconfiguration message:

- start applying the new integrity protection configuration in the uplink for RB#2 from and including the transmitted response message;

If after state transition the UE enters CELL\_PCH or URA\_PCH state, the UE shall, after the state transition and transmission of the response message:

- if the IE "Frequency info" is included in the received reconfiguration message:
  - select a suitable UTRA cell according to [4] on that frequency;
- if the IE "Frequency info" is not included in the received reconfiguration message:
  - select a suitable UTRA cell according to [4];
- prohibit periodical status transmission in RLC;
- remove any C-RNTI from MAC;
- clear the variable C\_RNTI;
- start timer T305 using its initial value if timer T305 is not running and if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;
- select Secondary CCPCH according to subclause 8.6.6.5;
- if the IE "UTRAN DRX cycle length coefficient" is included in the same message:
  - use the value in the IE "UTRAN DRX Cycle length coefficient" for calculating Paging occasion and PICH Monitoring Occasion as specified in subclause 8.6.3.2;
- if the UE enters CELL\_PCH state, and the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE:
  - initiate a cell update procedure according to subclause 8.3.1 using the cause "cell reselection";
  - when the cell update procedure completed successfully:
    - The procedure ends;
- if the UE enters URA\_PCH state, and after cell selection the criteria for URA update caused by "URA reselection" according to subclause 8.3.1 is fulfilled:
  - initiate a URA update procedure according to subclause 8.3.1 using the cause "URA reselection";
  - when the URA update procedure completed:
    - The procedure ends.

[...]

#### 8.6.6.14 DPCH frame offset

If "DPCH frame offset" is included in a message that instructs the UE to enter CELL\_DCH state:

- if only one Radio Link is included in the message, UTRAN should set "Default DPCH Offset Value" and "DPCH frame offset" respecting the following relation:
  - $(\text{Default DPCH Offset Value} * 512) \bmod 38400 = \text{DPCH frame offset} * 256$
  - where the IE values used are the Actual Values of the IEs as defined in section 11
- if more than one Radio Link are included in the message, UTRAN should set "Default DPCH Offset Value" and "DPCH frame offset" respecting the following relation:
  - $(\text{Default DPCH Offset Value} * 512) \bmod 38400 = \text{DPCH frame offset}_i * 256$

- where  $j$  indicates the first radio link listed in the message and the IE values used are the Actual Values of the IEs as defined in section 11
- If the UE receives a message where the above relation between "Default DPCH Offset Value" and "DPCH frame offset" is not respected, the UE shall set the variable INVALID\_CONFIGURATION to true.

If the IE "DPCH frame offset" is included the UE shall:

- use its value to determine the beginning of the DPCH frame.

[...]

#### 8.6.6.21 Default DPCH Offset Value

The UE shall:

- if the IE "Default DPCH Offset Value" is included:
  - use its value to determine Frame Offset and Chip Offset from the SFN timing in a cell;
- if the IE "Default DPCH Offset Value" is not included:
  - use the previously received value stored in variable DOFF. If there is no previously received value stored in DOFF, the UE should use the value 0.

After transition from CELL\_DCH state to other states, the UE shall:

- erase the value stored in variable DOFF.

## CHANGE REQUEST

⌘ **25.331 CR 830** ⌘ ev **r1** ⌘ Current version: **3.6.0** ⌘

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

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

<b>Title:</b>	⌘ Procedures for "same as UL"		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ May 21, 2001
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ R99
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)	<b>R96</b> (Release 1996)	<b>2</b> (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)	<b>R97</b> (Release 1997)	
	<b>B</b> (addition of feature),	<b>R98</b> (Release 1998)	
	<b>C</b> (functional modification of feature)	<b>R99</b> (Release 1999)	
	<b>D</b> (editorial modification)	<b>REL-4</b> (Release 4)	
	Detailed explanations of the above categories can be found in 3GPP TR 21.900.	<b>REL-5</b> (Release 5)	

<b>Reason for change:</b>	⌘ The UE behaviour is currently not specified for the case in which the "same as UL" choice is used together with an invalid "UL entity"
<b>Summary of change:</b>	⌘ If the "UL entity" does not exist or is not indicated in the message the UE shall set the variable INVALID_CONFIGURATION to true. <b>Backwards compatibility analysis</b> The Change is Backward compatible Correction to a function where procedural text was missing. The proposed changes would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.
<b>Consequences if not approved:</b>	⌘ The UE behaviour would be unspecified in some error conditions

<b>Clauses affected:</b>	⌘ 8.6.5.6, 8.6.5.10		
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications	⌘	
	<input type="checkbox"/> Test specifications		
	<input type="checkbox"/> O&M Specifications		
<b>Other comments:</b>	⌘		

### 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](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.



### 8.6.5.6 Added or Reconfigured DL TrCH information

If the IE "Added or Reconfigured DL TrCH information" is included then for the transport channel identified by the IE "DL Transport Channel Identity" the UE shall:

- if the choice "DL parameters" is set to 'independent':
  - perform the actions for the IE "Transport Format Set" as specified in subclause 8.6.5.1;
- if the choice "DL parameters" is set to 'same as uplink':
  - If the IE "UL Transport Channel Identity" indicates an existing or a new UL Transport Channel,
    - store as transport format for this transport channel the transport format associated with the transport channel identified by the IE "UL Transport Channel Identity"; [Editor's note: style changed to B2]
  - else,
    - set the variable INVALID\_CONFIGURATION to **TRUE**;
- if the IE "DCH quality target" is included:
  - perform the actions specified in subclause 8.6.5.4;
- if the IE "Transparent mode signalling info" is included:
  - consider the messages received on this transport channel to have the message type according to the value of the IE "Type of message";
  - if the choice "Transparent signalling mode" is set to "Mode 1":
    - consider the messages received on this transport channel affect all established DCHs;
  - if the choice "Transparent signalling mode" is set to "Mode 2":
    - consider the messages received on this transport channel affect the DCHs identified with the IE "UL controlled transport channels" in the IE "Controlled transport channels list";
    - if any of the DCHs identified with the IE "UL controlled transport channels" in the IE "Controlled transport channels list" does not exist:
      - set the variable INVALID\_CONFIGURATION to TRUE.

[...]

### 8.6.5.10 DL Transport channel information common for all transport channels

If the IE "DL Transport channel information common for all transport channels" is included the UE shall:

- if the IE "SCCPCH TFCS" is included:
  - perform actions for the TFCS of the selected SCCPCH as specified in subclause 8.6.5.2;
- if the IE choice "mode" is set to FDD:
  - if the choice "DL parameters" is set to 'Independent':
    - if the IE "DL DCH TFCS" is included:
      - perform actions as specified 8.6.5.2;
- if the IE choice "mode" is set to TDD:
  - if the IE "Individual DL CCTRCH information" is included:
    - for each DL TFCS identified by the IE "DL TFCS identity":

- if the IE choice "DL parameters" is set to 'independent':
  - perform actions for the IE "DL TFCS" as specified in 8.6.5.2;
- if the IE choice "DL parameters" is set to 'same as UL':
  - If the IE " UL DCH TFCS identity" indicates an existing or a new UL TFCS,  
[TAB]- store for that DL TFCS the TFCS identified by the IE "UL DCH TFCS identity".
  - else,  
[TAB]- set the variable INVALID\_CONFIGURATION to **TRUE**;

## CHANGE REQUEST

⌘ **25.331 CR 831** ⌘ 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  Radio Access Network  Core Network

<b>Title:</b>	⌘ Procedures for "same as UL"		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ May 23, 2001
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ REL-4
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900.		REL-4 (Release 4)
			REL-5 (Release 5)

<b>Reason for change:</b>	⌘ The UE behaviour is currently not specified for the case in which the "same as UL" choice is used together with an invalid "UL entity"
<b>Summary of change:</b>	⌘ If the "UL entity" does not exist or is not indicated in the message the UE shall set the variable INVALID_CONFIGURATION to true. <b>Backwards compatibility analysis</b> The Change is Backward compatible Correction to a function where procedural text was missing. The proposed changes would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.
<b>Consequences if not approved:</b>	⌘ The UE behaviour would be unspecified in some error conditions

<b>Clauses affected:</b>	⌘ 8.6.5.6, 8.6.5.10		
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications	⌘	
	<input type="checkbox"/> Test specifications		
	<input type="checkbox"/> O&M Specifications		
<b>Other comments:</b>	⌘		

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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.

### 8.6.5.6 Added or Reconfigured DL TrCH information

If the IE "Added or Reconfigured DL TrCH information" is included then for the transport channel identified by the IE "DL Transport Channel Identity" the UE shall:

- if the choice "DL parameters" is set to 'independent':
  - perform the actions for the IE "Transport Format Set" as specified in subclause 8.6.5.1;
- if the choice "DL parameters" is set to 'same as uplink':
  - If the IE "UL Transport Channel Identity" indicates an existing or a new UL Transport Channel,
    - store as transport format for this transport channel the transport format associated with the transport channel identified by the IE "UL Transport Channel Identity"; [Editor's note: style changed to B2]
  - else,
    - set the variable INVALID\_CONFIGURATION to TRUE;
- if the IE "DCH quality target" is included:
  - perform the actions specified in subclause 8.6.5.4;
- if the IE "Transparent mode signalling info" is included:
  - consider the messages received on this transport channel to have the message type according to the value of the IE "Type of message";
  - if the choice "Transparent signalling mode" is set to "Mode 1":
    - consider the messages received on this transport channel affect all established DCHs;
  - if the choice "Transparent signalling mode" is set to "Mode 2":
    - consider the messages received on this transport channel affect the DCHs identified with the IE "UL controlled transport channels" in the IE "Controlled transport channels list";
    - if any of the DCHs identified with the IE "UL controlled transport channels" in the IE "Controlled transport channels list" does not exist:
      - set the variable INVALID\_CONFIGURATION to TRUE.

[...]

