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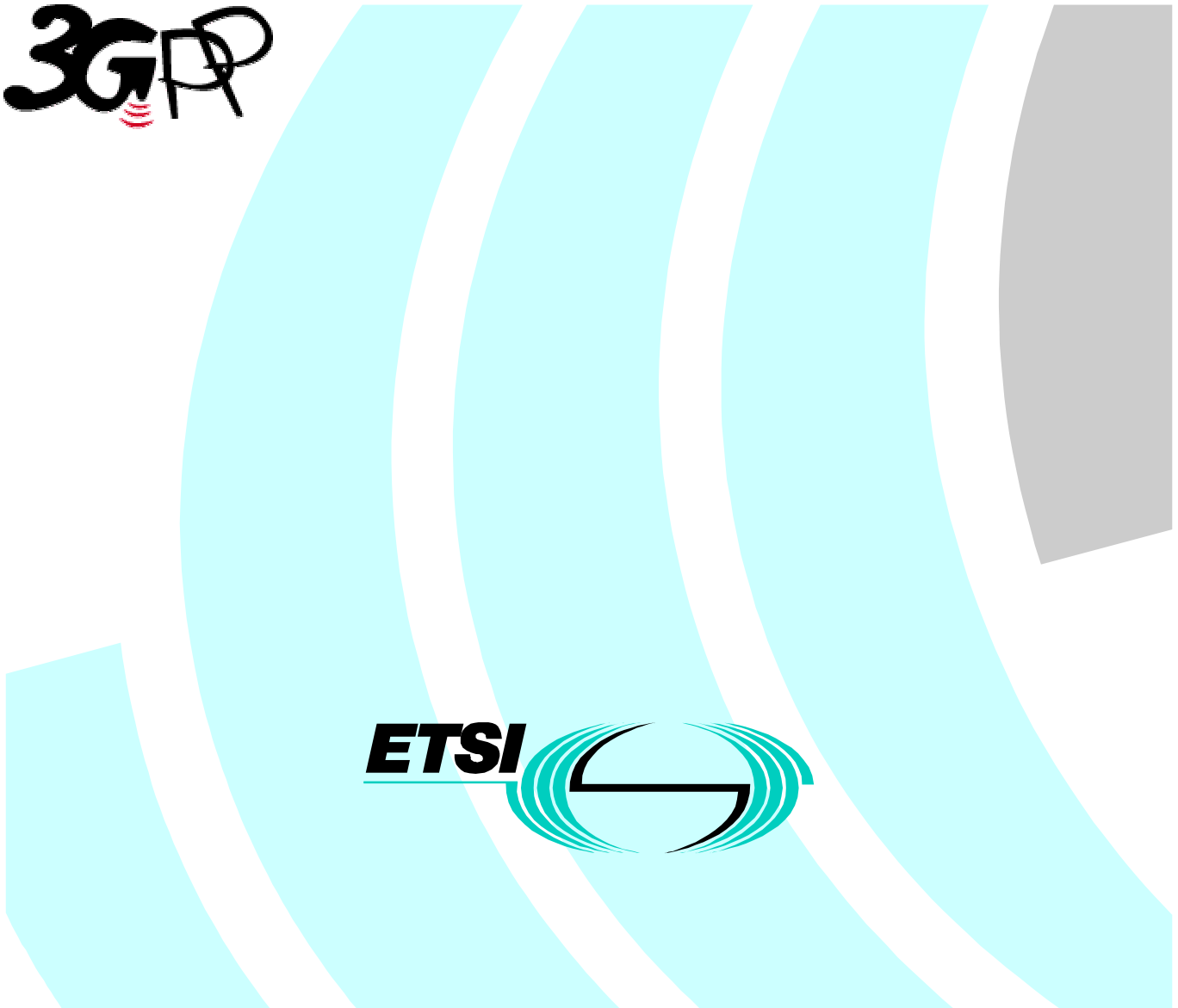
Technical Specification

Universal Mobile Telecommunications System (UMTS);
RRC Protocol Specification
(3G TS 25.331 version 3.1.0 Release 1999)



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Contents

Foreword

This Technical Specification has been produced by the 3GPP.

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of this TS, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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1 Scope

The present document describes the Radio Resource Control protocol for the UE-UTRAN radio interface.

The scope of this specification contains also the information to be transported in a transparent container between source RNC and target RNC in connection to SRNC relocation as defined in [4].

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.

[1] 3G TR 25.990: "Vocabulary for the UTRAN"

[2] 3G TS 25.301: "Radio Interface Protocol Architecture"

[3] 3G TS 25.303: "Interlayer Procedures in Connected Mode"

[4] 3G TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode "

[5] 3G TS 24.008: "Mobile radio interface layer 3 specification, Core Network Protocols - Stage 3"

[6] 3G TS 25.103: "RF Parameters in Support of RRM"

[7] 3G TS 25.215: "Physical layer – Measurements (FDD)"

[8] 3G TS 25.225: "Physical layer – Measurements (TDD)"

[9] 3G TS 25.401: "UTRAN overall description"

[10] 3G TS 25.402: "Synchronisation in UTRAN, stage 2"

[11] 3G TS 23.003: "Numbering, addressing and identification"

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in [1] apply.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ACK	Acknowledgement
AICH	Acquisition Indicator CHannel
AM	Acknowledged Mode

AS	Access Stratum
ASN.1	Abstract Syntax Notation.1
BCCH	Broadcast Control Channel
BCFE	Broadcast Control Functional Entity
BER	Bite Error Rate
BLER	BLock Error Rate
BSS	Base Station Sub-system
C	Conditional
CCPCH	Common Control Physical CHannel
CCCH	Common Control Channel
CN	Core Network
CM	Connection Management
CPCH	Common Packet CHannel
C-RNTI	Cell RNTI
DCA	Dynamic Channel Allocation
DCCH	Dedicated Control Channel
DCFE	Dedicated Control Functional Entity
DCH	Dedicated Channel
DC-SAP	Dedicated Control SAP
DL	Downlink
DRAC	Dynamic Resource Allocation Control
DSCH	Downlink Shared Channel
DTCH	Dedicated Traffic Channel
FACH	Forward Access Channel
FAUSCH	Fast Uplink Signalling Channel
FDD	Frequency Division Duplex
FFS	For Further Study
GC-SAP	General Control SAP
ID	Identifier
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IE	Information element
IP	Internet Protocol
ISCP	Interference on Signal Code Power
LAI	Location Area Identity
L1	Layer 1
L2	Layer 2
L3	Layer 3
M	Mandatory
MAC	Media Access Control
MCC	Mobile Country Code
MM	Mobility Management
MNC	Mobile Network Code
MS	Mobile Station
NAS	Non Access Stratum
Nt-SAP	Notification SAP
NW	Network
O	Optional
ODMA	Opportunity Driven Multiple Access
PCCH	Paging Control Channel
PCH	Paging Channel
PDCP	Packet Data Convergence Protocol
PDSCH	Physical Downlink Shared Channel
PDU	Protocol Data Unit
PLMN	Public Land Mobile Network
PNFE	Paging and Notification Control Functional Entity
PRACH	Physical Random Access CHannel
P-TMSI	Packet Temporary Mobile Subscriber Identity
PUSCH	Physical Uplink Shared Channel
QoS	Quality of Service
RAB	Radio access bearer
RB	Radio Bearer

RAI	Routing Area Identity
RACH	Random Access CHannel
RB	Radio Bearer
RFE	Routing Functional Entity
RL	Radio Link
RLC	Radio Link Control
RNTI	Radio Network Temporary Identifier
RNC	Radio Network Controller
RRC	Radio Resource Control
RSCP	Received Signal Code Power
RSSI	Received Signal Strength Indicator
SAP	Service Access Point
SCFE	Shared Control Function Entity
SF	Spreading Factor
SHCCH	Shared Control Channel
SIR	Signal to Interference Ratio
SSDT	Site Selection Diversity Transmission
S-RNTI	SRNC - RNTI
tbd	to be decided
TDD	Time Division Duplex
TF	Transport Format
TFCS	Transport Format Combination Set
TFS	Transport Format Set
TME	Transfer Mode Entity
TMSI	Temporary Mobile Subscriber Identity
Tr	Transparent
Tx	Transmission
UE	User Equipment
UL	Uplink
UM	Unacknowledged Mode
UMTS	Universal Mobile Telecommunications System
UNACK	Unacknowledgement
URA	UTRAN Registration Area
U-RNTI	UTRAN-RNTI
USCH	Uplink Shared Channel
UTRAN	UMTS Terrestrial Radio Access Network

4 General

The functional entities of the RRC layer are described below:

- Routing of higher layer messages to different MM/CM entities (UE side) or different core network domains (UTRAN side) is handled by the Routing Function Entity (**RFE**)

- Broadcast functions are handled in the broadcast control function entity (**BCFE**). The BCFE is used to deliver the RRC services, which are required at the GC-SAP. The BCFE can use the lower layer services provided by the Tr-SAP and UM-SAP.

- Paging of idle mode UE(s) is controlled by the paging and notification control function entity (**PNFE**). The PNFE is used to deliver the RRC services that are required at the Nt-SAP. The PNFE can use the lower layer services provided by the Tr-SAP and UM-SAP.

- The Dedicated Control Function Entity (**DCFE**) handles all functions specific to one UE. The DCFE is used to deliver the RRC services which are required at the DC-SAP and can use lower layer services of UM/AM-SAP and Tr-SAP depending on the message to be sent and on the current UE service state.

- In TDD mode, the DCFE is assisted by the Shared Control Function Entity (SCFE) location in the C-RNC, which controls the allocation of the PDSCH and PUSCH using lower layers services of UM-SAP and Tr-SAP.

- The Transfer Mode Entity (TME) handles the mapping between the different entities inside the RRC layer and the SAPs provided by RLC.

NOTE: Logical information exchange is necessary also between the RRC sublayer functional entities. Most of that is implementation dependent and not necessary to present in detail in a specification.

Figure 1 shows the RRC model for the UE side and Figure 2a and Figure 2b show the RRC model for the UTRAN side.

NOTE: Some further clarification in the diagrams may be beneficial to acknowledge the fact that a DC-SAP for example might be offered over a dedicated channel (with RRC terminated in SRNC) whereas GC-SAP and Nt-SAP may be offered over BCCH, PCH respectively in which cases RRC is located in Node B. It could be concluded from the figure that these channels use the same SAP offered by RLC (Tr-SAP, UM-SAP, AM-SAP) whereas in fact they will use different SAPs, though the SAP **type** might be the same

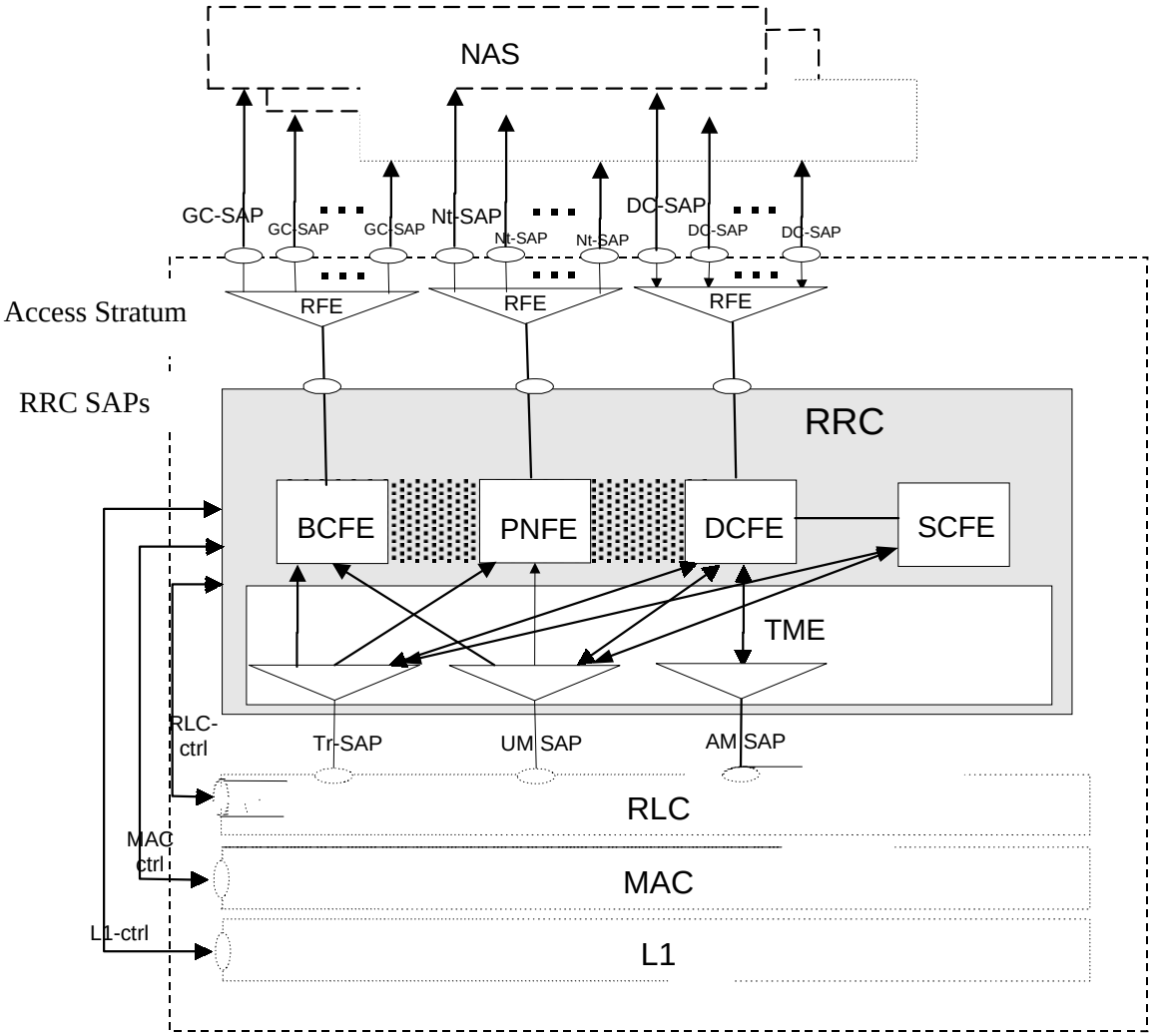


Figure 1: UE side model of RRC

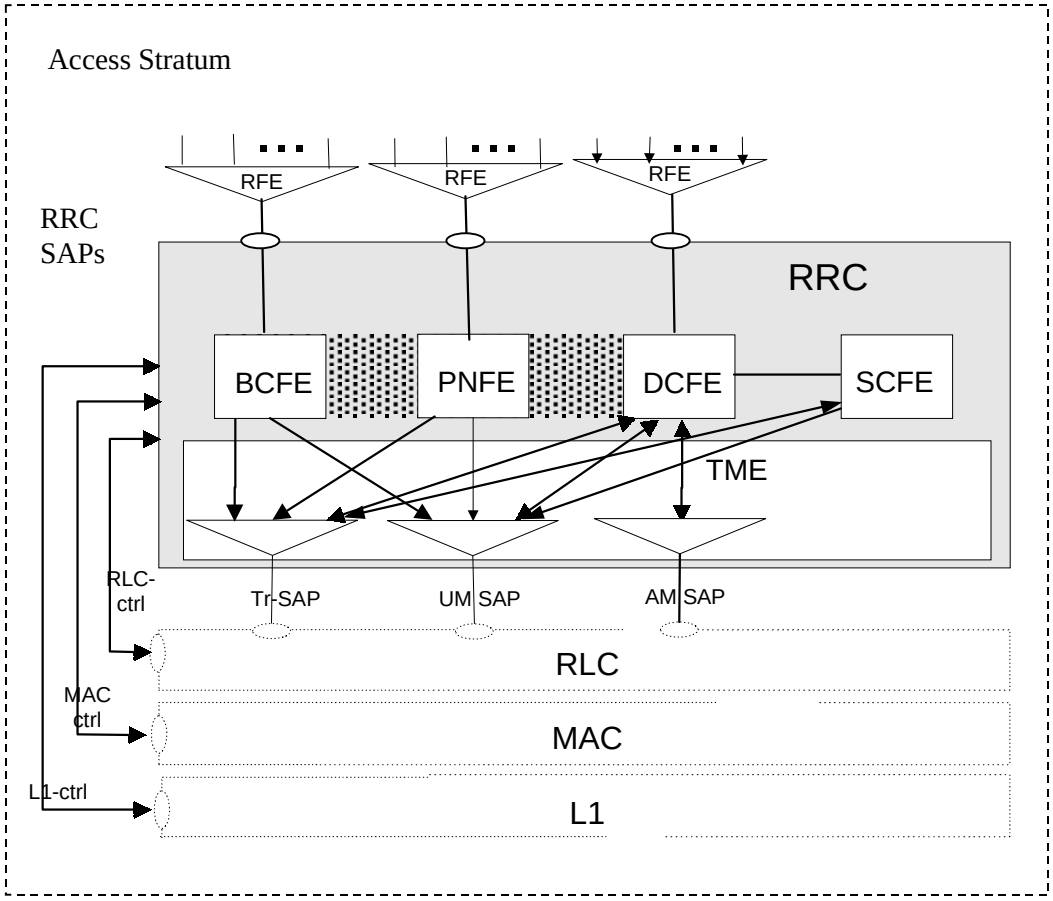


Figure 2a: UTRAN side RRC model (DS-MAP system)

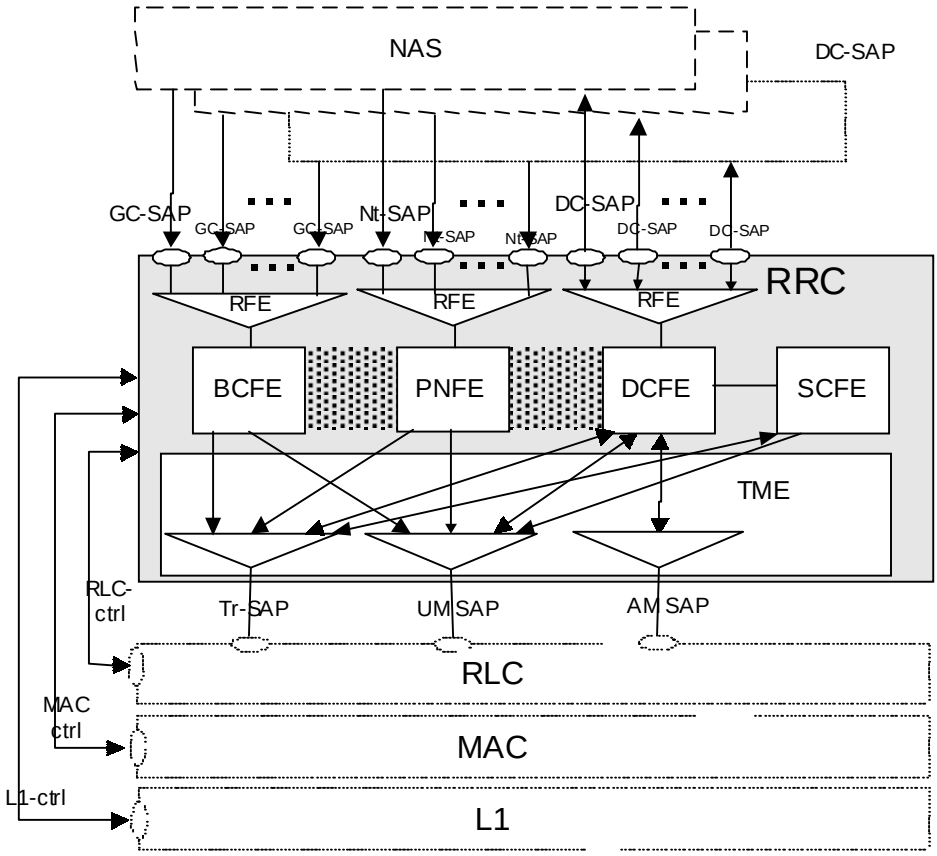


Figure 2b: UTRAN side RRC model (DS-41 System)

5 RRC Services provided to upper layers

The RRC offers the following services to upper layers, a description of these services is provided in [2].

In case of DS-41 system, the SAPs and primitives defined in TS 23.110 will be provided by RRC on UTRAN side as well as on UE side.

- General Control
- Notification
- Dedicated control

6 Services expected from lower layers

6.1 Services expected from Layer 2

6.2 Services expected from Layer 1

7 Functions of RRC

The RRC performs the functions listed below, a more detailed description of these functions is provided in 25.301:

- Broadcast of information provided by the non-access stratum (Core Network).
- Broadcast of information related to the access stratum.
- Establishment, maintenance and release of an RRC connection between the UE and UTRAN
- Establishment, reconfiguration and release of Radio Bearers
- Assignment, reconfiguration and release of radio resources for the RRC connection
- RRC connection mobility functions
- Routing of higher layer PDUs
- Control of requested QoS.
- UE measurement reporting and control of the reporting.
- Outer loop power control.
- Control of ciphering.
- Slow DCA.
- Broadcast of ODMA relay node neighbour information
- Collation of ODMA relay nodes neighbour lists and gradient information
- Maintenance of number of ODMA relay node neighbours
- Establishment, maintenance and release of a route between ODMA relay nodes
- Interworking between the Gateway ODMA relay node and the UTRAN
- Contention resolution (TDD mode)
- Paging/notification.

- Initial cell selection and re-selection in idle mode.
- Arbitration of radio resources on uplink DCH
- RRC message integrity protection
- Timing advance (TDD mode)

The following functions are regarded as further study items:

- Congestion control.
- Arbitration of the radio resource allocation between the cells.

8 RRC procedures

8.1 RRC Connection Management Procedures

8.1.1 Broadcast of system information

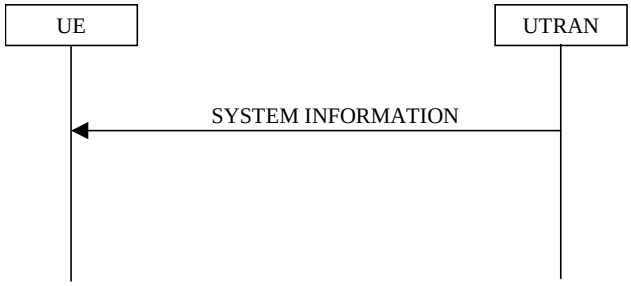


Figure 3: Broadcast of system information

8.1.1.1 General

The purpose of this procedure is to broadcast system information from the UTRAN to idle mode- and connected mode 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 to a number of system information blocks in a cell, including scheduling information for those system information blocks. The system information blocks contain the actual system information and/or references to other system information blocks including scheduling information for those system information blocks.

Figure 4 illustrates the relationship between the master information block and the system information blocks in a cell.

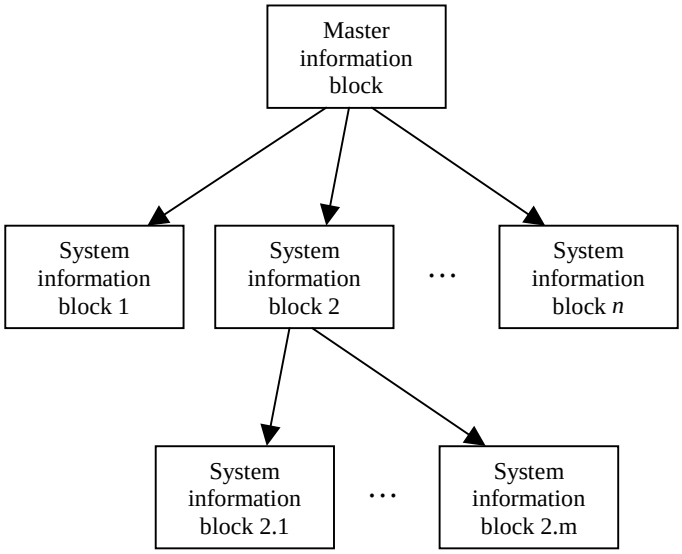


Figure 4: The overall structure of system information

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 is valid. If the area scope is *cell*, the UE shall read the system information block every time a new cell is entered. If the area scope is *PLMN*, the UE shall check the value tag for the system information block when a new cell is entered. 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 in the old cell, the UE shall re-read the system information block.

The *UE mode/state column* in table 8.1.1 specifies in which UE mode or UE state the IEs in a system information block are valid. If the UE mode is *idle mode*, the UE shall use the IEs given by the system information block in idle mode. If the UE mode is *connected mode*, the UE shall use the IEs given by the system information block in connected mode. If the UE state is *CELL_FACH*, the UE shall use the IEs given by the system information block when in state CELL_FACH. In state *CELL_DCH*, the UEs fulfilling the *Additional requirements column* shall use the IEs given by the system information block when in state CELL_DCH.

The *transport channel* column in table 8.1.1 specifies where the system information block is broadcast. If the transport channel is *BCH*, the UE shall read the system information block on a BCH transport channel. If the transport channel is *FACH*, the UE shall read the system information block on a FACH transport channel.

The *scheduling information column* in table 8.1.1 specifies the position and repetition period for the SIB.

Table 8.1.1: Specification of system information block characteristics

System information block	Area scope	UE mode/state	Transport channel	Scheduling information	Additional requirements
Master information block	Cell	Idle mode, Connected mode	BCH	SIB_POS = 0 FDD: SIB_REP = [8] TDD: SIB_REP = [8, 16, 32, 64] [SIB_OFF=1]	
		CELL_FACH	FACH	Scheduling not applicable	
System information block type 1	PLMN	Idle mode	BCH	Specified by the IE "Scheduling information"	
System information block type 2	PLMN	Connected mode	BCH	Specified by the IE "Scheduling information"	
System information block type 3	Cell	Idle mode, (Connected mode)	BCH	Specified by the IE "Scheduling information"	
System information block type 4	Cell	Connected mode	BCH	Specified by the IE "Scheduling information"	If System information block type 4 is not broadcast in a cell, the connected mode UE shall read System information block type 3
System information block type 5	Cell	Idle mode, (Connected mode)	BCH	Specified by the IE "Scheduling information"	
System information block type 6	Cell	Connected mode	BCH	Specified by the IE "Scheduling information"	If system information block type 6 is not broadcast in a cell, the connected mode UE shall read System information block type 5. 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
System information block type 7	Cell	Idle mode and Connected mode	BCH	Specified by the IE "Scheduling information"	
System information block type 8	Cell	Connected mode	BCH	Specified by the IE "Scheduling information"	
System information block type 9	Cell	Connected mode	BCH	Specified by the IE "Scheduling information"	
System information block type 10	Cell	CELL_DCH	FACH		This system information block shall only be acquired by UEs with certain capabilities (DRAC). If the system information block is not broadcast in a cell, the DRAC procedures do not apply in this cell.
System information block type 11	Cell	Idle mode (Connected mode)	BCH	Specified by the IE "Scheduling information"	

System information block type 12	Cell	Connected mode	BCH	Specified by the IE "Scheduling information"	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, Connected mode	BCH	Specified by the IE "Scheduling information"	
System information block type 13.1	Cell	Idle Mode, Connected mode	BCH	Specified by the IE "Scheduling information"	
System information block type 13.2	Cell	Idle Mode, Connected mode	BCH	Specified by the IE "Scheduling information"	
System information block type 13.3	Cell	Idle Mode, Connected mode	BCH	Specified by the IE "Scheduling information"	
System information block type 13.4	Cell	Idle Mode, Connected mode	BCH	Specified by the IE "Scheduling information"	
System information block type 14 (TDD)	Cell	Idle Mode, Connected mode	BCH, FACH	Specified by the IE "Scheduling information"	

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. 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 system information blocks. If a system information block is larger than the size of a SYSTEM INFORMATION message, it will be segmented and transmitted in several messages. If a system information block is smaller than a SYSTEM INFORMATION message, UTRAN may concatenate several complete system information blocks into the same message.

Four different segment types are defined:

- First segment.
- Subsequent segment
- Last segment
- Complete

Each of the types *First-*, *Subsequent-* and *Last segment* are used to transfer segments of a master information block or a system information block. The segment type *Complete* is used to transfer a complete master information block or a complete system information block.

Each segment consists of a header and a data field. The data field carries the actual 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 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. First segment

2. Subsequent segment
3. Last segment
4. Last segment + one or several Complete
5. One or several Complete

Not more than one segment from each master information block or system information block should be transmitted in the same SYSTEM INFORMATION message. When combination 3, 4 or 5 is used, padding should be inserted until the SYSTEM INFORMATION message has the same size as the BCH- or the FACH transport 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 or system information block shall be assembled in ascending order with respect to the segment index.

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 the repetition period (SIB_POS(0))
- Offset of the subsequent segments in ascending index order (SIB_OFF(i), i=1, 2, … SEG_COUNT-1)
  The position of the subsequent segments are calculated as: SIB_POS(i) = SIB_POS(i-1) + SIB_OFF(i).

The scheduling is based on the Cell System Frame number (SFN). The frame at which a particular segment (i) of a system information block occurs is defined as follows:

$$SFN \bmod SIB\_REP = SIB\_POS(i)$$

NOTE: SIB_POS must be less than SIB_REP for all segments.

In FDD, the scheduling of the master information block is fixed by the pre-defined repetition rate = [8] and the position=0. In TDD, the scheduling of the master information block is fixed to one of the constant repetition rates 8, 16, 32 or 64 and the position=0.

8.1.1.2 Initiation

The system information is continuously repeated on a regular basis in accordance with the scheduling defined for each system information block.

The UTRAN may temporarily send information blocks other than those scheduled.

8.1.1.3 Reception of SYSTEM INFORMATION messages by the UE

The UE shall receive SYSTEM INFORMATION messages broadcast on a BCH transport channel in idle mode as well as in states CELL_FACH, CELL_PCH and URA_PCH. Further, the UE shall receive SYSTEM INFORMATION messages broadcast on a FACH transport channel when in CELL_FACH state. In addition, UEs with certain service capabilities shall receive system information on a FACH transport channel when in CELL_DCH state.

Idle mode- and connected mode UEs may acquire different combinations of system information blocks. Before each acquisition, the UE should identify which system information blocks that are needed.

The UE may store system information blocks (including their value tag) for different cells and different PLMNs, to be used if the UE returns to these cells. This information is valid for a period of [TBD] hours after reception. All stored system information blocks shall be considered as invalid after the UE has been switched off.

When selecting a new PLMN, the UE shall consider all current system information blocks to be invalid. If the UE has stored valid system information blocks for the selected cell of the new PLMN, the UE may set those as current system information blocks.

8.1.1.3.1 Reception of SYSTEM INFORMATION messages broadcast on a BCH transport channel

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.

On reception of the master information block, the UE shall

- If SELECTED_CN has the value "GSM-MAP" and the IE "CN Type" has the value "GSM-MAP" or "GSM-MAP AND ANSI-41", the UE shall. check the IE "PLMN identity" in the master information block and verify that it is the selected PLMN.
- If SELECTED_CN has the value "ANSI-41 "and the IE "CN Type" has the value "ANSI-41" or "GSM-MAP AND ANSI-41", the UE shall store the ANSI-41 Information elements contained in the master information block and perform initial process for ANSI-41.
- store the "value tag" into the variable VALUE TAG for the master information block.
- check and store the IE "value tag" for all system information blocks that are to be used by the UE. If, for any system information blocks, the value tag is different from the value of the variable VALUE_TAG for that system information block or if no IEs from corresponding system information block have been stored, the UE shall read and store the IEs of that system information block.

The UE may use the scheduling information given by the master information to locate each system information block to be acquired.

Upon reception of a system information block, the UE shall perform the actions specified in subclause 8.1.1.5.

8.1.1.3.2 Reception of SYSTEM INFORMATION messages broadcast on a FACH transport channel

The master information block is not broadcast regularly on FACH. The master information block on BCH indicates the available system information blocks on FACH.

When receiving system information blocks on FACH, the UE shall perform the action as defined in subclause 8.1.1.5.

8.1.1.4 Modification of system information

Different rules apply for the updating of different types of system information blocks. If the system information block has a "value tag" in the master information block or higher level system information block, UTRAN shall indicate when any of the information elements are modified by changing the value of Value TAG. [Even if the value tag does not change, the UE shall consider the system information block to be invalid after a period of [TBD] hours from reception.] In addition to this, there are system information block types that contain information elements changing too frequently to be indicated by change in value tag. This type of system information blocks is not linked to a value tag in the master information block or higher-level system information block. All stored system information blocks shall be considered as invalid after the UE has been switched off.

8.1.1.4.1 Modification of system information blocks using a value tag

When system information is modified, UTRAN shall perform the following actions to indicate the change to the UEs:

- update the actual system information in the corresponding system information block.

- start to send the updated system information block on the BCCH instead of the old system information block.

- If the updated system information block is linked to a higher level system information block, update the higher level system information block with the "value tag" of the modified system information block.

- update the master information block with the "value tag" of the modified system information block or higher level system information block and change the "value tag" of the master information block.

- send the new master information block on the BCCH mapped on BCH instead of the old master information block.

- send the new master information block on the BCCH mapped on FACH in order to reach all UEs in state CELL_FACH. UTRAN may repeat the new master information block on the FACH to increase the probability of proper reception in all UEs needing the information.

- send the PAGING TYPE 1 message on the PCCH in order to reach idle mode UEs as well as connected mode UEs in state CELL_PCH and URA_PCH. In the IE "BCCH Modification Information" in the PAGING TYPE 1 message, UTRAN shall indicate the new value tag for the master information block. The PAGING TYPE 1 message should be sent in all paging occasions.

- It should be noted that for the proper operation of the BCCH Modification Information sent on the 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.

On reception of the PAGING TYPE 1 message, the UE shall

- check the "value tag" of the master information block indicated in the IE "BCCH Modification information". If the value tag is different from the value stored in the variable VALUE_TAG for the master information block, the UE shall read the new master information.

At reception of the new master information block (received on the BCCH mapped on BCH or FACH), the UE shall:

- store the new "value tag" sent in the variable VALUE_TAG for the master information block.

- check the IE "value tag" for all system information blocks that are used by the UE. The UE shall read each system information block, for which the value tag is different from the value stored in the variable VALUE_TAG for that system information block. On reception of a modified system information block, the UE shall perform the actions specified in subclause 8.1.1.5.

8.1.1.4.2 Modification of system information without value tag

When the UE has acquired a system information block not linked to a value tag, a timer shall be started using a value equal to the repetition rate (SIB_REP) for that system information block. When the timer expires, the information carried in the system information block is considered to be invalid and the UE shall acquire the system information block before the system information elements can be used. On reception of a modified system information block, the UE shall perform the actions specified in subclause 8.1.1.5.

8.1.1.4.3 Time critical 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. If such case, the UTRAN performs the following actions to indicate the change to the UEs:

- send the message PAGING TYPE 1 on the PCCH in order to reach idle mode UEs as well as connected mode UEs in state CELL_PCH and URA_PCH. In the IE "BCCH Modification Information", UTRAN shall indicate the time when the change will occur and the new value tag that will apply for the master information block after the change has occurred. The PAGING TYPE 1 message shall be sent in all paging occasions.

- send the message SYSTEM INFORMATION CHANGE INDICATION on the BCCH mapped on FACH in order to reach all UEs in state CELL_FACH. In the IE "BCCH Modification Information", UTRAN shall indicate the time when the change will occur and the new value tag that will apply for the master information block after the change has occurred. UTRAN may repeat the SYSTEM INFORMATION CHANGE INDICATION on the FACH to increase the probability of proper reception in all UEs needing the information.

- update the actual system information and change the "value tag" in the corresponding system information block.
- update the master information block with the "value tag" of the modified system information block and change the "value tag" of the master information block.
- at the indicated time, start to send the new master information block on the BCCH mapped on BCH instead of the old master information block and the updated system information block on the BCCH instead of the old system information block.

At reception of the PAGING TYPE 1 or SYSTEM INFORMATION CHANGE INDICATION message, the UE shall

- wait until the starting time, indicated in the IE "BCCH Modification Information". When the starting time occurs, the UE shall read the new master information block.

At reception of the new master information block, the UE shall:

- store the new "value tag" of the master information block.
- check the IE "value tag" for all system information blocks that are used by the UE. The UE shall read each system information block, for which the value tag is different from the value stored in the variable VALUE_TAG for that system information block. At reception of a modified system information block, the UE shall perform the actions specified in subclause 8.1.1.5.

If the UE can not find the master information block, it can assume that a physical reconfiguration has occurred and perform a new cell search.

8.1.1.5 Actions upon reception of system information blocks

8.1.1.5.1 System Information Block type 1

If in idle mode, the UE should store all relevant IEs included in this system information block. The UE shall also

- forward the content of the IE "NAS system info" to the non-access stratum entity indicated by the IE "CN domain identity".
- use the IE "CN_DRX_cycle length" to calculate frame number for the Paging Occasions and Page indicator as specified in TS 25.304.

If in connected mode the UE shall not use the values of the IEs in this system information block.

8.1.1.5.2 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 also

- use the IE "UTRAN_DRX_cycle length" to calculate frame number for the Paging Occasions and Page indicator as specified in TS 25.304.
- if in state CELL_FACH or CELL_PCH, start to perform periodical cell updates using the information in the IE "Information for periodic cell and URA update".
- if in state URA_PCH, start to perform periodical URA updates using the information in the IEs "URA identity" and "Information for periodic cell and URA update".

If in idle mode, the UE shall not use the values of the IEs in this system information block.

8.1.1.5.3 System Information Block type 3

The UE should store all relevant IEs included in this system information block. The UE shall also

- if IEs containing scheduling information for other system information blocks are included, the UE shall act on those IEs in a similar manner as specified for the scheduling information contained within the master information block.

8.1.1.5.4 System Information Block type 4

If in connected mode, the UE should store all relevant IEs included in this system information block. The UE shall also

- if IEs containing scheduling information for other system information blocks are included, the UE shall act on those IEs in a similar manner as specified for the scheduling information contained within the master information block.

If in idle mode, the UE shall not use the values of the IEs included in this system information block.

8.1.1.5.5 System Information Block type 5

The UE should store all relevant IEs included in this system information block. The UE shall also

- if IEs containing scheduling information for other system information blocks are included, the UE shall act on those IEs in a similar manner as specified for the scheduling information contained within the master information block.
- if the IE "Frequency info" is included, tune to the frequency given by this IE and use it as the active frequency.
- let the physical channel(s) of type PRACH given by the IE(s) "PRACH info" be the default in uplink.
- start to receive the physical channel of type AICH using the parameters given by the IE "AICH info".
- start to receive the physical channel of type PICH using the parameters given by the IE "PICH info".
- start to monitor its paging occasions on the PICH.
- start to receive the physical channel(s) of type Secondary CCPCH using the parameters given by the IE(s) "Secondary CCPCH info".

8.1.1.5.6 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 also

- if IEs containing scheduling information for other system information blocks are included, the UE shall act on those IEs in a similar manner as specified for the scheduling information contained within the master information block.
- if the IE "Frequency info" is included, tune to the frequency given by this IE and use it as the active frequency.
- let the physical channel(s) of type PRACH given by the IE(s) "PRACH info" be the default in uplink. 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". 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.
- start to receive the physical channel of type PICH using the parameters given by the IE "PICH info". 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 PICH.
- start to receive the physical channel(s) of type Secondary CCPCH using the parameters given by the IE(s) "Secondary CCPCH info". 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.

If in idle mode, the UE shall not use the values of the IEs in this system information block.

8.1.1.5.7 System Information Block type 7

The UE should store all relevant IEs included in this system information block. The UE shall also

- start a timer set to the value given by the repetition period (SIB_REP) for that system information block.

8.1.1.5.8 System Information Block type 8

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.

8.1.1.5.9 System Information Block type 9

If in connected mode, the UE should store all relevant IEs included in the system information block. The UE shall also

- 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.

8.1.1.5.10 System Information Block type 10

If in state CELL_DCH, the UE should store all relevant IEs included in this system information block. The UE shall also

- start a timer set to the value given by the repetition period (SIB_REP) for that system information block

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.