### 8.6.5.10 DL Transport channel information common for all transport channels

If the IE "DL Transport channel information common for all transport channels" is included the UE shall:

- if the IE "SCCPCH TFCS" is included:
  - perform actions for the TFCS of the selected SCCPCH as specified in subclause 8.6.5.2;
- if the IE choice "mode" is set to FDD:
  - if the choice "DL parameters" is set to 'Independent':
    - if the IE "DL DCH TFCS" is included:
      - perform actions as specified 8.6.5.2;
- if the IE choice "mode" is set to TDD:
  - if the IE "Individual DL CCTRCH information" is included:
    - for each DL TFCS identified by the IE "DL TFCS identity":

- if the IE choice "DL parameters" is set to 'independent':
  - perform actions for the IE "DL TFCS" as specified in 8.6.5.2;
- if the IE choice "DL parameters" is set to 'same as UL':
  - If the IE " UL DCH TFCS identity" indicates an existing or a new UL TFCS,  
[TAB]- store for that DL TFCS the TFCS identified by the IE "UL DCH TFCS identity".
  - else,  
[TAB]- set the variable INVALID\_CONFIGURATION to **TRUE**;

## CHANGE REQUEST

⌘ **25.331 CR 836** ⌘ ev **r1** ⌘ Current version: **3.6.0** ⌘

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

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

<b>Title:</b>	⌘ Editorial and minor corrections		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ May 21, 2001
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ R99
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900.		REL-4 (Release 4)
			REL-5 (Release 5)

<b>Reason for change:</b>	⌘	<p>1. Inconsistencies between Tabular and ASN.1</p> <p>Compressed mode with measurement purpose "multi-carrier" is missing.</p> <p>Slimit, SearchRAT Slimit is misspelled</p> <p>Qoffset<sub>1,s,n</sub> has only integer values but is defined as Real in Tabular</p> <p>In GSM Qrxlevmin is equivalent to RXLEV, not RSCP</p> <p>Max PDCP SN window size is CV and has a default value in Tabular</p> <p>Independent is used in Tabular, Explicit is used in ASN.1</p> <p>In DL Transport channel information common for all transport channels MP and OP is swapped for two IEs.</p> <p>DRAC Class Identity should be Integer(1.. maxDRACclasses) in Tabular</p> <p>Downlink DPCH info for each RL Post is missing some IEs that are present in ASN.1</p> <p>Downlink information for each radio link includes IEs that are not present in ASN.1</p> <p>T Reconfirm abort should be a Real</p> <p>Comments are added to ASN.1 for Alpha and UL-ControlledTrChList</p> <p>dpch-FrameOffset is misspelled in ASN.1</p> <p>IdentificationOfReceivedMessage is misspelled in ASN.1</p> <p>2. Erroneous description of PDSCH code mapping for the "signalling method" set to 'code range' and conflicting requirement in Tabular's semantics description.</p> <p>3. Compressed mode with measurement purpose "multi-carrier" is missing.</p>
<b>Summary of change:</b>	⌘	<p>1. Tabular is modified to be consistent with ASN.1. ASN.1 misspellings are corrected</p> <p>2. Description of PDSCH code mapping for the "signalling method" is corrected, and the misleading semantics description is removed from the Tabular.</p> <p>3. "Multi-carrier" is added to TGMP</p>

**Backward compatibility analysis:**

All proposed changes are backward compatible

1. Correction to a function where the specification was ambiguous.  
The changes would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.

2. Correction to a function where the specification was containing some contradictions.  
The changes would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise

3. Correction to a function where rules were missing.  
Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.

**Consequences if not approved:** ☞ The affected functions would not be correctly specified

**Clauses affected:** ☞ 8.6.6.10, 10.3.2.3, 10.3.2.4, 10.3.4.2, 10.3.5.1, 10.3.5.6, 10.3.5.7, 10.3.5.9, 10.3.5.16, 10.3.6.18, 10.3.6.22, 10.3.6.27, 10.3.6.30, 10.3.6.33, 10.3.6.43, 10.3.6.55, 11

**Other specs affected:** ☞  Other core specifications ☞   
 Test specifications  
 O&M Specifications

**Other comments:** ☞

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### 8.6.6.10 PDSCH code mapping (FDD only)

If the IE "PDSCH code mapping" is included, the UE shall:

- use the scrambling code defined by the IE "DL Scrambling Code" to receive the PDSCH;
- if the IE choice "signalling method" is set to 'code range':
  - map the TFCI(field2) values to PDSCH codes in the following way:
    - for the first group of the IE "PDSCH code mapping":
      - if the value of the IE "multi-code info" equals 1:
        - map the TFCI(field 2) = 0 to the PDSCH code specified by the IE "Spreading factor" and the code number given by the IE "Code number (for PDSCH code) start";
        - map TFCI(field 2) = 1 to the PDSCH code specified by the IE "Spreading factor" and the code number given by the IE "Code number (for PDSCH code) start"+1;
        - continue this process with unit increments in the value of TFCI(field 2) mapped to unit increments in code number until the code number equals the value of the IE "Code number (for PDSCH code) stop";
      - if the value of the IE "multi-code info" is greater than 1:
        - if the value of the difference between the IE "Code number (for PDSCH code) stop" and the IE "Code number (for PDSCH code) start" + 1 is not a multiple of the value of the IE "multi-code info":
          - set the variable INVALID\_CONFIGURATION to TRUE;
        - map TFCI (field 2)=0 to a set of PDSCH contiguous codes. This code set is specified by the IE "Spreading factor" and code numbers between 'code number start' denoted by the IE "Code number (for PDSCH code) start" and 'code number stop' given by IE "Code number (for PDSCH code) start" - 1 + the value of the IE "multi-code info";
        - continue this process with unit increments in the value of TFCI(field 2) mapped to a set of contiguous codes. This code set is specified by the IE "Spreading factor" and code numbers between 'code number start' = 'code number stop'+1 of the previous TFCI(field2) and 'code number stop'='code number start' - 1 + the value of the IE "multi-code info";
        - stop this process when the 'code number stop' associated to the last TFCI(field2) equals the value of the IE "Code number (for PDSCH code) stop";
    - for each of the next groups included in the IE "PDSCH code mapping":
      - continue the process in the same way as for the first group with the TFCI(field 2) value used by the UE to construct its mapping table starting at the largest TFCI(field 2) value reached in the previous group plus one;
      - if the value of the IE "Code number (for PDSCH code) start" equals the value of the IE "Code number (for PDSCH code) stop" (as may occur when mapping the PDSCH root code to a TFCI (field 2) value):
        - consider this as defining the mapping between the channelisation code and a single TFCI (i.e., TFCI(field 2) shall not be incremented twice);
- if the IE choice "signalling method" is set to 'TFCI range':
  - map the TFCI(field2) values to PDSCH codes in the following way:
    - for the first group of the IE "DSCH mapping":
      - map each of the TFCI(field 2) between 0 and the value of the IE "Max TFCI(field2)" to the PDSCH code specified by the IE "Spreading factor (for PDSCH code)" and the code number given by the IE "Code number (for PDSCH code)";
    - for each of the next groups included in the IE "DSCH mapping":

- map each of the TFCI(field 2) between the IE "Max TFCI(field2) value" specified in the last group plus one and the specified IE "Max TFCI(field2)" in the current group to the PDSCH code specified by the IE "Spreading factor (for PDSCH code)" and the code number given by the IE "Code number (for PDSCH code)";
- if the value of the IE "multi-code info" is greater than 1:
  - map each value of TFCI (field 2) to a set of PDSCH contiguous codes starting at the channelisation code denoted by the 'code number' parameter and including all codes with code numbers up to and including 'code number' - 1 + the value of the IE "multi-code info";
- if the IE choice "signalling method" is set to 'Explicit'
  - map the TFCI(field2) values to PDSCH codes in the following way:
    - for the first instance on the IE "PDSCH code info":
      - apply the PDSCH code specified by the IE "Spreading factor (for PDSCH code)" and the code number given by the IE "Code number (for PDSCH code)" for TFCI(field2)=0;
    - for the second instance of the IE "PDSCH code info":
      - apply the PDSCH code specified by the IE "Spreading factor (for PDSCH code)" and the code number given by the IE "Code number (for PDSCH code)" for TFCI(field2)=1;
    - continue in a similar way for each next instance of the IE "PDSCH code info";
  - if the value of the IE "multi-code info" is greater than 1, then
    - map each value of TFCI (field 2) to a set of PDSCH contiguous codes starting at the channelisation code denoted by the 'code number' parameter and including all codes with code numbers up to and including 'code number' - 1 + the value of the IE "multi-code info";
- if the IE choice "signalling method" is set to 'Replace':
  - map the TFCI(field2) values to PDSCH codes in the following way:
    - for each instance of the IE "Replaced PDSCH code":
      - replace the corresponding PDSCH code for the TFCI(field2) identified by the IE "TFCI(field2)" with the new code specified by the IE "Spreading factor (for PDSCH code)" and the code number given by the IE "Code number (for PDSCH code)";
  - if the value of the IE "multi-code info" is greater than 1:
    - map each value of TFCI (field 2) to a set of PDSCH contiguous codes starting at the channelisation code denoted by the 'code number' parameter and including all codes with code numbers up to and including 'code number' - 1 + the value of the IE "multi-code info".

[...]

## 10.3.2.3 Cell selection and re-selection info for SIB3/4

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Mapping Info	MD		Mapping info 10.3.2.5	Contains mapping function for quality measurements. Default is an implicit mapping: $Q_{map} = Q_{meas,LEV}$ , [4].
Cell_selection_and_reselection_quality_measure	MP		Enumerated (CPICH Ec/N0, CPICH RSCP)	Choice of measurement (CPICH Ec/N0 or CPICH RSCP) to use as quality measure Q for FDD cells.
CHOICE mode	MP			
>FDD				
>>S <sub>intrasearch</sub>	OP		Integer (-32..20 by step of 2)	[4] [dB]
>>S <sub>intersearch</sub>	OP		Integer (-32..20 by step of 2)	[4] [dB]
>>S <sub>searchHCS</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>RAT List	OP	1 to <maxOther RAT>		
>>>RAT identifier	MP		Enumerated (GSM, cdma2000)	
>>>S <sub>search,RAT</sub>	MP		Integer (-105..91 by step of 2)	[4] [dB]
>>>S <sub>HCS,RAT</sub>	OP		Integer (-32..20 by step of 2)	[4] [dB]
>>>S <sub>limit,SearchRAT</sub> .S <sub>limit,SearchRAT</sub>	OP		Integer (-32..20 by step of 2)	[4] [dB]
>TDD				
>>S <sub>intrasearch</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]

>>S <sub>intersearch</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>S <sub>searchHCS</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>>RAT List	OP	1 to <maxOther RAT>		
>>>>RAT identifier	MP		Enumerated (GSM, cdma2000)	
>>>>S <sub>search,RAT</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>>>S <sub>HCS,RAT</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>>>S <sub>limit,SearchRAT</sub> S <sub>limit,SearchRAT</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
Qhyst1 <sub>s</sub>	MP		Integer (0..40 by step of 2)	[4]
Qhyst2 <sub>s</sub>	CV-FDD-Quality-Measure		Integer (0..40 by step of 2)	Default value is Qhyst1 <sub>s</sub> [4]
Treselection <sub>s</sub>	MP		Integer (0..31)	[s]
HCS Serving cell Information	OP		HCS Serving cell information 10.3.7.12	
Maximum allowed UL TX power	MP		Maximum allowed UL TX power 10.3.6.39	[dBm] UE_TXPWR_MAX_RACH in [4].
CHOICE <i>mode</i>	MP			
>FDD				
>>Qqualmin	MP		Integer (-20..0)	Ec/N0, [dB]
>>Qrxlevmin	MP		Integer (-115..-25 by step of 2)	RSCP, [dBm]
>TDD				
>>Qrxlevmin	MP		Integer (-115..-25 by step of 2)	RSCP, [dBm]

Condition	Explanation
CV-FDD-Quality-Measure	Presence is not allowed if the IE "Cell_selection_and_reselection_quality_measure" has the value CPICH RSCP, otherwise the IE is mandatory and has a default value.