8.1.1.5.11 System Information Block type 11

The UE should store all relevant IEs included in this system information block. The UE shall also

- if IEs containing scheduling information for other system information blocks are included, the UE shall act on those IEs in a similar manner as specified for the scheduling information contained within the master information block.
- for each IE "measurement type" start a measurement using the set of IEs specified for that measurement type.

8.1.1.5.12 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 also

- if IEs containing scheduling information for other system information blocks are included, the UE shall act on those IEs in a similar manner as specified for the scheduling information contained within the master information block.
- for each IE "measurement type" start a measurement using the set of IEs specified for that measurement type.
- if the IEs "Intra-frequency cell info" and/or "Intra-frequency measurement quantity" is 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 the IEs "Inter-frequency cell info" and/or "Inter-frequency measurement quantity" is not included in the system information block, read the corresponding IE(s) in system information block type 11 and use that information for the inter-frequency measurement.
- if the IEs "Inter-system cell info" and/or "Inter-system measurement quantity" is not included in the system information block, read the corresponding IE(s) in system information block type 11 and use that information for the inter-system measurement.
- associate each measurement with the identity number given by the IE "Measurement identity number".
- if in state CELL_PCH or URA_PCH ignore the IEs "Intra-frequency reporting criteria" and "Intra-frequency reporting Quantity".

- if the IEs "Intra-frequency reporting Quantity for RACH Reporting" and/or "Maximum number of reported cells on RACH" is not included, store the corresponding IE(s) given by the system information block type 11.

If in idle mode, the UE shall not use the values of the IEs in this system information block.

8.1.1.5.13 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 DRX cycle length", "UE timers in idle mode" and "Capability update requirement" which shall be stored only in the idle mode case. The UE shall read SIB type 13 and the associated SIB type 13.1, 13.2, 13.3 and 13.4 only when the variable SELECTED_CN has the value "ANSI-41" and the IE "CN type" in the Master Information Block has the value "ANSI-41" or "ANSI-41 and GSM-MAP". The UE shall also

- forward the content of the IE "NAS(ANSI-41) system info" to the non-access stratum entity indicated by the IE "CN domain identity".
- use the IE "CN_DRX_cycle length" to calculate frame number for the Paging Occasions and Page indicator as specified in TS 25.304.

8.1.2 Paging

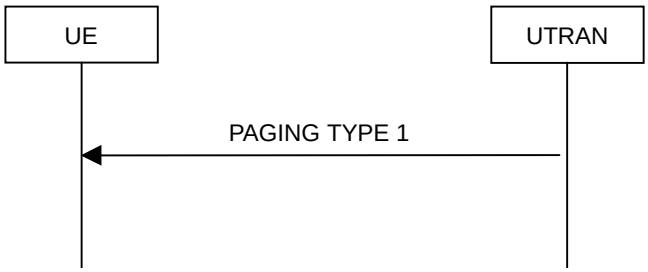


Figure 5: Paging

8.1.2.1 General

This procedure is used to transmit paging information to selected UEs in idle mode, CELL_PCH or URA_PCH state using the paging control channel (PCCH). Upper layers in the network may request paging, to e.g. establish a signalling connection. UTRAN may initiate paging in CELL_PCH or URA_PCH state, to trigger a UE state. In addition, UTRAN may initiate paging in idle mode, CELL_PCH and URA_PCH state to trigger reading of updated system information.

8.1.2.2 Initiation

UTRAN initiates the paging procedure by broadcasting a PAGING TYPE 1 message on an appropriate paging occasion on the PCCH.

UTRAN may repeat paging of a UE in several paging occasions to increase the probability of proper reception of a page.

UTRAN may page several UEs in the same paging occasion by including one IE "Paging record" for each UE in the PAGING TYPE 1 message. UTRAN may also indicate that system information has been updated, by including the value tag of the master information block in the IE "BCCH modification information" in the PAGING TYPE 1 message. In this case, UTRAN may omit the IEs "Paging record".

UTRAN shall not set more than one IE "Paging record" for same UE in one PAGING TYPE 1 message.

8.1.2.3 Reception of an PAGING TYPE 1 message by the UE

The UE shall in idle mode, CELL_PCH state and URA_PCH state receive the paging information for all its monitored paging occasions. For an UE in idle mode, the paging occasions are specified in TS 25.304 and depend on the IE "CN domain specific DRX cycle length coefficient", as specified in 8.5.7.1.1. For an UE in CELL_PCH state and URA_PCH

state the paging occasions depend on the IE "UTRAN DRX Cycle length coefficient" and the IE "DRX indicator", as specified in subclause 8.5.7.3.2 and 8.5.7.3.3 respectively.

When the UE receives a PAGING TYPE 1 message, it shall check each occurrence of the IE "Paging record"

For each included paging record the UE shall compare the included identity with the identity of the UE according to the following:

An idle mode UE shall

- if the IE "paging originator" is CN, compare the included identities of type CN UE identity with all of its allocated CN UE identities.
- for each match, forward the identity and paging cause to the upper layer entity indicated by the IE "CN domain identity".
- store the paging cause to be included in the RRC connection establishment procedure.
- if the IE "paging originator" is UTRAN, ignore that paging record.

A connected mode UE shall;

- if the IE "paging originator" is UTRAN, compare the included identities of type "Connected mode identity" with its allocated U-RNTI.
- for each match,, the UE shall enter CELL_FACH state and perform a cell update procedure with cause "paging response" as specified in subclause 8.3.1.2.
- if the IE "paging originator" is CN, ignore that paging record.

If the IE "BCCH modification info" is included, the UE shall perform the actions as specified in subclause 8.1.1

8.1.3 RRC connection establishment

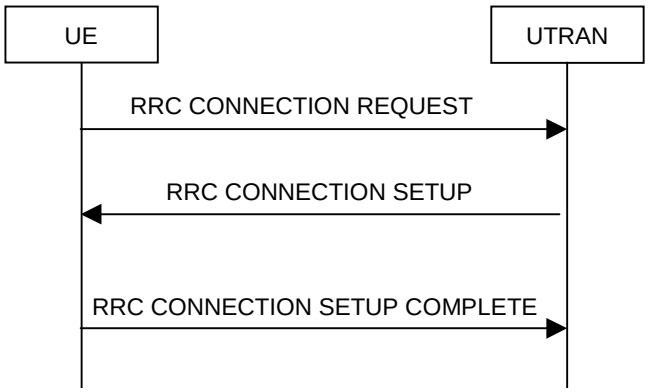


Figure 6: RRC Connection Establishment, network accepts RRC connection

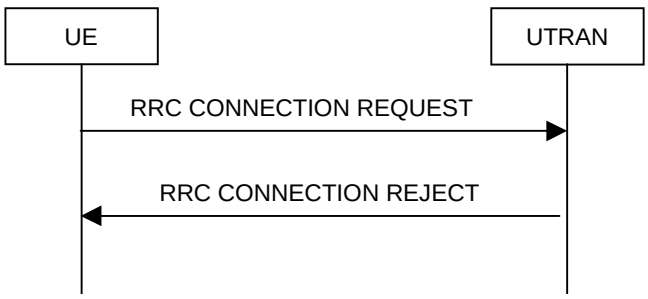


Figure 7: RRC Connection Establishment, network rejects RRC connection

8.1.3.1 General

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

8.1.3.2 Initiation

The non-access stratum in the UE may request the establishment of at most one RRC connection per UE.

The UE shall transmit an RRC CONNECTION REQUEST message on the uplink CCCH, reset counter V300, and start timer T300.

The UE shall set the IE "Establishment cause" according to indications from the non-access stratum or according to the paging cause received from the PAGING TYPE 1 message.

The UE shall set the IE "Initial UE identity" according to subclause 8.5.1

The UE shall indicate its capability in the IE "Initial UE capability".

The UE shall include a measurement report, 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.

8.1.3.3 Reception of an RRC CONNECTION REQUEST message by the UTRAN

UTRAN should either

- transmit an RRC CONNECTION SETUP message on the downlink CCCH or
- transmit an RRC CONNECTION REJECT message on the downlink CCCH. On the UTRAN side, the procedure ends and all context information for this UE may be deleted in UTRAN.

8.1.3.4 Reception of a 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 IE "Initial UE identity" in the most recent RRC CONNECTION REQUEST message sent by the UE.

- If the values are identical, the UE shall stop timer T300, and perform the following actions.
- If the values are different, the UE shall ignore the rest of the message

The UE shall act upon all received information elements as specified in 8.5.7, unless specified otherwise in the following.

The UE shall

- store the value of the IE "U-RNTI" and
- initiate the signalling link parameters according to the IE "RB mapping info".

If the IE "C-RNTI" is included, the UE shall

- use that C-RNTI on common transport channels in the current cell.

If neither the IE "PRACH info (for RACH)",nor the IE "Uplink DPCH info" is included, the UE shall

- let the physical channel of type PRACH that is given in system information to be the default in uplink for RACH

If neither the IE "Secondary CCPCH info", nor the IE "Downlink DPCH info" is included, the UE shall

- start to receive the physical channel of type Secondary CCPCH that is given in system information to be used as default by FACH.

The UE shall enter a state according to 8.5.8.

The UE shall transmit an RRC CONNECTION SETUP COMPLETE message on the uplink DCCH, with contents as specified below.

If requested in the IE "Capability update requirement" sent in the RRC CONNECTION SETUP message, the UE shall include its UTRAN-specific capabilities in the IE "UE radio capability".

If requested in the IE "Capability update requirement" sent in the RRC CONNECTION SETUP message, the UE shall include its inter-system capabilities in the IE "UE system specific capability".

When the transmission of the RRC CONNECTION SETUP COMPLETE message has been confirmed by RLC the UE shall update its variable UE_CAPABILITY_TRANSFERRED which UE capabilities it has transmitted to the UTRAN and the procedure ends.

8.1.3.5 Physical channel failure or T300 timeout

- Upon expiry of timer T300, or
- if the UE failed to establish the physical channel(s) indicated in the RRC CONNECTION SETUP message

the UE shall check the value of V300, and

- if V300 is equal to or smaller than N300, the UE shall transmit a new RRC CONNECTION REQUEST message on the uplink CCCH, restart timer T300 and increase counter V300. The UE shall set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.2.
- If V300 is greater than N300, the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2

8.1.3.6 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 IE "Initial UE identity" in the last RRC CONNECTION REQUEST message sent by the UE.

- If the values are identical, the UE shall stop timer T300 and perform the actions below
- If the values are different, the UE shall ignore the rest of the message

If the IE "wait time" is present, and

- if V300 is equal to or smaller than N300, the UE shall wait at least the time stated in the IE "wait time", transmit a new RRC CONNECTION REQUEST message on the uplink CCCH, restart timer T300 and increase counter V300. UE shall set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.2.
- If V300 is greater than N300 the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2

If the IE "wait time" is not present the UE shall

- enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2

8.1.3.7 Reception of an RRC CONNECTION SETUP COMPLETE message by the UTRAN

When UTRAN has received the RRC CONNECTION SETUP COMPLETE message, the procedure ends on the UTRAN side.

8.1.4 RRC connection release

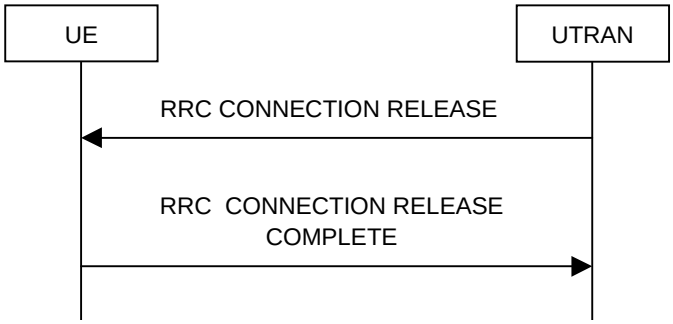


Figure 8: RRC Connection Release procedure

8.1.4.1 General

The purpose with this procedure is to release the RRC connection including the signalling link and all radio bearers between the UE and the UTRAN.

8.1.4.2 Initiation

When the UE is in state CELL_DCH or CELL_FACH, the UTRAN can at anytime initiate a RRC connection release by transmitting an RRC CONNECTION RELEASE message using unacknowledged mode.

UTRAN may transmit several RRC CONNECTION RELEASE messages to increase the probability of proper reception of the message by the UE. 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

- When in state CELL_DCH, transmit an RRC CONNECTION RELEASE COMPLETE message using unacknowledged mode to the UTRAN and start timer T308.
- When in state CELL_FACH, transmit an RRC CONNECTION RELEASE COMPLETE message using acknowledged mode to the UTRAN

Any succeeding RRC CONNECTION RELEASE messages that are received by the UE shall be ignored.

A release indication should be given to the non-access stratum.

When in CELL_DCH state, UE shall initialise the counter V308 with the value of the IE "Number of RRC Message Transmissions" , which indicates the number of times to send the RRC CONNECTION RELEASE COMPLETE message.

8.1.4.4 Expiry of timer T308 in CELL_DCH state

When in state CELL_DCH and the timer T308 expires, the UE shall decrease V308 by one. If V308 is greater than zero, the UE shall retransmit the RRC CONNECTION RELEASE COMPLETE message. If V308 is equal to zero, the UE shall release all its radio resources, enter idle mode and the procedure ends on the UE side. Actions the UE shall perform when entering idle mode are given in subclause 8.5.2

8.1.4.5 Successful transmission of the RRC CONNECTION RELEASE COMPLETE message in CELL_FACT state

When the UE is in state CELL_FACH and RLC has confirmed the transmission of the RRC CONNECTION RELEASE COMPLETE message it shall release all its radio resources, enter idle mode and the procedure ends on the UE side. Actions the UE shall perform when entering idle mode are given in subclause 8.5.2

8.1.4.6 Reception of an RRC CONNECTION RELEASE COMPLETE message by UTRAN

When UTRAN receives a RRC CONNECTION RELEASE COMPLETE message from the UE, it should release all UE dedicated resources and the procedure ends on the UTRAN side.

8.1.4.7 Unsuccessful transmission of the RRC CONNECTION RELEASE COMPLETE message in CELL_FACH state

When the UE is in state CELL_FACH and does not succeed in transmitting the RRC CONNECTION RELEASE COMPLETE message, it shall release all its radio resources, enter idle mode and the procedure ends on the UE side. Actions the UE shall perform when entering idle mode are given in subclause 8.5.2

8.1.4.8 Detection of dedicated physical channel release by UTRAN in CELL_DCH state

If the release is performed from the state CELL_DCH, and UTRAN detects loss of a 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.

8.1.4.9 No reception of an 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.

8.1.5 RRC connection re-establishment

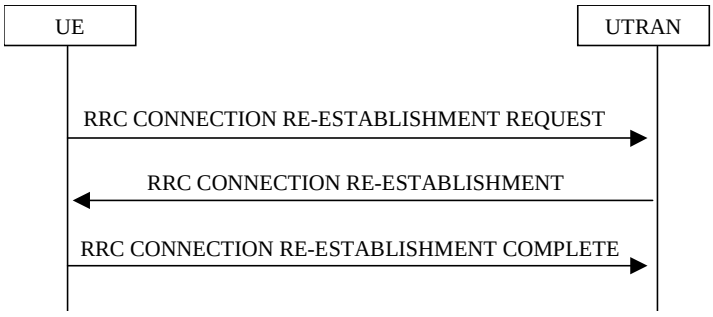


Figure 9: RRC Connection Re-establishment, successful case

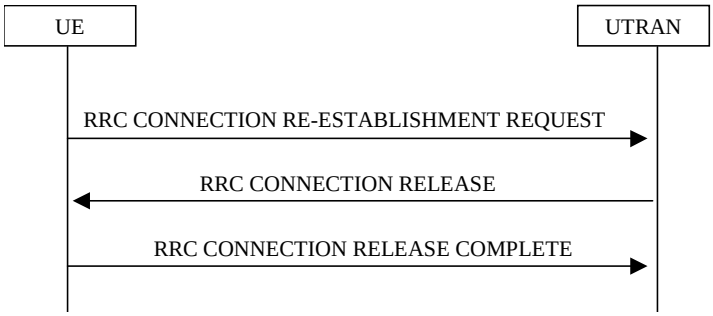


Figure 10: RRC Connection Re-establishment, failure case

8.1.5.1 General

The purpose of this procedure is to re-establish a lost RRC connection.

8.1.5.2 Initiation

When a UE loses the radio connection due to e.g. radio link failure (see 8.5.6) in CELL_DCH state, the UE may initiate a new cell selection by transiting to CELL_FACH state and request re-establishment of an RRC connection.

The UE shall start timer T314.

If the UE detects "in service area"(see 8.5.10), the UE shall stop timer T314 and transmit an RRC CONNECTION RE-ESTABLISHMENT REQUEST message on the uplink CCCH, reset counter V301, and start timer T301.

The UE shall

- Set the IE "U-RNTI" to the value stored in the UE.
- Include an IE "Measured Results", 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 12.

8.1.5.3 Reception of an RRC CONNECTION RE-ESTABLISHMENT REQUEST message by the UTRAN

UTRAN may either

- Initiate the RRC connection re-establishment procedure and transmit an RRC CONNECTION RE-ESTABLISHMENT message on the downlink DCCH on FACH or
- Initiate the RRC connection release procedure in CELL_FACH state.

8.1.5.4 Reception of an RRC CONNECTION RE-ESTABLISHMENT message by the UE

Upon reception of the RRC CONNECTION RE-ESTABLISHMENT message the UE shall

- Stop timer T301
- Re-establish the RRC connection according to the IEs included in the RRC CONNECTION RE-ESTABLISHMENT message
- Transmit a RRC CONNECTION RE-ESTABLISHMENT COMPLETE message on the uplink DCCH using AM RLC.

The UE shall use the contents of the RRC CONNECTION RE-ESTABLISHMENT message as specified in clause 8.5.7, unless specified otherwise in the following.

- For each reconfigured radio bearer use the mapping option applicable for the transport channels used according to the IE "RB mapping info".

- Configure MAC multiplexing if that is needed in order to use said transport channel(s).

- Use MAC logical channel priority when selecting TFC in MAC.

If neither the IEs "PRACH info" nor "Uplink DPCH info" is included, the UE shall

- Let the physical channel of type PRACH that is given in system information Block Type 6 be the default in uplink. If system information block type 6 is not present in the cell, the UE shall let the physical channel of type PRACH given in system information block type 5 be the default in uplink.

If neither the IEs "Secondary CCPCH info" nor "Downlink DPCH info" is included, the UE shall

- Start to receive the physical channel of type Secondary CCPCH that is given in system information.

The UE shall use the transport channel(s) applicable for the physical channel types that is used. If the IE "TFS" is neither included nor previously stored in the UE for that transport channel(s), the UE shall

- Use the TFS given in system information

If none of the TFS stored is compatible with the physical channel, the UE shall

- Delete the stored TFS and use the TFS given in system information

If the IE "New C-RNTI" is included, the UE shall

- Use that C-RNTI when using common transport channels of type RACH, FACH and CPCH in the current cell.

If the IE "New U-RNTI" is included, the UE shall update its identity.

If the IEs "CN domain identity" and "NAS system information" are included, the UE shall

- Forward the content of the IE to the non-access stratum entity of the UE indicated by the IE "CN domain identity".

The UE shall enter a state according to 8.5.8.

8.1.5.5 T314 timeout

- Upon expiry of timer T314

the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2

8.1.5.6 T301 timeout or DPCH failure

- Upon expiry of timer T301, or

- if the UE failed to re-establish the RRC Connection indicated in the RRC CONNECTION RE-ESTABLISHMENT message

the UE shall check the value of V301, and

- if V301 is equal to or smaller or equal than N301, the UE shall transmit a new RRC CONNECTION RE-ESTABLISHMENT REQUEST message on the uplink CCCH, restart timer T301 and increase counter V301. The UE shall set the IEs in the RRC CONNECTION RE-ESTABLISHMENT REQUEST message according to subclause 8.1.5.2.

- If V301 is greater than N301, the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2

8.1.5.7 Reception of an RRC CONNECTION RE-ESTABLISHMENT COMPLETE message by the UTRAN

When UTRAN has received the RRC CONNECTION RE-ESTABLISHMENT COMPLETE message, the procedure ends on the UTRAN side.

8.1.6 Transmission of UE capability information

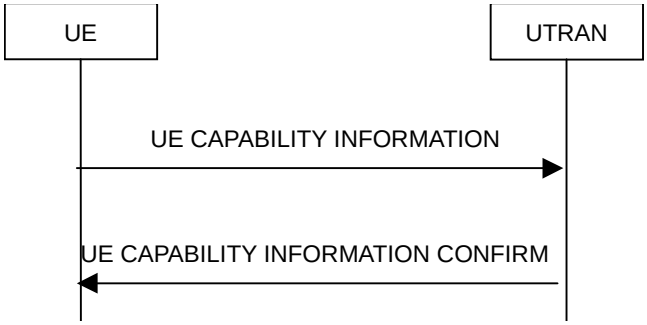


Figure 11: Transmission of UE capability information, normal flow

8.1.6.1 General

The UE capability update procedure is used by the UE to convey UE specific capability information to the UTRAN.

8.1.6.2 Initiation

The UE shall initiate the UE capability update procedure in the following situations:

- After the UE has received a UE CAPABILITY ENQUIRY message from the UTRAN.
- If UE capabilities stored in the variable UE_CAPABILITY_TRANSFERRED change during the RRC connection

The UE transmits the UE CAPABILITY INFORMATION message on the uplink DCCH using AM or UM RLC, starts timer T304 and resets counter V304.

If the UE CAPABILITY INFORMATION message is sent in response to a UE CAPABILITY ENQUIRY message, the UE shall

- include the UTRAN-specific UE capability information elements into the IE "UE radio capability", according to the requirement given in the IE "Capability update requirement" in the UE CAPABILITY ENQUIRY message.
- include one or more inter-system classmarks into the IE "UE system specific capability", according to the requirement given in the IE "Capability update requirement" in the UE CAPABILITY ENQUIRY message

8.1.6.3 Reception of an UE CAPABILITY INFORMATION message by the UTRAN

Upon reception of a UE CAPABILITY INFORMATION message, the UTRAN should transmit a UE CAPABILITY INFORMATION CONFIRM message on the downlink DCCH using UM or AM RLC. After the UE CAPABILITY INFORMATION CONFIRM message has been sent, the procedure is complete.

8.1.6.4 Reception of the UE CAPABILITY INFORMATION CONFIRM message by the UE

Upon reception of a UE CAPABILITY INFORMATION CONFIRM message, the UE shall stop timer T304. It shall then update its variable UE_CAPABILITY TRANSFERRED which UE capabilities it has transmitted to the UTRAN during the current RRC connection.

8.1.6.5 T304 timeout

Upon expiry of timer T304, the UE the UE shall check the value of V304 and

- If V304 is smaller or equal than N304, the UE shall retransmit a UE CAPABILITY INFORMATION message, restart timer T304 and increase counter V304.
- If V304 is greater than N304, the UE shall assume that radio link failure has occurred and initiate the RRC connection re-establishment procedure

8.1.7 UE capability enquiry

Figure 12: UE capability enquiry procedure, normal flow

8.1.7.1 General

The UE capability enquiry can be used to request the UE to transmit its capability information related to any radio access network that is supported by the UE.

8.1.7.2 Initiation

The UE capability enquiry procedure in initiated by UTRAN by transmitting a UE CAPABILITY ENQUIRY message on the DCCH using the UM or AM SAP.

8.1.7.3 Reception of an UE CAPABILITY ENQUIRY message by the UE

Upon reception of an UE CAPABILITY ENQUIRY message, the UE shall initiate the transmission of UE capability information procedure, which is specified in clause 8.1.6

8.1.8 Initial Direct transfer

Figure 13: Initial Direct transfer in the uplink, normal flow

8.1.8.1 General

The initial direct transfer procedure is used in the uplink to establish signalling sessions and signalling connections. It is also used to carry the initial higher layer (NAS) messages over the radio interface.

A signalling connection comprises one or several signalling sessions. This procedure requests the establishment of a new session, and triggers, depending on the routing and if no signalling connection exists for the chosen route for the session, the establishment of a signalling connection.

8.1.8.2 Initiation of Initial direct transfer procedure in the UE

In the UE, the initial direct transfer procedure shall be initiated, when the upper layers request the initialisation of a new session. This request also includes a request for the transfer of a NAS message. When not stated otherwise elsewhere, the UE may initiate the initial direct transfer procedure also when another procedure is ongoing, and in that case the state of the latter procedure shall not be affected. The UE shall transmit the INITIAL DIRECT TRANSFER message on the uplink DCCH using AM RLC.

The System Information Block Type 1 and 13 may contain CN NAS information which the upper layers in the UE can use in choosing the value to set the IE "CN Domain Identity" to. If available the UE shall use this CN NAS information as well as user preference and subscription information in setting the value of IE "CN Domain Identity" to indicate which CN node the NAS message is destined to. If the upper layers in the UE have not set a value for the IE "CN Domain Identity" RRC shall set it to the value "don't care". In addition the UE shall set the IE "Service Descriptor" and the IE "Flow Identifier" to a value allocated by the UE for that particular session.

If the INITIAL DIRECT TRANSFER message is in response to a Paging Type 1 message, the upper layers in the UE shall set the IE "CN Domain Identity" to the value indicated in the corresponding paging message. The UE shall also set the IE "Service Descriptor" and IE "Flow Identifier" to a value allocated for that particular session.

In CELL_FACH state, the UE shall include IE "Measured results" on RACH into the DIRECT TRANSFER message, if the message is sent to establish a signalling connection and if RACH measurement reporting has been requested 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 12.

When the transmission of the INITIAL DIRECT TRANSFER message has been confirmed by RLC the procedure ends.

8.1.8.3 Reception of INITIAL DIRECT TRANSFER message by the UTRAN

On reception of the INITIAL DIRECT TRANSFER message the NAS message should be routed using the IE "CN Domain Identity" and the IE "Service Descriptor". The UTRAN should use the UE context to store the contents of the IE "Flow Identifier" for that particular session.

If no signalling connection exists towards the chosen node, then a signalling connection is established.

If the IE "Measured results" is present in the message, the UTRAN shall extract the contents to be used for radio resource control.

When the UTRAN receives an INITIAL DIRECT TRANSFER message, it shall not affect the state of any other ongoing RRC procedures, when not stated otherwise elsewhere.

8.1.9 Downlink Direct transfer

Figure 14a: Downlink Direct transfer, normal flow

8.1.9.1 General

The downlink direct transfer procedure is used in the downlink direction to carry higher layer (NAS) messages over the radio interface

8.1.9.2 Initiation of downlink direct transfer procedure in the UTRAN

In the UTRAN, the direct transfer procedure is initiated when the upper layers request the transfer of a NAS message after the initial signalling connection is established. The UTRAN may initiate the downlink direct transfer procedure also when another RRC procedure is ongoing, and in that case the state of the latter procedure shall not be affected. The UTRAN shall transmit the DOWNLINK DIRECT TRANSFER message on the downlink DCCH using AM RLC on RB 2 or RB 3. The UTRAN should select the RB according to the following:

- If the non-access stratum indicates "low priority" for this message, RB 3 should be selected, if available. Specifically, for a GSM-MAP based CN, RB 2 should, if available, be selected when "SAPI 3" is requested.
- If the non-access stratum indicates "high priority" for this message, RB 2 should be selected. Specifically, for a GSM-MAP based CN, RB 2 should be selected when "SAPI 0" is requested. RB 2 should also be selected when RB 3 is not available.

The UTRAN sets the IE "CN Domain Identity" to indicate, which CN domain the NAS message is originated from.

8.1.9.3 Reception of a DOWNLINK DIRECT TRANSFER message by the UE

Upon reception of the DOWNLINK DIRECT TRANSFER message, the UE RRC shall, using the IE "CN Domain Identity", route the contents of the higher layer PDU, if any, to the correct higher layer entity.

When the UE receives a DOWNLINK DIRECT TRANSFER message, it shall not affect the state of any other ongoing RRC procedures when not stated otherwise elsewhere.

8.1.10 Uplink Direct transfer

Figure 14b: Uplink Direct transfer, normal flow

8.1.10.1 General

The uplink direct transfer procedure is used in the uplink direction to carry all subsequent higher layer (NAS) messages over the radio interface.

8.1.10.2 Initiation of uplink direct transfer procedure in the UE

In the UE, the uplink direct transfer procedure shall be initiated when the upper layers request a transfer of a NAS message after the initial signalling connection is established. When not stated otherwise elsewhere, the UE may initiate the uplink direct transfer procedure also when another procedure is ongoing, and in that case the state of the latter procedure shall not be affected. The UE shall transmit the UPLINK DIRECT TRANSFER message on the uplink DCCH using AM RLC on RB 2 or RB 3. The UE shall select the RB according to the following:

- If the non-access stratum indicates "low priority" for this message, RB 3 shall be selected, if available. Specifically, for a GSM-MAP based CN, RB 2 shall, if available, be selected when "SAPI 3" is requested.
- If the non-access stratum indicates "high priority" for this message, RB 2 shall be selected. Specifically, for a GSM-MAP based CN, RB 2 shall be selected when "SAPI 0" is requested. RB 2 shall also be selected when RB 3 is not available.

The UE shall set the IE "Flow Identifier" to the same value as that allocated to that particular session when transmitting the INITIAL DIRECT TRANSFER message for that session.

8.1.10.3 Reception of UPLINK DIRECT TRANSFER message by the UTRAN

On reception of the UPLINK DIRECT TRANSFER message the NAS message should be routed using the value indicated in the IE "Flow Identifier".

If the IE "Measured results" is present in the message, the UTRAN shall extract the contents to be used for radio resource control.

When the UTRAN receives an UPLINK DIRECT TRANSFER message, it shall not affect the state of any other ongoing RRC procedures, when not stated otherwise elsewhere.

8.1.11 UE dedicated paging

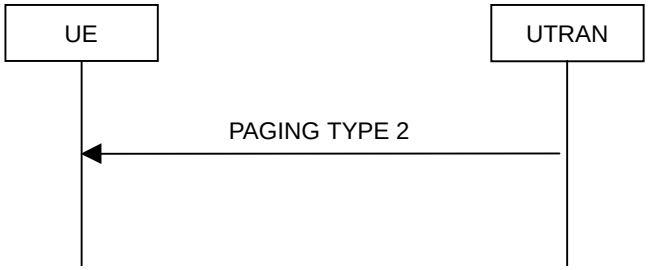


Figure 15: UE dedicated paging

8.1.11.1 General

This procedure is used to transmit dedicated paging information to one UE in connected mode in states CELL_DCH and CELL_FACH. Upper layers in the network may request initiation of paging, for e.g. to establish a signalling connection.

8.1.11.2 Initiation

For an UE in states CELL_DCH or CELL_FACH, UTRAN initiates the procedure by transmitting a PAGING TYPE 2 message on the DCCH. When not stated otherwise elsewhere, the UTRAN may initiate the UE dedicated paging procedure also when another RRC procedure is ongoing, and in that case the state of the latter procedure shall not be affected.

8.1.11.3 Reception of an PAGING TYPE 2 message by the UE

When the UE receives a PAGING TYPE 2 message, it shall not affect the state of any other ongoing RRC procedures, when not stated otherwise elsewhere.

The UE shall indicate paging and forward the paging cause and the paging record type identifier to the upper layer entity indicated by the CN domain identity.

8.1.12 Security mode control

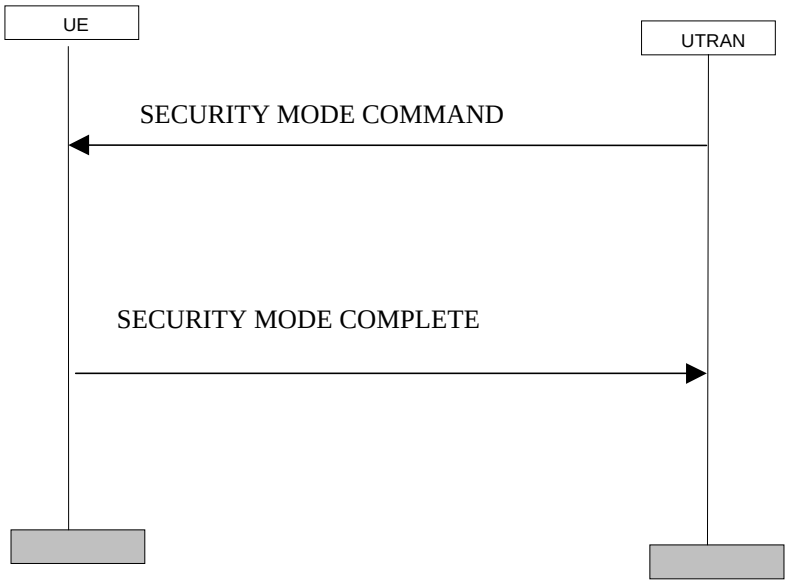


Figure 16: Security mode control procedure

8.1.12.1 General

The purpose of this procedure is to trigger the start of ciphering or to command the change of the cipher key, both for the signalling link and for any of the radio bearers.

It is also used to start integrity protection or to restart integrity protection for uplink and downlink signalling.

8.1.12.2 Initiation

Prior to UTRAN initiates a security mode control procedure for control of ciphering and if the UE has radio bearers using RLC-AM or RLC-UM, UTRAN suspends all radio bearers belonging to the CN domain for which the security mode control procedure is initiated. Also the signalling radio bearers, except the one used for RRC messages using RLC-AM, used by the security mode procedure itself, are suspended. For each suspended radio bearer, UTRAN includes the current RLC send sequence number in the IE "Radio bearer downlink activation time info" in the IE "Ciphering mode info".

Further, if the UE has radio bearers using RLC-TM, UTRAN sets the IE "Activation time for DPCH" in the IE "Ciphering mode info" to the CFN at which the new ciphering configuration shall become active.

To start or reconfigure ciphering and/or integrity protection, the UTRAN sends a SECURITY MODE COMMAND message on the downlink DCCH in AM RLC.

When the transmission of the SECURITY MODE COMMAND has been confirmed by RLC, and if the security mode control procedure is used to control ciphering, UTRAN starts to cipher the messages on the signalling radio bearer used for RRC messages using RLC-AM, with the new ciphering configuration.

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 8.5.7.

If the IE "ciphering capabilities" is the same as indicated by variable UE_CAPABILITY_TRANSFERRED, the UE shall send a SECURITY MODE COMPLETE message on the uplink DCCH in AM RLC, using any new cipher and/or integrity protection configuration.

For each radio bearer mapped on RLC-UM or RLC-AM, for which the ciphering configuration was changed, the UE shall include the current value of the RLC send state variable, VT(S), in the IE "Radio bearer uplink ciphering activation time info".

When the transmission of the SECURITY MODE COMPLETE message has been confirmed by RLC, the UE shall resume data transmission on any suspended radio bearers mapped on RLC-UM or RLC-AM and the procedure ends.

8.1.12.4 Cipher activation time too short

If the time specified by the IE "Activation time for DPCH" or the IE "Radio bearer downlink ciphering activation time info" contained in the IE "Ciphering mode info" has elapsed, the UE shall switch immediately to the new cipher configuration.

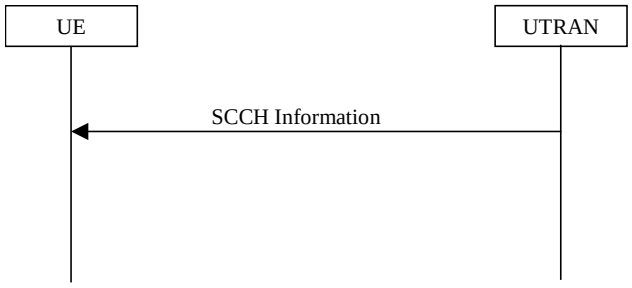
8.1.12.5 Unsuccessful verification of IE 'UE ciphering capabilities'

If the received IE 'UE ciphering capabilities' is not the same as indicated by variable UE_CAPABILITY_TRANSFERRED, the UE shall release all its radio resources, enter idle mode and the procedure ends on the UE side. Actions the UE shall perform when entering idle mode are given in subclause 8.5.2.

8.1.12.6 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. When UTRAN has received a SECURITY MODE COMPLETE message and the integrity protection has successfully been applied, the procedure ends.

8.1.13 Broadcast of SCCH information



8.1.13.1 General

The purpose of this procedure is to broadcast SCCH information e.g. PCCPCH allocation information.

8.1.13.2 Initiation

The SCCH broadcast information is continuously repeated on a regular basis in accordance with the transmission of PSCH.

8.1.13.3 Reception SCCH Information message by the UE

The UE shall evaluate the received SCCH Information and shall operate accordingly.

If the UE failed to decode the SCCH Information no further action shall be performed.

8.1.14 Signalling connection release procedure

Figure 17: Signalling connection release procedure, normal case

8.1.14.1 General

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

8.1.14.2 Initiation of SIGNALLING CONNECTION RELEASE by the UTRAN

The UTRAN may initiate the signalling connection release procedure, if it receives a signalling connection release request from one CN domain and if the UE remains engaged in a signalling connection to another CN domain.

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

The IE "Flow Identifier" indicates the signalling flow identities that are released when the CN domain releases the signalling connection to the UE.

8.1.14.3 Reception of SIGNALLING CONNECTION RELEASE by the UE

Upon reception of a SIGNALLING CONNECTION RELEASE message, the UE shall indicate the release of all signalling flows identified by the values of the IE "Flow identifier" to the corresponding higher layer entities.

8.2 Radio Bearer control procedures

8.2.1 Radio bearer establishment

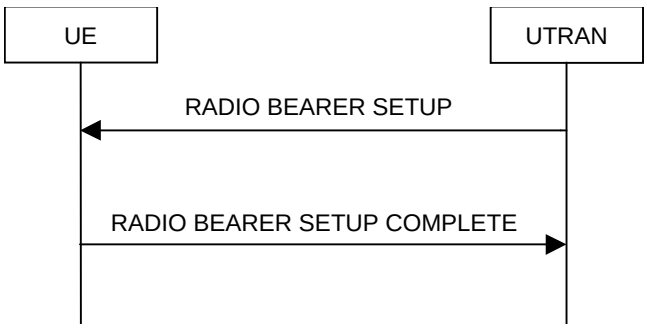


Figure 18: Radio Bearer Establishment, normal case

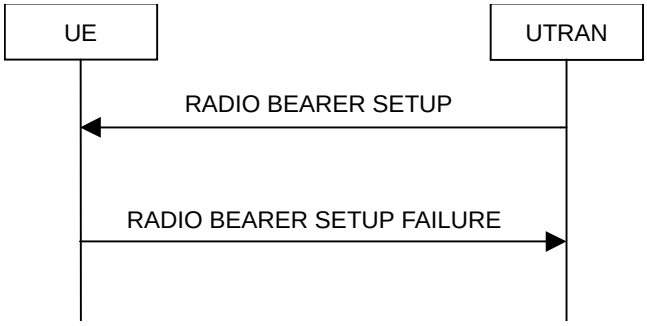


Figure 19: Radio Bearer Establishment, UE reverts to old configuration

8.2.1.1 General

The purpose with this procedure is to establish new radio bearer(s). While doing so, the procedure may perform a hard handover, see 8.3.5. The procedure may also be used to establish a transport channel for the transparent transfer of signalling.

8.2.1.2 Initiation

The upper layer in the network may request an establishment of radio bearer(s).

To initiate the procedure, UTRAN

- Configures new radio links in any new physical channel configuration and start transmission and reception on the new radio links.
- Transmits a RADIO BEARER SETUP message on the downlink DCCH using AM or UM RLC.

If transport channels are added, reconfigured or deleted in uplink and/or downlink, UTRAN shall

- Set TFCS according to the new transport channel(s)

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.