10.3.2.4 Cell selection and re-selection info for SIB11/12

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Qoffset1 <sub>s,n</sub>	MD		RealInteger(-50.0..50.0 by step of 4)	Default value is 0.
Qoffset2 <sub>s,n</sub>	CV-FDD-Quality-Measure		RealInteger(-50.0..50.0 by step of 4)	Default value is 0.
Maximum allowed UL TX power	MD		Maximum allowed UL TX power 10.3.6.39	[dBm] UE_TXPWR_MAX_RACH in [4]. Default is the Maximum allowed UL TX power for the serving cell
HCS neighbouring cell information	OP		HCS Neighbouring cell information 10.3.7.11	
CHOICE mode	MP			
>FDD				
>>Qqualmin	MD		Integer (-20..0)	Ec/N0, [dB] Default value is Qqualmin for the serving cell
>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell
>TDD				
>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell
>GSM				
>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP <del>RXLEV</del> , [dBm] Default value is Qrxlevmin for the serving cell

Condition	Explanation
FDD-Quality-Measure	Presence is not allowed if the IE "Cell_selection_and_reselection_quality_measure" has the value CPICH RSCP, otherwise the IE is mandatory and has a default value.

[...]

10.3.4.2 PDCP info

The purpose of the PDCP info IE is to indicate which algorithms shall be established and to configure the parameters of each of the algorithms.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Support for lossless SRNS relocation	CV- <i>LosslessCriteria</i>		Boolean	TRUE means support
Max PDCP SN window size	CV <i>Lossless</i>		Integer (255, 65535)	Maximum PDCP sequence number window size. The handling of sequence number when the Max PDCP SN window size is 255 is specified in [23]. Default value is 65535.
PDCP PDU header	MD		Enumerated (present, absent)	Whether a PDCP PDU header is existent or not. Default value is "present"
Header compression information	OP	1 to <maxPDCPAlgoType>		
>CHOICE <i>algorithm type</i>	MP			
>>RFC2507				Header compression according to IETF standard RFC2507
>>>F_MAX_PERIOD	MD		Integer (1..65535)	Largest number of compressed non-TCP headers that may be sent without sending a full header. Default value is 256.
>>>F_MAX_TIME	MD		Integer (1..255)	Compressed headers may not be sent more than F_MAX_TIME seconds after sending last full header. Default value is 5.
>>>MAX_HEADER	MD		Integer (60..65535)	The largest header size in octets that may be compressed. Default value is 168.
>>>TCP_SPACE	MD		Integer (3..255)	Maximum CID value for TCP connections. Default value is 15.
>>>NON_TCP_SPACE	MD		Integer (3..65535)	Maximum CID value for non-TCP connections. Default value is 15.
>>>EXPECT_REORDERING	MD		Enumerated (reordering not expected, reordering expected)	Whether the algorithm shall reorder PDCP SDUs or not. Default value is "reordering not expected".

Condition	Explanation
<i>LosslessCriteria</i>	This IE is present only if the IE "RLC mode" is "Acknowledged" and the IE "In-sequence delivery " is "True".
<i>Lossless</i>	This IE shall be present if the IE "Support for lossless SRNS relocation" is TRUE, otherwise it shall be absent.

[...]

10.3.5.1 Added or Reconfigured DL TrCH information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Downlink transport channel type	MP		Enumerated(DCH,DSCH)	
DL Transport channel identity	MP		Transport channel identity 10.3.5.18	
CHOICE DL parameters				
>IndependentExplicit				
>>TFS	MP		Transport Format Set 10.3.5.23	
>SameAsUL				
>>Uplink transport channel type	MP		Enumerated(DCH,USCH)	USCH is TDD only
>>UL TrCH identity	MP		Transport channel identity 10.3.5.18	Same TFS applies as specified for indicated UL TrCH
DCH quality target	OP		Quality target 10.3.5.10	
Transparent mode signalling info	CV- MessageType		Transparent mode signalling info 10.3.5.17	This IE is not used in RB RELEASE message nor RB RECONFIGURATION message

Condition	Explanation
MessageType	This IE is absent in Radio Bearer Release message and Radio Bearer Reconfiguration message. Otherwise it is OPTIONAL.

[...]

10.3.5.6 DL Transport channel information common for all transport channels

Information Element/Group name	Need	Multi	Type and reference	Semantics description
SCCPCH TFCS	OP		Transport Format Combination Set 10.3.5.20	This IE should be absent within IE "Predefined RB configuration"
CHOICE mode	OP			
>FDD				
>>CHOICE DL parameters	<u>MPOP</u>			
>>>IndependentExplicit				
>>>>DL DCH TFCS	<u>OPMP</u>		Transport Format Combination Set 10.3.5.20	
>>>SameAsUL				(no data)
>TDD				
>>Individual DL CCTrCH information	OP	1 to >maxCCTrCH>		
>>>DL TFCS Identity	MP		Transport format combination set identity 10.3.5.21	Identifies a special CCTrCH for shared or dedicated channels.
>>>CHOICE DL parameters	MP			
>>>>Independent				
>>>>>DL TFCS	MP		Transport format combination set 10.3.5.20	
>>>>SameAsUL				
>>>>>UL DCH TFCS Identity	MP		Transport format combination set identity 10.3.5.21	Same TFCS applies as specified for the indicated UL DCH TFCS identity except for information applicable for UL only

NOTE This information element is included within IE "Predefined TrCh configuration"

10.3.5.7 DRAC Static Information

NOTE: Only for FDD.

Contains static parameters used by the DRAC procedure. Meaning and use is described in subclause 14.8.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Transmission Time Validity	MP		Integer(1..256)	number of frames
Time duration before retry	MP		Integer(1..256)	number of frames
DRAC Class Identity	MP		Integer(1..maxDRACclasses)	Indicates the class of DRAC parameters to use in SIB10 message

[...]

10.3.5.9 Predefined TrCH configuration

This information element concerns a pre- defined configuration of transport channel parameters.



Information Element/Group name	Need	Multi	Type and Reference	Semantics description
UL Transport channel information common for all transport channels	MP		UL Transport channel information common for all transport channels 10.3.5.24	
<b>Added or Reconfigured TrCH information [Bold]</b>				
Added or Reconfigured UL TrCH information	MP	1 to <maxTrCH preconf>		
>Added or Reconfigured UL TrCH information	MP		Added or Reconfigured UL TrCH information 10.3.5.2	
DL Transport channel information common for all transport channels	MP		DL Transport channel information common for all transport channels 10.3.5.6	
<b>Downlink transport channels [Bold]</b>				
Added or Reconfigured DL TrCH information	MP	1 to <maxTrCH preconf>		
>Added or Reconfigured DL TrCH information	MP		Added or Reconfigured DL TrCH information 10.3.5.1	

[...]

### 10.3.5.16 TFCS Removal Information

Information Element/Group name	Need	Multi	IE type and reference	Semantics description
Removal TFCI information	MP	1 to <maxTFC>		
>TFCI	MP		Integer(0..1023)	In TDD 0 is a reserved value

Range Bound	Explanation
<i>MaxDelTFCcount</i>	Maximum number of Transport Format Combinations to be removed.

[...]

10.3.6.18 Downlink DPCH info common for all RL

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Timing Indication	MP		Enumerated(Initialise, Maintain)	
CFN-targetSFN frame offset	CV TimInd		Integer(0..255)	In frame
<b>CHOICE mode</b>				
<b>&gt;FDD</b>				
>>Downlink DPCH power control information	OP		Downlink DPCH power control information 10.3.6.23	
>>Power offset $P_{\text{Pilot-DPDCH}}$	MP		Integer(0..24)	Power offset equals $P_{\text{Pilot}} - P_{\text{DPDCH}}$ , range 0..6 dB, in steps of 0.25 dB
>>Downlink rate matching restriction information	OP		Downlink rate matching restriction information 10.3.6.31	If this IE is set to "absent", no Transport CH is restricted in TFI.
>>Spreading factor	MP		Integer(4, 8, 16, 32, 64, 128, 256, 512)	
>>Fixed or Flexible Position	MP		Enumerated (Fixed, Flexible)	
>>TFCI existence	MP		Boolean	TRUE indicates that TFCI exists
<b>&gt;&gt;CHOICE SF</b>				
<b>&gt;&gt;&gt;SF = 256</b>				
>>>>Number of bits for Pilot bits	MP		Integer (2,4,8)	In bits
<b>&gt;&gt;&gt;&gt;SF = 128</b>				
>>>>Number of bits for Pilot bits	MP		Integer(4,8)	In bits
>>>>Otherwise				(no data)
<b>&gt;TDD</b>				
>>Common timeslot info	MD		Common Timeslot Info 10.3.6.10	Default is the current Common timeslot info

CHOICE SF	Condition under which the given SF is chosen
SF=128	"Spreading factor" is set to 128
SF=256	"Spreading factor" is set to 256
Otherwise	"Spreading factor" is set to a value distinct from 128 and 256

Condition	Explanation
<i>TimInd</i>	This IE is OPTIONAL if the IE "Timing Indication" is set to "Initialise". Otherwise it is absent.

[...]

10.3.6.22 Downlink DPCH info for each RL Post

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE <i>mode</i>	MP			
>FDD				
>>Primary CPICH usage for channel estimation	MP		Primary CPICH usage for channel estimation 10.3.6.62	
>>Secondary scrambling code	MD		Secondary scrambling code 10.3.6.74	Default is the same scrambling code as for the Primary CPICH
>>>CHOICE <i>Spreading factor</i>	MP		Integer(4, 8, 16, 32, 64, 128, 256, 512)	Defined in CHOICE SF512-AndCodenumbr with "code number" in ASN.1
>>>Code number	MP		Integer(0..max CodeNum)	
>>>Scrambling code change	CH SF/2		Enumerated (code change, no code change)	Indicates whether the alternative scrambling code is used for compressed mode method 'SF/2'.
>>>>TPC combination index	MP		TPC combination index 10.3.6.85	
>TDD				
>>>Downlink DPCH timeslots and codes	MP		Downlink Timeslots and Codes 10.3.6.32	

[...]

## 10.3.6.27 Downlink information for each radio link

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Choice mode	MP			
>FDD				
>>Primary CPICH info	MP		Primary CPICH info 10.3.6.60	
>>PDSCH with SHO DCH Info	OP		PDSCH with SHO DCH Info 10.3.6.47	
>>PDSCH code mapping	OP		PDSCH code mapping 10.3.6.43	
>TDD				
>>Primary CCPCH info	MP		Primary CCPCH info 10.3.6.57	
Downlink DPCH info for each RL	OP		Downlink DPCH info for each RL 10.3.6.21	
Secondary CCPCH info	OP		Secondary CCPCH info 10.3.6.71	
References to system information blocks	OP	1 to <maxSIB-FACH>		
>Scheduling information	MP		Scheduling information 10.3.8.16	
>SIB type SIBs only	MP		SIB Type SIBs only, 10.3.8.22	

[...]

## 10.3.6.30 Downlink PDSCH information

NOTE: Only for FDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>PDSCH with SHO DCH Info	OP		PDSCH with SHO DCH Info 10.3.6.47	
>>PDSCH code mapping	OP		PDSCH code mapping 10.3.6.43	

[...]