8.2.1.3 Reception of a RADIO BEARER SETUP message by the UE

Upon reception of a RADIO BEARER SETUP message the UE shall perform actions as specified below and transmit a RADIO BEARER SETUP COMPLETE message on the uplink DCCH using AM RLC. When the transmission of the RADIO BEARER SETUP COMPLETE message has been confirmed by RLC the UE shall resume data transmission on RB 2 and upwards if RLC-AM or RLC-UM is used on those radio bearers, the UE shall clear the variable ORDERED_CONFIG and the procedure ends.

The UE shall store the received physical channel configuration and the activation time in the variable ORDERED_CONFIG.

The UE shall act upon all received information elements as specified in 8.5.7, unless specified otherwise in the following.

The UE shall be able to receive an RADIO BEARER SETUP message and perform a hard handover, even if no prior UE measurements have been performed on the target cell and/or frequency

The UE shall

- For the new radio bearer(s), use the multiplexing option applicable for the transport channels used according to the IE "RB mapping info"
- For radio bearer(s) existing prior to the message, use the multiplexing option applicable for the transport channels used, according to their IE "RB mapping info" or their previously stored multiplexing options.

- Configure MAC multiplexing if that is needed in order to use said transport channel(s).
- Use MAC logical channel priority when selecting TFC in MAC.
- Suspend data transmission on RB 2 and upward, if RLC-AM or RLC-UM is used on those radio bearers

If the IE "New C-RNTI" is included, the UE shall

- Use that C-RNTI when using common transport channels of type RACH, FACH and CPCH in the current cell.

The UE should turn off the transmitter during the reconfiguration. The UE may first release the current physical channel configuration and shall then establish a new physical channel configuration according to 8.5.7 and the following.

If neither the IE "PRACH info" nor the IE "Uplink DPCH info" is included, the UE shall

- Let the physical channel of type PRACH that is given in system information be the default in uplink.

If neither the IE "Secondary CCPCH info" nor the IE "Downlink DPCH info" is included, the UE shall

- Start to receive the physical channel of type Secondary CCPCH that is given in system information.

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 then the UE shall act upon the 'PDSCH code mapping' IE as specified in Section 8.5.7 and:

- Infer that the PDSCH will be transmitted from the BS from which the downlink DPCH is transmitted.

The UE shall use the transport channel(s) applicable for the physical channel types that is used. If neither the IE "TFS" is included or previously stored in the UE for that transport channel(s), the UE shall

- Use the TFS given in system information

If none of the TFS stored is compatible with the physical channel, the UE shall

- Delete stored TFS and use the TFS given in system information

The UE shall enter a state according to 8.5.8.

8.2.1.4 Unsupported configuration in the UE

If UTRAN instructs the UE to use a configuration that it does not support, the UE transmit a RADIO BEARER SETUP FAILURE message on the DCCH using AM RLC and set the IE "failure cause" the cause value "configuration unacceptable".

When the transmission of the RADIO BEARER SETUP FAILURE message has been confirmed by RLC, the UE shall resume data transmission on RB 2 and upwards if RLC-AM or RLC-UM is used on those radio bearers, the UE shall clear the variable ORDERED_CONFIG and the procedure ends.

8.2.1.5 Physical channel failure

If the UE failed to establish the physical channel(s) indicated in the RADIO BEARER SETUP message the UE shall

- Revert to the configuration prior to the reception of the RADIO BEARER SETUP message (old configuration) and transmit a RADIO BEARER SETUP FAILURE message on the DCCH using AM RLC. The procedure ends and the UE shall resume data transmission on RB 2 and upwards if RLC-AM or RLC-UM is used on those radio bearers and resumes the normal operation as if no radio bearer establishment attempt had occurred.

A physical channel failure occurs in case the criteria as defined in 8.5.4 are not fulfilled. If the UE is unable to revert to the old configuration or if used, the activation time has expired, the UE shall

initiate a RRC connection re-establishment procedure according to subclause 8.1.5 and set the IE "failure cause" the cause value "physical channel failure".

8.2.1.6 Reception of the RADIO BEARER SETUP COMPLETE message by the UTRAN

When UTRAN has received the RADIO BEARER SETUP COMPLETE message, UTRAN may delete any old configuration and the procedure ends on the UTRAN side.

8.2.1.7 Reception of RADIO BEARER SETUP FAILURE by the UTRAN

When UTRAN has received the RADIO BEARER SETUP FAILURE message, UTRAN may restore the old and delete the new configuration and the procedure ends on the UTRAN side. Upper layers should be notified of the failure.

8.2.1.8 Incompatible simultaneous reconfiguration

If the variable ORDERED_CONFIG is set upon the reception of the RADIO BEARER SETUP message, the UE shall

- keep the old configuration as before the RADIO BEARER SETUP message was received
- transmit an RRC STATUS message on the DCCH using AM RLC. When the transmission of RRC STATUS message has been confirmed by RLC the procedure ends and the UE shall clear the variable ORDERED_CONFIG and resume normal operation as if no RADIO BEARER SETUP message had been received.

8.2.2 Radio bearer reconfiguration

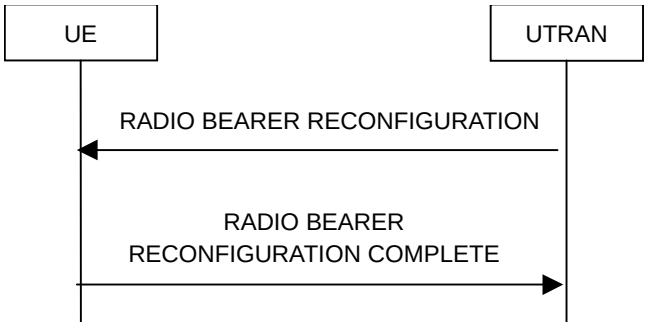


Figure 20: Radio bearer reconfiguration, normal flow

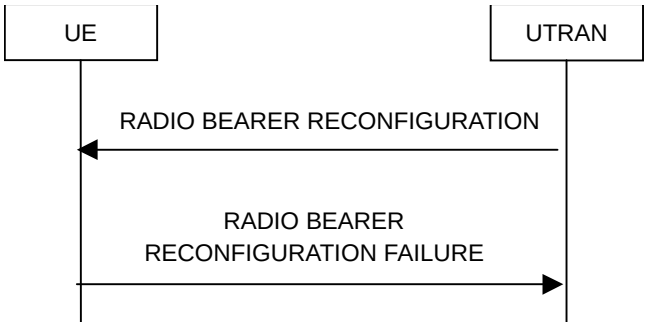


Figure 21: Radio bearer reconfiguration, failure case

8.2.2.1 General

The radio bearer reconfiguration procedure is used to reconfigure parameters for a radio bearer or the signalling link to reflect a change in QoS. While doing so, the procedure may perform a hard handover, see 8.3.5.

8.2.2.2 Initiation

The UTRAN initiates the procedure by

- Configuring new radio links in any new physical channel configuration and start transmission and reception on the new radio links.

- Transmitting a RADIO BEARER RECONFIGURATION message on the downlink DCCH using AM or UM RLC.

If transport channels are added, reconfigured or deleted in uplink and/or downlink, the UTRAN shall

- Set TFCS according to the new transport channel(s)

UTRAN should indicate that uplink transmission shall be suspended on certain bearers. Uplink transmission on a radio bearer used by the RRC signalling should not be suspended.

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 RECONFIGURATION by the UE in CELL_DCH state

Upon reception of a RADIO BEARER RECONFIGURATION message in CELL_DCH state, the UE shall perform actions specified below.

The UE shall be able to receive an RADIO BEARER RECONFIGURATION message and perform a hard handover, even if no prior UE measurements have been performed on the target cell and/or frequency

The UE shall store the received physical channel configuration and the activation time in the variable ORDERED_CONFIG.

The UE shall act upon all received information elements as specified in 8.5.7, unless specified otherwise in the following.

The UE shall

- For each reconfigured radio bearer or signalling link, use the multiplexing option applicable for the transport channels used according to the IE "RB mapping info"

- Configure MAC multiplexing if that is needed in order to use said transport channel(s).

- Use MAC logical channel priority when selecting TFC in MAC.

- Suspend or resume uplink transmission for each radio bearer, as indicated by the IE "RB suspend/resume" information element.

- Suspend data transmission on RB 2 and upward, if RLC-AM or RLC-UM is used on those radio bearers

The UE should turn off the transmitter during the reconfiguration. The UE may first release the current physical channel configuration and shall then establish a new physical channel configuration according to 8.5.7 and the following.

If neither the IE "PRACH info" nor the IE "Uplink DPCH info" is included, the UE shall

- Let the physical channel of type PRACH that is given in system information be the default in.

If neither the IEs "Secondary CCPCH info" nor "Downlink DPCH info" is included, the UE shall

- Start to receive the physical channel of type Secondary CCPCH that is given in system information.

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 then the UE shall act upon the 'PDSCH code mapping' IE as specified in Section 8.5.7 and:

- Infer that the PDSCH will be transmitted from the BS from which the downlink DPCH is transmitted.

The UE shall use the transport channel(s) applicable for the physical channel types that is used. If neither the IE "TFS" is included or previously stored in the UE for that transport channel(s), the UE shall

- Use the TFS given in system information

If none of the TFS stored is compatible with the physical channel, the UE shall

- Delete stored TFS and use the TFS given in system information

If the IE "Primary CCPCH info" and the IE "New C-RNTI" are included, the UE shall

- Select the cell indicated by the IE "Primary CCPCH info".
- Use the given C-RNTI when using common transport channels of type RACH, FACH and CPCH in that given cell after having completed the transition to that cell.

The UE shall enter a state according to 8.5.8.

The UE shall transmit a RADIO BEARER RECONFIGURATION COMPLETE message on the uplink DCCH using AM RLC. When the transmission of the RADIO BEARER RECONFIGURATION COMPLETE message has been confirmed by RLC, the UE shall clear the variable ORDERED_CONFIG and the UE shall resume data transmission on each radio bearer fulfilling the following criteria:

- The radio bearer identity is RB 2 and upward
- RLC-AM or RLC-UM is used; and
- The radio bearers was not indicated to be suspended by the IE "RB suspend/resume" information element in the RADIO BEARER RECONFIGURATION message.

The procedure ends.

If the RADIO BEARER RECONFIGURATION message is used to initiate a transition from CELL_DCH to CELL_FACH state, the RADIO BEARER RECONFIGURATION COMPLETE message shall be transmitted on the RACH after the UE has completed the state transition. The UE shall clear the variable ORDERED_CONFIG and the procedure ends.

8.2.2.4 Reception of an RADIO BEARER RECONFIGURATION message by the UE in CELL_FACH state

Upon reception of a RADIO BEARER RECONFIGURATION message in CELL_FACH state, the UE shall perform actions specified below.

The UE shall store the received physical channel configuration and the activation time in the variable ORDERED_CONFIG.

The UE shall act upon all received information elements as specified in 8.5.7, unless specified otherwise in the following.

The UE shall

- For each reconfigured radio bearer or signalling link, use the multiplexing option applicable for the transport channels used according to the IE "RB mapping info"
- Configure MAC multiplexing if that is needed in order to use said transport channel(s).
- Use MAC logical channel priority when selecting TFC in MAC.
- Suspend or resume uplink transmission for each radio bearer, as indicated by the IE "RB suspend/resume".

If the IE "New C-RNTI" is included, the UE shall

- Use that C-RNTI when using common transport channels of type RACH, FACH and CPCH in the current cell.

If neither the IE "PRACH info" nor the IE "Uplink DPCH info" is included, the UE shall

- Let the physical channel of type PRACH that is given in system information be the default in uplink

If neither the IE "Secondary CCPCH info" nor the IE "Downlink DPCH info" is included, the UE shall

If the IE 'PDSCH code mapping' is included but the IE 'PDSCH with SHO DCH Info' is not included then the UE shall act upon the 'PDSCH code mapping' IE as specified in Section 8.5.7 and:

- Infer that the PDSCH will be transmitted from the BS from which the downlink DPCH is transmitted (there being only one link in the active set).

- Start to receive the physical channel of type Secondary CCPCH that is given in system information.

The UE shall use the transport channel(s) applicable for the physical channel types that is used. If neither the IE "TFS" is included or previously stored in the UE for that transport channel(s), the UE shall

- Use the TFS given in system information

If none of the TFS stored is compatible with the physical channel, the UE shall

- Delete stored TFS and use the TFS given in system information

The UE shall enter a state according to 8.5.8.

The UE shall transmit a RADIO BEARER RECONFIGURATION COMPLETE message on the uplink DCCH using AM RLC. When the transmission of the RADIO BEARER RECONFIGURATION COMPLETE message has been confirmed by RLC, the UE shall clear the variable ORDERED_CONFIG and the procedure ends.

8.2.2.5 Reception of a RADIO BEARER RECONFIGURATION COMPLETE message by the UTRAN

When UTRAN has received the RADIO BEARER RECONFIGURATION COMPLETE message, UTRAN may delete the old configuration..

8.2.2.6 Unsupported configuration in the UE

If the UTRAN instructs the UE to use a configuration that it does not support, the UE shall

- transmit a RADIO BEARER RECONFIGURATION FAILURE message on the DCCH using AM RLC.

- set the cause value in IE "failure cause" to "configuration unacceptable".

When the transmission of the RADIO BEARER RECONFIGURATION FAILURE message has been confirmed by RLC, the UE shall clear the variable ORDERED_CONFIG and the UE shall resume data transmission on RB 2 and upwards if RLC-AM or RLC-UM is used on those radio bearers. It shall resume the normal operation as if no radio bearer reconfiguration attempt had occurred and the procedure ends.

8.2.2.7 Physical channel failure

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

If the UE failed to establish the physical channel(s) indicated in the RADIO BEARER RECONFIGURATION message the UE shall

- Revert to the configuration prior to the reception of the RADIO BEARER RECONFIGURATION message (old configuration)

- transmit a RADIO BEARER RECONFIGURATION FAILURE message on the DCCH using AM RLC.

- set the cause value in IE "failure cause" to "physical channel failure".

- When the transmission of the RADIO BEARER RECONFIGURATION FAILURE message has been confirmed by RLC, the UE shall resume data transmission on RB 2 and upwards if RLC-AM or RLC-UM is used on those radio bearers. The procedure ends and the UE resumes the normal operation as if no radio bearer reconfiguration attempt had occurred.

If the UE is unable to revert to the old configuration or if used, the activation time has expired, the UE shall

- Initiate a RRC connection re-establishment procedure according to subclause 8.1.5

8.2.2.8 Reception of a RADIO BEARER RECONFIGURATION FAILURE message by the UTRAN

When UTRAN has received the RADIO BEARER RECONFIGURATION FAILURE message, UTRAN may restore the old and delete the new configuration. The procedure ends on the UTRAN side. Upper layers should be notified of the failure.

8.2.2.9 No response from the UE in CELL DCH_state

If no RADIO BEARER RECONFIGURATION COMPLETE message or RADIO BEARER RECONFIGURATION FAILURE message has been received, the UTRAN may delete the old and new configuration. If the UE requests a re-establishment of the RRC connection, before all UE dedicated resources have been cleared, the new configuration may be re-assigned in the re-establishment procedure.

During transition from CELL_DCH to CELL_FACH, the UTRAN may also receive a CELL UPDATE message if the UE cannot use the assigned physical channel.

8.2.2.10 No response from the UE in CELL_FACH state

If no RADIO BEARER RECONFIGURATION COMPLETE message or RADIO BEARER RECONFIGURATION FAILURE message has been received, the UTRAN may delete the old and new configuration. If the UE makes a cell update before all UE dedicated resources have been cleared, the configuration procedure can be restarted.

8.2.2.11 Physical channel failure during transmission from CELL_DCH to CELL_FACH

If the UE fails to select the cell, which was assigned in the RADIO BEARER RECONFIGURATION message initiating transition from CELL_DCH to CELL_FACH, the UE shall perform cell reselection and initiate the cell update procedure.

8.2.2.12 Suspension of signalling bearer

If the RADIO BEARER RECONFIGURATION message includes a request to suspend the signalling link with the IE "RB suspend/resume" , the UE shall

- Revert to the configuration prior to the reception of the RADIO BEARER RECONFIGURATION message (old configuration)
- send a RADIO BEARER RECONFIGURATION FAILURE message to the UTRAN.
- set the cause value in IE "failure cause" to "configuration unacceptable".
- When the transmission of the RADIO BEARER RECONFIGURATION FAILURE message has been confirmed by RLC, the procedure ends and the UE shall resume the normal operation as if no radio bearer reconfiguration attempt had occurred.

8.2.2.13 Incompatible simultaneous reconfiguration

If the variable ORDERED_CONFIG is set upon the reception of the RADIO BEARER RECONFIGURATION message, the UE shall

- keep the old configuration as before the RADIO BEARER RECONFIGURATION message was received
- transmit an RRC STATUS message on the DCCH using AM RLC. When the transmission of RRC STATUS message has been confirmed by RLC the procedure ends and the UE shall clear the variable ORDERED_CONFIG and resume normal operation as if no RADIO BEARER RECONFIGURATION message had been received.

8.2.3 Radio bearer release

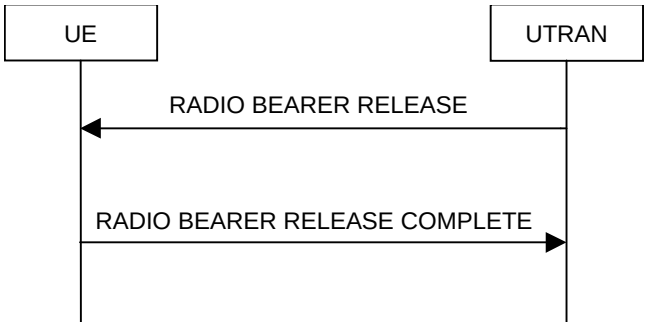


Figure 22: Radio Bearer Release, normal case

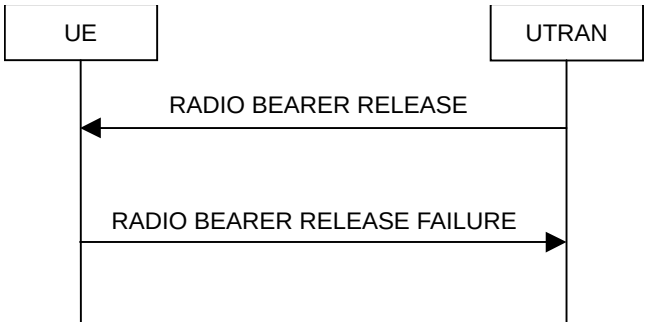


Figure 23: Radio Bearer Release, UE reverts to old configuration

8.2.3.1 General

The purpose of this procedure is to release existing radio bearer(s). While doing so, the procedure may perform a hard handover, see 8.3.5.

8.2.3.2 Initiation

The upper layer in the network may request a release of radio bearer(s).

To initiate the procedure, UTRAN

- Configures new radio links in any new physical channel configuration and start transmission and reception on the new radio links.
- Transmits a RADIO BEARER RELEASE message on the downlink DCCH using AM or UM RLC.

If transport channels are added, reconfigured or deleted in uplink and/or downlink, UTRAN shall

Set TFCS according to the new transport channel(s)

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.

8.2.3.3 Reception of RADIO BEARER RELEASE by the UE

Upon reception of a RADIO BEARER RELEASE message the UE shall perform the following.

The UE shall store the received physical channel configuration and the activation time in the variable ORDERED_CONFIG.

The UE shall act upon all received information elements as specified in 8.5.7, unless specified otherwise in the following.

The UE shall be able to receive an RADIO BEARER RELEASE message and perform a hard handover, even if no prior UE measurements have been performed on the target cell and/or frequency

The UE shall

- For the released radio bearer(s), delete all stored multiplexing options
- For all remaining radio bearer(s), use the multiplexing option applicable for the transport channels used according to their IE "RB mapping info" or their previously stored multiplexing options.
- Configure MAC multiplexing if that is needed in order to use said transport channel(s).
- Use MAC logical channel priority when selecting TFC in MAC.
- Suspend data transmission on RB 2 and upward, if RLC-AM or RLC-UM is used on those radio bearers

If the IE "New C-RNTI" is included, the UE shall

- Use that C-RNTI when using common transport channels of type RACH, FACH and CPCH in the current cell.

The UE should turn off the transmitter during the reconfiguration. The UE may first release the current physical channel configuration and shall then establish a new physical channel configuration according to 8.5.7 and the following.

If neither the IE "PRACH info" nor the IE "Uplink DPCH info" is included, the UE shall

- Let the physical channel of type PRACH that is given in system information be the default in uplink.

If neither the IE "Secondary CCPCH info" nor the IE "Downlink DPCH info" is included, the UE shall

- Start to receive the physical channel of type Secondary CCPCH that is given in system information.

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 then the UE shall act upon the 'PDSCH code mapping' IE as specified in Section 8.5.7 and:

- Infer that the PDSCH will be transmitted from the BS from which the downlink DPCH is transmitted.

The UE shall use the transport channel(s) applicable for the physical channel types that is used. If neither the IE "TFS" is included or previously stored in the UE for that transport channel(s), the UE shall

- Use the TFS given in system information

If none of the TFS stored is compatible with the physical channel, the UE shall

- Delete stored TFS and use the TFS given in system information
- If the RADIO BEARER RELEASE message is used to initiate a state transition to the CELL_FACH state and if an IE primary CCPCH info and C-RNTI to a given cell is included, the UE shall elect the cell indicated by the PCCPCH info IE.
- Use the C-RNTI when using common transport channels of type RACH, FACH and CPCH in that given cell after having completed the transition to that cell.

The UE shall enter a state according to 8.5.8.

The UE shall transmit a RADIO BEARER RELEASE COMPLETE message on the uplink DCCH using AM RLC. When the transmission of the RADIO BEARER RELEASE COMPLETE message has been confirmed by RLC the UE shall clear the variable ORDERED_CONFIG, the UE shall resume data transmission on RB 2 and upwards if RLC-AM or RLC-UM is used on those radio bearers and the procedure ends.

If the RADIO BEARER RELEASE message is used to initiate a transition from CELL_DCH to CELL_FACH state, the RADIO BEARER RELEASE COMPLETE message shall be transmitted on the RACH after the UE has completed the state transition.

8.2.3.4 Unsupported configuration in the UE

If UTRAN instructs the UE to use a configuration that it does not support, the UE shall Transmit a RADIO BEARER RELEASE FAILURE message on the DCCH using AM RLC and set the value of the IE "failure cause" to "configuration unacceptable".

When the transmission of the RADIO BEARER RELEASE FAILURE message has been confirmed by RLC, the UE shall clear the variable ORDERED_CONFIG and the UE shall resume data transmission on RB 2 and upwards if RLC-AM or RLC-UM is used on those radio bearers. The procedure ends.

8.2.3.5 Physical channel failure

If the UE failed to establish the physical channel(s) indicated in the RADIO BEARER RELEASE message the UE shall

- Revert to the configuration prior to the reception of the RADIO BEARER RELEASE message (old configuration) and transmit a RADIO BEARER RELEASE FAILURE message on the DCCH using AM RLC and set the value of the IE "failure cause" to "physical channel failure". When the transmission of the RADIO BEARER RELEASE FAILURE message has been confirmed by RLC, the UE shall resume data transmission on RB 2 and upwards if RLC-AM or RLC-UM is used on those radio bearers. The procedure ends and the UE resumes the normal operation as if no radio bearer release attempt had occurred.

A physical channel failure occurs in case the criteria as defined in 8.5.4 are not fulfilled . If the UE is unable to revert to the old configuration or if used, the activation time has expired, the UE shall

- Initiate a RRC connection re-establishment procedure according to subclause 8.1.5

8.2.3.6 Reception of the RADIO BEARER RELEASE COMPLETE message by the UTRAN

When UTRAN has received the RADIO BEARER RELEASE COMPLETE message, UTRAN may delete any old configuration, and the procedure ends on the UTRAN side.

8.2.3.7 Reception of the RADIO BEARER RELEASE FAILURE message by the UTRAN

When UTRAN has received the RADIO BEARER RELEASE FAILURE message, UTRAN may restore the old and delete the new configuration and the procedure ends on the UTRAN side. Upper layers should be notified of the failure.

8.2.3.8 Physical channel failure during transition from CELL_DCH to CELL_FACH

During transition from CELL_DCH to CELL_FACH, the UTRAN may also receive a CELL UPDATE message if the UE cannot use the assigned physical channel.

If the UE fails to select the cell, which was assigned in the RADIO BEARER RELEASE message initiating transition from CELL_DCH to CELL_FACH, the UE shall perform cell reselection and initiate the cell update procedure.

8.2.3.9 Incompatible simultaneous reconfiguration

If the variable ORDERED_CONFIG is set upon the reception of the RADIO BEARER RELEASE message, the UE shall

- keep the old configuration as before the RADIO BEARER RELEASE message was received

- transmit an RRC STATUS message on the DCCH using AM RLC. When the transmission of RRC STATUS message has been confirmed by RLC the procedure ends and the UE shall clear the variable ORDERED_CONFIG and resume normal operation as if no RADIO BEARER RELEASE message had been received.

8.2.4 Transport channel reconfiguration

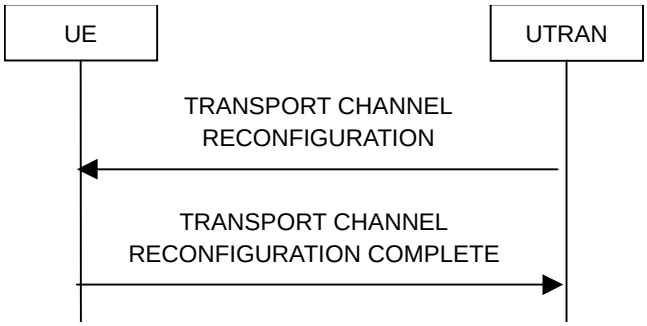


Figure 24: Transport channel reconfiguration, normal flow

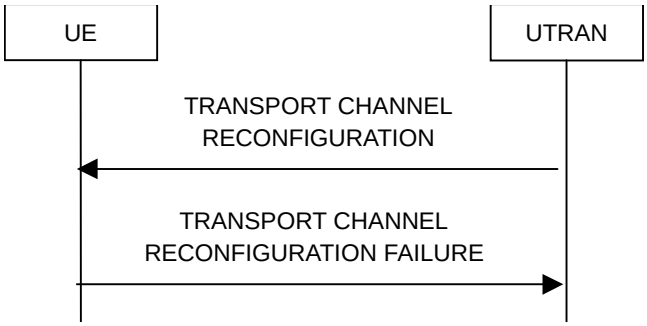


Figure 25: Transport channel reconfiguration, failure case

8.2.4.1 General

The transport channel reconfiguration procedure is used to reconfigure transport channel parameters. While doing so, the procedure may perform a hard handover, see 8.3.5.

8.2.4.2 Initiation

The UTRAN shall

- Configure new radio links in any new physical channel configuration and start transmission and reception on the new radio links.
- transmit a TRANSPORT CHANNEL RECONFIGURATION message on the downlink DCCH using AM or UM RLC.

If transport channels are added, reconfigured or deleted in uplink and/or downlink, the UTRAN shall

- Set TFCS according to the new transport channel(s)

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.

8.2.4.3 Reception of an TRANSPORT CHANNEL RECONFIGURATION message by the UE in CELL_DCH state

Upon reception of a TRANSPORT CHANNEL RECONFIGURATION message in CELL_DCH state, the UE shall perform the following actions.

The UE shall store the received physical channel configuration and the activation time in the variable ORDERED_CONFIG.

The UE shall act upon all received information elements as specified in 8.5.7, unless specified otherwise in the following.

The UE shall be able to receive an TRANSPORT CHANNEL RECONFIGURATION message and perform a hard handover, even if no prior UE measurements have been performed on the target cell and/or frequency

The UE should turn off the transmitter during the reconfiguration. The UE may first release the current physical channel configuration and shall then establish a new physical channel configuration according to 8.5.7 and the following.

The UE shall suspend data transmission on RB 2 and upward, if RLC-AM or RLC-UM is used on those radio bearers.

If neither the IE "PRACH info" nor the IE "Uplink DPCH info" is included, the UE shall

- Let the physical channel of type PRACH that is given in system information be the default in uplink.

If neither the IE "Secondary CCPCH info" nor the IE "Downlink DPCH info" is included, the UE shall

- Start to receive the physical channel of type Secondary CCPCH that is given in system information.

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 then the UE shall act upon the 'PDSCH code mapping' IE as specified in Section 8.5.7 and:

- Infer that the PDSCH will be transmitted from the BS from which the downlink DPCH is transmitted.

The UE shall use the transport channel(s) applicable for the physical channel types that is used. If the IE "TFS" is neither included nor previously stored in the UE for that transport channel(s), the UE shall

- Use the TFS given in system information

If none of the TFS stored is compatible with the physical channel, the UE shall

- Delete stored TFS and use the TFS given in system information

If the TRANSPORT CHANNEL RECONFIGURATION message is used to initiate a state transition to the CELL_FACH state and if the IE "Primary CCPCH info" and IE "New C-RNTI" to a given cell is included, the UE shall

- Select the cell indicated by the IE "Primary CCPCH info".
- Use the C-RNTI when using common transport channels of type RACH, FACH and CPCH in that given cell after having completed the transition to that cell.

The UE shall enter a state according to 8.5.8.

The UE shall transmit a TRANSPORT CHANNEL RECONFIGURATION COMPLETE message on the uplink DCCH using AM RLC. If the TRANSPORT CHANNEL RECONFIGURATION message is used to initiate a transition from CELL_DCH to CELL_FACH state, the TRANSPORT CHANNEL RECONFIGURATION COMPLETE message shall be transmitted on the RACH after the UE has completed the state transition. When the transmission of the TRANSPORT CHANNEL RECONFIGURATION COMPLETE message has been confirmed by RLC, the UE shall clear the variable ORDERED_CONFIG, the UE shall resume data transmission on RB 2 and upwards if RLC-AM or RLC-UM is used on those radio bearers and the procedure ends.

8.2.4.4 Reception of an TRANSPORT CHANNEL RECONFIGURATION message by the UE in CELL_FACH state

Upon reception of a TRANSPORT CHANNEL RECONFIGURATION message in CELL_FACH state, the UE shall perform the following

The UE shall store the received physical channel configuration and the activation time in the variable ORDERED_CONFIG.

The UE shall act upon all received information elements as specified in 8.5.7, unless specified otherwise in the following.

If the IE "New C-RNTI" is included, the UE shall

- Use that C-RNTI when using common transport channels of type RACH, FACH and CPCH in the current cell.

If neither the IE "PRACH info" nor IE "Uplink DPCH info" is included, the UE shall

- Let the physical channel of type PRACH that is given in system information be the default in uplink

If neither the IE "Secondary CCPCH info" nor IE "Downlink DPCH info" is included, the UE shall

- Start to receive the physical channel of type Secondary CCPCH that is given in system information.

If the IE 'PDSCH code mapping' is included but the IE 'PDSCH with SHO DCH Info' is not included then the UE shall act upon the 'PDSCH code mapping' IE as specified in Section 8.5.7 and:

- Infer that the PDSCH will be transmitted from the BS from which the downlink DPCH is transmitted (there being only one link in the active set).

The UE shall use the transport channel(s) applicable for the physical channel types that is used. If the IE "TFS" is neither included nor previously stored in the UE for that transport channel(s), the UE shall

- Use the TFS given in system information

If none of the TFS stored is compatible with the physical channel, the UE shall

- Delete stored TFS and use the TFS given in system information

The UE shall enter a state according to 8.5.8.

The UE shall transmit a TRANSPORT CHANNEL RECONFIGURATION COMPLETE message on the uplink DCCH using AM RLC. When the transmission of the TRANSPORT CHANNEL RECONFIGURATION COMPLETE message has been confirmed by RLC, the UE shall clear the variable ORDERED_CONFIG and the procedure ends.

8.2.4.5 Reception of the TRANSPORT CHANNEL RECONFIGURATION COMPLETE message by the UTRAN

When UTRAN has received the TRANSPORT CHANNEL RECONFIGURATION COMPLETE message, UTRAN may delete any old configuration and the procedure ends on the UTRAN side.

8.2.4.6 Unsupported configuration in the UE

If the UTRAN instructs the UE to use a configuration that it does not support, the UE shall

- transmit a TRANSPORT CHANNEL RECONFIGURATION FAILURE message on the DCCH using AM RLC and set the cause value in IE "Failure Cause" to "configuration unacceptable".

- When the transmission of the TRANSPORT CHANNEL RECONFIGURATION FAILURE message has been confirmed by RLC, the UE shall clear the variable ORDERED_CONFIG, the UE shall resume data transmission on RB 2 and upwards if RLC-AM or RLC-UM is used on those radio bearers and the procedure ends.

8.2.4.7 Physical channel failure

If the UE failed to establish the physical channel(s) indicated in the TRANSPORT CHANNEL RECONFIGURATION message the UE shall

- Revert to the configuration prior to the reception of the TRANSPORT CHANNEL RECONFIGURATION message (old configuration) and transmit a TRANSPORT CHANNEL RECONFIGURATION FAILURE message on the DCCH using AM RLC and set the cause value in IE "Failure Cause" to "physical channel failure". When the transmission of the TRANSPORT CHANNEL RECONFIGURATION FAILURE message has been confirmed by RLC, the UE shall resume data transmission on RB 2 and upwards if RLC-AM or RLC-UM is used on those radio bearers. The procedure ends and the UE resumes the normal operation as if no transport channel reconfiguration attempt had occurred.

A physical channel failure occurs in case the criteria as defined in 8.5.4 are not fulfilled. If the UE is unable to revert to the old configuration or if used, the activation time has expired, the UE shall

- Initiate a RRC connection re-establishment procedure according to subclause 8.1.5

8.2.4.8 Reception of the TRANSPORT CHANNEL RECONFIGURATION FAILURE message by the UTRAN

When UTRAN has received the TRANSPORT CHANNELRECONFIGURATION FAILURE message, UTRAN may restore the old and delete the new configuration and the procedure ends on the UTRAN side. Upper layers should be notified of the failure.

8.2.4.9 Non-receipt of TRANSPORT CHANNEL CONFIGURATION COMPLETE message and TRANSPORT CHANNEL RECONFIGURATION FAILURE message in CELL_DCH state

If UTRAN does not receive TRANSPORT CHANNEL RECONFIGURATION COMPLETE message or TRANSPORT CHANNEL RECONFIGURATION FAILURE it may delete the old and new configuration. If the UE requests a re-establishment of the RRC connection, before all UE dedicated resources have been cleared, the new configuration may be re-assigned in the re-establishment procedure.

During transition from CELL_DCH to CELL_FACH, the UTRAN may also receive a CELL UPDATE message if the UE cannot use the assigned physical channel.

8.2.4.10 Non-receipt of TRANSPORT CHANNEL CONFIGURATION COMPLETE message and TRANSPORT CHANNEL RECONFIGURATION FAILURE message in CELL_FACH state

If UTRAN does not receive TRANSPORT CHANNEL RECONFIGURATION COMPLETE message or TRANSPORT CHANNEL RECONFIGURATION FAILURE message it may delete the old and new configuration. If the UE makes a cell update before all UE dedicated resources have been cleared, the configuration procedure can be restarted.

8.2.4.11 Physical channel failure during transition from CELL_DCH to CELL_FACH

If the UE fails to select the cell, which was assigned in the TRANSPORT CHANNEL RECONFIGURATION message initiating transition from CELL_DCH to CELL_FACH, the UE shall perform cell and initiate the cell update procedure.

8.2.4.12 Incompatible simultaneous reconfiguration

If the variable ORDERED_CONFIG is set upon the reception of the TRANSPORT CHANNEL RECONFIGURATION message, the UE shall

- keep the old configuration as before the TRANSPORT CHANNEL RECONFIGURATION message was received

- transmit an RRC STATUS message on the DCCH using AM RLC. When the transmission of RRC STATUS message has been confirmed by RLC the procedure ends and the UE shall clear the variable ORDERED_CONFIG and resume normal operation as if no TRANSPORT CHANNEL RECONFIGURATION message had been received.

8.2.5 Transport format combination control

Figure 26: Transport format combination control, normal flow

8.2.5.1 General

The transport format combination control procedure is used to control the allowed uplink transport format combinations within the transport format combination set.

8.2.5.2 Initiation

The UTRAN shall transmit the TRANSPORT FORMAT COMBINATION CONTROL message on the downlink DCCH using AM or UM RLC. When not stated otherwise elsewhere, the UE may initiate the transport format combination control procedure also when another procedure is ongoing, and in that case the state of the latter procedure shall not be affected.

UTRAN should not initiate a transport format combination control procedure, during while awaiting the completion of the following procedures:

- Radio bearer establishment (section 8.2.1)
- Radio bearer release (section 8.2.3)
- Radio bearer reconfiguration (section 8.2.2)
- Transport channel reconfiguration (section 8.2.4)
- Physical channel reconfiguration (section 8.2.6)

To change the sub-set of allowed transport format combinations, the UTRAN shall set the allowed TFCs in the IE "TFC subset". The network can optionally specify the duration for which a new TFC sub-set applies. The network shall do this by using the IE "TFC Control duration".

To completely remove the previous restrictions of allowed transport format combinations, the UTRAN shall set the "full transport format combination" in the IE "TFC subset".

8.2.5.3 Reception of a TRANSPORT FORMAT COMBINATION CONTROL message by the UE

Upon reception of the TRANSPORT FORMAT COMBINATION CONTROL message, and if the variable ORDERED_CONFIG is not set the UE shall determine whether the IE "TFC Control duration" is included.

If the IE "TFC Control duration" is not included then the UE shall:

- Store the newly specified TFC (sub)set in the variable to be called 'default TFC (sub)set'
- Configure the allowed transport format combinations as defined in subclause 8.5.7.5.3

If the IE "TFC Control duration" is included in the message then:

- The TFC set or TFC sub-set specified in the message shall be activated at frame *n* + *z* where *n* is the frame (with 10 ms resolution) at which the UE received the message and *z* is specified in TR 25.926 (UE radio access capabilities). The specified TFC set or sub-set shall then be applied for the number of (10 ms) frames specified in the IE "TFC Control duration".

If no further TFC Control messages are received during this interval then:

- At the end of the defined period the UE shall change the TFC (sub)set back to the 'default TFC (sub)set'.

If further TFC Control messages are received during the 'TFC Control duration' period then the UE shall re-configure itself in accordance with the TFC (sub)set defined in the most recently received message.

8.2.5.4 Incompatible simultaneous reconfiguration

If the variable ORDERED_CONFIG is set, the UE shall

- keep the TFC subset as before the TRANSPORT FORMAT COMBINATION CONTROL message was received

- transmit a TRANSPORT FORMAT COMBINATION CONTROL FAILURE message on the DCCH using AM RLC. The UE shall set the IE "failure cause" to "incompatible simultaneous reconfiguration". When the transmission of TRANSPORT FORMAT COMBINATION CONTROL FAILURE message has been confirmed by RLC the procedure ends.

8.2.6 Physical channel reconfiguration

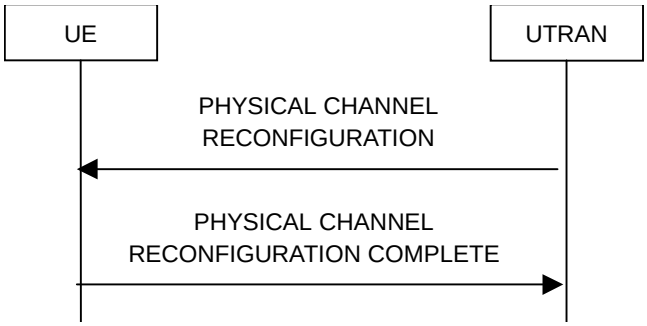


Figure 27: Physical channel reconfiguration, normal flow

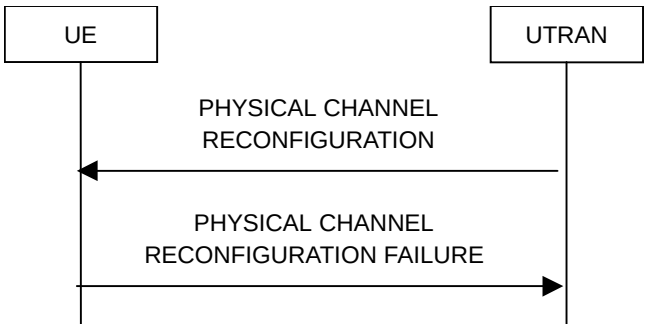


Figure 28: Physical channel reconfiguration, failure case

8.2.6.1 General

The physical channel reconfiguration procedure is used to establish, reconfigure and release physical channels. While doing so, the procedure may perform a hard handover, see 8.3.5.