## 10.3.6.33 DPCH compressed mode info

NOTE: Only for FDD.

This information element indicates the parameters of the compressed mode to be used by the UE in order to perform inter-frequency and inter-RAT measurements.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Transmission gap pattern sequence		1 to <maxTGP		

Information Element/Group name	Need	Multi	Type and reference	Semantics description
		S>		
>TGPSI	MP		TGPSI 10.3.6.82	
>TGPS Status Flag	MP		Enumerated( active, inactive)	This flag indicates the current status of the Transmission Gap Pattern Sequence, whether it shall be activated or deactivated.
>TGCFN	CV Active		Integer (0..255)	Connection Frame Number of the first frame of the first pattern within the Transmission Gap Pattern Sequence.
>Transmission gap pattern sequence configuration parameters	OP			
>>TGMP	MP		Enumerated( TDD measurement, FDD measurement, GSM carrier RSSI measurement, GSM Initial BSIC identification, GSM BSIC re- confirmation, <u>Multi-carrier measurement</u> )	Transmission Gap pattern sequence Measurement Purpose.
>>TGPRC	MP		Integer (1..511, Infinity)	The number of transmission gap patterns within the Transmission Gap Pattern Sequence.
>>TGSN	MP		Integer (0..14)	Transmission Gap Starting Slot Number The slot number of the first transmission gap slot within the TGCFN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>TGL1	MP		Integer(1..14)	The length of the first Transmission Gap within the transmission gap pattern expressed in number of slots
>>TGL2	MD		Integer (1..14)	The length of the second Transmission Gap within the transmission gap pattern. If omitted, then TGL2=TGL1.
>>TGD	MP		Integer(15..269, undefined)	Transmission gap distance indicates the number of slots between starting slots of two consecutive transmission gaps within a transmission gap pattern. If there is only one transmission gap in the transmission gap pattern, this parameter shall be set to zero.
>>TGPL1	MP		Integer (1..144)	The duration of transmission gap pattern 1.
>>TGPL2	MD		Integer (1..144)	The duration of transmission gap pattern 2. If omitted, then TGPL2=TGPL1.
>>RPP	MP		Enumerated (mode 0, mode 1).	Recovery Period Power control mode during the frame after the transmission gap within the compressed frame. Indicates whether normal PC mode or compressed PC mode is applied
>>ITP	MP		Enumerated (mode 0, mode 1).	Initial Transmit Power is the uplink power control method to be used to compute the initial transmit power after the compressed mode gap.
>>UL/DL mode	MP		Enumerated (UL only, DL only, UL/DL)	Defines whether only DL, only UL, or combined UL/DL compressed mode is used.
>>Downlink compressed mode method	CV DL		Enumerated (puncturing, SF/2, higher layer scheduling)	Method for generating downlink compressed mode gap
>>Uplink compressed mode method	CV UL		Enumerated (SF/2, higher layer scheduling)	Method for generating uplink compressed mode gap
>>Downlink frame type	MP		Enumerated (A, B)	
>>DeltaSIR1	MP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE during the frame containing the start of the first transmission gap in the transmission gap pattern (without including the effect of the bit-rate increase)
>>DeltaSIRafter1	MP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE one frame after the frame containing the start of the first transmission gap in the transmission gap pattern.
>>DeltaSIR2	OP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE during the frame containing the start of the second transmission gap

Information Element/Group name	Need	Multi	Type and reference	Semantics description
				in the transmission gap pattern (without including the effect of the bit-rate increase) When omitted, DeltaSIR2 = DeltaSIR1.
>>DeltaSIRafter2	OP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE one frame after the frame containing the start of the second transmission gap in the transmission gap pattern. When omitted, DeltaSIRafter2 = DeltaSIRafter1.
>>N Identify abort	CV Initial BSIC		Integer(1..128)	Indicates the maximum number of repeats of patterns that the UE shall use to attempt to decode the unknown BSIC of the GSM cell in the initial BSIC identification procedure
>>T Reconfirm abort	CV Re-confirm BSIC		<u>Real(0.5..10.0 by step of 0.5)</u> Integer(1..20)	Indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure. The time is given in steps of 0.5 seconds.

Condition	Explanation
<i>UL</i>	This information element is only sent when the value of the "UL/DL mode" IE is "UL only" or "UL/DL".
<i>DL</i>	This information element is only sent when the value of the "UL/DL mode" IE is "DL only" or "UL/DL".
<i>Active</i>	This information element is only sent when the value of the "TGPS Status Flag" IE is "Active".
<i>Initial BSIC</i>	This information element is only sent when the value of the IE "TGMP" is set to "GSM Initial BSIC identification".
<i>Re-confirm BSIC</i>	This information element is only sent when the value of the IE "TGMP" is set to "GSM BSIC re-confirmation".

[...]

### 10.3.6.43 PDSCH code mapping

NOTE: Only for FDD.

This IE indicates the association between each possible value of TFCI(field 2) and the corresponding PDSCH channelisation code(s). The following signalling methods are specified:

- 'code range': the mapping is described in terms of a number of groups, each group associated with a given spreading factor;
- 'TFCI range': the mapping is described in terms of a number of groups, each group corresponding to a given PDSCH channelisation code;
- 'Explicit': the mapping between TFCI(field 2) value and PDSCH channelisation code is spelt out explicitly for each value of TFCI (field2);
- 'Removal': replace individual entries in the TFCI(field 2) to PDSCH code mapping table with new PDSCH code values.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
DL Scrambling Code	MD		Secondary scrambling code 10.3.6.74	Scrambling code on which PDSCH is transmitted. Default is the same scrambling code as for the Primary CPICH
Choice <i>signalling method</i> >code range	MP			
>>PDSCH code mapping	MP	1 to < maxPDSC H-TFCIgroups >		
>>>Spreading factor	MP		Integer(4, 8, 16, 32, 64, 128, 256)	
>>>multi-code info	MP		Integer(1..16)	This parameter indicates the number of PDSCH transmitted to the UE. The PDSCH codes all have the same SF as denoted by the 'Spreading factor' parameter. Contiguous codes are assigned, starting at the channelisation code denoted by the spreading factor and code number parameter and including all codes, with code numbers up to and including 'code number' - 1 + 'multi-code info'. Note that 'code number' - 1 + 'multi-code info' will not be allowed to exceed 'Spreading factor - 1'
>>>Code number (for PDSCH code) start	MP		Integer(0..Spreading factor-1)	
>>>Code number (for PDSCH code) stop	MP		Integer(0..Spreading factor-1)	
>TFCI range				
>>DSCH mapping	MP	1 to < maxPDSC H-TFCIgroups >		
>>>Max TFCI(field2) value	MP		Integer(1..1023)	This is the maximum value in the range of TFCI(field 2) values for which the specified PDSCH code applies
>>>Spreading factor (for PDSCH code)	MP		Integer(4, 8, 16, 32, 64, 128, 256)	
>>>Code number (for PDSCH code)	MP		Integer(0..Spreading factor-1)	
>>>multi-code info	MP		Integer(1..16)	Semantics as described for this parameter above
>Explicit				
>>PDSCH code info	MP	1 to < maxTFCI-2-Combs >		The first instance of the parameter <i>PDSCH code</i> corresponds to TFCI (field2) = 0, the second to TFCI(field 2) = 1 and so on.
>>>Spreading factor (for PDSCH code)	MP		Integer(4, 8, 16, 32, 64, 128, 256)	
>>>Code number (for PDSCH code)	MP		Integer(0..Spreading factor-1)	



Information Element/Group name	Need	Multi	Type and reference	Semantics description
code)			reading factor-1)	
>>>multi-code info	MP		Integer(1..16)	Semantics as described for this parameter above
>Replace				This choice is made if the PDSCH code(s) associated with a given value of TFCI(field 2) is to be replaced.
>>Replaced PDSCH code	MP	1 to <maxTFCI-2-Combs >		Identity of the PDSCH code(s) to be used for the specified value of TFCI(field 2). These code identity(s) replace any that had been specified before
>>>TFCI (field 2)	MP		Integer (0..1023)	Value of TFCI(field 2) for which PDSCH code mapping will be changed
>>>Spreading factor (for PDSCH code)	MP		Integer(4, 8, 16, 32, 64, 128, 256)	
>>>Code number (for PDSCH code)	MP		Integer(0..Sp reading factor-1)	
>>>multi-code info	MP		Integer(1..16)	Semantics as described for this parameter above

[...]

## 10.3.6.55 PRACH system information list

Information element	Need	Multi	Type and reference	Semantics description
PRACH system information	MP	1 .. <maxPRACH>		
>PRACH info	MP		PRACH info (for RACH) 10.3.6.52	
>Transport channel identity	MP		Transport channel identity 10.3.5.18	
>RACH TFS	MD		Transport format set 10.3.5.23	Default value is the value of "RACH TFS" for the previous PRACH in the list NOTE: The first occurrence is then MP) NOTE: For TDD in this release there is a single TF within the RACH TFS.
>RACH TFCS	MD		Transport Format Combination Set 10.3.5.20	Default value is the value of "RACH TFCS" for the previous PRACH in the list. NOTE: The first occurrence is then MP). NOTE: For TDD in this release there is no TFCS required.
>PRACH partitioning	MD		PRACH partitioning 10.3.6.5310-3-6.46	Default value is the value of "PRACH partitioning" for the previous PRACH in the list (note : the first occurrence is then MP)
>Persistence scaling factors	OP		Persistence scaling	This IE shall not be present if only ASC 0 and ASC 1 are

			factors 10.3.6.48	defined. If this IE is absent, value is the value of "Persistence scaling factors" for the previous PRACH in the list if value exists
>AC-to-ASC mapping	OP		AC-to-ASC mapping 10.3.6.1	Only present in SIB 5 If this IE is absent, value is the value of "AC-to-ASC mapping" for the previous PRACH in the list if value exists
>CHOICE mode	MP			
>>FDD				
>>>Primary CPICH TX power	MD		Primary CPICH TX power 10.3.6.61	Default value is the value of "Primary CPICH TX power" for the previous PRACH in the list (note : the first occurrence is then MP)
>>>Constant value	MD		Constant value 10.3.6.11	Default value is the value of "Constant value" for the previous PRACH in the list (note : the first occurrence is then MP)
>>>PRACH power offset	MD		PRACH power offset 10.3.6.54	Default value is the value of "PRACH power offset" for the previous PRACH in the list (note : the first occurrence is then MP)
>>>RACH transmission parameters	MD		RACH transmission parameters 10.3.6.67	Default value is the value of "RACH transmission parameters" for the previous PRACH in the list (note : the first occurrence is then MP)
>>>AICH info	MD		AICH info 10.3.6.2	Default value is the value of "AICH info" for the previous PRACH in the list (note : the first occurrence is then MP)
>>TDD				(no data)

NOTE: If the setting of the PRACH information results in that a combination of a signature, preamble scrambling code and subchannel corresponds to a RACH with different TFS and/or TFCS, then for that combination only the TFS/TFCS of the PRACH listed first is valid, where PRACHs listed in System Information Block type 5 shall be counted first.

[...]

### 11.3 Information element definitions

[...]

```

-- Actual value = IE value * 0.125
Alpha ::= INTEGER (0..8)
[...]

-- TrCH-Type is always DCH
UL-ControlledTrChList ::= SEQUENCE (SIZE (1..maxTrCH)) OF
    TransportChannelIdentity
[...]

DL-DPCH-InfoPerRL ::= CHOICE {
    fdd SEQUENCE {
        pCPICH-UsageForChannelEst PCPICH-UsageForChannelEst,
        dpch-FrameOffset DPCH-FrameOffset,
        secondaryCPICH-Info SecondaryCPICH-Info OPTIONAL,
        dl-ChannelisationCodeList DL-ChannelisationCodeList,
        tpc-CombinationIndex TPC-CombinationIndex,
        ssdt-CellIdentity SSDT-CellIdentity OPTIONAL,
        closedLoopTimingAdjMode ClosedLoopTimingAdjMode OPTIONAL
    }
}

```

```

    },
    tdd                                DL-CCTrChList
}
[...]

ProtocolErrorMoreInformation ::= SEQUENCE {
    diagnosticsType                CHOICE {
        type1                       CHOICE {
            asnl-ViolationOrEncodingError    NULL,
            messageTypeNonexistent          NULL,
            messageNotCompatibleWithReceiverState
        }
    },
    spare                            NULL
}
[...]

| IdentificationOfReceivedMessage IdentificationOfReceivedMessage,
|   ie-ValueNotComprehended
| IdentificationOfReceivedMessage IdentificationOfReceivedMessage,
|   conditionalInformationElementError
| IdentificationOfReceivedMessage IdentificationOfReceivedMessage,
|   messageExtensionNotComprehended
| IdentificationOfReceivedMessage IdentificationOfReceivedMessage,
|   spare1                            NULL,
|   spare2                            NULL
|   },
|   spare                            NULL
}
[...]

| IdentificationOfReceivedMessage IdentificationOfReceivedMessage ::= SEQUENCE {
|   rrc-TransactionIdentifier          RRC-TransactionIdentifier,
|   receivedMessageType               ReceivedMessageType
| }
| [...]

TGMP ::= ENUMERATED {
|   tdd-Measurement, fdd-Measurement,
|   gsm-CarrierRSSIMeasurement,
|   gsm-initialBSICIdentification, gsmBSICReconfirmation,
|   multi-carrier }
|
| [...]

```

## CHANGE REQUEST

⌘ **25.331 CR 837** ⌘ 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  Radio Access Network  Core Network

<b>Title:</b>	⌘ Editorial and minor corrections		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ May 23, 2001
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ R99
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)	<b>R96</b>	<b>2</b> (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)	<b>R97</b>	(Release 1996)
	<b>B</b> (addition of feature),	<b>R98</b>	(Release 1997)
	<b>C</b> (functional modification of feature)	<b>R99</b>	(Release 1998)
	<b>D</b> (editorial modification)	<b>REL-4</b>	(Release 1999)
	Detailed explanations of the above categories can	<b>REL-4</b>	(Release 4)
	be found in 3GPP <a href="#">TR 21.900</a> .	<b>REL-5</b>	(Release 5)

<b>Reason for change:</b>	⌘	<p>1. Inconsistencies between Tabular and ASN.1</p> <p>Compressed mode with measurement purpose "multi-carrier" is missing.</p> <p>Slimit, SearchRAT Slimit is misspelled</p> <p>Qoffset<sub>1,s,n</sub> has only integer values but is defined as Real in Tabular</p> <p>In GSM Qrxlevmin is equivalent to RXLEV, not RSCP</p> <p>Max PDCP SN window size is CV and has a default value in Tabular</p> <p>Independent is used in Tabular, Explicit is used in ASN.1</p> <p>In DL Transport channel information common for all transport channels MP and OP is swapped for two IEs.</p> <p>DRAC Class Identity should be Integer(1.. maxDRACclasses) in Tabular</p> <p>Downlink DPCH info for each RL Post is missing some IEs that are present in ASN.1</p> <p>Downlink information for each radio link includes IEs that are not present in ASN.1</p> <p>T Reconfirm abort should be a Real</p> <p>Comments are added to ASN.1 for Alpha and UL-ControlledTrChList</p> <p>dpch-FrameOffset is misspelled in ASN.1</p> <p>IdentificationOfReceivedMessage is misspelled in ASN.1</p> <p>2. Erroneous description of PDSCH code mapping for the "signalling method" set to 'code range' and conflicting requirement in Tabular's semantics description.</p> <p>3. Compressed mode with measurement purpose "multi-carrier" is missing.</p>
<b>Summary of change:</b>	⌘	<p>1. Tabular is modified to be consistent with ASN.1. ASN.1 misspellings are corrected</p> <p>2. Description of PDSCH code mapping for the "signalling method" is corrected, and the misleading semantics description is removed from the Tabular.</p> <p>3. "Multi-carrier" is added to TGMP</p>

**Backward compatibility analysis:**

All proposed changes are backward compatible

1. Correction to a function where the specification was ambiguous.  
The changes would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.

2. Correction to a function where the specification was containing some contradictions.  
The changes would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise

3. Correction to a function where rules were missing.  
Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.

**Consequences if not approved:** ⌘ The affected functions would not be correctly specified

**Clauses affected:** ⌘ 8.6.6.10, 10.3.2.3, 10.3.2.4, 10.3.4.2, 10.3.5.1, 10.3.5.6, 10.3.5.7, 10.3.5.9, 10.3.5.16, 10.3.6.18, 10.3.6.22, 10.3.6.27, 10.3.6.30, 10.3.6.33, 10.3.6.43, 10.3.6.55, 11

**Other specs affected:** ⌘  Other core specifications ⌘   
 Test specifications  
 O&M Specifications

**Other comments:** ⌘

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

Comprehensive information and tips about how to create CRs can be found at: [http://www.3gpp.org/3G\\_Specs/CRs.htm](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.

### 8.6.6.10 PDSCH code mapping (FDD only)

If the IE "PDSCH code mapping" is included, the UE shall:

- use the scrambling code defined by the IE "DL Scrambling Code" to receive the PDSCH;
- if the IE choice "signalling method" is set to 'code range':
  - map the TFCI(field2) values to PDSCH codes in the following way:
    - for the first group of the IE "PDSCH code mapping":
      - if the value of the IE "multi-code info" equals 1:
        - map the TFCI(field 2) = 0 to the PDSCH code specified by the IE "Spreading factor" and the code number given by the IE "Code number (for PDSCH code) start";
        - map TFCI(field 2) = 1 to the PDSCH code specified by the IE "Spreading factor" and the code number given by the IE "Code number (for PDSCH code) start"+1;
        - continue this process with unit increments in the value of TFCI(field 2) mapped to unit increments in code number until the code number equals the value of the IE "Code number (for PDSCH code) stop";
      - if the value of the IE "multi-code info" is greater than 1:
        - if the value of the difference between the IE "Code number (for PDSCH code) ~~stop~~start" and the IE "Code number (for PDSCH code) stop" + 1 is not a multiple of the value of the IE "multi-code info":
          - set the variable INVALID\_CONFIGURATION to TRUE;
        - map TFCI (field 2)=0 to a set of PDSCH contiguous codes. This code set is specified by the IE "Spreading factor" and code numbers between 'code number start' denoted by the IE "Code number (for PDSCH code) start" and 'code number stop' given by IE "Code number (for PDSCH code) start" - 1 + the value of the IE "multi-code info";
        - continue this process with unit increments in the value of TFCI(field 2) mapped to a set of contiguous codes. This code set is specified by the IE "Spreading factor" and code numbers between 'code number start' = 'code number stop'+1 of the previous TFCI(field2) and 'code number stop'='code number start' - 1 + the value of the IE "multi-code info";
        - stop this process when the 'code number stop' associated to the last TFCI(field2) equals the value of the IE "Code number (for PDSCH code) stop";
    - for each of the next groups included in the IE "PDSCH code mapping":
      - continue the process in the same way as for the first group with the TFCI(field 2) value used by the UE to construct its mapping table starting at the largest TFCI(field 2) value reached in the previous group plus one;
      - if the value of the IE "Code number (for PDSCH code) start" equals the value of the IE "Code number (for PDSCH code) stop" (as may occur when mapping the PDSCH root code to a TFCI (field 2) value):
        - consider this as defining the mapping between the channelisation code and a single TFCI (i.e., TFCI(field 2) shall not be incremented twice);
- if the IE choice "signalling method" is set to 'TFCI range':
  - map the TFCI(field2) values to PDSCH codes in the following way:
    - for the first group of the IE "DSCH mapping":
      - map each of the TFCI(field 2) between 0 and the value of the IE "Max TFCI(field2)" to the PDSCH code specified by the IE "Spreading factor (for PDSCH code)" and the code number given by the IE "Code number (for PDSCH code)";
    - for each of the next groups included in the IE "DSCH mapping":

- map each of the TFCI(field 2) between the IE "Max TFCI(field2) value" specified in the last group plus one and the specified IE "Max TFCI(field2)" in the current group to the PDSCH code specified by the IE "Spreading factor (for PDSCH code)" and the code number given by the IE "Code number (for PDSCH code)";
- if the value of the IE "multi-code info" is greater than 1:
  - map each value of TFCI (field 2) to a set of PDSCH contiguous codes starting at the channelisation code denoted by the 'code number' parameter and including all codes with code numbers up to and including 'code number' - 1 + the value of the IE "multi-code info";
- if the IE choice "signalling method" is set to 'Explicit'
  - map the TFCI(field2) values to PDSCH codes in the following way:
    - for the first instance on the IE "PDSCH code info":
      - apply the PDSCH code specified by the IE "Spreading factor (for PDSCH code)" and the code number given by the IE "Code number (for PDSCH code)" for TFCI(field2)=0;
    - for the second instance of the IE "PDSCH code info":
      - apply the PDSCH code specified by the IE "Spreading factor (for PDSCH code)" and the code number given by the IE "Code number (for PDSCH code)" for TFCI(field2)=1;
    - continue in a similar way for each next instance of the IE "PDSCH code info";
  - if the value of the IE "multi-code info" is greater than 1, then
    - map each value of TFCI (field 2) to a set of PDSCH contiguous codes starting at the channelisation code denoted by the 'code number' parameter and including all codes with code numbers up to and including 'code number' - 1 + the value of the IE "multi-code info";
- if the IE choice "signalling method" is set to 'Replace':
  - map the TFCI(field2) values to PDSCH codes in the following way:
    - for each instance of the IE "Replaced PDSCH code":
      - replace the corresponding PDSCH code for the TFCI(field2) identified by the IE "TFCI(field2)" with the new code specified by the IE "Spreading factor (for PDSCH code)" and the code number given by the IE "Code number (for PDSCH code)";
  - if the value of the IE "multi-code info" is greater than 1:
    - map each value of TFCI (field 2) to a set of PDSCH contiguous codes starting at the channelisation code denoted by the 'code number' parameter and including all codes with code numbers up to and including 'code number' - 1 + the value of the IE "multi-code info".