8.2.6.2 Initiation

To initiate the procedure, the UTRAN should

- Configure new radio links in any new physical channel configuration and start transmission and reception on the new radio links.

- transmit a PHYSICAL CHANNEL RECONFIGURATION message on the downlink DCCH using AM or UM RLC.

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.

8.2.6.3 Reception of a PHYSICAL CHANNEL RECONFIGURATION message by the UE in CELL_DCH state

Upon reception of a PHYSICAL CHANNEL RECONFIGURATION message, the UE shall perform the following actions.

The UE shall store the received physical channel configuration and the activation time in the variable ORDERED_CONFIG.

The UE shall act upon all received information elements as specified in 8.5.7, unless specified otherwise in the following.

The UE shall be able to receive an 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

The UE shall suspend data transmission on RB 2 and upward, if RLC-AM or RLC-UM is used on those radio bearers.

If the IE "New C-RNTI" is included, the UE shall

- Use that C-RNTI when using common physical channels of type RACH, FACH and CPCH in the current cell.

The UE should turn off the transmitter during the reconfiguration. The UE may first release the current physical channel configuration and shall then establish a new physical channel configuration according to 8.5.7 and the following.

If neither the IE "PRACH info" nor IE "Uplink DPCH info" is included, the UE shall

- Let the physical channel of type PRACH that is given in system information be the default in uplink.

If neither the IE "Secondary CCPCH info" nor IE "Downlink DPCH info" is included, the UE shall

- Start to receive the physical channel of type Secondary CCPCH that is given in system information.

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 then the UE shall act upon the 'PDSCH code mapping' IE as specified in Section 8.5.7 and:

- Infer that the PDSCH will be transmitted from the BS from which the downlink DPCH is transmitted.

The UE shall use the physical channel(s) applicable for the physical channel types that is used. If IE "TFS" is neither included nor previously stored in the UE for that physical channel(s), the UE shall

- Use the TFS given in system information

If none of the TFS stored is compatible with the physical channel, the UE shall

- Delete stored TFS and use the TFS given in system information

If the PHYSICAL CHANNEL RECONFIGURATION message is used to initiate a state transition to the CELL_FACH state and if an IE "Primary CCPCH info" and IE "New C-RNTI" to a given cell is included, the UE shall

- Select the cell indicated by the IE "Primary CCPCH info".

- Use the C-RNTI when using common transport channels of type RACH, FACH and CPCH in that given cell after having completed the transition to that cell.

The UE shall enter a state according to 8.5.8.

The UE shall transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on the uplink DCCH using AM RLC. When the transmission of the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message has been confirmed by RLC, the UE shall clear the variable ORDERED_CONFIG, the UE shall resume data transmission on RB 2 and upwards if RLC-AM or RLC-UM is used on those radio bearers and the procedure ends.

If the PHYSICAL CHANNEL RECONFIGURATION message is used to initiate a transition from CELL_DCH to CELL_FACH state, the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message shall be transmitted on the RACH after the UE has completed the state transition. The UE shall clear the variable ORDERED_CONFIG and the procedure ends.

8.2.6.4 Reception of PHYSICAL CHANNEL RECONFIGURATION by the UE in CELL_FACH state

The UE shall store the received physical channel configuration and the activation time in the variable ORDERED_CONFIG.

The UE shall act upon all received information elements as specified in 8.5.7, unless specified otherwise in the following.

If the IE "New C-RNTI" is included, the UE shall

- Use that C-RNTI when using common physical channels of type RACH, FACH and CPCH in the current cell.

If neither the IE "PRACH info" nor IE "Uplink DPCH info" is included, the UE shall

- Let the physical channel of type PRACH that is given in system information be the default in uplink.

If neither the IE "Secondary CCPCH info" nor IE "Downlink DPCH info" is included, the UE shall

- Start to receive the physical channel of type Secondary CCPCH that is given in system information.

If the IE 'PDSCH code mapping' is included but the IE 'PDSCH with SHO DCH Info' is not included then the UE shall act upon the 'PDSCH code mapping' IE as specified in Section 8.5.7 and:

- Infer that the PDSCH will be transmitted from the BS from which the downlink DPCH is transmitted (there being only one link in the active set).

The UE shall use the physical channel(s) applicable for the physical channel types that is used. If neither the IE "TFS" is included or previously stored in the UE for that physical channel(s), the UE shall

- Use the TFS given in system information

If none of the TFS stored is compatible with the physical channel, the UE shall

- Delete stored TFS and use the TFS given in system information

The UE shall transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on the uplink DCCH using AM RLC. When the transmission of the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message has been confirmed by RLC, the UE shall enter a state according to subclause 8.5.8 applied on the PHYSICAL CHANNEL RECONFIGURATION message. If the UE ends up in the CELL_PCH or URA_PCH state, it shall delete its C-RNTI. The UE shall clear the variable ORDERED_CONFIG and the procedure ends.

8.2.6.5 Reception of a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message by the UTRAN

When UTRAN has received the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message, UTRAN may delete any old configuration and the procedure ends on the UTRAN side.

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

8.2.6.6 Unsupported configuration in the UE

If the UE instructs the UE to use a configuration that it does not support, the UE shall

- transmit a PHYSICAL CHANNEL RECONFIGURATION FAILURE message on the DCCH using AM RLC and shall set the cause value in IE "failure cause" to "configuration unacceptable".

When the transmission of the PHYSICAL CHANNEL RECONFIGURATION FAILURE message has been confirmed by RLC, the UE shall clear the variable ORDERED_CONFIG and the procedure ends.

8.2.6.7 Physical channel failure

If the UE failed to establish the physical channel(s) indicated in the PHYSICAL CHANNEL RECONFIGURATION message the UE shall

- Revert to the configuration prior to the reception of the PHYSICAL CHANNEL RECONFIGURATION message (old configuration) and transmit a PHYSICAL CHANNEL RECONFIGURATION FAILURE message on the DCCH using AM RLC and shall set the cause value in IE "failure cause" to "physical channel failure". The procedure ends and the UE resumes the normal operation as if no physical channel reconfiguration attempt had occurred.

A physical channel failure occurs in case the criteria as defined in 8.5.4 are not fulfilled . If the UE is unable to revert to the old configuration or if used, the activation time has expired, the UE shall

- Initiate a RRC connection re-establishment procedure according to subclause 8.1.5

8.2.6.8 Reception of the PHYSICAL CHANNEL RECONFIGURATION FAILURE message by the UTRAN

When UTRAN has received the PHYSICAL CHANNEL RECONFIGURATION FAILURE message, UTRAN may delete the new configuration and the procedure ends on the UTRAN side. Upper layers should be notified of the failure.

8.2.6.9 Non-receipt of PHYSICAL CHANNEL RECONFIGURATION COMPLETE message or PHYSICL CHANNEL RECONFIGURATION FAILURE message in CELL_DCH state

If no PHYSICAL CHANNEL RECONFIGURATION COMPLETE message or PHYSICAL CHANNEL RECONFIGURATION FAILURE message has been received, the UTRAN may delete the old and new configuration. If the UE requests a re-establishment of the RRC connection, before all UE dedicated resources have been cleared, the new configuration may be re-assigned in the re-establishment procedure.

During transition from CELL_DCH to CELL_FACH, the UTRAN may also receive a CELL UPDATE message if the UE cannot use the assigned physical channel.

8.2.6.10 Non-receipt of PHYSICAL CHANNEL RECONFIGURATION COMPLETE message or PHYSICL CHANNEL RECONFIGURATION FAILURE message in CELL_FACH state

If no PHYSICAL CHANNEL RECONFIGURATION COMPLETE message or PHYSICAL CHANNEL RECONFIGURATION FAILURE message has been received, the UTRAN may delete the old and new configuration. If the UE makes a cell update before all UE dedicated resources have been cleared, the configuration procedure can be restarted.

8.2.6.11 Physical channel failure during transition from CELL_DCH to CELL_FACH

If the UE fails to select the cell, which was assigned in the PHYSICAL CHANNEL RECONFIGURATION message initiating transition from CELL_DCH to CELL_FACH, the UE shall perform cell and initiate the cell update procedure.

8.2.6.12 Incompatible simultaneous reconfiguration

If the variable ORDERED_CONFIG is set upon the reception of the PHYSICAL CHANNEL RECONFIGURATION message, the UE shall

- keep the old configuration as before the PHYSICAL CHANNEL RECONFIGURATION message was received
- transmit an RRC STATUS message on the DCCH using AM RLC. When the transmission of RRC STATUS message has been confirmed by RLC the procedure ends and the UE shall clear the variable ORDERED_CONFIG and resume normal operation as if no PHYSICAL CHANNEL RECONFIGURATION message had been received.

8.2.7 Physical Shared Channel Allocation [TDD only]

Figure 29: Physical Shared Channel Allocation

8.2.7.1 General

The purpose of this procedure is to allocate physical resources to USCH or DSCH transport channels in TDD mode, for temporary usage by a UE.

8.2.7.2 Initiation

The UE is in the CELL_FACH or CELL_DCH state, and at least one RB using USCH or DSCH has been established.

The UTRAN sends the "PHYSICAL SHARED CHANNEL RECONFIGURATION" message via the SHCCH , to allocate PUSCH or PDSCH resources to exactly one CCTrCH.

8.2.7.3 Reception of a PHYSICAL SHARED CHANNEL ALLOCATION message by the UE

The UE shall check the C-RNTI to see if the UE is addressed by the message. If so, the UE shall evaluate the message and use the IEs as specified below.

If the CCTrCH addressed by the TFCS-Id in the PHYSICAL SHARED CHANNEL ALLOCATION message is a CCTrCH for DSCH, the UE shall:

- decode the IE "CCTrCH Activation CFN" and the IE "CCTrCH Duration", to determine the time interval for which the allocation shall be valid;
- configure Layer 1 according to the PDSCH information, for the specified time interval;
- start receiving the PDSCH where the TFCI is included;
- receive the PDSCHs, and decode and demultiplex them into the respective DSCH channels according to the TFCI.

If the CCTrCH addressed by the TFCS-Id in the message PHYSICAL SHARED CHANNEL ALLOCATION is a CCTrCH for USCH, the UE shall:

- decode the IE "CCTrCH Activation CFN" and the IE "CCTrCH Duration", to determine the time interval for which the allocation shall be valid;
- configure Layer 1 according to the PUSCH information, for the specified time interval;

- evaluate and apply the potential Timing Advance value for uplink transmissions;
- determine the TFCS subset and hence the TFCI values which are possible given the PUSCH allocation for that CCTrCH;
- configure the MAC-c/sh in the UE with this TFCS restriction if necessary;
- transmit USCH Transport Block Sets as required, within the TFCS limits given by the PUSCH allocation.

In addition, the UE shall evaluate the IE "PUSCH Allocation Pending" parameter: If its value is "pending", the UE starts a timer T311. As long as this timer is running, the UE is not allowed to use the RACH for potential USCH capacity requests. See the USCH CAPACITY REQUEST procedure.

In addition if the message contains an optional IE "Timing Advance Information" the UE shall configure the Layer 1 with the new Timing Advance.

Note that the message can also be used to block or enable the UE to issue PUSCH capacity requests, without allocating PUSCH or PDSCH, as shown in the PUSCH capacity request procedure below. In this case, no TFCS-ID and no PUSCH or PDSCH Information is included.

8.2.8 PUSCH capacity request [TDD only]

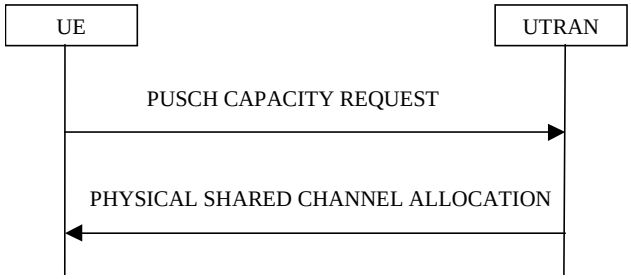


Figure 30: PUSCH Capacity request procedure

8.2.8.1 General

With this procedure, the UE transmits its request for PUSCH resources to the UTRAN. In the normal case, the UTRAN responds with a PHYSICAL SHARED CHANNEL ALLOCATION message, which either allocates the requested PUSCH resources, or allocates a PDSCH resource, or may just serve as an acknowledgement, indicating that PUSCH allocation is pending.

With the PUSCH CAPACITY REQUEST message, the UE can request capacity for one or more USCH.

NOTE: Triggering of the capacity request is controlled by the measurement control procedure. It is FFS whether a measurement report message can be used instead of the PUSCH capacity request message.

8.2.8.2 Initiation

The UE is in the CELL_FACH or CELL_DCH state, and at least one RB using USCH has been established. The RRC in the UE sees the requirement to allocate physical resources (PUSCH) to an USCH channel.

The RRC decides to send a PUSCH capacity request on the SHCCH. This is possible if

- No USCH transmission takes place, where the capacity request for further PUSCH resources could be included, and
- The UE has been informed by the UTRAN that no PUSCH allocation is pending – or the timer T311 has been expired.
- The timer T310 (capacity request repetition timer) is not running.

So the UE sends a PUSCH CAPACITY REQUEST message on the uplink SHCCH, resets counter V310, and starts timer T310.

With one PUSCH CAPACITY REQUEST message, capacity for one or more USCH can be requested. It shall include these information elements:

- C-RNTI to be used as UE identity.
- Radio Bearer ID, for each radio bearer requiring capacity on USCH.
- RLC buffer payload for these radio bearers

As an option, the message may include:

- Intra-frequency measurement report

The object to be measured shall have been configured before. A typical example is the interference in a DL Time Slot.

8.2.8.3 Reception of a PUSCH CAPACITY REQUEST message by the UTRAN

The UTRAN should send a PHYSICAL SHARED CHANNEL ALLOCATION message to the UE, either for allocating PUSCH or PDSCH resources, or just as an acknowledgement, announcing a pending PUSCH allocation.

8.2.8.4 Reception of a PHYSICAL SHARED CHANNEL ALLOCATION message by the UE

Once the UE receives this message with the correct C-RNTI included, it shall stop the timer T310 and shall evaluate the message as described in the Physical Shared Channel Allocation procedure. In particular, it shall take the IE "PUSCH Allocation Pending" into account: If this IE has the value "pending", the UE shall start the timer T311. As long as this timer is running, the UE is prohibited to send PUSCH Capacity Requests on the SHCCH.

If the IE "PUSCH Allocation Pending" indicates "not pending", the UE shall stop the timer T311, and is allowed to send PUSCH Capacity Requests on the SHCCH again.

If the PUSCH capacity allocated in this message is not sufficient for all the USCH transmission requests which the UE may have, the RRC in the UE may decide to issue further PUSCH Capacity Requests, either on the USCH or on the SHCCH – provided the SHCCH is available, i.e. timer T311 is not running..

8.2.8.5 T310 time out

Upon expiry of timer T310, the UE shall

- If V310 is equal to or smaller than N310, transmit a new PUSCH CAPACITY REQUEST message on the Uplink SHCCH, restart timer T310 and increase counter V310. The UE shall set the IEs in the PUSCH CAPACITY REQUEST message as specified above.

8.2.8.6 Maximum number of re-attempts exceeded

In this case the UE stops the procedure. – It can start another PUSCH capacity request procedure if the UE-RRC sees the need for it.

8.2.9 Downlink outer loop control

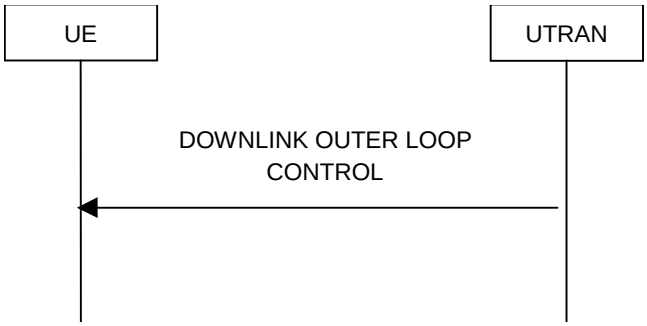


Figure 31: Downlink Outer Loop Control , normal flow

8.2.9.1 General

The downlink outer loop control procedure is used to control the downlink outer loop power control running in the UE.

8.2.9.2 Initiation

The UTRAN may transmit the DOWNLINK OUTER LOOP CONTROL message on the downlink DCCH using AM or UM RLC.

To prevent the UE from increasing its DL Eb/No target value above its current value, the UTRAN should set the "Downlink Outer Loop Control" IE to TRUE.

To remove the previous restriction on the downlink outer loop power control, the UTRAN should set the "Downlink Outer Loop Control" IE to FALSE.

8.2.9.3 Reception of DOWNLINK OUTER LOOP CONTROL message by the UE

Upon reception of the DOWNLINK OUTER LOOP CONTROL message, the UE shall read the IE "Downlink Outer Loop Control".

If the IE "Downlink Outer Loop Control" is set to TRUE, the UE shall prevent its DL Eb/No target value from increasing above the current value.

If the IE "Downlink Outer Loop Control" is set to FALSE, the UE shall remove the above restriction.

8.3 RRC connection mobility procedures

8.3.1 Cell update

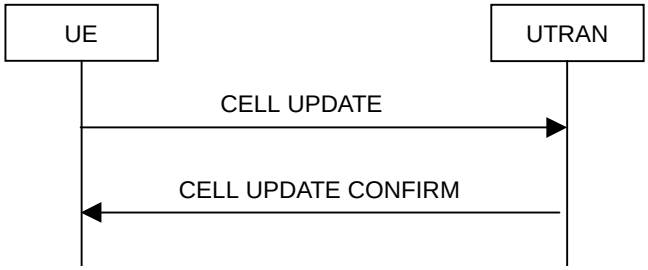


Figure 32: Cell update procedure, basic flow

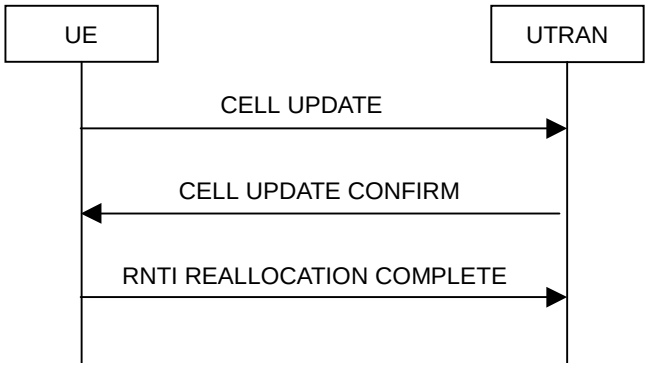


Figure 33: Cell update procedure with RNTI reallocation

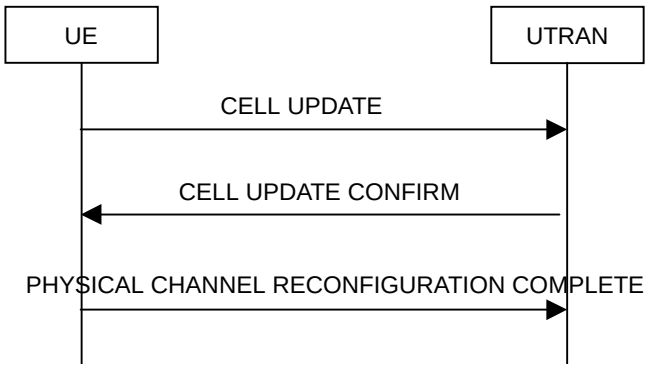


Figure 34: Cell update procedure with physical channel reconfiguration

8.3.1.1 General

The main purpose of the cell update procedure is to update UTRAN with the current cell of the UE after cell reselection in CELL_FACH or CELL_PCH state. It may also be used for supervision of the RRC connection, even if no cell reselection takes place. The cell update procedure can also be used to re-configure the AM RLC entities for the signalling link. The UE can use a CELL UPDATE message to notify the unrecoverable error in an AM RLC entity for the signalling link (see NOTE).

NOTE: PHYSICAL CHANNEL RECONFIGURATION COMPLETE message is only used when common channels are configured (doesn't apply to dedicated channels)

8.3.1.2 Initiation

A UE in CELL_FACH, CELL_PCH or URA_PCH state may apply the cell update procedure for a number of purposes. The specific requirements the UE shall take into account for each case are specified in the following:

- In CELL_FACH or CELL_PCH state, the UE shall perform the cell update procedure when selecting another cell (cell reselection)
- In CELL_FACH and CELL_PCH state, the UE shall perform the cell update procedure upon expiry of T305 while the UE is in the service area. The UE shall only perform this periodic cell updating if configured by means of the IE "Information for periodical cell and URA update" in System Information Block Type 2. The UE shall initially start timer T305 upon entering CELL_FACH or CELL_PCH state
- In CELL_PCH state and URA_PCH state, the UE shall initiate the cell update procedure if it wants to transmit UL data
- In CELL_PCH and URA_PCH state, the UE shall perform the cell update procedure when receiving a PAGING TYPE 1 message as in subclause 8.1.2.3
- moving to CELL_FACH state, if not already in that state
- delete any C-RNTI and suspend data transmission on RB 2 and upward, if RLC-AM or RLC-UM is used on those radio bearers
- sending a CELL UPDATE message on the uplink CCCH,
- starting timer T302 and resetting counter V302

The IE "cell update cause" shall be used as follows;

- In case of cell reselection: "cell reselection",
- In case of periodic cell updating: "periodic cell update",
- In case of UL data transmission: "UL data transmission",
- In case of paging response: "paging response".

The IE "AM_RLC error indication" shall be set when the UE detects unrecoverable error in an AM RLC entity for the signalling link.

The UE shall include an intra-frequency measurement report in the CELL UPDATE message, 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 12.

8.3.1.3 T305 expiry and the UE detects that it is out of service area

When the T305 expires and the UE detects that it is out of service area that is specified in subclause 8.5.5, the UE shall

- start timer T307
- search for cell to camp

8.3.1.3.1 Re-entering of service area

When the UE detects that it is no longer out of service area before the expiry of T307, the UE shall

- transmit a CELL UPDATE message on the uplink CCCH

8.3.1.3.2 Expiry of timer T307

When the T307 expires, the UE shall

- move to idle mode

- release all dedicated resources
- indicate a RRC connection failure to the non-access stratum

Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2

8.3.1.4 Reception of an CELL UPDATE message by the UTRAN

When the UTRAN receives a CELL UPDATE message, it should transmit a CELL UPDATE CONFIRM message on the downlink DCCH.

When the UTRAN detects AM_RLC error, it waits for CELL UPDATE message from the UE and when the UTRAN receives it, UTRAN commands the UE to re-configure AM_RLC by sending CELL UPDATE CONFIRM message. This procedure can be used not only in the case of AM_RLC error but also in the case that UTRAN wants to re-configure AM_RLC for other reasons such as in the case when SRNC Relocation is initiated without keeping RLC status (current counters) from old SRNC to new SRNC.

8.3.1.5 Reception of the CELL UPDATE CONFIRM message by the UE

Upon receiving the CELL UPDATE CONFIRM message, the UE shall stop timer T302.

The UE shall act upon all received information elements as specified in 8.5.7, unless specified otherwise in the following.

If the CELL UPDATE CONFIRM message includes the IE "CN domain identity" and the IE "NAS system information", the UE shall forward the content of the IE "NAS system information" to the non-access stratum entity of the UE identified by the IE "CN domain identity".

If the CELL UPDATE CONFIRM message includes the IE "URA-Id" the UE shall store this URA identity.

If the CELL UPDATE CONFIRM message does not include IE "new C-RNTI", IE "new U-RNTI", IE "PRACH info" nor IE "Secondary CCPCH info", no RRC response message is sent to the UTRAN.

If the CELL UPDATE CONFIRM message includes the IE "new C-RNTI" and optionally the IE "new U-RNTI" but does not include IE "PRACH info" or IE "Secondary CCPCH info", the UE shall update its identities and transmit an RNTI REALLOCATION COMPLETE message on the uplink DCCH using the PRACH indicated in the broadcast system information.

If the CELL UPDATE CONFIRM message includes the IE "PRACH info" and/or the IE "Secondary CCPCH info", the UE shall

- Perform the actions stated in subclauses 8.5.7.6.2 and 8.5.7.6.3
- update its identities if the CELL UPDATE CONFIRM message includes the IE new C-RNTI" and optionally the IE "new U-RNTI"
- transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on the uplink DCCH using the PRACH indicated in CELL UPDATE CONFIRM message

The UE shall enter a state according to subclause 8.5.8 applied on the CELL UPDATE CONFIRM message, unless specified otherwise below.

If the IE "Cell update cause" in CELL UPDATE message was set to "UL data transmission" or "paging response", the UE shall remain in CELL_FACH state.

If the IE "Cell update cause" in CELL UPDATE message was set to "periodic cell update" or "cell reselection", the UE shall return to the state it was in before initiating the cell update procedure.

If the CELL UPDATE CONFIRM message includes the IE "DRX cycle length coefficient", the UE shall update DRX cycle length.

In case none of the above conditions apply, the UE shall return to the state it was in before initiating the cell update procedure.

In case the UE ends in CELL_FACH or CELL_PCH state and periodic cell updating is configured, it shall reset timer T305.

In case the UE does not end in CELL_FACH state, it shall delete its C-RNTI.

If the UE remains in CELL_FACH state and the CELL UPDATE CONFIRM message includes the IE "New C-RNTI" the UE shall then resume data transmission on RB 2 and upward , if RLC-AM or RLC-UM is used on those radio bearers.

8.3.1.6 T302 expiry or cell reselection

- Upon expiry of timer T302, and/or
- upon reselection of another UTRA cell when waiting for the CELL UPDATE CONFIRM message,

the UE shall check the value of V302 and

- If V302 is smaller or equal than N302, the UE shall retransmit a CELL UPDATE message on the uplink CCCH, restart timer T302 and increase counter V302. The IE "Cell update cause" shall be set to the event causing the transmission of the CELL UPDATE message, see subclause 8.3.1.2.
- If V302 is greater than N302, the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2

8.3.1.7 Reception of the RNTI REALLOCATION COMPLETE message by the UTRAN

See subclause 8.3.3.4

8.3.1.8 Reception of the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message by the UTRAN

When the UTRAN receives PHYSICAL CHANNEL RECONFIGURATION message, the procedure ends.

8.3.2 URA update

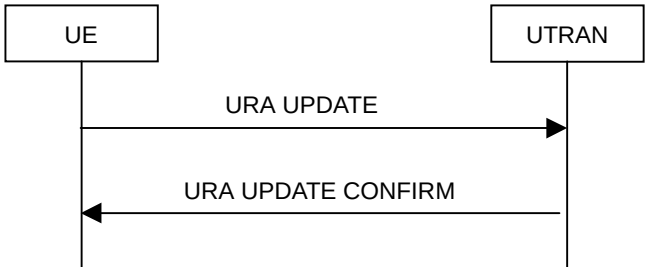


Figure 35: URA update procedure, basic flow

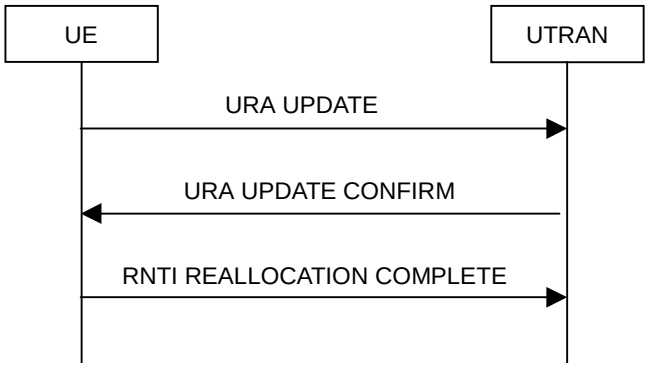


Figure 36: URA update procedure with RNTI reallocation

8.3.2.1 General

The main purpose of the URA update procedure is to update UTRAN with the current URA of the UE after URA reselection in URA_PCH state. It may also be used for supervision of the RRC connection, even if no URA reselection takes place. UTRAN registration areas may be hierarchical to avoid excessive signalling. This means that several URA identifiers may be broadcast in one cell and that different UEs in one cell may reside in different URAs. A UE in URA_PCH state shall always have one and only one valid URA. The URA UPDATE CONFIRM message may also contain new NAS system information.

8.3.2.2 Initiation

A UE in URA_PCH state may apply the URA update procedure for a number of purposes. The specific requirements the UE shall take into account for each case are specified in the following:

- In URA_PCH state, the UE shall perform the URA update procedure when the current URA assigned to the UE is not present in the list of URA IDs broadcast in a cell
- In URA_PCH state, the UE shall perform the URA update procedure upon expiry of T306 while the UE is in the service area. The UE shall only perform this periodic URA updating if configured by means of the IE "Information for periodical cell and URA update" in System Information Block Type 2. The UE shall initially start timer T306 upon entering URA_PCH state

The UE shall start the URA update procedure by

- temporarily storing the list of URA IDs broadcast in a cell
- moving to CELL_FACH state
- sending a URA UPDATE message on the uplink CCCH,
- starting timer T303 and resetting counter V303

The IE "URA update cause" shall be set as follows;

- In case of URA reselection, to: "URA reselection",
- In case of periodic URA updating, to: "periodic URA update",

8.3.2.3 T306 expiry and the UE detects that it is out of service area

When the T306 expires and the UE detects that it is out of service area, which is specified in subclause 8.5.5, the UE shall

- start timer T307
- search for cell to camp

8.3.2.3.1 Re-entering of service area

When the UE detects that it is no longer out of service area before the expiry of T307, the UE shall

- transmit URA UPDATE message on the uplink CCCH

8.3.2.3.2 Expiry of timer T307

When the T307 expires, the UE shall

- move to idle state.
- release all dedicated resources
- indicate a RRC connection failure to the non-access stratum

Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2

8.3.2.4 Reception of an URA UPDATE message by the UTRAN

When the UTRAN receives a URA UPDATE message, it should transmit a URA UPDATE CONFIRM message on the downlink CCCH or DCCH.

The UTRAN should assign the URA ID to the UE in the URA UPDATE CONFIRM message in a cell where multiple URAs are valid.

8.3.2.5 Reception of an URA UPDATE CONFIRM message by the UE

Upon receiving the URA UPDATE CONFIRM message, the UE shall stop timer T303 and restart timer T306.If the URA UPDATE CONFIRM message includes the IEs "new C-RNTI" and optionally IE "new U-RNTI", the UE shall

- update its identities and transmit an RNTI REALLOCATION COMPLETE message on the uplink DCCH using the PRACH indicated in the broadcast system information..

If the URA UPDATE CONFIRM message includes the IE "URA ID", the UE shall

- confirm whether indicated URA ID is in the list of URA IDs which is temporarily stored in the UE
- update URA ID and store in itself.

If the URA UPDATE CONFIRM message does not include the IE "URA ID", the UE shall

- confirm whether only one URA ID exists in the list of URA IDs which is temporarily stored in the UE
- update URA ID and stored in itself.

If the URA UPDATE CONFIRM message includes the IEs "CN domain identity" and "NAS system information", the UE shall forward the content of the IE to the non-access stratum entity of the UE indicated by the IE "CN domain identity".

The UE shall enter a state according to subclause 8.5.8 applied on the URA UPDATE CONFIRM message, unless otherwise specified below.

If the UE does not end up in the CELL_FACH state, the UE shall, after other possible actions:

- retrieve secondary CCPCH info (for PCH) from the SYSTEM INFORMATION broadcast from the new cell
- delete its C-RNTI and
- The procedure ends.

8.3.2.6 Confirmation error of URA ID list

- When indicated URA ID is not included in the list of URA IDs or

- when the URA ID is not indicated and the list of URA IDs includes more than one URA ID,

the UE shall check the value of V303 and

- If V303 is smaller or equal than N303, the UE shall retransmit a URA UPDATE message on the uplink CCCH, restart timer T303 and increase counter V303. The UE shall set the IEs in the URA UPDATE message according to subclause 8.3.2.2. If V303 is greater than N303, the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2

8.3.2.7 T303 expiry or URA reselection

- Upon expiry of timer T303, and/or

- upon reselection of another UTRA cell when waiting for the URA UPDATE CONFIRM message,

the UE shall check the value of V303 and

- If V303 is smaller or equal than N303, the UE shall retransmit a URA UPDATE message on the uplink CCCH, restart timer T303 and increase counter V303. The UE shall set the IEs in the URA UPDATE message according to subclause 8.3.2.2.

- If V303 is greater than N303, the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2

8.3.2.8 Reception of the RNTI REALLOCATION COMPLETE message by the UTRAN

See subclause 8.3.3.4

8.3.3 RNTI reallocation

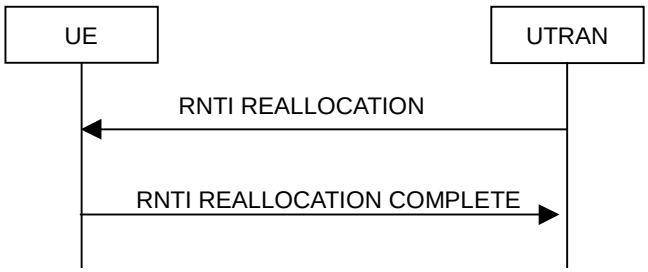


Figure 37: RNTI reallocation procedure, normal flow

8.3.3.1 General

The purpose of this procedure is to allocate a new C-RNTI and/or U-RNTI to an UE in connected mode.

8.3.3.2 Initiation

To initiate the procedure UTRAN transmits an RNTI REALLOCATION message to the UE on the downlink DCCH.

8.3.3.3 Reception of RNTI REALLOCATION message by the UE

When the UE receives an RNTI REALLOCATION message, it shall take the following actions and then transmit an RNTI REALLOCATION COMPLETE message on the uplink DCCH. The procedure ends when the transmission of the RNTI REALLOCATION COMPLETE message has been confirmed by RLC.

If the IE "new U-RNTI" is present, the UE shall store and start to use the values of these IEs as the current U-RNTI.

If the IE "new C-RNTI" is present, the UE shall store and start to use the value of this IE.

If the IE "CN domain identity" and the IE "NAS system information" are included, the UE shall forward the content of the IE to the non-access stratum entity of the UE indicated by the IE "CN domain identity".

8.3.3.4 Reception of an RNTI REALLOCATION COMPLETE message by the UTRAN

When the network receives RNTI REALLOCATION COMPLETE message, UTRAN may delete any old C-RNTI and old U-RNTI. The procedure ends.

8.3.4 Active set update in soft handover

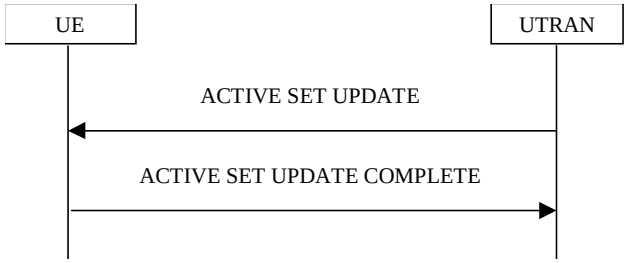


Figure 38: Active Set Update procedure, successful case

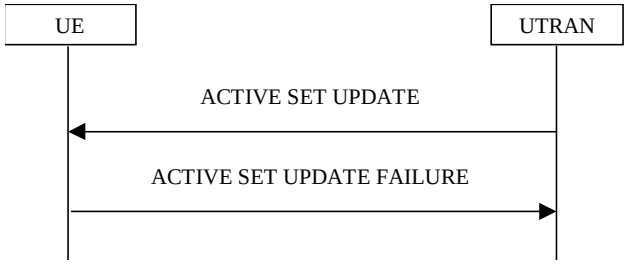


Figure 39: Active Set Update procedure, failure case

8.3.4.1 General

The purpose of the active set update procedure is to update the active set of the connection between the UE and UTRAN. This procedure shall be used in CELL_DCH state. The UE should keep on using the old RLs while allocating the new RLs. Also the UE should keep on using the transmitter during the reallocation process.

8.3.4.2 Initiation

The procedure is initiated when UTRAN orders a UE in CELL_DCH state, to make the following modifications of the active set of the connection.

a) Radio link addition

b) Radio link removal

c) Combined radio link addition and removal

In case a) and c), UTRAN should

- prepare new additional radio link(s) in the UTRAN prior to the command to the UE.

In all cases, UTRAN should

- send an ACTIVE SET UPDATE message on downlink DCCH using AM or UM RLC.

UTRAN should include the following information:

- IE "Radio Link Addition Information": Downlink DPCH information and other optional parameters relevant for the additional radio links with Primary CCPCH info used for the reference ID to indicate which radio link to add. This IE is need in case a) and c).

- IE "Radio Link Removal Information": Primary CCPCH info used for the reference ID to indicate which radio link to remove. This IE is need in case b) and c).

If SRNC relocation is performed simultaneously during active set update procedure when all radio links are replaced simultaneously, the UTRAN shall include the IE "U-RNTI" and IE "CN domain identity" and IE "NAS system information" in the ACTIVE SET UPDATE messages.

8.3.4.3 Reception of an ACTIVE SET UPDATE message by the UE

- Upon reception of an ACTIVE SET UPDATE message the UE shall s tore the received IE "Radio Link Addition Information" and the IE "Radio Link Removal Information" to the variable ORDERED_ASU.

The UE shall act upon all received information elements as specified in 8.5.7, unless specified otherwise in the following.

The UE shall

- at first, add the RLs indicated in the IE "Radio Link Addition Information".

- remove the RLs indicated in the IE "Radio Link Removal Information" . If the UE active set is full or becomes full, an RL, which is indicated to remove, shall be removed before adding RL, which is indicated to add.

- If the ACTIVE SET UPDATE message includes the IE "U-RNTI", update its identity.

- If the ACTIVE SET UPDATE message includes the IE "CN domain identity" and the IE "NAS system information", the UE shall forward the content of the IE to the non-access stratum entity of the UE indicated by the IE "CN domain identity".

- If the ACTIVE SET UPDATE message includes the IE 'TFCI combining indicator' associated with a radio link to be added then the UE should configure Layer 1 to soft combine TFCI (field 2) of this new link with those links already in the TFCI (field 2) combining set.

- transmit an ACTIVE SET UPDATE COMPLETE message on the uplink DCCH using AM RLC. When the transmission of the ACTIVE SET UPDATE COMPLETE message has been confirmed by RLC the contents of the variable ORDERED_ASU shall be cleared and the procedure ends on the UE side.

8.3.4.4 Abnormal case: Unsupported configuration in the UE

- If UTRAN instructs the UE to use a configuration that it does not support, or

- If a radio link in the IE "Radio Link Removal Information" in the ACTIVE SET UPDATE message is not part of the active set

the UE shall

- Keep the active set and the contents of the variable ORDERED_ASU, as it was before the ACTIVE SET UPDATE message was received

- Transmit an ACTIVE SET UPDATE FAILURE message on the DCCH using AM RLC.

- Set the IE "failure cause" to "configuration unacceptable".

- When the transmission of the ACTIVE SET UPDATE FAILURE message has been confirmed by RLC the procedure ends on the UE side.

8.3.4.5 Reception of the ACTIVE SET UPDATE COMPLETE message by the UTRAN

When the UTRAN has received the ACTIVE SET UPDATE COMPLETE message,

- the UTRAN may remove radio link(s) that are indicated to remove to the UE in case b) and c)
- and the procedure ends on the UTRAN side.