[...]

## 10.3.2.3 Cell selection and re-selection info for SIB3/4

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Mapping Info	MD		Mapping info 10.3.2.5	Contains mapping function for quality measurements. Default is an implicit mapping: $Q_{map} = Q_{meas,LEV}$ , [4].
Cell_selection_and_reselection_quality_measure	MP		Enumerated (CPICH Ec/N0, CPICH RSCP)	Choice of measurement (CPICH Ec/N0 or CPICH RSCP) to use as quality measure Q for FDD cells.
CHOICE mode	MP			
>FDD				
>>S <sub>intrasearch</sub>	OP		Integer (-32..20 by step of 2)	[4] [dB]
>>S <sub>intersearch</sub>	OP		Integer (-32..20 by step of 2)	[4] [dB]
>>S <sub>searchHCS</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>RAT List	OP	1 to <maxOther RAT>		
>>>RAT identifier	MP		Enumerated (GSM, cdma2000)	
>>>S <sub>search,RAT</sub>	MP		Integer (-105..91 by step of 2)	[4] [dB]
>>>S <sub>HCS,RAT</sub>	OP		Integer (-32..20 by step of 2)	[4] [dB]
>>>S <sub>limit,SearchRAT</sub> , S <sub>limit,SearchRAT</sub>	OP		Integer (-32..20 by step of 2)	[4] [dB]
>TDD				
>>S <sub>intrasearch</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]



>>S <sub>intersearch</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>S <sub>searchHCS</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>>RAT List	OP	1 to <maxOther RAT>		
>>>>RAT identifier	MP		Enumerated (GSM, cdma2000)	
>>>>S <sub>search,RAT</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>>>S <sub>HCS,RAT</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
>>>>S <sub>limit,SearchRAT</sub> S <sub>limit,SearchRAT</sub>	OP		Integer (-105..91 by step of 2)	[4] [dB]
Qhyst1 <sub>s</sub>	MP		Integer (0..40 by step of 2)	[4]
Qhyst2 <sub>s</sub>	CV-FDD-Quality-Measure		Integer (0..40 by step of 2)	Default value is Qhyst1 <sub>s</sub> [4]
Treselection <sub>s</sub>	MP		Integer (0..31)	[s]
HCS Serving cell Information	OP		HCS Serving cell information 10.3.7.12	
Maximum allowed UL TX power	MP		Maximum allowed UL TX power 10.3.6.39	[dBm] UE_TXPWR_MAX_RACH in [4].
CHOICE mode	MP			
>FDD				
>>Qqualmin	MP		Integer (-20..0)	Ec/N0, [dB]
>>Qrxlevmin	MP		Integer (-115..-25 by step of 2)	RSCP, [dBm]
>TDD				
>>Qrxlevmin	MP		Integer (-115..-25 by step of 2)	RSCP, [dBm]

Condition	Explanation
CV-FDD-Quality-Measure	Presence is not allowed if the IE "Cell_selection_and_reselection_quality_measure" has the value CPICH RSCP, otherwise the IE is mandatory and has a default value.

10.3.2.4 Cell selection and re-selection info for SIB11/12

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Qoffset1 <sub>s,n</sub>	MD		RealInteger(-50.0..50.0 by step of 4)	Default value is 0.
Qoffset2 <sub>s,n</sub>	CV-FDD-Quality-Measure		RealInteger(-50.0..50.0 by step of 4)	Default value is 0.
Maximum allowed UL TX power	MD		Maximum allowed UL TX power 10.3.6.39	[dBm] UE_TXPWR_MAX_RACH in [4]. Default is the Maximum allowed UL TX power for the serving cell
HCS neighbouring cell information	OP		HCS Neighbouring cell information 10.3.7.11	
CHOICE mode	MP			
>FDD				
>>Qqualmin	MD		Integer (-20..0)	Ec/N0, [dB] Default value is Qqualmin for the serving cell
>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell
>TDD				
>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell
>GSM				
>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell

Condition	Explanation
FDD-Quality-Measure	Presence is not allowed if the IE "Cell_selection_and_reselection_quality_measure" has the value CPICH RSCP, otherwise the IE is mandatory and has a default value.

[...]

10.3.4.2 PDCP info

The purpose of the PDCP info IE is to indicate which algorithms shall be established and to configure the parameters of each of the algorithms.

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
Support for lossless SRNS relocation	CV- <i>LosslessCriteria</i>		Boolean	TRUE means support	
Max PDCP SN window size	CV <i>Lossless</i>		Integer (255, 65535)	Maximum PDCP sequence number window size. The handling of sequence number when the Max PDCP SN window size is 255 is specified in [23]. <del>Default value is 65535.</del>	
PDCP PDU header	MD		Enumerated (present, absent)	Whether a PDCP PDU header is existent or not. Default value is "present"	
Header compression information	OP	1 to <maxPDCPAlgoType >			
>CHOICE <i>algorithm type</i> >>RFC 2507	MP			Header compression according to IETF standard RFC 2507	
>>>F_MAX_PERIOD	MD		Integer (1..65535)	Largest number of compressed non-TCP headers that may be sent without sending a full header. Default value is 256.	
>>>F_MAX_TIME	MD		Integer (1..255)	Compressed headers may not be sent more than F_MAX_TIME seconds after sending last full header. Default value is 5.	
>>>MAX_HEADER	MD		Integer (60..65535)	The largest header size in octets that may be compressed. Default value is 168.	
>>>TCP_SPACE	MD		Integer (3..255)	Maximum CID value for TCP connections. Default value is 15.	
>>>NON_TCP_SPACE	MD		Integer (3..65535)	Maximum CID value for non-TCP connections. Default value is 15.	
>>>EXPECT_REORDERING	MD		Enumerated (reordering not expected, reordering)	Whether the algorithm shall reorder PDCP SDUs or not. Default value is	

			expected)	"reordering not expected".	
>>RFC 3095				Header compression according to IETF standard RFC 3095	REL-4
>>>Max_CID	MD		Integer (1..16383)	Highest context ID number to be used by the compressor. Default value is 15.	REL-4
>>>Profiles	MP	1 to <maxROHC-Profiles>		Profiles supported by the decompressor.	REL-4
>>>>Profile instance	MP		Integer(1 .. 3)	Supported profile types. At least four spare values.	REL-4
>>>MRRU	MD		Integer (0 .. 65535)	Maximum reconstructed reception unit. Default value is 0 (no segmentation).	REL-4
>>>Packet _Sizes_Allowed	OP	1 to <maxROHC-PacketSizes>		List of packet sizes that are allowed to be produced by RFC 3095.	REL-4
>>>>Packet size	MP		Integer (2 .. 1500)	Packet size as defined in RFC 3095.	REL-4
>>>>Reverse-Decompression_Depth	MD		Integer (0..65535)	Determines whether reverse decompression should be used or not and the maximum number of packets that can be reverse decompressed by the decompressor. Default value is 0 (reverse decompression shall not be used).	REL-4

Condition	Explanation
<i>LosslessCriteria</i>	This IE is present only if the IE "RLC mode" is "Acknowledged" and the IE "In-sequence delivery" is "True".
<i>Lossless</i>	This IE shall be present if the IE "Support for lossless SRNS relocation" is TRUE, otherwise it shall be absent.

[...]

10.3.5.1 Added or Reconfigured DL TrCH information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Downlink transport channel type	MP		Enumerated(DCH,DSCH)	
DL Transport channel identity	MP		Transport channel identity 10.3.5.18	
CHOICE DL parameters				
>IndependentExplicit				
>>TFS	MP		Transport Format Set 10.3.5.23	
>SameAsUL				
>>Uplink transport channel type	MP		Enumerated(DCH,USCH)	USCH is TDD only
>>UL TrCH identity	MP		Transport channel identity 10.3.5.18	Same TFS applies as specified for indicated UL TrCH
DCH quality target	OP		Quality target 10.3.5.10	
Transparent mode signalling info	CV- MessageType		Transparent mode signalling info 10.3.5.17	This IE is not used in RB RELEASE message nor RB RECONFIGURATION message

Condition	Explanation
MessageType	This IE is absent in Radio Bearer Release message and Radio Bearer Reconfiguration message. Otherwise it is OPTIONAL.

[...]

10.3.5.6 DL Transport channel information common for all transport channels

Information Element/Group name	Need	Multi	Type and reference	Semantics description
SCCPCH TFCS	OP		Transport Format Combination Set 10.3.5.20	This IE should be absent within IE "Predefined RB configuration"
CHOICE mode	OP			
>FDD				
>>CHOICE DL parameters	<u>MPOP</u>			
>>>IndependentExplicit				
>>>>DL DCH TFCS	<u>OPMP</u>		Transport Format Combination Set 10.3.5.20	
>>>SameAsUL				(no data)
>TDD				
>>Individual DL CCTrCH information	OP	1 to >maxCCTrCH>		
>>>DL TFCS Identity	MP		Transport format combination set identity 10.3.5.21	Identifies a special CCTrCH for shared or dedicated channels.
>>>CHOICE DL parameters	MP			
>>>>Independent				
>>>>>DL TFCS	MP		Transport format combination set 10.3.5.20	
>>>>SameAsUL				
>>>>>UL DCH TFCS Identity	MP		Transport format combination set identity 10.3.5.21	Same TFCS applies as specified for the indicated UL DCH TFCS identity except for information applicable for UL only

NOTE This information element is included within IE "Predefined TrCh configuration"

10.3.5.7 DRAC Static Information

NOTE: Only for FDD.

Contains static parameters used by the DRAC procedure. Meaning and use is described in subclause 14.8.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Transmission Time Validity	MP		Integer(1..256)	number of frames
Time duration before retry	MP		Integer(1..256)	number of frames
DRAC Class Identity	MP		Integer(1.. <u>maxDRACclass es8</u> )	Indicates the class of DRAC parameters to use in SIB10 message

[...]

10.3.5.9 Predefined TrCH configuration

This information element concerns a pre- defined configuration of transport channel parameters.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
UL Transport channel information common for all transport channels	MP		UL Transport channel information common for all transport channels 10.3.5.24	
<b>Added or Reconfigured TrCH information</b> <b>[Bold]</b>				
Added or Reconfigured UL TrCH information	MP	1 to <maxTrCH preconf>		
>Added or Reconfigured UL TrCH information	MP		Added or Reconfigured UL TrCH information 10.3.5.2	
DL Transport channel information common for all transport channels	MP		DL Transport channel information common for all transport channels 10.3.5.6	
<b>Downlink transport channels</b> <b>[Bold]</b>				
Added or Reconfigured DL TrCH information	MP	1 to <maxTrCH preconf>		
>Added or Reconfigured DL TrCH information	MP		Added or Reconfigured DL TrCH information 10.3.5.1	

[...]

### 10.3.5.16 TFCS Removal Information

Information Element/Group name	Need	Multi	IE type and reference	Semantics description
Removal TFCI information	MP	1 to <maxTFC>		
>TFCI	MP		Integer(0..1023)	In TDD 0 is a reserved value

Range Bound	Explanation
<i>MaxDelTFCcount</i>	Maximum number of Transport Format Combinations to be removed.

[...]

10.3.6.18 Downlink DPCH info common for all RL

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Timing Indication	MP		Enumerated(Initialise, Maintain)	
CFN-targetSFN frame offset	CV TimInd		Integer(0..255)	In frame
<b>CHOICE mode</b>				
<b>&gt;FDD</b>				
>>Downlink DPCH power control information	OP		Downlink DPCH power control information 10.3.6.23	
>>Power offset $P_{\text{Pilot-DPDCH}}$	MP		Integer(0..24)	Power offset equals $P_{\text{Pilot}} - P_{\text{DPDCH}}$ , range 0..6 dB, in steps of 0.25 dB
>>Downlink rate matching restriction information	OP		Downlink rate matching restriction information 10.3.6.31	If this IE is set to "absent", no Transport CH is restricted in TFI.
>>Spreading factor	MP		Integer(4, 8, 16, 32, 64, 128, 256, 512)	
>>Fixed or Flexible Position	MP		Enumerated (Fixed, Flexible)	
>>TFCI existence	MP		Boolean	TRUE indicates that TFCI exists
>>CHOICE SF	MP			
>>>SF = 256				
>>>>Number of bits for Pilot bits	MP		Integer (2,4,8)	In bits
>>>>SF = 128				
>>>>Number of bits for Pilot bits	MP		Integer(4,8)	In bits
>>>>Otherwise				(no data)
<b>&gt;TDD</b>				
>>Common timeslot info	MD		Common Timeslot Info 10.3.6.10	Default is the current Common timeslot info

CHOICE SF	Condition under which the given SF is chosen
SF=128	"Spreading factor" is set to 128
SF=256	"Spreading factor" is set to 256
Otherwise	"Spreading factor" is set to a value distinct from 128 and 256

Condition	Explanation
<i>TimInd</i>	This IE is OPTIONAL if the IE "Timing Indication" is set to "Initialise". Otherwise it is absent.

[...]



10.3.6.22 Downlink DPCH info for each RL Post

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE <i>mode</i>	MP			
>FDD				
>>Primary CPICH usage for channel estimation	MP		Primary CPICH usage for channel estimation 10.3.6.62	
>>Secondary scrambling code	MD		Secondary scrambling code 10.3.6.74	Default is the same scrambling code as for the Primary CPICH
>>>CHOICE <i>Spreading factor</i>	MP		<a href="#">Integer(4, 8, 16, 32, 64, 128, 256, 512)</a>	<a href="#">Defined in CHOICE SF512-AndCodenum with "code number" in ASN.1</a>
>>>Code number	MP		Integer(0..max CodeNum)	
>>>Scrambling code change	CH SF/2		<a href="#">Enumerated (code change, no code change)</a>	<a href="#">Indicates whether the alternative scrambling code is used for compressed mode method 'SF/2'.</a>
>>>>TPC combination index	MP		TPC combination index 10.3.6.85	
>TDD				
>>>Downlink DPCH timeslots and codes	MP		Downlink Timeslots and Codes 10.3.6.32	

[...]

10.3.6.27 Downlink information for each radio link

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Choice mode	MP			
>FDD				
>>Primary CPICH info	MP		Primary CPICH info 10.3.6.60	
>>PDSCH with SHO DCH Info	OP		PDSCH with SHO DCH Info 10.3.6.47	
>>PDSCH code mapping	OP		PDSCH code mapping 10.3.6.43	
>TDD				
>>Primary CCPCH info	MP		Primary CCPCH info 10.3.6.57	
Downlink DPCH info for each RL	OP		Downlink DPCH info for each RL 10.3.6.21	
Secondary CCPCH info	OP		Secondary CCPCH info 10.3.6.71	
<del>References to system information blocks</del>	<del>OP</del>	<del>1 to &lt;maxSIB-FACH&gt;</del>		
<del>&gt;Scheduling information</del>	<del>MP</del>		<del>Scheduling information 10.3.8.16</del>	
<del>&gt;SIB type SIBs only</del>	<del>MP</del>		<del>SIB Type SIBs only, 10.3.8.22</del>	

[...]

10.3.6.30 Downlink PDSCH information

NOTE: Only for FDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>PDSCH with SHO DCH Info	OP		PDSCH with SHO DCH Info 10.3.6.47	
>>PDSCH code mapping	OP		PDSCH code mapping 10.3.6.43	

[...]

10.3.6.33 DPCH compressed mode info

NOTE: Only for FDD.

This information element indicates the parameters of the compressed mode to be used by the UE in order to perform inter-frequency and inter-RAT measurements.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Transmission gap pattern sequence		1 to <maxTGP		

Information Element/Group name	Need	Multi	Type and reference	Semantics description
		S>		
>TGPSI	MP		TGPSI 10.3.6.82	
>TGPS Status Flag	MP		Enumerated( active, inactive)	This flag indicates the current status of the Transmission Gap Pattern Sequence, whether it shall be activated or deactivated.
>TGCFN	CV Active		Integer (0..255)	Connection Frame Number of the first frame of the first pattern within the Transmission Gap Pattern Sequence.
>Transmission gap pattern sequence configuration parameters	OP			
>>TGMP	MP		Enumerated( TDD measurement, FDD measurement, GSM carrier RSSI measurement, GSM Initial BSIC identification, GSM BSIC re-confirmation, <a href="#">Multi-carrier measurement</a> )	Transmission Gap pattern sequence Measurement Purpose.
>>TGPRC	MP		Integer (1..511, Infinity)	The number of transmission gap patterns within the Transmission Gap Pattern Sequence.
>>TGSN	MP		Integer (0..14)	Transmission Gap Starting Slot Number The slot number of the first transmission gap slot within the TGCFN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>TGL1	MP		Integer(1..14)	The length of the first Transmission Gap within the transmission gap pattern expressed in number of slots
>>TGL2	MD		Integer (1..14)	The length of the second Transmission Gap within the transmission gap pattern. If omitted, then TGL2=TGL1.
>>TGD	MP		Integer(15..269, undefined)	Transmission gap distance indicates the number of slots between starting slots of two consecutive transmission gaps within a transmission gap pattern. If there is only one transmission gap in the transmission gap pattern, this parameter shall be set to zero.
>>TGPL1	MP		Integer (1..144)	The duration of transmission gap pattern 1.
>>TGPL2	MD		Integer (1..144)	The duration of transmission gap pattern 2. If omitted, then TGPL2=TGPL1.
>>RPP	MP		Enumerated (mode 0, mode 1).	Recovery Period Power control mode during the frame after the transmission gap within the compressed frame. Indicates whether normal PC mode or compressed PC mode is applied
>>ITP	MP		Enumerated (mode 0, mode 1).	Initial Transmit Power is the uplink power control method to be used to compute the initial transmit power after the compressed mode gap.
>>UL/DL mode	MP		Enumerated (UL only, DL only, UL/DL)	Defines whether only DL, only UL, or combined UL/DL compressed mode is used.
>>Downlink compressed mode method	CV DL		Enumerated (puncturing, SF/2, higher layer scheduling)	Method for generating downlink compressed mode gap
>>Uplink compressed mode method	CV UL		Enumerated (SF/2, higher layer scheduling)	Method for generating uplink compressed mode gap
>>Downlink frame type	MP		Enumerated (A, B)	
>>DeltaSIR1	MP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE during the frame containing the start of the first transmission gap in the transmission gap pattern (without including the effect of the bit-rate increase)
>>DeltaSIRafter1	MP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE one frame after the frame containing the start of the first transmission gap in the transmission gap pattern.
>>DeltaSIR2	OP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE during the frame containing the start of the second transmission gap

Information Element/Group name	Need	Multi	Type and reference	Semantics description
				in the transmission gap pattern (without including the effect of the bit-rate increase) When omitted, DeltaSIR2 = DeltaSIR1.
>>DeltaSIRafter2	OP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE one frame after the frame containing the start of the second transmission gap in the transmission gap pattern. When omitted, DeltaSIRafter2 = DeltaSIRafter1.
>>N Identify abort	CV Initial BSIC		Integer(1..128)	Indicates the maximum number of repeats of patterns that the UE shall use to attempt to decode the unknown BSIC of the GSM cell in the initial BSIC identification procedure
>>T Reconfirm abort	CV Re-confirm BSIC		<del>Real(0.5..10.0 by step of 0.5)</del> <del>Integer(+..20)</del>	Indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure. The time is given in steps of 0.5 seconds.

Condition	Explanation
<i>UL</i>	This information element is only sent when the value of the "UL/DL mode" IE is "UL only" or "UL/DL".
<i>DL</i>	This information element is only sent when the value of the "UL/DL mode" IE is "DL only" or "UL/DL".
<i>Active</i>	This information element is only sent when the value of the "TGPS Status Flag" IE is "Active".
<i>Initial BSIC</i>	This information element is only sent when the value of the IE "TGMP" is set to "GSM Initial BSIC identification".
<i>Re-confirm BSIC</i>	This information element is only sent when the value of the IE "TGMP" is set to "GSM BSIC re-confirmation".

[...]

### 10.3.6.43 PDSCH code mapping

NOTE: Only for FDD.

This IE indicates the association between each possible value of TFCI(field 2) and the corresponding PDSCH channelisation code(s). The following signalling methods are specified:

- 'code range': the mapping is described in terms of a number of groups, each group associated with a given spreading factor;
- 'TFCI range': the mapping is described in terms of a number of groups, each group corresponding to a given PDSCH channelisation code;
- 'Explicit': the mapping between TFCI(field 2) value and PDSCH channelisation code is spelt out explicitly for each value of TFCI (field2);
- 'Removal': replace individual entries in the TFCI(field 2) to PDSCH code mapping table with new PDSCH code values.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
DL Scrambling Code	MD		Secondary scrambling code 10.3.6.74	Scrambling code on which PDSCH is transmitted. Default is the same scrambling code as for the Primary CPICH
Choice <i>signalling method</i>	MP			
>code range				
>>PDSCH code mapping	MP	1 to < maxPDSC H-TFCIgroups >		
>>>Spreading factor	MP		Integer(4, 8, 16, 32, 64, 128, 256)	
>>>multi-code info	MP		Integer(1..16 )	<del>This parameter indicates the number of PDSCH transmitted to the UE. The PDSCH codes all have the same SF as denoted by the 'Spreading factor' parameter. Contiguous codes are assigned, starting at the channelisation code denoted by the spreading factor and code number parameter and including all codes, with code numbers up to and including 'code number' - 1 + 'multi-code info'. Note that 'code number' - 1 + 'multi-code info' will not be allowed to exceed 'Spreading factor - 1'</del>
>>>Code number (for PDSCH code) start	MP		Integer(0..Spreading factor-1)	
>>>Code number (for PDSCH code) stop	MP		Integer(0..Spreading factor-1)	
>TFCI range				
>>DSCH mapping	MP	1 to < maxPDSC H-TFCIgroups >		
>>>Max TFCI(field2) value	MP		Integer(1..1023)	This is the maximum value in the range of TFCI(field 2) values for which the specified PDSCH code applies
>>>Spreading factor (for PDSCH code)	MP		Integer(4, 8, 16, 32, 64, 128, 256)	
>>>Code number (for PDSCH code)	MP		Integer(0..Spreading factor-1)	
>>>multi-code info	MP		Integer(1..16 )	<del>Semantics as described for this parameter above</del>
>Explicit				
>>PDSCH code info	MP	1 to < maxTFCI-2-Combs >		The first instance of the parameter <i>PDSCH code</i> corresponds to TFCI (field2) = 0, the second to TFCI(field 2) = 1 and so on.
>>>Spreading factor (for PDSCH code)	MP		Integer(4, 8, 16, 32, 64, 128, 256)	
>>>Code number (for PDSCH code)	MP		Integer(0..Spreading factor-1)	

Information Element/Group name	Need	Multi	Type and reference	Semantics description
code)			reading factor-1)	
>>>multi-code info	MP		Integer(1..16)	Semantics as described for this parameter above
>Replace				This choice is made if the PDSCH code(s) associated with a given value of TFCI(field 2) is to be replaced.
>>Replaced PDSCH code	MP	1 to <maxTFCI-2-Combs >		Identity of the PDSCH code(s) to be used for the specified value of TFCI(field 2). These code identity(s) replace any that had been specified before
>>>TFCI (field 2)	MP		Integer (0..1023)	Value of TFCI(field 2) for which PDSCH code mapping will be changed
>>>Spreading factor (for PDSCH code)	MP		Integer(4, 8, 16, 32, 64, 128, 256)	
>>>Code number (for PDSCH code)	MP		Integer(0..Sp reading factor-1)	
>>>multi-code info	MP		Integer(1..16)	Semantics as described for this parameter above

[...]