8.3.4.6 Reception of the ACTIVE SET UPDATE FAILURE message by the UTRAN

When the UTRAN has received the ACTIVE SET UPDATE FAILURE message, the UTRAN may delete radio links that are indicated to add to the UE. The procedure ends on the UTRAN side.

8.3.4.7 Incompatible simultaneous reconfiguration

If any of the variables ORDERED_CONFIG or ORDERED_ASU are set, the UE shall:

- Transmit an RRC STATUS message on the DCCH using AM RLC.
- When the transmission of the RRC STATUS message has been confirmed by RLC the procedure ends and the UE shall keep the active set and the contents of the variable ORDERED_ASU, as it was before the ACTIVE SET UPDATE message was received.

8.3.5 Hard handover

8.3.5.1 General

The purposes of the hard handover procedure are;

- to change the frequency of the connection between the UE and UTRAN
- to change cell in a network that does not support macro diversity, and
- to change the mode between TDD and FDD.

This procedure may be used in CELL_DCH state.

8.3.5.2 Initiation

Hard handover initiated by the network is normally performed by the procedure "Physical channel reconfiguration" (8.2.6), but may also be performed by the procedures "radio bearer establishment" (8.2.1), "Radio bearer reconfiguration" (8.2.2), "Radio bearer release" (8.2.3) or "Transport channel reconfiguration" (8.2.4).

8.3.6 Inter-system handover to UTRAN

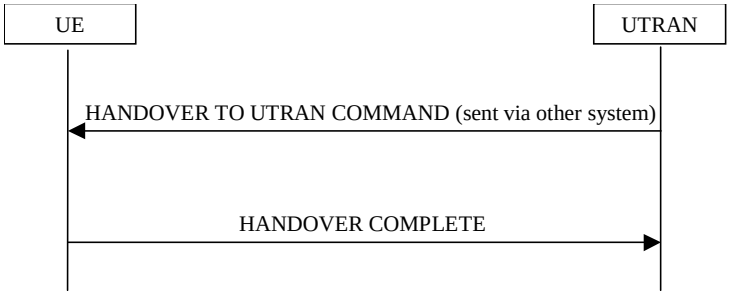


Figure 40: Inter system handover to UTRAN, successful case

8.3.6.1 General

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

8.3.6.2 Initiation

The procedure is initiated when a radio access system other than UTRAN, e.g. GSM, and, 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 system from which inter- system handover is performed.

UTRAN should include the following information in the HANDOVER TO UTRAN COMMAND message.

- the IE "U-RNTI" to be assigned
- The IE "Predefined radio configuration identity", to indicate which pre-defined configuration of RB, traffic channel and physical channel parameters shall be used
- PhyCH information elements

8.3.6.3 Reception of HANDOVER TO UTRAN COMMAND message by the UE

The UE shall act upon all received information elements as specified in 8.5.7, unless specified otherwise in the following.

The UE shall

- Store the value of the IE "U-RNTI" and
- Initiate the signalling link, the RB(s) and traffic channel(s) in accordance with the predefined parameters identified by the IE "Predefined radio 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
- Perform an open loop estimation to determine the UL transmission power, taking into account the received IE "Maximum allowed UL TX power" and move to CELL_DCH state
- Apply the same ciphering (ciphered/ unciphered, algorithm) as prior to inter system handover, unless a change of algorithm is requested by means of the "Ciphering algorithm"

If the UE succeeds to establish the connection to UTRAN, it shall transmit a HANDOVER COMPLETE message on the uplink DCCH. When the transmission of the HANDOVER COMPLETE message has been confirmed by RLC, the procedure ends.

8.3.6.4 UE fails to perform handover

If the UE does not succeed to establish 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 system.

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

8.3.6.5 Reception of message HANDOVER COMPLETE by the UTRAN

Upon receiving a HANDOVER COMPLETE message, UTRAN should consider the inter- system handover procedure as completed successfully and indicate this to the CN.

8.3.7 Inter-system handover from UTRAN

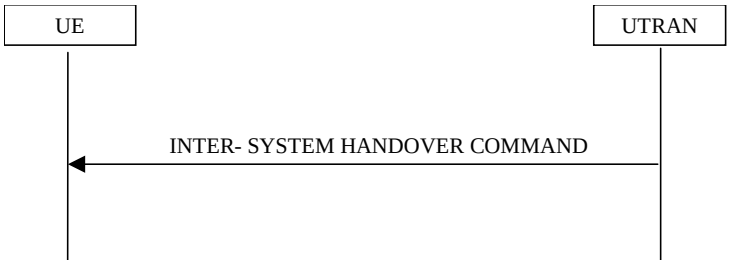


Figure 41: Inter system handover from UTRAN, successful case

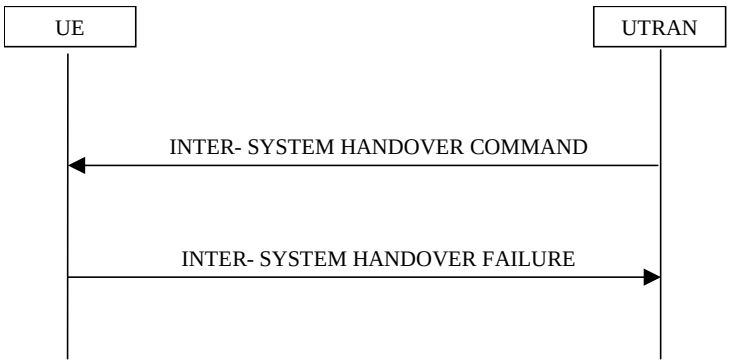


Figure 42: Inter system handover from UTRAN, failure case

8.3.7.1 General

The purpose of the inter system handover procedure is to, controlled by the network, transfer a connection between the UE and UTRAN to another radio access system (e.g. GSM). This procedure may be used in CELL_DCH and CELL_FACH state.

8.3.7.2 Initiation

The procedure is initiated when UTRAN orders a UE in CELL_DCH or CELL_FACH state, to make a handover to another radio access system than UTRAN, e.g. GSM.

To initiate the procedure, UTRAN sends an INTER- SYSTEM HANDOVER COMMAND message.

8.3.7.3 Reception of an INTER- SYSTEM HANDOVER COMMAND message by the UE

The UE shall take the following actions:

- Establish the connection to the other radio access system, by using the contents of the IE "Inter system message". This IE contains candidate/ target cell identifier(s) and radio parameters relevant for the other radio access system.

- switch the current connection to the other radio access system

NOTE 1: Requirements concerning the establishment of the radio connection towards the other radio access system and the signalling procedure are outside the scope of this specification.

NOTE 2: The release of the UMTS radio resources is initiated by the other system.

8.3.7.4 Successful completion of the inter-system handover

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

8.3.7.5 UE fails to complete requested handover

If the UE does not succeed to establish the connection to the other radio access system, it shall

- resume the connection to UTRAN using the resources used before receiving the INTER-SYSTEM HANDOVER COMMAND message and
- transmit the INTER-SYSTEM HANDOVER FAILURE message. When the transmission of the INTER-SYSTEM FAILURE message has been confirmed by RLC, the procedure ends.

8.3.7.6 Reception of an INTER-SYSTEM HANDOVER FAILURE message by UTRAN

Upon receiving an INTER-SYSTEM HANDOVER FAILURE message, UTRAN may release the resources in the other radio access system.

8.3.8 Inter-system cell reselection to UTRAN

8.3.8.1 General

The purpose of the inter system cell reselection procedure to UTRAN is to, under the control of the UE and to some extent the other radio access system, transfer a connection between the UE and another radio access system (e.g. GSM/GPRS) to UTRAN.

8.3.8.2 Initiation

When the UE makes an inter-system cell reselection to UTRAN according to the criteria specified in TS 25.304, it shall initiate this procedure. The inter-system cell reselection made by the UE may use system information broadcast from the other radio access system or UE dedicated information.

The UE shall initiate an RRC connection establishment procedure as specified in subclause 8.1.3 except that the IE "establishment cause" in the RRC CONNECTION REQUEST message shall be set to "Inter-system cell reselection". After initiating an RRC connection establishment, the UE shall release all resources specific to the other radio access system.

8.3.8.3 UE fails to complete an inter-system cell reselection

If the inter-system cell reselection fails before the UE has initiated the RRC connection establishment the UE may return back to the other radio access system.

If the RRC connection establishment fails the UE shall enter idle mode.

8.3.9 Inter-system cell reselection from UTRAN

8.3.9.1 General

The purpose of the inter system cell reselection procedure from UTRAN is to, under the control of the UE and to some extent the network, transfer a connection between the UE and UTRAN to another radio access system (e.g. GSM/GPRS).

8.3.9.2 Initiation

This procedure may be initiated in states CELL_FACH, CELL_PCH or URA_RCH.

When the UE based on received system information makes a cell reselection to a radio access system other than UTRAN, e.g. GSM/GPRS, according to the criteria specified in TS 25.304, the UE shall.

- start timer T309
- initiate the establishment of a connection to the other radio access system according to its specifications

8.3.9.3 Successful cell reselection

When the UE has succeeded in reselecting a cell in the other radio access system and has initiated an establishment of a connection, it shall stop timer T309 and release all UTRAN specific resources.

UTRAN should release all UE dedicated resources upon indication that the UE has completed a connection establishment to the other radio access system.

8.3.9.4 Expiry of timer T309

If the timer T309 expires before the UE succeeds to initiate an establishment of a connection to the other radio access system, the UE shall resume the connection to UTRAN using the resources used before initiating the inter system cell reselection procedure.

8.4 Measurement procedures

The UE measurements are grouped into 6 different categories, according to what the UE should measure.

The different types of measurements are:

- **Intra-frequency measurements**: measurements on downlink physical channels at the same frequency as the active set. Detailed description is found in subclause 14.1.
- **Inter-frequency measurements**: measurements on downlink physical channels at frequencies that differ from the frequency of the active set.
- **Inter-system measurements**: measurements on downlink physical channels belonging to another radio access system than UTRAN, e.g. PDC or GSM.
- **Traffic volume measurements**: measurements on uplink traffic volume. Detailed description is found in subclause 14.2.
- **Quality measurements**: Measurements of quality parameters, e.g. downlink transport block error rate.
- **Internal measurements**: Measurements of UE transmission power and UE received signal level. Detailed description is found in subclause 14.3.

The same type of measurements may be used as input to different functions in UTRAN. However, the UE shall support a number of measurements running in parallel. The UE shall also support that each measurement is controlled and reported independently of every other measurement.

Cells that the UE is monitoring (e.g. for handover measurements) are grouped in the UE into two different categories:

1. Cells, which belong to the **active set.** User information is sent from all these cells and they are simultaneously demodulated and coherently combined. In FDD, these cells are involved in soft handover. In TDD the active set always comprises of one cell only.
2. Cells, which are not included in the active set, but are monitored according to a neighbour list assigned by the UTRAN belong to the **monitored set.**

UTRAN may start a measurement in the UE by transmitting a MEASUREMENT CONTROL message. This message includes the following measurement control information:

1. **Measurement type**: One of the types listed above describing what the UE shall measure.
2. **Measurement identity number**: A reference number that should be used by the UTRAN when modifying or releasing the measurement and by the UE in the measurement report.
3. **Measurement command**: One out of three different measurement commands
   - Setup: Setup a new measurement.
   - Modify: Modify a previously defined measurement, e.g. to change the reporting criteria.
   - Release: Stop a measurement and clear all information in the UE that are related to that measurement.

4. **Measurement objects:** The objects the UE shall measure on, and corresponding object information.
5. **Measurement quantity:** The quantity the UE shall measure. This also includes the filtering of the measurements.
6. **Reporting quantities:** The quantities the UE shall include in the report in addition to the quantities that are mandatory to report for the specific event.
7. **Measurement reporting criteria**: The triggering of the measurement report, e.g. periodical or event-triggered reporting. The events are described for each measurement type in chapter 14.
8. **Reporting mode**: This specifies whether the UE shall transmit the measurement report using acknowledged or unacknowledged data transfer of RLC.

All these measurement parameters depend on the measurement type and are described in more detail in chapter 14.

When the reporting criteria are fulfilled, i.e. a specified event occurred or the time since last report indicated for periodical reporting has elapsed, the UE shall send a MEASUREMENT REPORT message to UTRAN.

In idle mode, the UE shall perform measurements according to the measurement control information included in System Information Block Type 11, which is transmitted on the BCCH.

In CELL_FACH, CELL_PCH or URA_PCH state, the UE shall perform measurements according to the measurement control information included in System Information Block Type 12, which is transmitted on the BCCH. If the UE has not received System Information Block Type 12, it shall perform measurements according to the measurement control information included in System Information Block Type 11, which is transmitted on the BCCH.

In CELL_DCH state, the UE shall report radio link related measurements to the UTRAN with a MEASUREMENT REPORT message. In order to receive information for the establishment of immediate macrodiversity (FDD) or to support the DCA algorithm (TDD), the UTRAN may also request the UE to append radio link related measurement reports to the following messages sent on the RACH:

- RRC CONNECTION REQUEST message sent to establish an RRC connection.
- RRC CONNECTION RE-ESTABLISHMENT REQUEST message sent to re-establish an RRC connection.
- DIRECT TRANSFER message sent uplink to establish a signalling connection.
- CELL UPDATE message sent to respond to a UTRAN originated page.
- MEASUREMENT REPORT message sent to report uplink traffic volume.
- CAPACITY REQUEST message sent to request PUSCH capacity (TDD only)

NOTE: Whether or not measured results can be appended to other messages and in other scenarios is FFS.

8.4.1 Measurement control

Figure 43: Measurement Control, normal case

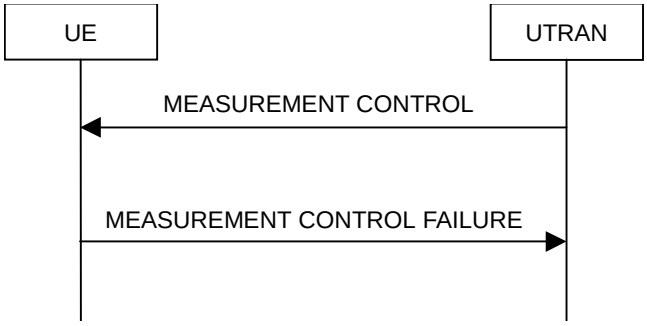


Figure 44: Measurement Control, UE reverts to old measurements

8.4.1.1 General

The purpose of the measurement control procedure is to Setup, modify or release a measurement in the UE.

8.4.1.2 Initiation

The UTRAN may request a measurement in the UE to be setup, modified or released with a MEASUREMENT CONTROL message, which is transmitted on the downlink DCCH using AM RLC.

When a new measurement is setup, UTRAN should set the IE "Measurement identity number" to a value, which is not used for other measurements.

UTRAN should take the UE capabilities into account when a measurement is assigned to the UE.

8.4.1.3 Reception of MEASUREMENT CONTROL by the UE

Upon reception of a MEASUREMENT CONTROL message the UE shall perform actions specified in 8.5.7 unless otherwise specified below.

The UE shall

- Read the IE "Measurement command"

If the IE "measurement command" has the value "setup", the UE shall

- Store this measurement in the variable MEASUREMENT_IDENTITY according to the IE "measurement identity number"
- Store into the variable MEASUREMENT_IDENTITY the control information defined by IE "Measurement object", the IE "Measurement quantity", the IE "Reporting quantity", the IE "Measurement reporting criteria", the IE "Measurement validity", the IE "Reporting mode" and if present all IEs "Additional measurement identity number", which are valid for this measurement type and
- Begin measurements according to the stored control information for this measurement identity number

See chapter 14 for detailed description of a measurement object, measurement quantity and measurement reporting criteria for the different types of measurements.

If the IE "Measurement command" has the value "modify", the UE shall

- Retrieve the stored measurement information associated with the identity indicated in the IE "measurement identity number"
- If any of the IEs "measurement object", IE "measurement quantity", IE "reporting quantity", IE "measurement reporting criteria", IE "measurement validity", IE "reporting mode" or IE "Additional measurement identity number" are present in the MEASUREMENT CONTROL message, the control information defined by that IE shall replace the corresponding stored information.
- Store the new set of IEs and associate them with the measurement identity number and

- Resume the measurements according to the new stored measurement control information

If the IE "measurement command has the value "release", the UE shall

- Terminate the measurement associated with the identity given in the IE "measurement identity number"
- Clear all stored measurement control information related associated to this measurement identity number.

After the above actions have been performed, the procedure is complete.

8.4.1.4 Unsupported measurement in the UE

If UTRAN instructs the UE to perform a measurement that is not supported by the UE, the UE shall

- Retain the measurement configuration that was valid before the MEASUREMENT CONTROL message was received.
- Transmit a MEASUREMENT CONTROL FAILURE message on the DCCH using AM RLC.

The UE shall set the cause value in IE "failure cause" to "unsupported measurement".

8.4.1.5 Reception of the MEASUREMENT CONTROL FAILURE message by the UTRAN

When the UTRAN receives a MEASUREMENT CONTROL FAILURE message the procedure ends.

8.4.1.6 Measurements after transition from CELL_DCH to CELL_FACH state

The UE shall obey the follow rules for different measurement types after transiting from CELL_DCH to CELL_FACH state:

Intra-frequency measurement

The UE shall stop intra-frequency type measurement reporting assigned in a MEASUREMENT CONTROL message.

After transition to CELL_FACH state, the UE shall begin monitoring neighbouring cells listed in the "intra-frequency cell info" received in "System Information Block 12" (or "System Information Block 11").

If the UE has no previously assigned, valid intra-frequency measurement for CELL_DCH state, the UE shall store "intra-frequency measurement reporting criteria", from "System Information Block 12" (or "System Information Block 11"), for use after a subsequent transition to CELL_DCH state.

If the UE receives the "Intra-frequency reporting quantity for RACH Reporting" and "Maximum number of Reported cells on RACH" IEs from "System Information Block 12" (or "System Information Block 11"), the UE use this information for reporting measured results in RACH messages.

Inter-frequency measurement

The UE shall stop the inter-frequency type measurement reporting assigned in a MEASUREMENT CONTROL message.

After transition to CELL_DCH state, the UE shall begin monitoring neighbouring cells listed in the "inter-frequency cell info" received in "System Information Block 12" (or "System Information Block 11").

Inter-system measurement

The UE shall stop the inter-system type measurement reporting assigned in a MEASUREMENT CONTROL message.

After transition to CELL_DCH state, the UE shall begin monitoring neighbouring cells listed in the "inter-system" cell info" received in "System Information Block 12" (or "System Information Block 11").

Quality measurement

The UE shall stop the quality type measurement reporting assigned in a MEASUREMENT CONTROL message after transition from CELL_DCH to CELL_FACH state.

UE internal measurement

The UE shall stop the UE internal measurement reporting type of measurement assigned in a MEASUREMENT CONTROL message.

Traffic volume measurement

The UE shall stop or continue traffic volume type measurement reporting assigned in a MEASUREMENT CONTROL message according to the following rules:

- If the IE "measurement validity" for this measurement has been assigned to value "release", the UE shall delete the measurement associated with the variable MEASUREMENT IDENTITY
- If the IE "measurement validity" for the measurement has been assigned to value "resume", and the IE "UE state for reporting" has been assigned to value "CELL_DCH", the UE shall stop measurement reporting and save the measurement associated with the variable MEASUREMENT IDENTITY to be used after the next transition to CELL_DCH state.
- If the IE "measurement validity" for the measurement has been assigned to value "resume", and the IE "UE state for reporting" has been assigned to value "all states", the UE shall continue measurement reporting.
- If the UE has previously stored a measurement, for which the IE "measurement validity" has been assigned to value "resume" and for which the IE "UE state for reporting" has been assigned to value "all states except CELL_DCH", the UE shall resume this measurement and associated reporting.

If no traffic volume type measurement has been assigned to the UE with a MEASUREMENT CONTROL message when transiting to CELL_FACH state, the UE shall begin a traffic volume type measurement according to traffic volume measurement type information received in "System Information Block 12" (or "System Information Block 11").

8.4.1.7 Measurements after transition from CELL_FACH to CELL_DCH state

The UE shall obey the follow rules for different measurement types after transiting from CELL_FACH to CELL_DCH state:

Intra-frequency measurement

If the UE has previously stored an intra-frequency measurement, for which the IE "measurement validity" has been assigned to value "resume" and for which the IE "UE state for reporting" has been assigned to value "CELL_DCH", the UE shall resume this measurement and associated reporting.

If the UE has no previously assigned measurement, it shall continue monitoring the list of neighbouring cells assigned in the "intra-frequency cell info" IE in "System Information Block 12" (or "System Information Block 11"). If the "intra-frequency measurement reporting criteria" IE was included in "System Information Block 12" (or "System Information Block 11"), the UE shall send the MEASUREMENT REPORT message when reporting criteria are fulfilled. When the UE receives a MEASUREMENT CONTROL message including an intra-frequency measurement type assignment, the UE shall stop monitoring and measurement reporting for the list of neighbouring cells assigned in the "intra-frequency cell info" IE in "System Information Block 12" (or "System Information Block 11"). It shall also delete the measurement reporting criteria received in "System Information Block 12" (or "System Information Block 11").

Inter-frequency measurement

The UE shall stop monitoring the list of neighbouring cells assigned in the "inter-frequency cell info" IE in "System Information Block 12" (or "System Information Block 11"). If the UE has previously stored an inter-frequency measurement, for which the IE "measurement validity" has been assigned to value "resume" and for which the IE "UE state for reporting" has been assigned to value "CELL_DCH", the UE shall resume this measurement and associated reporting.

Inter-system measurement

The UE shall stop monitoring the list of neighbouring cells assigned in the "inter-frequency system info" IE in "System Information Block 12" (or "System Information Block 11"). If the UE has previously stored an inter-system measurement, for which the IE "measurement validity" has been assigned to value "resume" and for which the IE "UE state for reporting" has been assigned to value "CELL_DCH", the UE shall resume this measurement and associated reporting.

Traffic volume measurement

The UE shall stop or continue traffic volume type measurement reporting assigned in a MEASUREMENT CONTROL message sent on the FACH according to the following rules:

- If the IE "measurement validity" for this measurement has been assigned to value "release", the UE shall delete the measurement associated with the variable MEASUREMENT IDENTITY

- If the IE "measurement validity" for the measurement has been assigned to value "resume", and the IE "UE state for reporting" has been assigned to value "CELL_FACH", the UE shall stop measurement reporting and save the measurement associated with the variable MEASUREMENT IDENTITY to be used after the next transition to CELL_FACH state.

- If the IE "measurement validity" for the measurement has been assigned to value "resume", and the IE "UE state for reporting" has been assigned to value "all states", the UE shall continue measurement reporting.

If the UE has previously stored a measurement, for which the IE "measurement validity" has been assigned to value "resume" and for which the IE "UE state for reporting" has been assigned to value "CELL_DCH", the UE shall resume this measurement and associated reporting.

If no traffic volume type measurement has been assigned to the UE with a MEASUREMENT CONTROL message when transiting to CELL_DCH state, the UE shall continue an ongoing traffic volume type measurement, which was assigned in "System Information Block 12" (or "System Information Block 11")

Traffic volume type measurement control parameters assigned in a MEASUREMENT CONTROL message shall always supersede parameters conveyed in "System Information Block 12" (or "System Information Block 11").If the UE receives a MEASUREMENT CONTROL message including an traffic volume measurement type assignment, the UE shall delete the traffic volume measurement control information received in "System Information Block 12" (or "System Information Block 11").

8.4.1.8 Measurements after transition from idle mode to CELL_DCH state

The UE shall obey the follow rules for different measurement types after transiting from idle mode to CELL_DCH state:

Intra-frequency measurement

The UE shall continue monitoring the list of neighbouring cells assigned in the "intra-frequency cell info" IE in "System Information Block 12" (or "System Information Block 11"). If the "intra-frequency measurement reporting criteria" IE was included in "System Information Block 12" (or "System Information Block 11"), the UE shall send the MEASUREMENT REPORT message when reporting criteria are fulfilled.

When the UE receives a MEASUREMENT CONTROL message including an intra-frequency measurement type assignment, the UE shall stop monitoring and measurement reporting for the list of neighbouring cells assigned in the "intra-frequency cell info" IE in "System Information Block 12" (or "System Information Block 11"). It shall also delete the measurement reporting criteria received in "System Information Block 12" (or "System Information Block 11").

Inter-frequency measurement

The UE shall stop monitoring the list of neighbouring cells assigned in the "inter-frequency cell info" IE in "System Information Block 12" (or "System Information Block 11").

Inter-system measurement

The UE shall stop monitoring the list of neighbouring cells assigned in the "inter-frequency system info" IE in "System Information Block 12" (or "System Information Block 11").

Traffic volume measurement

The UE shall begin a traffic volume type measurement, which was assigned in "System Information Block 12" (or "System Information Block 11").

8.4.1.9 Measurements after transition from idle mode to CELL_FACH state

The UE shall obey the follow rules for different measurement types after transiting from idle mode to CELL_FACH state:

Intra-frequency measurement

The UE shall begin monitoring neighbouring cells listed in the "intra-frequency cell info" received in "System Information Block 12" (or "System Information Block 11").

If the UE receives "intra-frequency measurement reporting criteria", from "System Information Block 12" (or "System Information Block 11"), the UE shall store this information to use after a subsequent transition to CELL_DCH state.

If the UE receives the "Intra-frequency reporting quantity for RACH Reporting" and "Maximum number of Reported cells on RACH" IEs from "System Information Block 12" (or "System Information Block 11"), the UE use this information for reporting measured results in RACH messages.

Inter-frequency measurement

?1?The UE shall begin monitoring neighbouring cells listed in the "inter-frequency cell info" received in "System Information Block 12" (or "System Information Block 11").

Inter-system measurement

The UE shall begin monitoring neighbouring cells listed in the "inter-system" cell info" received in "System Information Block 12" (or "System Information Block 11").

Traffic volume measurement

The UE shall begin a traffic volume type measurement according to traffic volume measurement type information received in "System Information Block 12" (or "System Information Block 11").

8.4.2 Measurement report

Figure 45: Measurement report, normal case

8.4.2.1 General

The purpose of the measurement reporting procedure is to transfer measurement results from the UE to UTRAN.

8.4.2.2 Initiation

In CELL_DCH state, the UE shall transmit a MEASUREMENT REPORT message on the uplink DCCH when the reporting criteria stored in variable MEASUREMENT_IDENTITY are fulfilled for any ongoing measurements that are being performed in the UE.

In CELL_FACH state, the UE shall transmit a MEASUREMENT REPORT message on the uplink DCCH when the reporting criteria stored in variable MEASUREMENT_IDENTITY are fulfilled for an ongoing traffic volume measurement which is being performed in the UE.

In CELL_PCH or URA_PCH state, the UE shall first perform the cell update procedure in order to transit to CELL_FACH state and then transmit a MEASUREMENT REPORT message on the uplink DCCH when the reporting criteria stored in variable MEASUREMENT_IDENTITY are fulfilled for an ongoing traffic volume measurement which is being performed in the UE.

Criteria are fulfilled if either

- The time indicated in the stored IE "Periodical reporting" has elapsed a given measurement was either initiated or since the last measurement report related to this measurement was transmitted.

- An event in stored IE "Measurement reporting criteria" was triggered. Events and triggering of reports for different measurement types are described in detail in chapter 14.

The UE shall transmit the MEASUREMENT REPORT message using either AM or UM RLC according to the stored IE "measurement reporting mode" associated with the measurement identity number that triggered the report.

For the measurement, which triggered the MEASUREMENT REPORT message, the UE shall

- Set the IE "measurement identity number " to the measurement identity number which is associated with that measurement in variable MEASUREMENT_IDENTITY

- Set the IE "measured results" to include measurements according to the IE "reporting quantity" of that measurement stored in variable MEASUREMENT_IDENTITY

- Set the IE "Measured results" in the IE "Additional measured results" according to the IE "reporting quantity" for all measurements associated with the measurement identities included in the IE "additional measurements" stored in variable MEASUREMENT_IDENTITY of the measurement that triggered the measurement report. If several additional measured results are to be included, the UE shall sort them in ascending order according to their IE "measurement identity number" in the MEASUREMENT REPORT message.

If the MEASUREMENT REPORT message was triggered by an event (i.e. not a periodical report), the UE shall

- Set the measurement event results according to the event that triggered the report

8.4.2.3 Reception of a MEASUREMENT REPORT message by the UTRAN

When the UTRAN receives the MEASUREMENT REPORT message, the measurement reporting procedure ends.

8.5 General procedures

8.5.1 Selection of initial UE identity

The purpose of the IE "Initial UE identity" is to provide a unique UE identification at the establishment of an RRC connection. The type of identity shall be selected by the UE according to the following.

If the variable SELECTED_CN in the UE has the value "GSM-MAP", the UE shall choose "UE id type" in the IE "Initial UE identity" with the following priority:

1. TMSI (GSM-MAP): The TMSI (GSM-MAP) shall be chosen if available. The IE "LAI" in the IE "Initial UE identity" shall also be present when TMSI (GSM-MAP) is used, for making it unique.

2. P-TMSI (GSM-MAP): The P-TMSI (GSM-MAP) shall be chosen if available and no TMSI (GSM-MAP) is available. The IE "RAI" in the IE "Initial UE identity" shall in this case also be present when P-TMSI (GSM-MAP) is used, for making it unique.

3. IMSI (GSM-MAP): The IMSI (GSM-MAP) shall be chosen if available and no TMSI (GSM-MAP) or P-TMSI is available.

4. IMEI: The IMEI shall be chosen when none of the above three conditions are fulfilled.

When being used, the IEs "TMSI (GSM-MAP)," "P-TMSI (GSM-MAP)", "IMSI (GSM-MAP)", "LAI" and "RAI" shall be set equal to the values of the corresponding identities stored in the USIM or SIM.

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 [25.304].

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

The UE shall compare the 20 most significant bits of the ciphering hyper frame number for each radio bearer and store the highest value in the USIM.

The UE shall store the integrity protection hyper frame number in the USIM.

8.5.3 Open loop power control upon establishment of DPCCH

When establishing the first DPCCH the UE shall start the UL inner loop power control at a power level according to:

- DPCCH_Initial_power = DPCCH_Power_offset – CPICH_RSCP

Where

DPCCH_Power_offset shall have the value of IE "DPCCH Power offset" in IE "Uplink DPCH power control info

The value for the CPICH_RSCP shall be measured by the UE.

8.5.4 Physical channel establishment criteria

When a physical dedicated channel establishment is initiated by the UE, the UE shall start a timer T312 and wait for layer 1 to indicate N312 successive "in c" indications. At this occasion, the physical channel is considered established and the timer T312 is stopped and reset.

If the timer T312 expires before the physical channel is established, the UE shall consider this as a "physical channel establishment failure".

8.5.5 Detection of out of service area

When a suitable cell is not found based on the description in section 5.2.2.1 of TS25.304, the UE considers it as an "out of service area".

8.5.6 Radio link failure criteria

In L_DCH State the UE shall start timer T313 after receiving N313 consecutive "out of sync" indications for the established DPCCH physical channel from layer 1. The UE shall stop and reset timer T313 upon receiving successive N315 "in sync" indications from layer 1 and upon change of RRC state. If T313 expires, the UE shall consider it as a "Radio link failure".

8.5.7 Generic actions on receipt of an information element

8.5.7.1 CN information elements

8.5.7.1.1 CN domain specific DRX cycle length coefficient

If the IE "CN domain specific DRX cycle length coefficient" is present, the UE shall use it to calculate the DRX cycle length, according to the following:

Set k to the value of the IE "CN domain specific DRX cycle length coefficient".

Store the result of 2^k *PBP, where PBP is the Paging Block Periodicity, as the DRX cycle length for the CN domain as indicated by the IE "CN domain identity."

The UE shall determine its idle mode paging occasions and PICH monitoring occasions for that CN domain, according to TS 25.304, based on the stored DRX cycle length, when using DRX in idle mode.

8.5.7.1.2 NAS system information

If the IE "CN related information"."CN domain identity" and the IE "CN related information"."NAS system information" are present in a message, the UE shall forward the content of the IE "NAS system information" to the non-access stratum entity of the UE indicated by the IE "CN domain identity".

8.5.7.2 UTRAN mobility information elements

8.5.7.3 UE information elements

8.5.7.3.1 Activation time

If the IE "Activation time" is present, the UE shall

- activate the new configuration present in the same message as this IE at the indicated time.

NOTE: The new configuration is typically a dedicated physical channel present in the same message as the "Activation time" IE.

8.5.7.3.2 UTRAN DRX Cycle length coefficient

If the IE "UTRAN DRX cycle length coefficient" is present, the UE shall use it to calculate the DRX cycle length, in connected mode according to the following:

Set k to the value of the IE "UTRAN DRX cycle length coefficient".

Store the result of 2^k *PBP, where PBP is the Paging Block Periodicity, as the DRX cycle length for connected mode.

The UE shall determine its connected mode paging occasions and PICH monitoring occasions in the same way as for idle mode, according to TS 25.304, based on the stored DRX cycle length for connected mode, when using Discontinuous Reception (DRX) in CELL_PCH and URA_PCH state.

8.5.7.3.3 DRX Indicator

If the IE "DRX Indicator" is included and set to 'DRX with cell updating', the UE shall use the current UTRAN DRX Cycle length coefficient as DRX cycle length coefficient in the formulas for calculating Paging Occasion and PICH Monitoring Occasion.

If the IE "DRX Indicator" is included and is set to 'no DRX' the UE shall stop using DRX.

8.5.7.3.4 Ciphering mode info

If the IE "Ciphering mode info" is present, the UE shall check the IE "Ciphering mode command" as part of the IE "Ciphering mode info", and perform the following:

1. If IE "Ciphering mode command" has the value "start/restart", the UE shall

   1.1 Start or restart ciphering, using the ciphering algorithm (UEA [TS 33.102]) indicated by the IE "Ciphering algorithm", if that IE is present. If the IE "Ciphering algorithm" is not present, the current algorithm shall be used.

   1.2 If a new ciphering key is available, the new ciphering key shall be used at a restart and the ciphering hyperframe number shall be set to zero.

   1.3 If the IE "Activation time for DPCH" is present in the IE "Ciphering mode info", the UE shall apply the new configuration at that time for radio bearers using RLC-TM.

   1.4 If the IE "Radio bearer downlink ciphering activation time info" is present in the IE "Ciphering mode info", the UE shall apply the following procedure for each radio bearer using RLC-AM and RLC-UM indicated by the IE "RB identity":

1.4.1 Suspend data transmission on the radio bearer

1.4.2 Store the current RLC send state variable, VT(S), for that radio bearer

1.4.3 When the data transmission of that radio bearer is resumed, the UE shall switch to the new ciphering configuration according to the following:

1.4.3.1 Use the old ciphering configuration for the transmitted and received RLC PDUs with RLC sequence number less than the RLC sequence number indicated in the IE "Radio bearer downlink ciphering activation time info".

1.4.3.2 Use the new ciphering configuration shall be used for the transmitted and received RLC PDUs with RLC sequence number greater than or equal to the RLC sequence number indicated in the IE "Radio bearer downlink ciphering activation time info".

1.4.3.3 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.

1.5 For the signalling radio bearer for RRC signalling using RLC-AM, the UE shall apply the new ciphering configuration directly.

2. If IE "Ciphering mode command" has the value "modify", the UE shall change to the ciphering algorithm (UEA [TS 33.102]) indicated by the IE "Ciphering algorithm" contained in the IE "Ciphering mode info".

3. If the IE "Ciphering mode command" has the value "stop", the UE shall stop using ciphering.

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

8.5.7.3.5 Integrity protection mode info

If the IE "Integrity protection mode info" is present, the UE shall check the IE "Integrity protection mode command" as part of the IE "Integrity protection mode info", and perform the following:

- If IE "Integrity protection mode command" has the value "start/restart", the UE shall start or restart integrity protection, using the algorithm indicated by the IE "Integrity protection algorithm" (UIA [TS 33.102]) and use the IE "Integrity protection initialisation number" as the value of FRESH [TS 33.102] ", both contained in the IE "Integrity protection mode info". If a new integrity protection key has been received, the new key shall be used and the integrity protection HFN shall be set to 0.

- If IE "Integrity protection mode command" has the value "modify", the UE shall start to use integrity protection, using the integrity protection algorithm (UIA [TS 33.102]) indicated by the IE "Integrity protection algorithm" contained of the IE "Integrity protection mode info".

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

8.5.7.3.6 Configuration of CTCH occasions

A CTCH is mapped onto only one S-CCPCH, which is the same as carrying the PCH.

The CTCH occasions are identified by the first radio frame of the TTI which can contain CTCH data. The CTCH occasions are fixed on the system frame number cycle 0 .. 4095 (i.e. no modulo calculation) and thus repeated cyclically.

The CTCH occasions are determined by a set of parameters.

M_{TTI}: number of radio frames in the TTI of the FACH used for CTCH

N: period of CTCH allocation on S-CCPCH, integer number of radio frames,
$M_{TTI} \leq N \leq MaxSFN - K$, where N is a multiple of M_{TTI} (cf. 3G TS 25.212 and 3G TS 25.222).

MaxSFN: maximum system frame number = 4096 (cf. 3G TS 25.402).

K: CBS frame offset, integer number of radio frames $0 \leq K \leq N-1$ where K is a multiple of M_{TTI} .

The CTCH occasions are calculated as follows:

SFN = (K + m N) , m = 0, 1,..., M, M chosen that K+mN ≤ MaxSFN.

The parameters N and K are broadcast as system information.

8.5.7.4 Radio bearer information elements

8.5.7.4.1 RB mapping info

If the IE "RB identity" and the IE "RB mapping info" are included, the UE shall

- If any, delete all previously stored multiplexing options for that radio bearer.
- Store each new multiplexing option for that radio bearer.

8.5.7.4.2 RLC Info

If the IE "RB identity" and the IE "RLC Info" are included, the UE shall

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

8.5.7.4.3 PDCP Info

If the IEs "RB identity" and "PDCP info" are included, the UE shall

- Configure the PDCP entity for that radio bearer accordingly

8.5.7.5 Transport channel information elements

8.5.7.5.1 Transport Format Set

If the IE "transport channel identity" and the IE "Transport format set" is included, the UE shall

- store the transport format set for that transport channel.

If the IE "Transport format Set" has the choice "Transport channel type" set to "Dedicated transport channel", the UE shall

- Calculate the transport block size for all transport formats in the TFS as

TB size = RLC PDU size + MAC header size,

where,

MAC header size is according to 25.321 if MAC multiplexing is used. Otherwise it is 0 bits.

8.5.7.5.2 Transport format combination set

If the IE "Transport format combination set" is included, the UE shall

- start to respect those transport format combinations.

8.5.7.5.3 Transport format combination subset

If the IE "Transport format combination subset" is included, the UE shall

- restrict the transport format combination set to that transport format combination subset. If the transport format combination subset indicates the "full transport format combination set" any restriction on transport format combination set is released and the UE may use the full transport format combination set.

8.5.7.6 Physical channel information elements

8.5.7.6.1 Frequency info

If the IE "Frequency info" is included the UE shall

- Store that frequency as the active frequency and
- Tune to that frequency.

If the IE "Frequency info" is not included and the UE has a stored active frequency, the UE shall

- Continue to use the stored active frequency

If the IE "Frequency info" is not included and the UE has no stored active frequency, it shall

- map any used physical channels on the frequency given in system information as default

8.5.7.6.2 PRACH info

If the IE "PRACH info" is included, the UE shall

- Release any active dedicated physical channels in the uplink and
- let the PRACH be the default in the uplink for RACH

8.5.7.6.3 Secondary CCPCH info

If the IE "Secondary CCPCH info" is indicated by a dedicated message, the UE shall start to receive that Secondary CCPCH in the downlink. If the IE "Secondary CCPCH info" is not indicated by a dedicated message, the UE selects a SCCPCH from the broadcast SCCPCHs on BCH which are set to "Selection indicator"="On" based on "Initial UE identity" in idle mode or "old U-RNTI" in connected mode and the UE shall start to receive that Secondary CCPCH in the downlink.