## 10.3.6.55 PRACH system information list

Information element	Need	Multi	Type and reference	Semantics description
PRACH system information	MP	1 .. <maxPRACH>		
>PRACH info	MP		PRACH info (for RACH) 10.3.6.52	
>Transport channel identity	MP		Transport channel identity 10.3.5.18	
>RACH TFS	MD		Transport format set 10.3.5.23	Default value is the value of "RACH TFS" for the previous PRACH in the list NOTE: The first occurrence is then MP) NOTE: For TDD in this release there is a single TF within the RACH TFS.
>RACH TFCS	MD		Transport Format Combination Set 10.3.5.20	Default value is the value of "RACH TFCS" for the previous PRACH in the list. NOTE: The first occurrence is then MP). NOTE: For TDD in this release there is no TFCS required.
>PRACH partitioning	MD		PRACH partitioning 10.3.6.5310-3-6.46	Default value is the value of "PRACH partitioning" for the previous PRACH in the list (note : the first occurrence is then MP)
>Persistence scaling factors	OP		Persistence scaling	This IE shall not be present if only ASC 0 and ASC 1 are

			factors 10.3.6.48	defined. If this IE is absent, value is the value of "Persistence scaling factors" for the previous PRACH in the list if value exists
>AC-to-ASC mapping	OP		AC-to-ASC mapping 10.3.6.1	Only present in SIB 5 If this IE is absent, value is the value of "AC-to-ASC mapping" for the previous PRACH in the list if value exists
>CHOICE mode	MP			
>>FDD				
>>>Primary CPICH TX power	MD		Primary CPICH TX power 10.3.6.61	Default value is the value of "Primary CPICH TX power" for the previous PRACH in the list (note : the first occurrence is then MP)
>>>Constant value	MD		Constant value 10.3.6.11	Default value is the value of "Constant value" for the previous PRACH in the list (note : the first occurrence is then MP)
>>>PRACH power offset	MD		PRACH power offset 10.3.6.54	Default value is the value of "PRACH power offset" for the previous PRACH in the list (note : the first occurrence is then MP)
>>>RACH transmission parameters	MD		RACH transmission parameters 10.3.6.67	Default value is the value of "RACH transmission parameters" for the previous PRACH in the list (note : the first occurrence is then MP)
>>>AICH info	MD		AICH info 10.3.6.2	Default value is the value of "AICH info" for the previous PRACH in the list (note : the first occurrence is then MP)
>>TDD				(no data)

NOTE: If the setting of the PRACH information results in that a combination of a signature, preamble scrambling code and subchannel corresponds to a RACH with different TFS and/or TFCS, then for that combination only the TFS/TFCS of the PRACH listed first is valid, where PRACHs listed in System Information Block type 5 shall be counted first.

[...]

### 11.3 Information element definitions

[...]

```

-- Actual value = IE value * 0.125
Alpha ::= INTEGER (0..8)
[...]

-- TrCH-Type is always DCH
UL-ControlledTrChList ::= SEQUENCE (SIZE (1..maxTrCH)) OF
    TransportChannelIdentity
[...]

DL-DPCH-InfoPerRL ::= CHOICE {
    fdd SEQUENCE {
        pCPICH-UsageForChannelEst
        epchdpch-FrameOffset
        secondaryCPICH-Info
        dl-ChannelisationCodeList
        tpc-CombinationIndex
        ssdt-CellIdentity
        closedLoopTimingAdjMode
        PCPICH-UsageForChannelEst,
        DPCH-FrameOffset,
        SecondaryCPICH-Info OPTIONAL,
        DL-ChannelisationCodeList,
        TPC-CombinationIndex,
        SSDT-CellIdentity OPTIONAL,
        ClosedLoopTimingAdjMode OPTIONAL
    }
}

```



```

    },
    tdd
  }
  DL-CCTrChList

DL-DPCH-InfoPerRL-r4 ::= CHOICE {
  fdd SEQUENCE {
    pCPICH-UsageForChannelEst PCPICH-UsageForChannelEst,
    dpchdpch-FrameOffset DPCH-FrameOffset,
    secondaryCPICH-Info SecondaryCPICH-Info OPTIONAL,
    dl-ChannelisationCodeList DL-ChannelisationCodeList,
    tpc-CombinationIndex TPC-CombinationIndex,
    ssdt-CellIdentity SSDT-CellIdentity OPTIONAL,
    closedLoopTimingAdjMode ClosedLoopTimingAdjMode OPTIONAL
  },
  tdd DL-CCTrChList-r4
}

```

[...]

```

ProtocolErrorMoreInformation ::= SEQUENCE {
  diagnosticsType CHOICE {
    type1 CHOICE {
      asnl-ViolationOrEncodingError NULL,
      messageTypeNonexistent NULL,
      messageNotCompatibleWithReceiverState
    }
  }
  IdentificationOfReceivedMessageIdentificationOfReceivedMessage,
  ie-ValueNotComprehended
  IdentificationOfReceivedMessageIdentificationOfReceivedMessage,
  conditionalInformationElementError
  IdentificationOfReceivedMessageIdentificationOfReceivedMessage,
  messageExtensionNotComprehended
  IdentificationOfReceivedMessageIdentificationOfReceivedMessage,
  spare1 NULL,
  spare2 NULL
  },
  spare NULL
}

```

[...]

```

IdentificationOfReceivedMessage IdentificationOfReceivedMessage ::= SEQUENCE {
  rrc-TransactionIdentifier RRC-TransactionIdentifier,
  receivedMessageType ReceivedMessageType
}

```

[...]

```

TGMP ::= ENUMERATED {
  tdd-Measurement, fdd-Measurement,
  gsm-CarrierRSSIMeasurement,
  gsm-initialBSICIdentification, gsmBSICReconfirmation,
  multi-carrier }

```

[...]

CR-Form-v4

## CHANGE REQUEST

⌘ **25.331 CR 838** ⌘ rev **r1** ⌘ Current version: **3.6.0** ⌘

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

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

<b>Title:</b>	⌘ Editorial Correction		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 2001-05-25
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ R99
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

<b>Reason for change:</b>	⌘ The reference to the "Ellipsoid point with altitude and uncertainty ellipsoid" IE is incorrect.
<b>Summary of change:</b>	⌘ The reference to section "10.3.8.e" is changed to "10.3.8.4c", since section "10.3.8.e" does not exist in v3.6.0.  <u>Backwards Compatability Analysis:</u> <ul style="list-style-type: none"> <li>• Proposed changes are backward compatible.                      1 and 2. Correction to a function where rules were missing.</li> </ul> Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.
<b>Consequences if not approved:</b>	⌘ If not approved, then a nonexisting section will be referenced.

<b>Clauses affected:</b>	⌘ 10.2.48.8.18		
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	
<b>Other comments:</b>	⌘		

**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](http://www.3gpp.org/3G_Specs/CRs.htm). Below is a brief summary:

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

10.2.48.8.18 System Information Block type 15

The system information block type 15 contains information useful for UE-based or UE-assisted positioning methods.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
GPS Data ciphering info	OP		UE positioning Cipher info 10.3.7.86	If this IE is present then the SIB types 15.1, 15.2 & 15.3 are ciphered in accordance with the Data Assistance Ciphering Algorithm specified in [18]
Reference position	MP		Ellipsoid point with altitude and uncertainty ellipsoide 10.3.8.4ce	approximate position where the UE is located
GPS Reference Time	MP		UE positioning GPS reference time 10.3.7.96	
Satellite information	OP	1 to <maxSat>		This IE is present whenever bad (failed/failing) satellites are detected by UTRAN [18].
>BadSatID	MP		Enumerated(0..63)	

CR-Form-v4

## CHANGE REQUEST

⌘ **25.331 CR 839** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

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

<b>Title:</b>	⌘ Editorial Correction		
<b>Source:</b>	⌘ TSG-RAN WG2		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 2001-05-25
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ REL-4
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="http://www.3gpp.org/Specs/CRs.htm">TR 21.900</a> .		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

<b>Reason for change:</b>	⌘ The reference to the "Ellipsoid point with altitude and uncertainty ellipsoid" IE is incorrect.
<b>Summary of change:</b>	⌘ The reference to section "10.3.8.e" is changed to "10.3.8.4c", since section "10.3.8.e" does not exist in v3.6.0.  <u>Backwards Compatability Analysis:</u> <ul style="list-style-type: none"> <li>• Proposed changes are backward compatible.                      1 and 2. Correction to a function where rules were missing.</li> </ul> Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.
<b>Consequences if not approved:</b>	⌘ If not approved, then a nonexisting section will be referenced.

<b>Clauses affected:</b>	⌘ 10.2.48.8.18		
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	
<b>Other comments:</b>	⌘		

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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.

### 10.2.48.8.18 System Information Block type 15

The system information block type 15 contains information useful for UE-based or UE-assisted positioning methods.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
GPS Data ciphering info	OP		UE positioning Cipher info 10.3.7.86	If this IE is present then the SIB types 15.1, 15.2 & 15.3 are ciphered in accordance with the Data Assistance Ciphering Algorithm specified in [18]
Reference position	MP		Ellipsoid point with altitude and uncertainty ellipsoid 10.3.8.4ce	approximate position where the UE is located
GPS Reference Time	MP		UE positioning GPS reference time 10.3.7.96	
Satellite information	OP	1 to <maxSat>		This IE is present whenever bad (failed/failing) satellites are detected by UTRAN [18].
>BadSatID	MP		Enumerated(0..63)	