The UE selects one SCCPCH based on the following algorithm.

- Selected SCCPCH = (Initial UE Identity) mod (listed SCCPCHs with "Selection Indicator"="on") (idle mode)
- Selected SCCPCH = (old U-RNTI) mod (listed SCCPCHs with "Selection Indicator"="on") (connected mode)

8.5.7.6.4 Uplink DPCH info

If the IE "Uplink DPCH info" is included, the UE shall

- release any active uplink physical channels and activate the given physical channels.

8.5.7.6.5 Downlink DPCH info

If the IE "Downlink DPCH info" is included, the UE shall

- Activate the dedicated physical channels indicated by that IE

8.5.7.6.6 Maximum allowed UL TX power

If the IE "Maximum allowed UL TX power" is included, the UE shall

- Keep the UE uplink transmit power below the indicated power value. If the current UE uplink transmit power is above the indicated power value, the UE shall decrease the power to a level below the power value.

8.5.7.6.7 Gated transmission control info

If the IE "Gated transmission control info" is included and the gating rate equals Full, then UE shall

- Stop gated transmission of uplink(if supported) and downlink DPCCH at activation time.

Otherwise, UE shall

- Start gated transmission of uplink(if supported) and downlink DPCCH at activation time with given gating rate and pattern.

8.5.7.6.8 PDSCH with SHO DCH Info (FDD only)

If the IE 'PDSCH with SHO DCH Info' is included, the UE shall

- Configure itself such that when an allocation on the DSCH is made it will receive the PDSCH from the specified BS within the active set
- Configure the Layer 1 to only soft combine the DPCCH TFCI(field 2) of the radio links within the associated DCH active set which are specified
- Infer that the set of radio links for which TFCI (field 2) should be soft combined will include all radio links within the active set if the IE 'TFCI combining set' is not included and the sending of the message in which the IE 'PDSCH with SHO DCH Info' is being used will result in a transport channel switch from a state in which the DSCH transport channel was not available to a state in which it is available.

8.5.7.6.9 PDSCH code mapping (FDD only)

If the IE 'PDSCH code mapping' is included, the UE shall

- Configure Layer 1 to support the mapping of TFCI(field 2) values to PDSCH channelisation codes as specified in the IE.

8.5.7.6.10 Uplink DPCH power control info

If the IE "Uplink DPCH power control info" is included the UE shall

- Start inner loop power control as specified in 8.5.3
- For the UL inner loop power control use the parameters specified in the IE

8.5.7.7 Measurement information elements

8.5.7.7.1 Measurement validity

If the IE "measurement validity" for a given measurement has been assigned to value "release", the UE shall delete the measurement associated with the variable MEASUREMENT IDENTITY after the UE makes a transition to a new state.

If the IE "measurement validity" for this measurement has been assigned to value "resume", the UE shall save the measurement associated with the variable MEASUREMENT IDENTITY .The IE "UE state" defines the scope of resuming the measurement.

If the "UE state" is defined as 'all states', the UE shall continue the measurement after making a transition to a new state. This scope is assigned only for traffic volume type measurements.

If the "UE state" is defined as 'all states except CELL_DCH', the UE shall store the measurement to be resumed after a subsequent transition from CELL_DCH state to any of the other states in connected mode. This scope is assigned only for traffic volume type measurements.

If the "UE state" is defined as 'CELL_DCH', the UE shall store the measurement to be resumed after a subsequent transition to CELL_DCH state. After cell re-selection, the UE shall delete an ongoing measurement intra-frequency or inter-frequency and inter-system type measurement associated with the variable MEASUREMENT IDENTITY. Other measurement types shall, however, be continued regardless of cell reselection.

8.5.7.8 Other information elements

8.5.8 Generic state transition rules depending on received information elements

The state the UE shall move to depends on the presence of a number of IEs as follows:

IF either IE "Uplink DPCH info" OR IE "Downlink DPCH info" is included THEN

The UE shall move to CELL_DCH state

ELSIF "DRX indicator" is included AND set to "DRX with Cell updating" THEN

The UE shall move to CELL_PCH state

ELSIF "DRX indicator" is included AND set to "DRX with URA updating" THEN

The UE shall move to URA_PCH state

ELSE

The UE shall move to CELL_FACH state

END

8.5.9 Open loop power control

For FDD and prior to PRACH transmission the UE shall calculate the power for the first preamble as:

Preamble_Initial_Power = Primary CPICH DL TX power – CPICH_RSCP + UL interference + Constant Value

Where

Primary CPICH DL TX power shall have the value of IE "Primary CPICH DL TX power",

UL interference shall have the value of IE "UL interference" and

Constant Value shall have the value of IE "Constant Value"

The IEs "Primary CPICH DL TX power", "UL interference" and "Constant value" shall be read on system information in system information block 6 and system information block 7.

The value for the CPICH_RSCP shall be measured by the UE.

As long as the physical layer is configured for PRACH transmission, the UE shall continuously recalculate the Preamble_Initial_Power when any of the broadcast parameters used in the above formula changes. The new Preamble_Initial_Power shall then be resubmitted to the physical layer.

For TDD the UE shall calculate the UL transmit power according to the following formulas for the PRACH preamble and dedicated channel respectively

$P_{PRACH} = L_{PCCPCH} + I_{BTS}$ + RACH Constant value

And for dedicated channels:

$P_{UE} = \alpha L_{PCCPCH} + (1-\alpha)L_0 + I_{BTS} + SIR_{TARGET}$ + DPCH Constant value

Where:

P_{PRACH} & P_{UE} : Transmitter power level in dBm,

L_{PCCPCH}: Measure representing path loss in dB (reference transmit power is broadcast on BCH).

L_0: Long term average of path loss in dB

I_{BTS}: Interference signal power level at cell's receiver in dBm, which is broadcast on BCH

α: α is a weighting parameter, which represents the quality of path loss measurements. α may be a function of the time delay between the uplink time slot and the most recent down link PCCPCH time slot. α is calculated at the UE.

SIR_{TARGET}: Target SNR in dB. A higher layer outer loop adjusts the target SIR.

RACH Constant value: This value shall be read on system information

DPCH Constant value: This value shall be read on system information

8.5.10 Detection of in service area

When a suitable cell is found based on the description in section 5.2.2.1 of TS25.304, the UE considers it as an "in service area".

9 Protocol states

9.1 RRC States and State Transitions including GSM

Figure 46 shows the RRC states in Connected Mode, including transitions between UTRAN connected mode and GSM connected mode for PSTN/ISDN domain services, and between UTRAN connected mode and GSM/GPRS packet modes for IP domain services. It also shows the transitions between Idle Mode and UTRAN Connected Mode and further the transitions within UTRAN connected Mode.

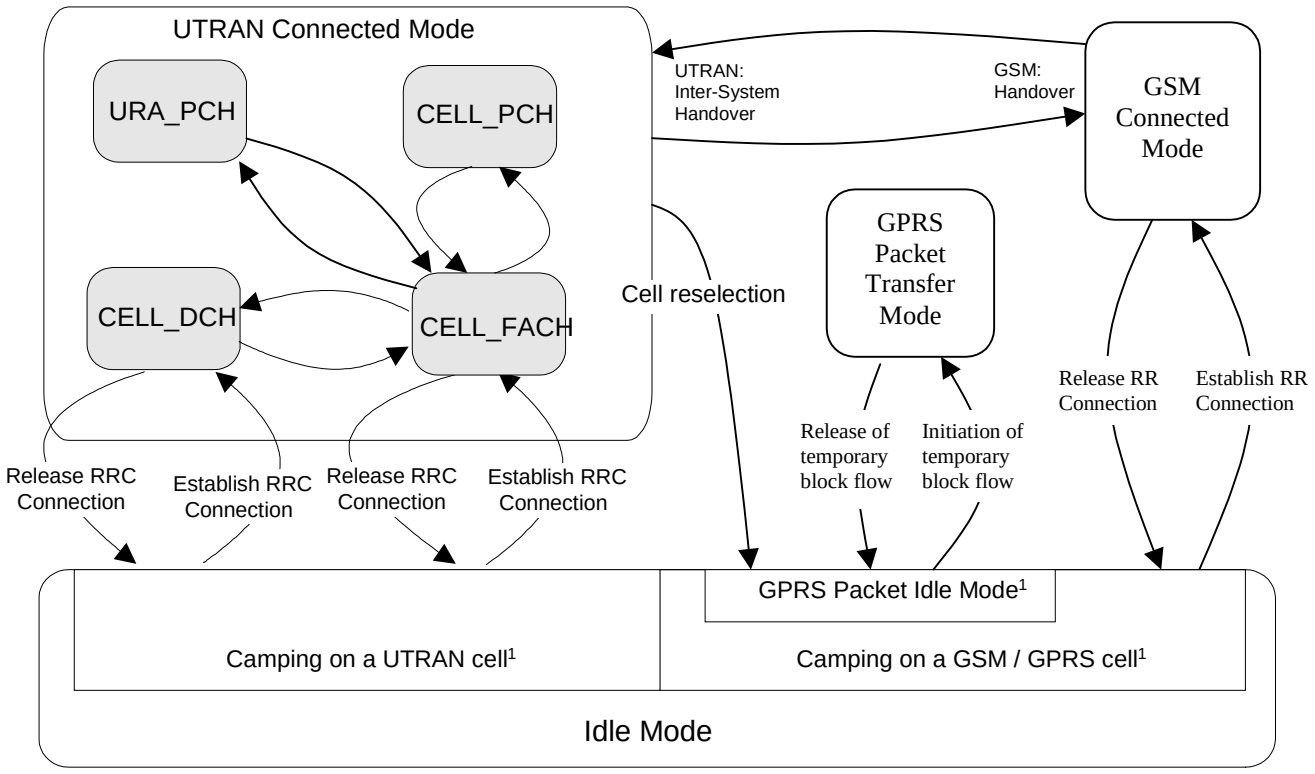


Figure 46: RRC States and State Transitions including GSM
[1: The indicated division within Idle Mode is only included for clarification and shall not be interpreted as states.]

It shall be noted that not all states may be applicable for all UE connections. For a given QoS requirement on the UE connection, only a subset of the states may be relevant.

After power on, the UE stays in Idle Mode until it transmits a request to establish an RRC Connection. In Idle Mode the connection of the UE is closed on all layers of the access stratum. In Idle Mode the UE is identified by non-access stratum identities such as IMSI, TMSI and P-TMSI. In addition, the UTRAN has no own information about the individual Idle Mode UEs, and it can only address e.g. all UEs in a cell or all UEs monitoring a paging occasion. The UE behaviour within this mode is described in [4].

The UTRAN Connected Mode is entered when the RRC Connection is established. The UE is assigned a radio network temporary identity (RNTI) to be used as UE identity on common transport channels.

NOTE: The exact definition of RRC connection needs further refinement.

The RRC states within UTRAN Connected Mode reflect the level of UE connection and which transport channels that can be used by the UE.

For inactive stationary data users the UE may fall back to PCH on both the Cell and URA levels. That is, upon the need for paging, the UTRAN shall check the current level of connection of the given UE, and decide whether the paging message shall be sent within the URA, or should it be sent via a specific cell.

9.2 Transition from Idle Mode to UTRAN Connected Mode

The transition to the UTRAN Connected Mode from the Idle Mode can only be initiated by the UE by transmitting a request for an RRC Connection. The event is triggered either by a paging request from the network or by a request from upper layers in the UE.

When the UE receives a message from the network that confirms the RRC connection establishment, the UE enters the CELL_FACH or CELL_DCH state of UTRAN Connected Mode.

In the case of a failure to establish the RRC Connection the UE goes back to Idle Mode. Possible causes are radio link failure, a received reject response from the network or lack of response from the network (timeout).

9.3 UTRAN Connected Mode States and Transitions

9.3.1 CELL_DCH state

The CELL_DCH state is characterised by

- A dedicated physical channel is allocated to the UE in uplink and downlink.
- The UE is known on cell level according to its current active set.
- Dedicated transport channels, downlink and uplink (TDD) shared transport channels, and a combination of these transport channels can be used by the UE.

The CELL_DCH-state is entered from the Idle Mode through the setup of an RRC connection, or by establishing a dedicated physical channel from the CELL_FACH state.

A PDSCH may be assigned to the UE in this state, to be used for a DSCH. In TDD a PUSCH may also be assigned to the UE in this state, to be used for a USCH.

9.3.1.1 Transition from CELL_DCH to Idle Mode

Transition to Idle Mode is realised through the release of the RRC connection.

9.3.1.2 Transition from CELL_DCH to CELL_FACH state

Transition to CELL_FACH state occurs when all dedicated channels have been released, which may be

a) via explicit signalling.

at the end of the time period for which the dedicated channel was allocated (TDD)

9.3.1.3 Radio Resource Allocation tasks (CELL_DCH)

For the DCH, several physical channel allocation strategies may be applied. The allocations can be either permanent (needing a DCH release message) or based on time or amount-of-data.

Resource allocation can be done separately for each packet burst with fast signalling on the DCH

For each radio frame the UE and the network indicate the current data rate (in uplink and downlink respectively) using the transport format combination indicator (TFCI). However, in TDD, DCH and DSCH or USCH may be mapped on different CCTrCHs, their TFCI are totally independent. DCH transmission is not modified by the simultaneous existence of DSCH/USCH. If the configured set of combinations (i.e. transport format set for one transport channel) are found to be insufficient to retain the QoS requirements for a transport channel, the network initiates a reconfiguration of the transport format set (TFS) for that transport channel. This reconfiguration can be done during or in between data transmission. Further, the network can reconfigure the physical channel allowing an increase or decrease of the peak data rate.

For the uplink data transmission, the UE reports the observed traffic volume to the network in order for the network to re-evaluate the current allocation of resources. This report contains e.g. the amount of data to be transmitted or the buffer status in the UE.

For codecs that support variable-rate operation the UE can be allowed by RRC in UTRAN to reduce transmission rate independently without requesting a new codec mode from the NW side within the limits defined by the NW in the current TFS for the impacted radio bearer.

The codec mode adaptation in the UE may be initialised e.g. when the maximum power level has been reached, or it is otherwise preferable from the UE point of view to decrease the power consumption by decreasing the data rate. The new Codec mode selected by the UE is signalled to the NW by means of the TFCI.

9.3.1.4 RRC Connection mobility tasks (CELL_DCH)

Depending on the amount and frequency of data macrodiversity (soft handover) may or may not be applied.

The RRC Connection mobility is handled by measurement reporting, soft handover and hard handover procedures.

9.3.1.5 UE Measurements (CELL_DCH)

The UE shall perform measurements and transmit measurement reports according to the measurement control information.

The UE shall use the connected mode measurement control information received in other states until new measurement control information has been assigned to the UE.

9.3.1.6 Acquisition of system information (CELL_DCH)

UEs with certain capabilities shall read system information broadcast on FACH.

9.3.2 CELL_FACH state

The CELL_FACH state is characterised by:

- No dedicated physical channel is allocated to the UE.
- The UE continuously monitors a FACH in the downlink
- The UE is assigned a default common or shared transport channel in the uplink (e.g. RACH) that it can use anytime according to the access procedure for that transport channel
- The position of the UE is known by UTRAN on cell level according to the cell where the UE last made a cell update.
- In TDD mode, one or several USCH or DSCH transport channels may have been established.

In the CELL_FACH substate the UE shall perform the following actions:

- listens to an FACH
- listens to the BCH transport channel of the serving cell for the decoding of system information messages
- initiates a cell update procedure on cell change of another UTRA cell
- Use C-RNTI assigned in the current cell as the UE identity on common transport channels except for when a new cell is selected
- transmits uplink control signals and small data packets on the RACH.
- In FDD mode, transmits uplink control signals and larger data packets on CPCH when resources are allocated to cell and UE is assigned use of those CPCH resources.
- In TDD mode, transmits signalling messages or user data in the uplink and/or the downlink using USCH and/or DSCH when resources are allocated to the cell and the UE is assigned use of those USCH/DSCH resources
- In TDD mode, transmits measurement reports in the uplink using USCH when resources are allocated to it in order to trigger a handover procedure in the UTRAN

9.3.2.1 Transition from CELL_FACH to CELL_DCH state

A transition occurs, when a dedicated physical channel is established via explicit signalling.

9.3.2.2 Transition from CELL_FACH to CELL_PCH state

The transition occurs when UTRAN orders the UE to move to CELL_PCH state, which is done via explicit signalling..

9.3.2.3 Transition from CELL_FACH to Idle Mode

Upon release of the RRC connection, the UE moves to the idle mode.

9.3.2.4 Transition from CELL_FACH to URA_PCH State

The transition occurs when UTRAN orders the UE to move to URA _PCH state, which is done via explicit signalling e.g. Upon completion of the URA update procedure.

9.3.2.5 Radio Resource Allocation Tasks (CELL_FACH)

In the CELL_ FACH state the UE will monitor an FACH. It is enabled to transmit uplink control signals and it may be able to transmit small data packets on the RACH.

The network can assign the UE transport channel parameters (e.g. transport format sets) in advance, to be used when a DCH is used. Upon assignment of the physical channel for DCH, the UE shall move to CELL_DCH state and use the pre-assigned TFS for the DCH.

If no UE dedicated physical channel or transport channel configuration has been assigned, the UE shall use the common physical channel and transport channel configuration according to the system information.

For the uplink data transmission, the UE reports the observed traffic volume to the network in order for the network to re-evaluate the current allocation of resources. This report contains e.g. the amount of data to be transmitted or the buffer status in the UE.

When there is either user or control data to transmit, a selection procedure determines whether the data should be transmitted on a common transport channel, or if a transition to CELL_DCH should be executed. The selection is dynamic and depends on e.g. traffic parameters (amount of data, packet burst frequency).

In FDD mode, the UTRAN can assign CPCH resources to the UE in CELL_FACH state. When CPCH resources are assigned, the UE will continue to monitor FACHs. The UE may use the RACH to transmit uplink control signals and small data packets. The UE also may choose to transmit data packets, larger than those carried on the RACH, on the CPCH channel. The UE selects either the RACH or one of the CPCH channels to make maximum use of the capacity available on that channel.

In FDD mode, the UE provides the UTRAN with CPCH measurement data, which includes data, queue depth (current size of data buffers), average access time for each CPCH channel used, and average traffic volume on each CPCH channel used. With these measures, the UTRAN can reallocate network resources on a periodic basis. The UTRAN allocates CPCH Sets to each cell and assigns UEs to one of the cell's CPCH Sets. The UEs can dynamically access the CPCH resources without further UTRAN control.

In the TDD mode, the UTRAN can assign USCH / DSCH resources to the UE in CELL_FACH state. When USCH / DSCH resources are assigned, the UE will continue to monitor FACHs, depending on the UE capability. The UE may use the USCH / DSCH to transmit signalling messages or user data in the uplink and / or the downlink using USCH and / or DSCH when resources are allocated to cell and UE is assigned use of those USCH / DSCH.

For the uplink data transmission on USCH the UE reports to the network the traffic volume (current size of RLC data buffers), The UTRAN can use these measurement reports to re-evaluate the current allocation of the USCH / DSCH resources.

9.3.2.6 RRC Connection mobility tasks (CELL_FACH)

In this state the location of the UE is known on cell level. A cell update procedure is used to report to the UTRAN, when the UE selects a new cell to observe the common downlink channels of a new cell. Downlink data transmission on the FACH can be started without prior paging.

The UE monitors the broadcast channel and system information on BCCH of its own and neighbour cells and from this the need for the updating of cell location is identified.

The UE shall perform cell reselection and upon selecting a new UTRA cell, it shall initiate a cell update procedure. Upon selecting a new cell belonging to another radio access system than UTRA, the UE shall enter idle mode and make an access to that system according to its specifications.

9.3.2.7 UE Measurements (CELL_FACH)

The UE shall perform measurements and transmit measurement reports according to the measurement control information.

By default, the UE shall use the measurement control information broadcast within the system information. However, for measurements for which the network also provides measurement control information within a MEASUREMENT CONTROL message, the latter information takes precedence.

9.3.2.8 Transfer and update of system information (CELL_FACH)

The UE shall read the BCH to acquire valid system information. For each acquisition, the UE may need different combinations of system information broadcast on BCH. The scheduling on the broadcast channel is done in such way that the UE knows when the requested information can be found.

When the system information is modified, the scheduling information is updated to reflect the changes in system information transmitted on BCH. The new scheduling information is broadcast on FACH in order to inform UEs about the changes. If the changes are applicable for the UE, the modified system information is read on BCH.

9.3.3 CELL_PCH state

The CELL_PCH state is characterised by:

- No dedicated physical channel is allocated to the UE
- The UE uses DRX for monitoring a PCH via an allocated PICH.
- No uplink activity is possible.
- The position of the UE is known by UTRAN on cell level according to the cell where the UE last made a cell update in CELL_FACH state.

In this state the UE shall perform the following actions:

- monitor the paging occasions according to the DRX cycle and receive paging information on the PCH

- listens to the BCH transport channel of the serving cell for the decoding of system information messages
- initiates a cell update procedure on cell change.
- A UE supporting Cell Broadcast Service (CBS) shall be capable to receive BMC messages in the CELL_PCH RRC state.

The DCCH logical channel cannot be used in this sub. If the network wants to initiate any activity, it needs to make a paging request on the PCCH logical channel in the known cell to initiate any downlink activity.

9.3.3.1 Transition from CELL_PCH to CELL_FACH state

The UE is transferred to CELL_FACH state either by paging from UTRAN or through any uplink access.

9.3.3.2 Radio Resource Allocation Tasks (CELL_PCH)

In CELL_PCH state no resources have been granted for data transmission. For this purpose, a transition to another state has to be executed.

The UE may use Discontinuous Reception (DRX) in order to reduce power consumption. When DRX is used the UE needs only to receive at one paging occasion per DRX cycle. The UE may be instructed to use a specific DRX cycle length by the network. The UE shall determine its paging occasions in the same way as for Idle Mode, see [4].

9.3.3.3 RRC Connection mobility tasks (CELL_PCH)

In the CELL_PCH state, the UE mobility is performed through cell reselection procedures, which may differ from the one defined in [4].

The UE shall perform cell reselection and upon selecting a new UTRA cell, it shall move to CELL_FACH state and initiate a cell update procedure in the new cell. After the cell update procedure has been performed, the UE shall change its state back to CELL_PCH state if neither the UE nor the network has any more data to transmit.

Upon selecting a new cell belonging to another radio access system than UTRA, the UE shall enter idle mode and make an access to that system according to its specifications.

In case of low UE activity, UTRAN may want to reduce the cell-updating overhead by ordering the UE to move to the URA_PCH State. This transition is made via the CELL_FACH state. UTRAN may apply an inactivity timer, and optionally, a counter, which counts the number of cell updates e.g. UTRAN orders the UE to move to URA_PCH when the number of cell updates has exceeded certain limits (network parameter).

9.3.3.4 UE Measurements (CELL_PCH)

The UE shall perform measurements and transmit measurement reports according to the measurement control information.

The UE shall use the measurement control information according to the system information when no UE dedicated measurement control information has been assigned.

9.3.3.5 Transfer and update of system information (CELL_PCH)

The UE shall read the BCH to acquire valid system information. For each acquisition, the UE may need different combinations of system information broadcast on BCH. The scheduling on the broadcast channel is done in such way that the UE knows when the requested information can be found.

9.3.4 URA_PCH State

The URA_PCH state is characterised by:

- No dedicated channel is allocated to the UE
- The UE uses DRX for monitoring a PCH via an allocated PICH.

- No uplink activity is possible
- The location of the UE is known on UTRAN Registration area level according to the URA assigned to the UE during the last URA update in CELL_FACH state.

In this state the UE performs the following actions:

- monitor the paging occasions according to the DRX cycle and receive paging information on the PCH
- listens to the BCH transport channel of the serving cell for the decoding of system information messages
- initiates a URA updating procedure on URA change.
- A UE supporting Cell Broadcast Service (CBS) shall be capable to receive BMC messages in the URA_PCH RRC state.

The DCCH logical channel cannot be used in this state. If the network wants to initiate any activity, it needs to make a paging request on the PCCH logical channel within the URA where the location of the UE is known. If the UE needs to transmit anything to the network, it goes to the CELL_FACH state. The transition to URA_PCH State can be controlled with an inactivity timer, and optionally, with a counter which counts the number of cell updates. When the number of cell updates has exceeded certain limits (a network parameter), then the UE changes to the URA_PCH State.

URA updating is initiated by the UE, which, upon the detection of the Registration area, sends the network the Registration area update information on the RACH of the new cell.

9.3.4.1 Transition from URA_PCH State to CELL_FACH State (URA_PCH)

Any activity causes the UE to be transferred to CELL_ FACH State. Uplink access is performed by RACH .

Note that the release of an RRC connection is not possible in the URA_PCH State. The UE will first move to CELL_FACH State to perform the release signalling.

9.3.4.2 Radio Resource Allocation Tasks (URA _PCH)

In URA_PCH State no resources have been granted for data transmission. For this purpose, a transition to CELL_FACH State has to be executed.

The UE may use Discontinuous Reception (DRX) in order to reduce power consumption. When DRX is used the UE needs only to receive at one paging occasion per DRX cycle. The UE may be instructed to use a specific DRX cycle length by the network. The UE shall determine its paging occasions in the same way as for Idle Mode, see [4].

9.3.4.3 RRC Connection mobility tasks (URA_PCH)

In URA_PCH State the location of a UE is known on UTRAN Registration area level.

In this state, the UE mobility is performed through URA reselection procedures, which may differ from the definitions in S2.04. The UE shall perform cell reselection and upon selecting a new UTRA cell belonging to an URA which does not match the URA used by the UE, the UE shall move to CELL_FACH state and initiates a URA update towards the network. After the URA update procedure has been performed, the UE shall change its state back to URA_PCH state if neither the UE nor the network has any more data to transmit.

Upon selecting a new cell belonging to another radio access system than UTRA, the UE shall enter idle mode and make an access to that system according to its specifications (FFS).

9.3.4.4 UE Measurements (URA_PCH)

The UE shall perform measurements and transmit measurement reports according to the measurement control information.

The UE shall use the measurement control information according to the system information when no UE dedicated measurement control information has been assigned.

9.3.4.5 Transfer and update of system information (URA_PCH)

The same mechanisms to transfer and update system information as for state CELL_PCH are applicable for UEs in URA_PCH state, see section **Error! Reference source not found.**.

9.4 Inter-system handover with PSTN/ISDN domain services

When using PSTN / ISDN domain services, UTRAN is using an Inter-Radio access system Handover Procedure and GSM is using a Handover procedure for the transition from UTRAN Connected Mode to GSM Connected Mode.

9.5 Inter-system handover with IP domain services

When using IP domain services, the UE initiates cell reselection from a GSM/GPRS cell to a UTRAN cell and then uses the RRC Connection Establishment procedure for the transition to UTRAN Connected mode.

When the RRC Connection is established from Idle Mode (GPRS Packet Idle Mode) the RRC CONNECTION REQUEST message contains an indication, that UTRAN needs to continue an already established GPRS UE context from the CN. This indication allows UTRAN to e.g. prioritise the RRC CONNECTION REQUEST from the UE.

In UTRAN connected mode UTRAN is using UE or network initiated cell reselection to change from a UTRAN cell to a GSM/GPRS cell. If the cell reselection was successful the UE enters Idle Mode (GPRS Packet Idle Mode). The UE sends a packet channel request from Idle Mode (GPRS Packet Idle mode) to establish a Temporary Block flow and enter GPRS Packet Transfer Mode. In the GPRS Packet Transfer Mode the UE sends a RA Update request message. The RA Update Request message sent from the UE contains an indication that GSM/GPRS need to continue an already established UTRAN UE context from the CN. This means that the RA Update request is always sent for the transition from UTRAN Connected Mode to GSM/GPRS regardless if the RA is changed or not.

NOTE: The reason for using RA update instead of a new message is to reduce the impact on the existing GSM/GPRS specification.

9.6 Inter-system handover with simultaneous IP and PSTN/ISDN domain services

NOTE: This is an initial assumption that needs to be seen by SMG2 and requiring checking by SMG2, when the work on this item has progressed.

9.6.1 Inter-system handover UTRAN to GSM / BSS

For a UE in CELL_DCH state using both PSTN / ISDN and IP Domain services the Inter-system handover procedure is based on measurement reports from the UE but initiated from UTRAN.

The UE performs the Inter-system handover from UTRAN Connected Mode to GSM Connected Mode first. When the UE has sent handover complete message to GSM / BSS the UE initiates a temporary block flow towards GPRS and sends a RA update request.

If the Inter-system handover from UTRAN Connected Mode to GSM Connected Mode was successful the handover is considered as successful regardless if the UE was able to establish a temporary block flow or not towards GPRS.

In case of Inter-system handover failure the UE has the possibility to go back to UTRAN Connected Mode and re-establish the connection in the state it originated from without attempting to establish a temporary block flow. If the UE has the option to try to establish a temporary block flow towards GSM / GPRS after Inter-system handover failure is FFS.

9.6.2 Inter-system handover GSM / BSS to UTRAN

For a UE in GSM Connected Mode using both PSTN / ISDN and IP domain services the Inter-system handover procedure is based on measurement reports from the UE but initiated from GSM / BSS.

The UE performs the Inter-system handover from GSM Connected Mode to UTRAN Connected Mode.

In UTRAN Connected Mode both services are established in parallel.

If the Inter-System handover from GSM Connected mode to UTRAN Connected Mode was successful the handover is considered as successful.

In case of Inter-system handover failure the UE has the possibility to go back to GSM Connected Mode and re-establish the connection in the state it originated from.

10 Message and information element functional definition and content

The function of each Radio Resource Control message together with message contents in the form of a list of information elements is defined in subclause 10.1.

Functional definitions of the information elements are then described in subclause 10.2.

Information elements are marked as either M- mandatory, O - Optional or C -conditional (see Table 10.1).

Table 10.1: meaning of abbreviations used in RRC messages and information elements

Abbreviation	Meaning
M	IEs marked as Mandatory (M) will always be included in the message.
O	IEs marked as Optional (O) may or may not be included in the message.
C	IEs marked as Conditional (C) will be included in a message only if the condition is satisfied otherwise the IE is not included.

10.1 Radio Resource Control messages

In connected mode, RB 0,1,2 and optionally 3 are available for usage by RRC messages using RLC-UM and RLC-AM on the DCCH. The UE and UTRAN shall select radio bearer for RRC messages using RLC-UM or RLC-AM on the DCCH, according to the following:

- RB 0 shall be used for all messages sent on the DCCH, when using RLC unacknowledged mode (RLC-UM).
- RB 1 shall be used for all messages sent on the DCCH, when using RLC acknowledged mode (RLC-AM), except for the DOWNLINK DIRECT TRANSFER and UPLINK DIRECT TRANSFER messages.
- RB 2 or 3 shall be used by the DOWNLINK DIRECT TRANSFER and UPLINK DIRECT TRANSFER messages sent on the DCCH in RLC acknowledged mode (RLC-AM), as specified in subclause 8.1.8.

For RRC messages on the DCCH using RLC transparent mode (RLC-TM), the transparent signalling DCCH shall be used.

10.1.1 ACTIVE SET UPDATE (FDD only)

NOTE: Functional description of this message to be included here

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN → UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Integrity protection mode info	O			
U-RNTI	O			New U-RNTI
Activation time	O			
Ciphering mode info	O			
CN information elements				
PLMN identity	O			(Note 2)
CN common GSM-MAP NAS system information	O		GSM-MAP NAS system information	
CN domain related information		0 to <MaxNoCNdomains>		CN related information to be provided for each CN domain
>CN domain identity	O			(Note 2)
>CN domain specific GSM-MAP NAS system info	O		GSM-MAP NAS system information	(Note 2)
Phy CH information elements				
Maximum allowed UL TX power	O			
Radio link addition information		0 to <MaxAddRLcount>		Radio link addition information required for each RL to add
>TPC combination index	M			
>Primary CPICH info	M			Note 1
>TFCI combining indicator	O			
>Downlink DPCH info	M			
>Secondary CCPCH Info	O			Note 2
>References to system information blocks		0 to <MaxSysInfoBlockFACHCount>		Note 2
>>Scheduling information				Note 2
Radio link removal information		0 to <MaxDelRLcount>		Radio link removal information required for each RL to remove
>Primary CPICH info	M			Note 1
SSDT indicator	O			
Gated Transmission Control Info	O			

Multi bound	Explanation
MaxAddRLcount	Maximum number of radio links which can be added
MaxDelRLcount	Maximum number of radio links which can be removed/deleted
MaxSysInfoFACHCount	Maximum number of references to system information blocks on the FACH

NOTE 1: If it is assumed that primary CPICH downlink scrambling code is always allocated with sufficient reuse distances, primary CPICH downlink scrambling code will be enough for designating the different radio links.

NOTE 2: The Secondary CCPCH info and the references to SIB are present when the UE needs to listen to system information on FACH.

10.1.2 ACTIVE SET UPDATE COMPLETE (FDD only)

NOTE: Functional description of this message to be included here

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			

10.1.3 ACTIVE SET UPDATE FAILURE (FDD only)

NOTE: Functional description of this message to be included here

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Failure cause	M			

10.1.4 CELL UPDATE

This message is used by the UE to initiate a cell update procedure.

RLC-SAP: TM

Logical channel: CCCH

Direction: UE→UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
U-RNTI	M			
Cell update cause	M			
AM_RLC error indication	O			Indicates AM_RLC unrecoverable error occurred on c-plane in the UE
Measurement information elements				
Measured results on RACH	O			

10.1.5 CELL UPDATE CONFIRM

This message confirms the cell update procedure and can be used to reallocate new RNTI information for the UE valid in the new cell.

RLC-SAP: UM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Integrity protection mode info	O			
New U-RNTI	O			
New C-RNTI	O			
RLC re-configuration indicator	C-AM_RLC_recon			
UTRAN DRX cycle length coefficient	O		DRX cycle length coefficient	
DRX Indicator	O			
Ciphering mode info	O			
UTRAN mobility information elements				
URA identifier	O			
CN information elements				
PLMN identity	O			(Note1,2)
CN common GSM-MAP NAS system information	O		GSM-MAP NAS system information	
CN domain related information		0 to <MaxNoCNdomains>		CN related information to be provided for each CN domain
>CN domain identity	O			(Note1,2)
>CN domain specific GSM-MAP NAS system info	O		GSM-MAP NAS system information	(Note1,2)
Physical CH information elements				
Uplink Radio Resources				
Maximum allowed ULTX power	O			
PRACH info (for RACH)	O			
CHOICE *mode*				
>FDD				
>>PRACH info (for FAUSCH)	O (FFS)			
Downlink Radio Resources				
CHOICE *mode*				
>FDD				
>>Primary CPICH info	O			
>TDD				
>>Primary CCPCH info	O			
Secondary CCPCH info	O			

Multi Bound	Explanation
MaxNoCN domains	Maximum number of CN domains

Condition	Explanation
AM_RLC_recon	This IE is only sent when the UTRAN requests AM RLC re-configuration

NOTE 1: It depends on the length of these information whether this message can be used to notify these information to UE.

NOTE 2: Necessity of PLMN is FFS and for CN domain identity and NAS system information, the confirmation in SA WG2 is needed.

10.1.6 DOWNLINK DIRECT TRANSFER

NOTE: Functional description of this message to be included here

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN -> UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
CN information elements				
CN Domain Identity	M			
NAS message	M			

10.1.7 DOWNLINK OUTER LOOP CONTROL

NOTE: Functional description of this message to be included here

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
PhyCH information elements				
Downlink Outer Loop Control	M			Indicates whether the UE is allowed or not to increase its SIR-target value above its current value

10.1.8 HANDOVER TO UTRAN COMMAND

NOTE: Functional description of this message to be included here

RLC-SAP: N/A

Logical channel: N/A

Direction: UTRAN → UE

Information Element	Presence	Multi	IE type and reference	Semantics description
UE information elements				
U-RNTI	M			
Activation time	O			
Ciphering algorithm	O		As defined in 10.2.3.6	Included in case of change of algorithm during handover
RB information elements				
Predefined radio configuration identity	M			
PhyCH information elements				
Frequency info_2	M			
>UARFCN uplink (Nu)	M		As defined in 10.2.6.14	
>Radio access mode	M		As defined in 10.2.6.14	
Maximum allowed UL TX power	M			
Uplink DPCH power control info_2	M			
>DPDCH power offset	M		As defined in 10.2.6.44	
>>Power Control Algorithm	M		Enumerated (algorithm 1 or algorithm 2)	Specifies algorithm to be used by UE to interpret TPC commands
>TPC step size	C-algorithm1		As defined in 10.2.6.44	
Uplink radio resource information				
>Uplink DPDCH info_2	M			
>>Scrambling code type	M		As defined in 10.2.6.43	
>>Scrambling code number	M		As defined in 10.2.6.43	
>>DPDCH channelisation code	M		As defined in 10.2.6.43	
Downlink radio resource information				
>Downlink DPCH power control info	M			
>Downlink information		1 to <Max Rlcount>		Send downlink information for each radio link to be set-up
>>Primary CCPCH info_2	M			
>>>Primary scrambling code	M		As defined in 10.2.6.29	
>>Downlink DPDCH info_2	M			
>>>Secondary scrambling code	O		As defined in 10.2.6.9	
>>>Spreading factor	M		As defined in 10.2.6.9	
>>>Code number	M		As defined in 10.2.6.9	

10.1.9 INITIAL DIRECT TRANSFER

NOTE: Functional description of this message to be included here

RLC-SAP: AM

Logical channel: DCCH

Direction: UE -> UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
CN information elements				
Service Descriptor	M			
Flow Identifier	M			Allocated by UE for a particular session
CN domain identity	M			
NAS message	M			
Measurement information elements				
Measured results on RACH	O			

10.1.10 INTER-SYSTEM HANDOVER COMMAND

This message is used for handover from UMTS to another system e.g. GSM. One or several messages from the other system can be included in the Inter-System message information element in this message. These messages are structured and coded according to that systems specification.

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Activation time	O			
Other information Elements				
Inter-System message	M			

10.1.11 INTER-SYSTEM HANDOVER FAILURE

This message is sent on the RRC connection used before the Inter-System Handover was executed. The message indicates that the UE has failed to seize the new channel in the other system.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Inter-System handover failure cause	O			FFS
Other Information Elements				
Inter-System message	O			

10.1.12 MEASUREMENT CONTROL

NOTE: Functional description of this message to be included here

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Measurement Information elements				
Measurement Identity Number	M			
Measurement Command	M			
Measurement Type	C Setup			
Measurement Reporting Mode	C NotRelease			
Additional measurement identity number		0 to <MaxAdditionalMeas>		
CHOICE Measurement				
>Intra-frequency				
>>Intra-frequency cell info		1 to <MaxIntraCells>		Measurement object
>>Intra-frequency measurement quantity	C event trigger			
>>Intra-frequency measurement reporting quantity	O			
>>Maximum number of reporting cells	O			
>>Measurement validity	O			
>>**CHOICE report criteria**				
>>>Intra-frequency measurement reporting criteria				
>>>Periodical reporting criteria				
>>>No reporting			NULL	
>Inter-frequency				
>>Inter-frequency cell info		1 to <MaxInterCells>		Measurement object
>>Inter-frequency measurement quantity	C event trigger			
>>Inter-frequency measurement reporting quantity	O			
>>Maximum number of reporting cells	O			
>>Measurement validity	O			
>>Inter-frequency set Update				
>>**CHOICE report criteria**				
>>>Intra-frequency measurement reporting criteria				
>>>Inter-frequency measurement reporting criteria				
>>>Periodical reporting criteria				

Information Element	Presence	Multi	IE type and reference	Semantics description
>>>No reporting			NULL	
>Inter-system				
>>Inter-system cell info		1 to <MaxInterSysCells>		Measurement object
>>Inter-system measurement quantity	C event trigger			
>>Inter-system measurement reporting quantity	O			
>>Maximum number of reporting cells	O			
>>**CHOICE report criteria**				
>>>Inter-system measurement reporting criteria				
>>>Periodical reporting criteria				
>>>No reporting			NULL	
>Traffic Volume				
>>Traffic volume measurement Object				
>>Traffic volume measurement quantity	C event trigger			
>>Traffic volume measurement reporting quantity	O			
>>Measurement validity	O			
>>**CHOICE report criteria**				
>>>Traffic volume measurement reporting criteria				
>>>Periodical reporting criteria				
>>>No reporting			NULL	
>Quality				
>>Quality measurement Object				
>>Quality measurement quantity	C event trigger			
>>Quality measurement reporting quantity	O			
>>**CHOICE report criteria**				
>>>Quality measurement reporting criteria				
>>>Periodical reporting criteria				
>>>No reporting			NULL	
>UE internal				
>>UE internal measurement quantity	C event trigger			
>>UE internal measurement reporting quantity	O			
>>**CHOICE report criteria**				
>>>UE internal measurement reporting criteria				
>>>Periodical reporting criteria				
>>>No reporting			NULL	

Condition	Explanation
Setup	This IE is only included if measurement command is Setup
NotRelease	This IE is only included if measurement command is Setup or Modify
Event trigger	This element is only included if the Reporting mode IE is set to event trigger reporting mode.

Multi Bound	Explanation
MaxIntraCells	Maximum number of Intra-frequency cells in a measurement control
MaxInterCells	Maximum number of Inter-frequency cells in a measurement control
MaxInterSysCells	Maximum number of Inter-System cells in a measurement control

CHOICE *Measurement*	**Condition under which the given *Measurement* is chosen**
Intra-frequency	if measurement type=Intra-frequency measurement
Inter-frequency	if measurement type=Inter-frequency measurement
Inter-system	if measurement type=Intra-system measurement
Traffic volume	if measurement type=traffic volume measurement
Quality	if measurement type=Quality measurement
UE internal	if measurement type=UE internal measurement
CHOICE *reporting criteria*	**Condition under which the given *reporting criteria* is chosen**
******* measurement reporting criteria	Chosen when event triggering is required
Periodical reporting criteria	Chosen when periodical reporting is required
No reporting	Chosen when this measurement only is used as additional measurement to another measurement

Multi Bound	Explanation
MaxAdditionalMeas	Maximum number of additional measurements for a given measurement identity

10.1.13 MEASUREMENT CONTROL FAILURE

NOTE: Functional description of this message to be included here

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Failure cause	M			

10.1.14 MEASUREMENT REPORT

NOTE: Functional description of this message to be included here

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Measurement Information Elements				
Measurement identity number	M			
Measured Results	C MR required			
Additional Measured results		0 to <MaxAdditionalMeas>		
>Measured Results	M			
CHOICE event result	C event trigger			
>Intra-frequency measurement event results				
>Inter-frequency measurement event results				
>Inter-system measurement event results				For IS-2000 results, include fields of the *Pilot Strength Measurement Message* from Section 2.7.2.3.2.5 of TIA/EIA/IS-2000.5
>Traffic volume measurement event results				
>Quality measurement event results				

Condition	Explanation
Event trigger	This element is only included in the message that is sent in event trigger reporting mode.
MR required	This information element is included by the sender only if indicated optionally by Reporting Quantity in Measurement Control

Multi Bound	Explanation
MaxAdditionalMeas	Maximum number of additional measurements for a given measurement identity

CHOICE *event result*	Condition under which the given *event result* is chosen
Intra-frequency measurement event results	
Inter-frequency measurement event results	
Inter-system measurement event results	
Traffic volume measurement event results	
Quality measurement event results	

10.1.15 PAGING TYPE 1

This message is used to send information on the paging channel. One or several UEs, in idle or connected mode, can be paged in one message, which also can contain other information.

RLC-SAP: TM

Logical channel: PCCH

Direction: UTRAN → UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE Information elements				
Paging record		0 to <Page Count>		
Other information elements				
BCCH modification info	O			

Multi Bound	Explanation
Page Count	Number of UEs paged in the Paging Type 1 message

10.1.16 PAGING TYPE 2

This message is used to page an UE in connected mode, when using the DCCH for CN originated paging.

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN → UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
CN Information elements				
CN domain identity	M			
Paging Record Type Identifier	M		Enumerated (IMSI (GSM-MAP), TMSI (GSM-MAP)/ P-TMSI, IMSI (DS-41), TMSI (DS-41))	
UE Information elements				
Paging cause	M			

10.1.17 PHYSICAL CHANNEL RECONFIGURATION

This message is used by UTRAN to assign, replace or release a set of physical channels used by a UE.

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UTRAN → UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE Information elements				
Integrity check info	O			
Integrity protection mode info	O			
Activation time	O			
New U-RNTI	O		U-RNTI	
New C-RNTI	C - RACH/FACH		C-RNTI	
UTRAN DRX cycle length coefficient	O		DRX cycle length coefficient	
DRX Indicator	O			
Re-establishment timer	O			
Ciphering mode info	O			
CN information elements	O			
PLMN identity	O			(Note1)
CN common GSM-MAP NAS system information	O		GSM-MAP NAS system information	
CN domain related information		0 to <MaxNoCNdomains>		CN related information to be provided for each CN domain
>CN domain identity	O			(Note1)
>CN domain specific GSM-MAP NAS system info	O		GSM-MAP NAS system information	(Note1)
Phy CH information elements				
Frequency info	O			
Uplink radio resources				
Maximum allowed UL TX power	O			
Uplink DPCH power control info	O			
CHOICE channel requirement	O			
>Uplink DPCH info				
>PRACH Info (for RACH)				
>CHOICE *mode*				
>>FDD				
>>>PRACH info (for FAUSCH)				
Downlink radio resources				
Downlink DPCH power control info	O			
Downlink information per radio link		0 to <MaxRLcount>		Send downlink information for each radio link
>CHOICE *mode*				
>>FDD				
>>>TPC combination index	C-ifDPCH			
>>>Primary CPICH info				
>>TDD				
>>>Primary CCPCH info	O			
>Downlink DPCH info	O			
>Secondary CCPCH info	O			For FACH/PCH
>References to system information blocks		0 to <MaxSysIn		Note 3

Information Element	Presence	Multi	IE type and reference	Semantics description
		foBlockFACHCount>		
>>Scheduling information				Note 3
CHOICE mode				
>TDD				
>>PICH info				
>>Uplink Timing Advance	O			
>>PUSCH power control info	O			
>FDD				
>>SSDT indicator	O			
>>CPCH SET Info	O			UL/DL radio resource for CPCH control (Note2)
>>Default DPCH Offset Value	O			
>>PDSCH with SHO DCH Info	O			
>>PDSCH code mapping	O			

Condition	Explanation
RACH/FACH	This information element is only included in the sent message when using RACH/FACH
IfDPCH	This IE is only sent if IE "Downlink DPCH info" is present

Multi Bound	Explanation
MaxSysInfoFACHCount	Maximum number of references to system information blocks on the FACH
MaxRLcount	Maximum number of radio links to be set up

CHOICE *channel requirement*	Condition under which the given *channel requirement* is chosen
Uplink DPCH info	
PRACH info (for FAUSCH)	
PRACH info (for RACH)	

NOTE 1: Necessity of PLMN is FFS and for CN domain identity and NAS system information, the confirmation in SA WG2 is needed.

NOTE 2: How to map UL and DL radio resource in the message is FFS.

NOTE 3: The Secondary CCPCH info and the references to SIB are present when the UE needs to listen to system information on FACH.

10.1.18 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	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			

10.1.19 PHYSICAL CHANNEL RECONFIGURATION FAILURE

NOTE: Functional description of this message to be included here

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Failure cause	M			

10.1.20 PHYSICAL SHARED CHANNEL ALLOCATION (TDD only)

This message is used by UTRAN to assign physical resources to USCH/DSCH transport channels in TDD, for temporary usage by the UE.

RLC-SAP: TM or AM

Logical channel: SHCCH

Direction: UTRAN → UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE Information elements				
Integrity check info	O			
C-RNTI	M			
PUSCH allocation pending	O			
TrCH information elements				
TFCS identity	O			
PhyCH information elements				
PUSCH power control info	O			
Uplink timing advance info	O			
PUSCH info	O			
PDSCH info	O			

10.1.21 PUSCH CAPACITY REQUEST (TDD only)

This message is used by the UE for request of PUSCH resources to the UTRAN.

RLC-SAP: TM

Logical channel: SHCCH

Direction: UE → UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
C-RNTI	M			
Measurement information elements				
Traffic amount information		1 to <RABCount>		Send traffic amount information for each Radio Access Bearer in the message
>RB ID	M			
>RLC buffer payload	M			
>Measured results on RACH	O			

Multi Bound	Explanation
RABCount	Number of traffic amount information in the message

10.1.22 RADIO BEARER RECONFIGURATION

This message is sent from UTRAN to reconfigure parameters related to a change of QoS. This procedure can also change the multiplexing of MAC, reconfigure transport channels and physical channels.

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UTRAN → UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE Information elements				
Integrity check info	O			
Integrity protection mode info	O			
Activation time	O			
New C-RNTI	C - RACH/FACH			
New U-RNTI	O		U-RNTI	
UTRAN DRX cycle length coefficient	O		DRX cycle length coefficient	
DRX Indicator	O			
Re-establishment timer	O			
Ciphering mode info	O			
CN information elements	O			
PLMN identity	O			(Note1)
CN common GSM-MAP NAS system information	O		GSM-MAP NAS system information	
CN domain related information		0 to <MaxNoCNdomains>		CN related information to be provided for each CN domain
>CN domain identity	O			(Note1)
CN domain specific GSM-MAP NAS system info	O		GSM-MAP NAS system information	(Note1)
RB information elements				
RB information to reconfigure		0 to <MaxRBcount>		
>RB identity	M			
>PDCP info	O			
>CHOICE *RLC info type*	O			Presence is FFS. For the first release this choice has only one possible value. This choice type may be extended in future releases.
>>RLC info	O			
>RB mapping info	O			
>RB suspend/resume	O			Not applicable to the signalling bearer.
TrCH Information Elements				
TFCS	O			for uplink TFCS
TFCS	O			for downlink TFCS
TFCS	O			For SCCPCH TFCS
CHOICE *mode*				
>TDD				
>>TFCS Identity	O			Uplink TFCS
>>TFCS Identity	O			Downlink TFCS
TFC subset	O			for TFC subset in uplink
Uplink transport channels				
Deleted TrCH information		0 to		

Information Element	Presence	Multi	IE type and reference	Semantics description
		<MaxDelTrCH>		
>Transport channel identity	M			
Added or Reconfigured TrCH information		0 to <MaxReconAddTrCH>		
>Transport channel identity	M			
>TFS	M			
CHOICE mode				
>FDD				
>>CPCH set ID	O			
>>DRAC information	C DRAC	1 to <MaxReconAddTrCH>		
>>Dynamic Control				
>>Transmission time validity				
>>Time duration before retry				
>>Silent period duration before release				
Downlink transport channels				
Deleted TrCH information		0 to <MaxDelTrCH>		
>Transport channel identity	M			
Added or Reconfigured TrCH information		0 to <MaxReconAddTrCH>		
>Transport channel identity	M			
>TFS	M			
PhyCH information elements				
Frequency info	O			
Uplink radio resources				
Maximum allowed UL TX power	O			
Uplink DPCH power control info	O			
CHOICE channel requirement	O			
>Uplink DPCH info				
>PRACH info (for RACH)				
>CHOICE *mode*				
>>FDD				
>>>PRACH info (for FAUSCH)				
Downlink radio resources				
Downlink DPCH power control info	O			
Downlink information per radio link		0 to <MaxRLcount>		Send downlink information for each radio link
>CHOICE *mode*				
>>FDD				
>>>TPC combination index	C-ifDPCH			
>>>Primary CPICH info				
>>TDD				
>>>Primary CCPCH info	O			
>Downlink DPCH info	O			
>Secondary CCPCH info	O			
>References to system information blocks		0 to <MaxSysInfoBlockFACHCount>		Note 3
>>Scheduling information				Note 3
CHOICE *mode*				
>FDD				

Information Element	Presence	Multi	IE type and reference	Semantics description
>>SSDT indicator	O			
>>CPCH SET Info	O			UL/DL radio resource for CPCH control (Note2)
>>Default DPCH Offset Value	O			
>>Downlink DPCH compressed mode info	O			
>>PDSCH with SHO DCH Info	O			
>>PDSCH code mapping	O			
>TDD				
>>Uplink Timing Advance	O			
>>PUSCH power control info	O			

Condition	Explanation
RACH/FACH	This information element is only sent when using RACH/FACH
DRAC	These information elements are only sent for transport channels which use the DRAC procedure
IfDPCH	This IE is only sent if IE "Downlink DPCH info" is present

Multi Bound	Explanation
MaxRLcount	Maximum number of radio links
MaxRBcount	Maximum number of RBs to be reconfigured
MaxDelTrCHcount	Maximum number of Transport CHannels to be removed
MaxReconAddTrCH	Maximum number of transport channels to add and reconfigure
MaxSysInfoFACHCount	Maximum number of references to system information blocks on the FACH

CHOICE *channel requirement*	**Condition under which the given *channel requirement* is chosen**
Uplink DPCH info	
PRACH info (for RACH)	
PRACH info (for FAUSCH)	

CHOICE *RLC info type*	**Condition under which the given *RLC info type* is chosen**
RLC info	Allowed when the value of IE "RB identity" is between 0 and 31, inclusive

NOTE 1: Necessity of PLMN is FFS and for CN domain identity and NAS system information, the confirmation in SA WG2 is needed.

NOTE 2: How to map UL and DL radio resource in the message is FFS.

NOTE 3: The Secondary CCPCH info and the references to SIB are present when the UE needs to listen to system information on FACH.

10.1.23 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	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			

10.1.24 RADIO BEARER RECONFIGURATION FAILURE

NOTE: Functional description of this message to be included here

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Failure cause	M			

10.1.25 RADIO BEARER RELEASE

NOTE: Functional description of this message to be included here

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UTRAN → UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE Information elements				
Integrity check info	O			
Integrity protection mode info	O			
Activation time	O			
New C-RNTI	C - RACH/FACH		C-RNTI	
New U-RNTI	O		U-RNTI	
UTRAN DRX cycle length coefficient	O		DRX cycle length coefficient	
DRX Indicator	O			
Re-establishment timer	O			
Ciphering mode info	O			
CN information elements	O			
PLMN identity	O			(Note1)
CN common GSM-MAP NAS system information	O		GSM-MAP NAS system information	
CN domain related information		0 to <MaxNoCNdomains>		CN related information to be provided for each CN domain
>CN domain identity	O			(Note1)
CN domain specific GSM-MAP NAS system info	O		GSM-MAP NAS system information	(Note1)
RB information elements				
RB information to release		1 to <MaxRBcount>		
>RB identity	M			
RB information to be affected		0 to <MaxOtherRBcount>		
>RB identity	M			
>RB mapping info	O			
TrCH Information Elements				
TFCS	O			for uplink TFCS
TFCS	O			for downlink TFCS
TFCS	O			For SCCPCH TFCS
CHOICE *mode*				
>TDD				
>>TFCS Identity	O			Uplink TFCS
>>TFCS Identity	O			Downlink TFCS
TFC subset	O			for TFC subset in uplink
Uplink transport channels				
Deleted TrCH information Transport channel identity		0 to <MaxDelTrCH>		
>Transport channel identity	M			
Added or Reconfigured TrCH information		0 to <MaxReconAddFFST		

Information Element	Presence	Multi	IE type and reference	Semantics description
		rCH>		
>Transport channel identity	M			
>TFS	M			
CHOICE mode				
>FDD				
>>CPCH set ID	O			
>>DRAC information	C DRAC	1 to <MaxReconAddFFSTrCH>		
>>Dynamic Control				
>>Transmission time validity				
>>Time duration before retry				
>>Silent period duration before release				
Downlink transport channels				
Deleted TrCH information		0 to <MaxDelTrCH>		
>Transport channel identity	M			
Added or Reconfigured TrCH information		0 to <MaxReconAddTrCH>		Editor: this limit should probably also be MaxReconAddFFSTrCH
>Transport channel identity	M			
>TFS	M			
PhyCH information elements				
Frequency info	O			
Uplink radio resources				
Maximum allowed UL TX power	O			
CHOICE channel requirement	O			
>Uplink DPCH info				
>PRACH info (for RACH)				
>CHOICE *mode*				
>>FDD				
>>>PRACH info (for FAUSCH)				
Downlink radio resources				
Downlink information per radio link		0 to <MaxRLcount>		Send downlink information for each radio link to be set-up
>CHOICE *mode*				
>>FDD				
>>>TPC combination index	C-ifDPCH			
>>>Primary CPICH info				
>>TDD				
>>>Primary CCPCH info	O			
>Downlink DPCH info	O			
>Secondary CCPCH info	O			
>References to system information blocks		0 to <MaxSysInfoBlockFACHCount>		Note 3
>Scheduling information				Note 3
Choice *mode*				
>FDD				
>>SSDT indicator				
>>CPCH SET Info	O			UL/DL radio resource for CPCH control (Note2)
>>Gated Transmission Control info	O, FFS			Note 3
>>PDSCH with SHO DCH Info	O			
>>PDSCH code mapping	O			
>TDD				
>>Uplink Timing Advance	O			

Condition	Explanation
RACH/FACH	This information element is only sent when using RACH/FACH
DRAC	These information elements are only sent for transport channels which use the DRAC procedure
IfDPCH	This IE is only sent if IE "Downlink DPCH info" is present

Multi Bound	Explanation
MaxRLcount	Maximum number of radio links
MaxDelRBcount	Maximum number of RBs to be released
MaxOtherRBcount	Maximum number of Other RBs (i.e., RBs not being released) affected by the procedure
MaxDelTrCHcount	Maximum number of Transport CHannels to be removed
MaxSysInfoFACHCount	Maximum number of references to system information blocks on the FACH
MaxReconAddFFSTrCH	Maximum number of transport channels to add and reconfigure

CHOICE *channel requirement*	**Condition under which the given *channel requirement* is chosen**
Uplink DPCH info	
PRACH Info (for RACH)	
PRACH info (for FAUSCH)	

NOTE 1: Necessity of PLMN is FFS and for CN domain identity and NAS system information, the confirmation in SA WG2 is needed.

NOTE 2: How to map UL and DL radio resource in the message is FFS.

NOTE 3: The Secondary CCPCH info and the references to SIB are present when the UE needs to listen to system information on FACH.

10.1.26 RADIO BEARER RELEASE COMPLETE

NOTE: Functional description of this message to be included here

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			

10.1.27 RADIO BEARER RELEASE FAILURE

NOTE: Functional description of this message to be included here

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Failure cause	M			

10.1.28 RADIO BEARER SETUP

NOTE: Functional description of this message to be included here

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UTRAN → UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Integrity protection mode info	O			
CN information elements				
NAS binding info	M			
CN domain identity				
UE Information elements				
Activation time	O			
New C-RNTI	C – RACH/FACH		C-RNTI	
New U-RNTI	O		U-RNTI	
UTRAN DRX cycle length coefficient	O		DRX cycle length coefficient	
DRX Indicator	O			
Re-establishment timer	O			
Ciphering mode info	O			
CN information elements	O			
PLMN identity	O			(Note1)
CN common GSM-MAP NAS system information	O		GSM-MAP NAS system information	
CN domain related information		0 to <MaxNoCNdomains>		CN related information to be provided for each CN domain
>CN domain identity	O			(Note1)
>CN domain specific GSM-MAP NAS system info	O		GSM-MAP NAS system information	(Note1)
RB information elements				
RB information to setup		1 to <MaxRBcount>		
>RB identity	M			
>PDCP info	O			
>CHOICE *RLC info type*	M			For the first release this choice has only one possible value. This choice type may be extended in future releases.
>>RLC info				
>RB mapping info	M			
RB information to be affected		0 to <MaxOtherRBcount>		
>RB identity	M			
>RB mapping info	M			
TrCH Information Elements				
TFCS	O			for uplink TFCS
TFCS	O			for downlink TFCS
TFCS	O			For SCCPCH TFCS
CHOICE *mode*				
>TDD				

Information Element	Presence	Multi	IE type and reference	Semantics description
>>TFCS Identity	O			Uplink TFCS
>>TFCS Identity	O			Downlink TFCS
TFC subset	O			for TFC subset in uplink
Uplink transport channels				
Deleted TrCH information		0 to <MaxDelTrCH>		
>Transport channel identity	M			
Added or Reconfigured TrCH information		0 to <MaxReconAddTrCH>		
>Transport channel identity	M			
>TFS	M			
CHOICE mode				
>FDD				
>>CPCH set ID	O			
>>DRAC information	C DRAC	1 to <MaxReconAddTrCH>		
>>>Dynamic Control				
>>>Transmission time validity				
>>>Time duration before retry				
>>>Silent period duration before release				
Downlink transport channels				
Deleted TrCH informationTransport channel identity		0 to <MaxDelTrCH>		
>Transport channel identity	M			
Added or Reconfigured TrCH information		0 to <MaxReconAddTrCH>		
>Transport channel identity	M			
>TFS	M			
PhyCH information elements				
Frequency info	O			
Uplink radio resources				
Maximum allowed UL TX power	O			
Uplink DPCH power control info	O			
CHOICE channel requirement	O			
>Uplink DPCH info				
>PRACH Info (for RACH)				
>CHOICE *mode*				
>>FDD				
>>>PRACH info (for FAUSCH)				
Downlink radio resources				
Downlink DPCH power control info	O			
Downlink information per radio link		0 to <MaxRLcount>		Send downlink information for each radio link
>CHOICE *mode*				
>>FDD				
>>>TPC combination index	ifDPCH			
>>>Primary CPICH info				
>>TDD				
>>>Primary CCPCH info	O			
>Downlink DPCH info	O			
>Secondary CCPCH info	O			
>References to system		0 to		Note 3

Information Element	Presence	Multi	IE type and reference	Semantics description
information blocks		<MaxSysInfoBlockFACHCount>		
>>Scheduling information				Note 3
CHOICE *mode*				
>FDD				
>>SSDT indicator	O			
>>CPCH SET Info	O			
>>Gated Transmission Control info	O			
>>Default DPCH Offset Value	O			
>>Downlink DPCH compressed mode info	O			
>>PDSCH with SHO DCH Info	O			
>>PDSCH code mapping	O			
>TDD				
>>Uplink Timing Advance	O			
>>PUSCH power control info	O			

Condition	Explanation
RACH/FACH	This information element is only sent when using RACH/FACH
IfDPCH	This IE is only sent if "Downlink DPCH info" is present

Multi Bound	Explanation
MaxRLcount	Maximum number of radio links
MaxDelTrCHcount	Maximum number of Transport CHannels to be removed
MaxReconAddcount	Maximum number of Transport CHannels reconfigured or added
MaxRBcount	Maximum number of RBs that could be setup with this message
MaxOtherRBcount	Maximum number of Other RBs (i.e., RBs not being released) affected by the procedure
MaxSysInfoFACHCount	Maximum number of references to system information blocks on the FACH

CHOICE *channel requirement*	**Condition under which the given *channel requirement* is chosen**
Uplink DPCH info	
PRACH info (for FAUSCH)	
PRACH info (for RACH)	

CHOICE *RLC info type*	**Condition under which the given *RLC info type* is chosen**
RLC info	Allowed when the value of IE "RB identity" is between 0 and 31, inclusive

NOTE 1: Necessity of PLMN is FFS and for CN domain identity and NAS system information, the confirmation in SA WG2 is needed.

NOTE 2: How to map UL and DL radio resource in the message is FFS.

NOTE 3: The Secondary CCPCH info and the references to SIB are present when the UE needs to listen to system information on FACH.

10.1.29 RADIO BEARER SETUP COMPLETE

NOTE: Functional description of this message to be included here

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			

10.1.30 RADIO BEARER SETUP FAILURE

NOTE: Functional description of this message to be included here

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Failure cause	M			

10.1.31 RNTI REALLOCATION

NOTE: Functional description of this message to be included here

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Integrity protection mode info	O			
New U-RNTI	O			
New C-RNTI	O			
Ciphering mode info	O			
CN information elements				
PLMN identity	O			(Note1,2)
CN common GSM-MAP NAS system information	O		GSM-MAP NAS system information	
CN domain related information		0 to <MaxNoCNdomains>		CN related information to be provided for each CN domain
>CN domain identity	O			(Note1,2)
>CN domain specific GSM-MAP NAS system info	O		GSM-MAP NAS system information	(Note1,2)

Multi Bound	Explanation
MaxNoCN domains	Maximum number of CN domains

NOTE 1: It depends on the length of these information whether this message can be used to notify these information to UE.

NOTE 2: Necessity of PLMN is FFS and for CN domain identity and NAS system information, the confirmation in SA WG2 is needed.

10.1.32 RNTI REALLOCATION COMPLETE

This message is used to confirm the new RNTI information for the UE.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			

10.1.33 RRC CONNECTION RE-ESTABLISHMENT

NOTE: Functional description of this message to be included here

RLC-SAP: UM

Logical channel: CCCH, DCCH

Direction: UTRAN → UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
New U-RNTI	O			
New C-RNTI	O			
Activation time	O			
Re-establishment timer	O			
CN information elements				
PLMN identity	O			(Note1)
CN common GSM-MAP NAS system information	O		GSM-MAP NAS system information	
CN domain related information		0 to <MaxNoCNdomains>		CN related information to be provided for each CN domain
>CN domain identity	O		GSM-MAP NAS system information	(Note1)
>CN domain specific GSM-MAP NAS system info	O			(Note1)
NAS binding info	C-RBsetup			
CN domain identity	C-RBsetup			
RB information to setup		0 to <MaxSetupRBcount>		
>RB identity	M			
>CHOICE *RLC info type*	M			For the first release this choice has only one possible value. This choice type may be extended in future releases.
>>RLC info				
>RB mapping info	M			
RB information to release		0 to <MaxRetRBcount>		
>RB identity	M			
RB information to reconfigure		0 to <MaxReconRBcount>		
>RB identity	M			
>CHOICE *RLC info type*	O			
>>RLC info				FFS
>>Signalling radio bearer type				
>RB mapping info	O			
>RB suspend/resume	O			Not applicable to the signalling bearer.
Transport Channel Information Elements				
TFCS	O			For uplink TFCS
TFCS	O			For downlink TFCS
TFCS	O			For SCCPCH TFCS
CHOICE *mode*				
>TDD				
>>TFCS Identity	O			Uplink TFCS

Information Element	Presence	Multi	IE type and reference	Semantics description
>>TFCS Identity	O			Downlink TFCS
TFC subset	O			For TFC subset in uplink
Uplink transport channels				
Deleted TrCH information		0 to <MaxDelTrCH>		
>Transport channel identity	M			
Added or Reconfigured TrCH information		0 to <MaxReconAddTrCH>		
>Transport channel identity	M			
>TFS	M			
CHOICE mode				
>FDD				
>>CPCH set ID	O			
>>DRAC information	C DRAC	1 to <MaxReconAddTrCH>		
>>>Dynamic Control				
>>>Transmission time validity				
>>>Time duration before retry				
>>>Silent period duration before release				
Downlink transport channels				
Transport channel identity		0 to <MaxDelTrCH>		
>Transport channel identity	M			
Reconfigured TrCH information		0 to <MaxReconAddTrCH>		
>>Transport channel identity	M			
>>TFS	M			
PhyCH information elements				
Frequency info	O			
Uplink radio resources				
Maximum allowed UL TX power	O			
Uplink DPCH power control info	O			
CHOICE channel requirement	O			
>Uplink DPCH info				
>PRACH info (for RACH)				
Downlink radio resources				
Downlink DPCH power control info	O			
Downlink information per radio link		0 to <MaxRlcount>		Send downlink information for each radio link to be set-up
>CHOICE *mode*				
>>FDD				
>>>TPC combination index	C-ifDPCH			
>>>Primary CPICH info				
>>TDD				
>>>Primary CCPCH info	O			
>Downlink DPCH info	O			
>Secondary CCPCH info	O			
CHOICE *mode*				
>FDD				
>>SSDT indicator	O			
>>CPCH SET info	O			UL/DL radio resource for CPCH control (Note3)
>>Default DPCH Offset Value	O			

Information Element	Presence	Multi	IE type and reference	Semantics description
>>Downlink DPCH compressed mode info	O			
>TDD				
>>Uplink Timing Advance	O			
>>PUSCH power control info	O			

NOTE 1: Necessity of PLMN is FFS and for CN domain identity and NAS system information, the confirmation in SA WG2 is needed.

NOTE 3: How to map UL and DL radio resource in the message is FFS.

Condition	Explanation
DRAC	These information elements are only sent for transport channels which use the DRAC procedure
RBsetup	This information element is only sent when RB information to setup exists
IfDPCH	This IE is only sent if IE "Downlink DPCH info" is present

CHOICE channel requirement	Condition under which the given channel requirement is chosen
Uplink DPCH info	
PRACH info (for RACH)	

CHOICE RLC info type	Condition under which the given RLC info type is chosen
RLC info	Allowed when the value of IE "RB identity" is between 0 and 31, inclusive
Signalling radio bearer type	

Multi Bound	Explanation
MaxNoCN domains	Maximum number of CN domains
MaxSetupRBcount	Maximum number of RBs to be setup
MaxRelRBcount	Maximum number of RBs to be released
MaxReconRBcount	Maximum number of RBs to be reconfigured
MaxDelTrCHcount	Maximum number of Transport CHannels to be removed
MaxReconAddTrCH	Maximum number of transport channels to add and reconfigure
MaxRLcount	Maximum number of radio links

10.1.34 RRC CONNECTION RE-ESTABLISHMENT COMPLETE

NOTE: Functional description of this message to be included here

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			

10.1.35 RRC CONNECTION RE-ESTABLISHMENT REQUEST

NOTE: Functional description of this message to be included here

RLC-SAP: TM

Logical channel: CCCH

Direction: UE → UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
U-RNTI	M			
Measurement information elements				
Measured results on RACH	M			

10.1.36 RRC CONNECTION REJECT

The network transmits this message when the requested RRC connection cannot be accepted.

RLC-SAP: UM

Logical channel: CCCH

Direction: UTRAN → UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Initial UE identity	M			
Rejection cause	M			
Wait time	O			

10.1.37 RRC CONNECTION RELEASE

NOTE: Functional description of this message to be included here

RLC-SAP: UM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Release cause	M			
Number of RRC Message Transmissions	M			

10.1.38 RRC CONNECTION RELEASE COMPLETE

NOTE: Functional description of this message to be included here

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			

10.1.39 RRC CONNECTION REQUEST

RRC Connection Request is the first message transmitted by the UE when setting up an RRC Connection to the network.

RLC-SAP: TM

Logical channel: CCCH

Direction: UE → UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Initial UE identity	M			
Establishment cause	M			
Initial UE capability	M			
Measurement information elements				
Measured results on RACH	M			

10.1.40 RRC CONNECTION SETUP

This message is used by the network to accept the establishment of an RRC connection for an UE, including assignment of signalling link information, transport channel information and optionally physical channel information.

RLC-SAP: UM

Logical channel: CCCH

Direction: UTRAN → UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Initial UE identity	M			
U-RNTI	M			
C-RNTI	O			Only if assigned to a common transport channel
Activation time	O			
UTRAN DRX cycle length coefficient	O		DRX cycle length coefficient	
DRX Indicator	O			
Re-establishment timer	O			
Capability update requirement	M			
RB information elements				
Signalling radio bearers		3 to 4		Information for signalling radio bearers, in the order RB 0 up to 3.
>CHOICE *RLC info type*	M			For the first release this choice has only one possible value. This choice type may be extended in future releases.
>>RLC info				
>RB mapping info	M			
TrCH information elements				
TFCS	O			For Uplink TFCS
TFCS	O			For Downlink TFCS
TFCS	O			For SCCPCH TFCS
CHOICE *mode*				
>TDD				
>>TFCS Identity	O			Uplink TFCS
>>>TFCS Identity	O			Downlink TFCS
TFC subset	O			For TFC subset in uplink
CPCH set ID	O			
Uplink transport channels				
Uplink transport channel information		1 to <MaxULTrCHCount>		
>Transport channel identity	M			
>TFS	M			
Downlink transport channels				
Downlink transport channel information		1 to <MaxDLTrCHCount>		
>Transport channel identity	M			
>TFS	M			
>Transparent mode signalling info	C if TM_DCH	0 or 1		
PhyCH information elements				
Frequency info	O			
Uplink radio resources				
Maximum allowed UL TX power	O			
Uplink DPCH power control info	O			
CHOICE channel	O			

Information Element	Presence	Multi	IE type and reference	Semantics description
requirement				
>Uplink DPCH info				
>PRACH info (for RACH)				
Downlink radio resources				
Downlink DPCH power control info	O			
Downlink information per radio link		0 to <Max RLcount>		Send downlink information for each radio link to be set-up
>CHOICE *mode*				
>>FDD				
>>>TPC combination index	C-ifDPCH			
>>>Primary CPICH info				
>>TDD				
>>>Primary CCPCH info	O			
>Downlink DPCH info	O			
>Secondary CCPCH info	O			
CHOICE *mode*				
>FDD				
>>SSDT indicator	O			
>>CPCH SET Info	O			UL/DL radio resource for CPCH control (Note 1)
>>Gated Transmission Control info	O, FFS			Note 2
>>Default DPCH Offset Value	O			
>>Downlink DPCH compressed mode info	O			
>TDD				
>>Uplink Timing Advance	O			
>>PUSCH power control info	O			

Condition	Explanation
IfTM_DCH	This information is only sent if a DCH carrying transparent mode DCCH information is used, e.g. to send transport format combination commands.
IfDPCH	This IE is only sent if IE "Downlink DPCH info" is present

Multi Bound	Explanation
MaxULTrCHCoun	Maximum number of new uplink transport channels
MaxDLTrCHCount	Maximum number of new downlink transport channels
MaxRLcoun	Maximum number of radio links to be set up

CHOICE channel requirement	Condition under which the given channel requirement is chosen
Uplink DPCH info	
PRACH info (for RACH)	

CHOICE RLC info type	Condition under which the given RLC info type is chosen
RLC info	Allowed when the value of IE "RB identity" is between 0 and 31, inclusive.

NOTE 1: How to map UL and DL radio resource in the message is FFS.

NOTE 2: The activation time should be present when the Gated Transmission control info is present in this message.

10.1.41 RRC CONNECTION SETUP COMPLETE

This message confirms the establishment of the RRC Connection by the UE.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Integrity protection hyper frame number	M			
Ciphering hyperframe number	M			
UE radio capability	O			
UE system specific capability	O		Inter-system message	

10.1.42 RRC STATUS

This message is sent to indicate a protocol error.

RLC-SAP: AM

Logical channel: DCCH

Direction: both

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			

10.1.43 SCCH INFORMATION

RLC-SAP: TM

Logical channel: SCCH

Direction: UTRAN -> UE

Information Element	Presence	Multi	IE type and reference	Semantics description
SCCH info	M		Bit String(3)	Reserved

10.1.44 SECURITY MODE COMMAND

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN to UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
CN Information elements				
CN domain identity	M			Indicates which cipher and integrity protection keys are is applicable
UE information elements				
Ciphering capability	M			
Ciphering mode info	O			Only present if ciphering shall be controlled

Multi Bound	Explanation
MaxReconRBs	For each radio bearer that is reconfigured

10.1.45 SECURITY MODE COMPLETE

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
RB Information elements				
Radio bearer uplink ciphering activation time info	O		Radio bearer activation time info	

Multi Bound	Explanation
MaxReconRBs	For each radio bearer that is reconfigured

10.1.46 SIGNALLING CONNECTION RELEASE

NOTE: Functional description of this message to be included here

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
CN information elements				
Signalling Flow related information		1 to <maxFlowID>		Flow identifier to be provided for each signalling flow to be released.
>Flow Identifier	M			

Multi Bound	Explanation
MaxFlowId	Maximum number of flow identifiers

10.1.47 SYSTEM INFORMATION

Information Element	Presence	Multi	IE type and reference	Semantics description
Message type	O			The message type is mandatory on the FACH, and absent on the BCH
CHOICE *mode*				
>FDD				
>>SFNprime	O		Enumerated (0,2..4094)	The IE is mandatory on the BCH, and absent on the FACH SFN=SFNprime (for first 10ms frame of 20ms TTI), SFN=SFNprime+1 (for last 10ms frame of 20ms TTI)
CHOICE Segment combination	M			
>Combination 1				
>>First Segment			First Segment	
>Combination 2				
>>Subsequent Segment			Subsequent Segment	
>Combination 3				
>>Last segment				
>Combination 4				
>>Last Segment			Last Segment	
>>Complete		1..indefinite	Complete	
>Combination 5				
>>Complete		1..indefinite	Complete	
SI Padding	C filling			

Condition	Explanation
filling	The padding is constrained to be such that the message fills the transport block.

10.1.47.1 First Segment

This segment type is used to transfer the first segment of a segmented system information block.

Information Element	Presence	Multi	IE type and reference	Semantics description
Other information elements				
SIB type	M			
SEG_COUNT	M			
SIB data	M			

10.1.47.2 Subsequent Segment

This segment type is used to transfer a subsequent segment of a segmented system information block.

Information Element	Presence	Multi	IE type and reference	Semantics description
Other information elements				
SIB type	M			
Segment index	M			
SIB data	M			

10.1.47.3 Last Segment

This segment type is used to transfer the last segment of a segmented system information block.

Information Element	Presence	Multi	IE type and reference	Semantics description
Other information elements				
SIB type	M			
Segment index	M			
SIB data	M			

10.1.47.4 Complete SIB

This segment type is used to transfer a non-segmented system information block.

Information Element	Presence	Multi	IE type and reference	Semantics description
Other information elements				
SIB type	M			
SIB content	M			

10.1.47.5 System Information Blocks

10.1.47.5.1 SIB Content

SIB Segments are the result of the segmentation of a 'SIB Content' IE. The SIB content IE is developed hereafter:

Information Element	Presence	Multi	IE type and reference	Semantics description
CHOICE SIB type	M			
>Master information block				
>System information block type 1				
>System information block type 2				
>System information block type 3				
>System information block type 4				
>System information block type 5				
>System information block type 6				
>System information block type 7				
>System information block type 8				
>System information block type 9				
>System information block type 10				
>System information block type 11				
>System information block type 12				
>System information block type 13				
>System information block type 13.1				
>System information block type 13.2				
>System information block type 13.3				
>System information block type 13.4				
>System information block type 14				

Condition	Explanation
SIB Type	The common value of the 'SIB type' field in the segment(s).

10.1.47.5.2 Master Information Block

Information Element	Presence	Multi	IE type and reference	Semantics description
Other information elements				
MIB Value tag	M			
CHOICE mode				
>TDD				
>>SFNprime	M		Integer (0,2..4094)	SFN=SFNprime (for first 10ms frame of 20ms TTI), SFN=SFNprime+1 (for last 10ms frame of 20ms TTI)
Network capability extension indication				A value of "False" indicates that the Initial UE capability is interpreted according to "Release 99 (first release)". If the value is set to "True", a new definition given in a future release is added to this information element.
Capability Extension Info	C-Ind			Note 1
References to other system information blocks		1 .. <maxSysInfoBlockcount>		
>Scheduling information	M			
CN information elements				
CN Type	M		Enumerated (GSM-MAP, ANSI-41, GSM-MAP AND ANSI-41)	
PLMN Identity	C-GSM			
ANSI-41 Information elements	C-ANSI			
>P_REV	M			
>MIN_P_REV	M			
>SID	M			
>NID	M			

NOTE 1: This information element may be defined in later releases.

Condition	Explanation
GSM	This information element shall be present in case (CN Type == "GSM-MAP") or (CN Type == "GSM-MAP AND ANSI-41")
ANSI	This information element shall be present in case (CN Type == "ANSI-41") or (CN Type == "GSM-MAP AND ANSI-41")

Multi Bound	Explanation
MaxSysInfoBlockcount	Maximum number of references to other system information blocks.

10.1.47.5.3 System Information Block type 1

The system information block type 1 contains NAS system information as well as UE timers and counters to be used in idle mode.

Information Element	Presence	Multi	IE type and reference	Semantics description
CN information elements				
CN common GSM-MAP NAS system information	O		GSM-MAP NAS system information	
CN domain related information		1 to <maxCNdomains>		Send CN information for each CN domain.
>CN domain identity	M			
>CN domain specific GSM-MAP NAS system information	M		GSM-MAP NAS system information	
>CN domain specific DRX cycle length coefficient	M		DRX cycle length coefficient	
UE information				
UE Timers and counters in idle mode	M			

Multi Bound	Explanation
MaxCNdomains	Maximum number of CN domains

10.1.47.5.4 System Information Block type 2

The system information block type 2 contains the URA identity and information for periodic cell and URA update. It also includes the UE timers and counters to be used in connected mode.

Information Element	Presence	Multi	IE type and reference	Semantics description
UTRAN mobility information elements				
URA identity		1 ..<maxURAcount>		
Information for periodic cell and URA update	M			
UE information				
UE Timers and counters in connected mode	M			
UTRAN DRX cycle length	M			
CHOICE *mode*				
>FDD				
>>TX Diversity Timing Mode	O		Enumerated(Normal Cell Mode,Macro Cell Mode)	*Note: The presence of this IE is mandatory if closed loop TX Diversity is used.*

Multi Bound	Explanation
MaxURAcount	Maximum number of URAs in a cell

10.1.47.5.5 System Information Block type 3

The system information block type 3 contains parameters for cell selection and re-selection. The block may also contain scheduling information for other system information blocks.

Information Element	Presence	Multi	IE type and reference	Semantics description
References to other system information blocks		0 .. <maxSysInfoBlockcount>		
>Scheduling information	M			
UTRAN mobility information elements				
Cell identity	M			The necessity and usage of cell identity is FFS.
Cell selection and re-selection info	M			
Cell Access Restriction	M			

Multi Bound	Explanation
MaxSysInfoBlockcount	Maximum number of references to other system information blocks.

10.1.47.5.6 System Information Block type 4

The system information block type 4 contains parameters for cell selection and re-selection to be used in connected mode. The block may also contain scheduling information for other system information blocks.

Information Element	Presence	Multi	IE type and reference	Semantics description
References to other system information blocks		0 .. <maxSysInfoBlockcount>		
>Scheduling information	M			
UTRAN mobility information elements				
Cell identity	M			The necessity and usage of cell identity is FFS.
Cell selection and re-selection info	M			
Cell Access Restriction	M			

Multi Bound	Explanation
MaxSysInfoBlockcount	Maximum number of references to other system information blocks.

10.1.47.5.7 System Information Block type 5

The system information block type 5 contains parameters for the configuration of the common physical channels in the cell. The block may also contain scheduling information for other system information blocks.

Information Element	Presence	Multi	IE type and reference	Semantics description
References to other system information blocks		0 .. <maxSysInfoBlockcount>		
>Scheduling information	M			
PhyCH information elements				
Frequency info	O			
Maximum allowed UL TX power	O			
CHOICE *mode*				
>TDD				
>>Midamble configuration	O			The maximum number of midamble shifts for burst type 1: 4, 8 or 16. Default value is 8. The maximum number of midamble shifts for burst type 2: 3 or 6. Default value is 3.
>FDD				
>>Secondary CPICH info	O			Note 2
Primary CCPCH info	O			Note 1
PRACH information		1 .. <maxPRACHcount>		
>PRACH info	M			
>TFS	M			
>CHOICE *mode*				
>>FDD				
>>>PRACH partitioning	M			
>>>Primary CPICH DL TX power	M			
>>>Constant value	M			
>>>PRACH power offset	M			
>>>AICH info	M			
>>TDD				
>>>ASC info	O			
Secondary CCPCH information		1 .. <maxSCCPCHcount>		
>Secondary CCPCH info	M			
>TFCS	M			For FACHs and PCH
>FACH/PCH information		1 .. <maxFACHcount>		
>>TFS				For each FACHs and PCH Note 3
>>CTCH indicator	M	Boolean		The value "TRUE" indicates that a CTCH is mapped on the FACH, and "FALSE" that no CTCH is mapped.
>PICH info	C-Pich			
CBS DRX Level 1 information	C-CTCH			

NOTE 1: DL scrambling code of the Primary CCPCH is the same as the one for Primary CPICH(FDD only).

NOTE 2: This parameter is needed in case of using adaptive array antenna.

NOTE 3: TFS for PCH shall be listed at the top of FACH/PCH information if PCH exists.(FACHcount=1)

Condition	Explanation
CTCH	Present only when the IE "CTCH indicator" is equal to TRUE for at least one FACH.
Pich	PICH info is present only when PCH is multiplexed on Secondary CCPCH

Multi Bound	Explanation
MaxPRACHcount	Maximum number of PRACHs
MaxSCCPCHcount	Maximum number of secondary CCPCHs
MaxFACHcount	Maximum number of FACHs mapped onto secondary CCPCHs
MaxPCHcount	Maximum number of PCHs mapped onto secondary CCPCHs
MaxSysInfoBlockcount	Maximum number of references to other system information blocks.

10.1.47.5.8 System Information Block type 6

The system information block type 6 contains parameters for the configuration of the common physical channels to be used in connected mode. The block may also contain scheduling information for other system information blocks.

Information Element	Presence	Multi	IE type and reference	Semantics description
References to other system information blocks		0 .. <maxSysInfoBlockcount>		
>Scheduling information	M			
PhyCH information elements				
Frequency info	O			
Maximum allowed UL TX power	O			
Primary CCPCH info	O			Note 1
CHOICE *mode*				
>FDD				
>>PICH Power offset	M			
>>AICH Power offset	M			
>>Secondary CPICH info	O			Note 2
PRACH information		0 .. <maxPRACHcount>		
>PRACH info	M			
>TFS	M			
>CHOICE *mode*				
>>FDD				
>>>PRACH partitioning	M			
>>>Primary CPICH DL TX power	M			
>>>Constant value	M			
>>>PRACH power offset	M			
>>>AICH info	M			
Secondary CCPCH information		0 .. <maxSCCPCHcount>		
>Secondary CCPCH info	M			
>TFCS	M			For FACHs and PCH
>FACH/PCH information		1 .. <maxFACHcount>		
>>TFS				For each FACHs and PCH Note 3
>>CTCH indicator	M	Boolean		The value "TRUE" indicates that a CTCH is mapped on the FACH, and "FALSE" that no CTCH is mapped.
>PICH info	C-Pich			
CBS DRX Level 1 information	C-CTCH			

NOTE 1: DL scrambling code of the Primary CCPCH is the same as the one for Primary CPICH (FDD only).

NOTE 2: This parameter is needed in case of using adaptive array antenna.

NOTE 3: TFS for PCH shall be listed at the top of FACH/PCH information if PCH exists.(FACHcount=1)

Condition	Explanation
CTCH	Present only when the IE "CTCH indicator" is equal to TRUE for at least one FACH.
Pich	PICH info is present only when PCH is multiplexed on Secondary CCPCH

Multi Bound	Explanation
MaxPRACHcount	Maximum number of PRACHs
MaxSCCPCHcount	Maximum number of secondary CCPCHs
MaxFACHcount	Maximum number of FACHs mapped onto secondary CCPCHs
MaxPCHcount	Maximum number of PCHs mapped onto secondary CCPCHs
MaxSysInfoBlockcount	Maximum number of references to other system information blocks.

10.1.47.5.9 System Information Block type 7

The system information block type 7 contains the fast changing parameters UL interference and Dynamic persistence level

Information Element	Presence	Multi	IE type and reference	Semantics description
UL interference	M			
PhyCH information elements				
PRACHs listed in system information block type 5		1 .. <maxPRACHcount>		The order of the PRACHs is the same as in system information block type 5.
>Dynamic persistence level	M			
PRACHs listed in system information block type 6		0 .. <maxPRACHcount>		The order of the PRACHs is the same as in system information block type 6.
>Dynamic persistence level	M			

Multi Bound	Explanation
MaxPRACHcount	Maximum number of PRACHs

10.1.47.5.10 System Information Block type 8 (FDD)

The system information block type 8 contains static CPCH information to be used in the cell.

Information Element	Presence	Multi	IE type and reference	Semantics description
UE information				
CPCH parameters	M			
PhyCH information elements				
CPCH SET info		1 .. <maxCPCHsetcount>		

Multi Bound	Explanation
MaxCPCHsetcount	Maximum number of CPCH sets per Node B

10.1.47.5.11 System Information Block type 9 (FDD)

The system information block type 9 contains CPCH information to be used in the cell.

Information Element	Presence	Multi	IE type and reference	Semantics description
PhyCH information elements				
CPCH set persistency value	M	1 .. <maxCPCHsetcount>		

Multi Bound	Explanation
MaxCPCHsetcount	Maximum number of CPCH sets per Node B

10.1.47.5.12 System Information Block type 10 (FDD)

The system information block type 10 contains information to be used by UEs having their DCH controlled by a DRAC procedure.

Information Element	Presence	Multi	IE type and reference	Semantics description
UE information				
DRAC information		1 .. <maxDRACclasses>		DRAC information is sent for each class of terminal
>Transmission probability	M			
>Maximum bit rate	M			

Multi Bound	Explanation
MaxDRACclasses	Maximum number of UE classes which would require different DRAC parameters

10.1.47.5.13 System Information Block type 11

The system information block type 11 contains measurement control information to be used in the cell. The block may also contain scheduling information for other system information blocks.

Information Element	Presence	Multi	IE type and reference	Semantics description
References to other system information blocks		0 .. <maxSysInfoBlockcount>		
>Scheduling information	M			
Measurement information elements				
Measurement control information		1 .. <maxMeasurementTypecount>		
>Measurement type	M			
>CHOICE Measurement				
>>Intra-frequency	C – Intrafreq			
>>>Intra-frequency cell info		1 .. <MaxIntraCells>		
>>>Intra-frequency Measurement quantity	M			
>>>Intra-frequency reporting Quantity for RACH Reporting	M			
>>>Maximum number of Reported cells on RACH	M			
>>Inter-frequency	C – Interfreq			
>>>Inter-frequency cell info		1 .. <MaxInterCells>		
>>>Inter-frequency Measurement quantity	M			
>>Inter-system	C – Intersys			
>>>Inter-system cell info	M	1 .. <MaxInterSysCells>		
>>>Inter-system measurement Quantity	M			
>>Traffic volume				
>>>Traffic volume measurement objects	O			
>>>Traffic volume measurement quantity	O			
>>UE Internal				
>>>UE internal measurement quantity	O			

Condition	Explanation
Measurement	The choice shall be consistent (same name) with the value of the 'Measurement type' IE
Intersys	Measurement type = Inter system measurement
Interfreq	Measurement type = Inter frequency measurement
Intrafreq	Measurement type = Intra frequency measurement
Blocktype	The presence of this IE depends on the definition of the system information block type.

Multi Bound	Explanation
MaxMeasTypeCount	Maximum number of measurement types
MaxSysInfoBlockcount	Maximum number of references to other system information blocks.
MaxIntraCells	Maximum number of intra-frequency cells in a measurement control.
MaxInterCells	Maximum number of inter-frequency cells in a measurement control
MaxInterSysCells	Maximum number of inter-system cells in a measurement control.

10.1.47.5.14 System Information Block type 12

The system information block type 12 contains measurement control information to be used in connected mode.

Information Element	Presence	Multi	IE type and reference	Semantics description
References to other system information blocks		0 .. <maxSysInfoBlockcount>		
>Scheduling information	M			
Measurement information elements				
Measurement control information		1 .. <maxMeasurementTypecount>		
>Measurement Identity Number	M			
>Measurement Type	M			
>CHOICE Measurement				
>>Intra-frequency	C – Intrafreq			
>>>Intra-frequency cell info		0 .. <MaxIntra Cells>		
>>>Intra-frequency Measurement quantity	O			
>>>Intra-frequency Reporting quantity for RACH reporting	O			
>>>Maximum number of Reported cells on RACH	O			
>>>Intra-frequency reporting Quantity	O			
>>Inter-frequency	C - Interfreq			
>>>Inter-frequency cell Info		0 .. <MaxInter Cells>		
>>>Inter-frequency Measurement quantity	O			
>>Inter-system	C - Intersys			
>>>Inter-system cell info		0 .. <MaxInter SysCells>		
>>>Inter-system measurement quantity	O			
>>Traffic volume				
>>>Traffic volume measurement objects	M			
>>>Traffic volume measurement quantity	M			
>>UE Internal				
>>>UE internal measurement quantity	M			

Condition	Explanation
Measurement	The choice shall be consistent (same name) with the value of the 'Measurement type' IE
Intersys	Measurement type = Inter system measurement
Interfreq	Measurement type = Inter frequency measurement
Intrafreq	Measurement type = Intra frequency measurement

Multi Bound	Explanation
MaxMeasTypeCount	Maximum number of measurement types
MaxSysInfoBlockcount	Maximum number of references to other system information blocks.
MaxIntraCells	Maximum number of intra-frequency cells in a measurement control.
MaxInterCells	Maximum number of inter-frequency cells in a measurement control
MaxInterSysCells	Maximum number of inter-system cells in a measurement control.

Option	Default value
All optional elements	If not present, the value shall be assumed to be that indicated for in idle mode in SIB 11.

10.1.47.5.15 System Information Block type 13

The system information block type 13 contains ANSI-41 system information.

Information Element	Presence	Multi	IE type and reference	Semantics description
Other information elements				
References to other system information blocks		0 .. <maxSysInfoBlockcount>		
>Scheduling information	M			
CN Information Elements				
CN information		1 to <maxCNdomains>		Send CN information for each CN domain.
>CN domain identity	M			
>NAS (ANSI-41) system information	M			
>CN DRX cycle length	M			
UE Information				
UE timers and counters in idle mode	O			
Capability update requirement	O			

10.1.47.5.15.1 System Information Block type 13.1

The system information block type 13.1 contains the ANSI-41 RAND information.

Information Element	Presence	Multi	IE type and reference	Semantics description
ANSI-41 information elements				
ANSI-41 RAND information	M			

10.1.47.5.15.2 System Information Block type 13.2

The system information block type 13.2 contains the ANSI-41 User Zone Identification information.

Information Element	Presence	Multi	IE type and reference	Semantics description
ANSI-41 information elements				
ANSI-41 User Zone Identification information	M			

10.1.47.5.15.3 System Information Block type 13.3

The system information block type 13.3 contains the ANSI-41 Private Neighbor List information.

Information Element	Presence	Multi	IE type and reference	Semantics description
ANSI-41 information elements				
ANSI-41 Private Neighbor List information	M			

10.1.47.5.15.4 System Information Block type 13.4

The system information block type 13.4 contains the ANSI-41 Global Service Redirection information.

Information Element	Presence	Multi	IE type and reference	Semantics description
ANSI-41 information elements				
ANSI-41 Global Service Redirection information	M			

10.1.47.5.16 System Information Block type 14 (TDD)

The system information block type 14 contains parameters for common and dedicated physical channel uplink outer loop power control information to be used in both idle and connected mode. The block may also contain scheduling information for other system information blocks.

Information Element	Presence	Multi	IE type and reference	Semantics description
Other information elements				
References to other system information blocks		0 .. <maxSysInfoBlockcount>		
>Scheduling information	M			
PhyCH information elements				
Primary CCPCH Tx Power	O			For path loss calculation
Individual Timeslot Info		1 to ….<maxTScount>		
>Timeslot	M			
>UL Interference	M			UL Timeslot Interference
RACH Constant Value	O			Operator controlled RACH Margin
DPCH Constant Value	O			Operator controlled UL DPCH Margin
USCH Constant Value	O			Operator controlled USCH Margin

Multi Bound	Explanation
maxTScount	Maximum number of timeslots

10.1.48 SYSTEM INFORMATION CHANGE INDICATION

This message is used to send information on FACH to the UEs in state CELL_FACH about coming modification of the system information.

RLC-SAP: TM

Logical channel: BCCH

Direction: UTRAN → UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
Other information elements				
BCCH modification info	M			

10.1.49 TRANSPORT CHANNEL RECONFIGURATION

This message is used by UTRAN to configure the transport channel of a UE. This also includes a possible reconfiguration of physical channels. The message can also be used to assign a TFC subset and reconfigure physical channel.

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UTRAN → UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE Information elements				
Integrity check info	O			
Integrity protection mode info	O			
Activation time	O			
New C-RNTI	C - RACH/FACH		C-RNTI	
New U-RNTI	O		U-RNTI	
UTRAN DRX cycle length coefficient	O		DRX cycle length coefficient	
DRX Indicator	O			
Re-establishment timer	O			
Ciphering mode info	O			
CN information elements	O			
PLMN identity	O			(Note1)
CN common GSM-MAP NAS system information	O		GSM-MAP NAS system information	
CN domain related information		0 to <MaxNoCNdomains>		CN related information to be provided for each CN domain
>CN domain identity	O			(Note1)
>CN domain specific GSM-MAP NAS system info	O		GSM-MAP NAS system information	(Note1)
TrCH Information Elements				
TFCS	O			for uplink TFCS
TFCS	O			for downlink TFCS
TFCS	O			For SCCPCH TFCS
CHOICE *mode*				
>TDD				
>>TFCS Identity	O			Uplink TFCS
>>TFCS Identity	O			Downlink TFCS
TFC subset	O			for TFC subset in uplink
Uplink transport channels				
Reconfigured TrCH information		0 to <MaxReconTrCH>		
>Transport channel identity				
>TFS				
CHOICE mode				
>FDD				
>>CPCH set ID	O			
>>DRAC information	C DRAC	1 to <MaxReconTrCHDRAC>		
>>>Dynamic Control				
>>>Transmission time validity				
>>>Time duration before retry				

Information Element	Presence	Multi	IE type and reference	Semantics description
>>>Silent period duration before release				
Downlink transport channels				
Reconfigured TrCH information		0 to <MaxReconTrCH>		
>Transport channel identity				
>TFS				
PhyCH information elements				
Frequency info	O			
Uplink radio resources				
Maximum allowed UL TX power	O			
Uplink DPCH power control info	O			
CHOICE channel requirement	O			
>Uplink DPCH info				
>PRACH info (for RACH)				
>CHOICE *mode*				
>>FDD				
>>>PRACH info (for FAUSCH)				
Downlink radio resources				
Downlink DPCH power control info	O			
Downlink information per radio link		0 to <MaxRLcount>		Send downlink information for each radio link
>CHOICE *mode*				
>>FDD				
>>>TPC combination index	C-ifDPCH			
>>>Primary CPICH info				
>>TDD				
>>>Primary CCPCH info	O			
>Downlink DPCH info	O			
>Secondary CCPCH info	O			
>References to system information blocks		0 to <MaxSysInfoBlockFACHCount>		Note 3
>>Scheduling information				Note 3
CHOICE *mode*				
>FDD				
>>SSDT indicator	O			
>>CPCH SET Info	O			UL/DL radio resource for CPCH control (Note2)
>>Gated Transmission Control info	O			
>>Default DPCH Offset Value	O			
>>Downlink DPCH compressed mode info	O			
>>PDSCH with SHO DCH Info	O			
>>PDSCH code mapping	O			
>TDD				
>>Uplink Timing Advance	O			
>>PUSCH power control info	O			

Condition	Explanation
RACH/FACH	This information element is only sent when using RACH/FACH
DRAC	These information elements are only sent for transport channels which use the DRAC procedure
IfDPCH	This IE is only sent if IE "Downlink DPCH info" is present

Multi Bound	Explanation
MaxRLcount	Maximum number of radio links to be set up
MaxReconcount	Maximum number of Transport Channels reconfigured
MaxReconTrCHDRAC	Maximum number of Transport CHannels which are controlled by DRAC and which are reconfigured
MaxSysInfoFACHCount	Maximum number of references to system information blocks on the FACH

CHOICE *channel requirement*	**Condition under which the given *channel requirement* is chosen**
Uplink DPCH info	
PRACH info (for RACH)	
PRACH info (for FAUSCH)	

NOTE 1: Necessity of PLMN is FFS and for CN domain identity and NAS system information, the confirmation in SA WG2 is needed.

NOTE 2: How to map UL and DL radio resource in the message is FFS.

NOTE 3 The Secondary CCPCH info and the references to SIB are present when the UE needs to listen to system information on FACH.

10.1.50 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	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			

NOTE: The usage of this message for indicating the cell the UE will select in the DCH->RACH/FACH case, is FFS.

10.1.51 TRANSPORT CHANNEL RECONFIGURATION FAILURE

NOTE: Functional description of this message to be included here

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Failure cause	M			

10.1.52 TRANSPORT FORMAT COMBINATION CONTROL

NOTE: Functional description of this message to be included here

RLC-SAP: TM, AM or UM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	C-notTM			
UE information elements				
Integrity check info	O			
TrCH information elements				
Choice ch				
>TFC subset	O			For DPCH TFCS in uplink
>TFC Control duration	C-notTMopt			

Condition	Explanation
NotTM	The message type is not included when transmitting the message on the transparent mode signalling DCCH
NotTMopt	The information element is not included when transmitting the message on the transparent mode signalling DCCH and is optional otherwise.

CHOICE *ch*	Condition under which the given *channel requirement* is chosen
Uplink DPCH info	
PRACH info (for RACH)	
PRACH info (for FAUSCH)	

10.1.53 TRANSPORT FORMAT COMBINATION CONTROL FAILURE

This message is sent to indicate that a received TRANSPORT FORMAT COMBINATION CONTROL message could not be handled by the UE.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Failure cause	M			

10.1.54 UE CAPABILITY ENQUIRY

The UE CAPABILITY ENQUIRY is used by the UTRAN to enquire inter-system classmarks from the UE.

RLC-SAP: t.b.d.

Logical channel: DCCH

Direction: UTRAN → UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Capability update requirement	M			

10.1.55 UE CAPABILITY INFORMATION

NOTE: Functional description of this message to be included here

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
UE radio capability	O			
Other information elements				
UE system specific capability	O		Inter-system message	Includes inter-system classmark

10.1.56 UE CAPABILITY INFORMATION CONFIRM

NOTE: Functional description of this message to be included here

RLC-SAP: UM

Logical channel: DCCH

Direction: UTRAN → UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			

10.1.57 UPLINK DIRECT TRANSFER

NOTE: Functional description of this message to be included here

RLC-SAP: AM

Logical channel: DCCH

Direction: UE ->UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
CN information elements				
Flow Identifier	M			Allocated by UE for a particular session
NAS message	M			
Measurement information elements				
Measured results	O			

10.1.58 URA UPDATE

This message is used by the UE to initiate a URA update procedure.

RLC-SAP: TM

Logical channel: CCCH

Direction: UE→UTRAN

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
U-RNTI	M			
URA update cause	M			

10.1.59 URA UPDATE CONFIRM

This message confirms the URA update procedure and can be used to reallocate new RNTI information for the UE valid after the URA update.

RLC-SAP: UM

Logical channel: CCCH or DCCH

Direction: UTRAN→UE

Information Element	Presence	Multi	IE type and reference	Semantics description
Message Type	M			
UE information elements				
Integrity check info	O			
Integrity protection mode info	O			
U-RNTI	C-CCCH			
New U-RNTI	O			
New C-RNTI	O			
UTRAN DRX cycle length coefficient	O		DRX cycle length coefficient	
DRX Indicator	O			
Ciphering mode info	O			
UTRAN mobility information elements				
URA identifier	O			
CN information elements				
PLMN identity	O			(Note1,2)
CN common GSM-MAP NAS system information	O		GSM-MAP NAS system information	
CN domain related information		0 to <MaxNoCNdomains>		CN related information to be provided for each CN domain
>CN domain identity	O			(Note1,2)
>CN domain specific GSM-MAP NAS system info	O		GSM-MAP NAS system information	(Note1,2)

Multi Bound	Explanation
MaxNoCN domains	Maximum number of CN domains

Condition	Explanation
CCCH	This IE is only sent when CCCH is used

NOTE 1: It depends on the length of these information whether this message can be used to notify these information to UE.

NOTE 2: Necessity of PLMN is FFS and for CN domain identity and NAS system information, the confirmation in SA WG2 is needed.

10.2 Information element functional definitions

10.2.1 CN Information elements

10.2.1.1 CN domain identity

Identifies the type of core network domain.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CN domain identity	M		Enumerated (CS domain, PS domain, Don't care)	

10.2.1.2 CN Type

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CN Type	M		Enumerated (GSM-MAP, ANSI-41)	Identifies the type of core network. This IE shall be used to control the interpretation of network dependent messages and information elements in the RRC protocol.

10.2.1.3 Flow Identifier

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Flow Identifier	M		Enumerated (0…15)	Allocated by UE for a particular session

10.2.1.4 IMEI

This IE contains an International Mobile Equipment Identity.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
IMEI	M			Setting specified in [TS 23.003]
>IMEI digit		15	INTEGER(0. .9)	

10.2.1.5 IMSI (GSM-MAP)

This IE contains an International Mobile Subscriber Identity, used towards a GSM-MAP type of core network.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
IMSI (GSM-MAP)	M			Setting specified in [TS 23.003]
>IMSI digit		6 to 15	INTEGER(0. .9)	

10.2.1.6 Location Area Identification

Identifies uniquely a location area for a GSM-MAP type of core network.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Location Area Identification	M			Setting specified in [TS 23.003]
>PLMN identity	M		PLMN identity	
>LAC	M		Bit string(16)	

10.2.1.7 NAS binding info

A field with non-access stratum information to bind a RB to the non-access stratum. This information is transparent to RRC.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
NAS binding info	M		Bit string (16)	

10.2.1.8 NAS message

A non-access stratum message to be transferred transparently through UTRAN.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
NAS message	M		Bit string (0..maxNAS messagelength)	

10.2.1.9 NAS system information (GSM-MAP)

This information element contains system information that belongs to the non-access stratum for a GSM-MAP type of core network. This information is transparent to RRC. It may contain either information specific to one CN domain (CS or PS) or information common for both CN domains.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
GSM-MAP NAS system information	M		Bit string(0..maxNASsystemiinfoLength)	

10.2.1.10 P-TMSI (GSM-MAP)

This IE contains an Packet Temporary Mobile Subscriber Identity, used towards a GSM-MAP type of core network.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
P-TMSI	M		Bitstring (32)	Setting specified in [TS 23.003]

10.2.1.11 PLMN identity

This information element identifies a Public Land Mobile Network for a GSM-MAP type of core network.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
PLMN identity				Setting of digits is defined in [TS 24.003]
>MCC, Mobile Country Code	M			
>>MCC digit		3	INTEGER(0. .9)	
>MNC, Mobile Network Code	M			
>>MNC digit		3	INTEGER(0. .9)	

10.2.1.12 Routing Area Code

Identifies a routing area within a location area for a GSM-MAP type of core network.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Routing Area Code	M		Bit string(8)	Setting specified in [TS 23.003]

10.2.1.13 Routing Area Identification

Identifies uniquely a routing area for a GSM-MAP type of core network.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Routing Area Identification	M			Setting specified in [TS 23.003]
>LAI	M		Location Area Identification	
>RAC	M		Routing Area Code	

10.2.1.14 Service Descriptor

The value of RR in the reference mentioned below is reserved for paging response.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Service Descriptor	M		Refer to TS24.007 v3.1.0, section 11.2.3.1.1	

10.2.1.15 TMSI (GSM-MAP)

This IE contains an Temporary Mobile Subscriber Identity, used towards a GSM-MAP type of core network.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
TMSI (GSM-MAP)	M		Bitstring (32)	Setting specified in [TS 23.003]

10.2.2 UTRAN mobility Information elements

10.2.2.1 Cell Access Restriction

Indicates the restrictions to cell access.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Cell Barred	M		Boolean	
Cell Reserved for operator use	M		Boolean	
Cell Reserved for SoLSA exclusive use	M		Boolean	

10.2.2.2 Cell identity

This information element identifies a cell unambiguously within a PLMN.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Cell identity	M		Integer (0..268 435 455)	

10.2.2.3 Cell selection and re-selection info

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Radio link timeout				
Cell_selection_and_reselection_quality_measure	M		Enumerated (Ec/N0, SIR)	Choice of measurement (CPICH Rx Ec/N0 or CPICH Rx SIR) to use as quality measure Q. Note 1.
$Qhyst_s$	M		Enumerated (0, 0.5, ..7.5)	[dB]
$Treselection_s$	M		Integer (0-31)	[s]
$Qsearch_s$	M		Integer (-20..0)	Ec/N0, [dB]
Cell Selection and Reselection parameters	O			Used in Alternative 2 in TS 25.304
>Decoding range	O			Decoding is done only when the cell measurement exceeds the neighbour cell decoding range.
$>Qoffset_s$	O			Offset for UEs decoding this cell for cell reselection measurement
>OffsetExp	C – if Qoffset			Expiration timer for UEs decoding the $Qoffset_s$

NOTE 1: The work in order to support the CPICH Rx SIR measurement is in progress in RAN WG4 and may impact the use of that measurement in this document

10.2.2.4 Information for periodic cell and URA update

This information element indicates information to support mechanisms for periodical cell/URA update procedures. It is mapped on System Information message.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
T_periodical_cell_update	M		Enumerated (No updating, 1..1023)	Designate the time period between updating in minutes, or if no periodical updating should be done.
T_periodical_ura_update	M		Enumerated (No updating, 1..1023)	Designate the time period between updating in minutes, or if no periodical updating should be done.

10.2.2.5 URA identity

Gives the identity of the UTRAN Registration Area. It can be used to indicate to the UE which URA it shall use in case of overlapping URAs.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
URA identity			Enumerated (0..65 535)	

10.2.3 UE Information elements

10.2.3.1 Activation time

Activation Time defines the CFN (Connection Frame Number) in which the operation/changes caused by the related message should be executed.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Activation time			Integer(0.. 255)	CFN [TS 25.402]

10.2.3.2 AM_RLC error indication

Indicates AM_RLC unrecoverable error occurred on c-plane in the UE.

10.2.3.3 Capability Update Requirement

This IE indicates to the UE which specific capabilities to transfer to the network.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
UE radio capability update requirement	M		Boolean	
System specific capability update requirement		0 to <MaxSystemCount>	Enumerated (GSM,..)	

10.2.3.4 Cell update cause

Indicates the cause for s cell update.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Cell update cause			Enumerated (cell reselection, periodic cell update, UL data transmission, paging response, RB control response)	

10.2.3.5 Ciphering capability

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Ciphering Algorithm capability	M		Enumerated	

NOTE: The WG1 and WG4 discussion should be concluded before the contents of this IE can be finalised.

10.2.3.6 Ciphering hyper frame number

This hyper frame number (HFN) is used to initialise the ciphering algorithm.

For ciphering, HFN is the most significant bits of COUNT. When the COUNT is initialised: COUNT = HFN (the LSB part of COUNT is set to zero).

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Ciphering HFN	M		Integer (0...2^20-1)	Start value for uplink and downlink COUNT. For RBs using RLC transparent mode or RLC unacknowledged mode, zeros shall be added to form a HFN of 25 bits

10.2.3.7 Ciphering mode info

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

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Ciphering mode command	M		Enumerated (start/restart, modify, stop)	
Ciphering algorithm	C-*notStop*		UEA [TS 33.102]	
Ciphering activation time information	C-*start/restart*			
>Activation time for DPCH	O		Activation time	Used for radio bearers mapped on RLC-TM
>Radio bearer downlink ciphering activation time info	O		Radio bearer activation time info	Used for radio bearers mapped on RLC-AM or RLC-UM

10.2.3.8 Code resource capability

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
DL multi-code capability				
UL multi-code capability				
DL Spreading factor capability				
UL Spreading factor capability				

NOTE: The WG1 and WG4 discussion should be concluded before the contents of this IE can be finalised.

10.2.3.9 CPCH Parameters (FDD)

These parameters are used by any UE using any CPCH set allocated to the Node B that is broadcasting this system information.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
NS_IP	M			Number of slots for initial delay for given priority level
Priority level	M			
Backoff control parameters				
>N_ap_retrans_max	M			Max number of AP transmissions without AP-AICH response (access cycle), a PHY parameter.
>N_access_fails	M			Max number of access cycles without AP-AICH response for link failure, a MAC parameter.
>NS_bo_no aich	M			Max number of slots for UE backoff after N ap_retrans_max unsuccessful AP access attempts, a MAC parameter.
>NF_bo_busy	M			Max number of frames for UE backoff after access attempt to busy CPCH, a MAC parameter.
>NF_bo_all_busy	M			Max number of frames for UE backoff after access attempt to last busy CPCH, a MAC parameter.
>NF_bo_collision	M			Max number of frames for UE backoff after collision on CPCH, a MAC parameter.
>T_CPCH	M			CPCH channel timing -Number of slots used to determine Tau values for CPCH channel timing

NOTE: The WG1 and WG2 discussion should be concluded before the contents of these IEs can be finalised. All of the IEs may be considered optional (O) if the UE is programmed with default values for each IE.

10.2.3.10 C-RNTI

The cell RNTI (C-RNTI) identifies an UE having a RRC connection within a cell.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
C-RNTI			Integer(0..65535)	

10.2.3.11 DRX cycle length coefficient

A coefficient in the formula to count the paging occasions to be used by a specific UE (specified in 25.304) .

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
DRX cycle length coefficient	M		Integer(2...12)	Refers to 'k' in the formula as specified in 25.304, Discontinuous reception

10.2.3.12 DRX Indicator

Indicates to a UE if DRX shall be used with Cell updating or URA updating or if no DRX at all shall be used.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
DRX indicator	M		Enumerated(no DRX, DRX with cell updating, DRX with URA updating)	

Condition	Explanation
NotStop	The IE is present only when the IE "Ciphering mode command" has the values "start/restart" or "modify".
Start/restart	The IE is present only when the IE "Ciphering mode command" has the value "start/restart".

10.2.3.13 Establishment cause

Cause for an RRC connection establishment request.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Establishment cause	M		Enumerated(Originating Speech Call, Originating CS Data Call, Originating PS Data Call, Terminating Speech Call, Terminating CS Data Call, Terminating PS Data Call, Emergency Call, Inter-system cell re-selection, Location Update (LAU & RAU), IMSI Detach, SMS, Other)	

NOTE: These causes shall be aligned with causes received from higher layers.

10.2.3.14 Failure cause

Cause for failure to perform the requested procedure.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Failure cause	M		Enumerated (Configuration unacceptable, physical channel failure, incompatible simultaneous reconfiguration))	

10.2.3.15 Initial UE capability

This is the UE capability information given in the RRC connection request message.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Initial UE Capability Extension Indication	M		Boolean FALSE	A value of "False" indicates that the Initial UE capability is interpreted according to "Release 99 (first release)". If the value is set to "True", a new definition given in a future release is added to this information element.
Capability extension info	C-Extension			Note 1
Maximum number of AM entities	M		Enumerated (3, 4 or more)	If the maximum number of AM entities is three, only two of these entities shall be used for signalling. If the maximum number is four, three entities may be used. This IE needs to be defined as extensible for future releases.
Downlink DCH capability	M		Boolean	This IE refers to the UE capability Maximum number of simultaneous transport channels supported in downlink. This parameter indicates whether UE supports only FACH (false) or also DCHs (true).
Uplink DCH capability	M		Boolean	This IE refers to the UE capability Maximum number of simultaneous transport channels supported in uplink. This parameter indicates whether UE supports only RACH (false) or also DCHs (true).

NOTE 1: This information element may be defined in later releases.

Condition	Explanation
C-Extension	This IE is included only when Signalling link type extension indicator is TRUE.

10.2.3.16 Initial UE identity

This information element identifies the UE at a request of an RRC connection.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CHOICE UE id type	M			
>IMSI (GSM-MAP)			IMSI (GSM-MAP)	
>TMSI (GSM-MAP)			TMSI (GSM-MAP)	
>P-TMSI (GSM-MAP)			P-TMSI (GSM-MAP)	
>IMEI			IMEI	
>ESN (DS-41)			TIA/EIA/IS-2000-4	
>IMSI (DS-41)			TIA/EIA/IS-2000-4	
>IMSI and ESN (DS-41)			TIA/EIA/IS-2000-4	
>TMSI (DS-41)			TIA/EIA/IS-2000-4	
LAI (GSM-MAP)			TS 24.008	
RAI (GSM-MAP)			TS 24.008	

CHOICE *UE Id Type*	Condition under which the given *UE Id Type* is used
IMSI(GSM-MAP)	See section 8.5.1
TMSI(GSM-MAP)	See section 8.5.1
P-TMSI(GSM-MAP)	See section 8.5.1
IMEI	See section 8.5.1
ESN (DS-41)	See section 8.5.1
IMSI (DS-41)	See section 8.5.1
IMSI and ESN (DS-41)	See section 8.5.1
TMSI (DS-41)	See section 8.5.1

10.2.3.17 Integrity check info

The Integrity check info contains the RRC message sequence number needed in the calculation of XMAC-I [TS 33.102] and the calculated MAC-I.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Message authentication code	M		Integer $(0..2^{32}-1)$	MAC-I [TS 33.102]
RRC Message sequence number	M			The local hyper frame number (HFN) is concatenated with the RRC message sequence number to form the input parameter COUNT-I for the integrity protection algorithm.

10.2.3.18 Integrity protection hyper frame number

This hyper frame number (HFN) is used to initialise the integrity protection algorithm.

For integrity protection, the HFN is concatenated with the sequence number in the IE "Integrity check info" to form the parameter COUNT-I in the integrity protection algorithm. HFN is the most significant bits of COUNT-I. When the COUNT-I is initialised: COUNT-I = HFN (the LSB part of COUNT-I is set to zero).

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Integrity protection HFN	M			Start value for uplink and downlink COUNT-I

10.2.3.19 Integrity protection mode info

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Integrity protection mode command	M		Enumerated(start/restart, modify)	
Integrity protection algorithm	M			UIA [TS 33.102]
Integrity protection initialisation number	C-*start/restart*		Integer ($0..2^{32}-1$)	FRESH [TS 33.102]

Condition	Explanation
Start/restart	The IE is present only when the IE "Integrity protection mode command" has the value "start/restart".

10.2.3.20 Inter-system handover failure cause

The purpose of this IE is to provide a reason for the failure of the Inter-system handover.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Inter-system handover failure cause	M		Enumerated(unspecified)	

10.2.3.21 Macro diversity capability (FDD)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Maximum number of RLs	M		Integer	

Parameters	REFERENCE	TYPE	NOTE
Maximum number of RLs		M	

NOTE: The WG1 and WG4 discussion should be concluded before the contents of this IE can be finalised.

10.2.3.22 Maximum bit rate (FDD)

Indicates the maximum user bit rate allowed on a DCH controlled by DRAC procedure for the transmission period (Transmission time validity).

10.2.3.23 Number of RRC Message Transmissions

This IE indicates how many times the receiver of a message containing this IE shall transmit the RRC response message.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Number of RRC Message Transmissions			Integer(1..8)	

10.2.3.24 Paging cause

Cause for a CN originated page.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Paging cause	M		Enumerated(Terminating Speech Call, Terminating CS Data Call, Terminating PS Data Call, SMS, Other)	

NOTE: These causes shall be aligned with causes received from higher layers.

10.2.3.25 Paging record

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Paging originator	M		Enumerated (UTRAN,CN)	
Paging cause	C isCN			
CN domain identity	C isCN			
CHOICE CN Identity	C idleMode			
>IMSI (GSM-MAP)			IMSI (GSM-MAP)	
>TMSI (GSM-MAP)			TMSI (GSM-MAP)	
>P-TMSI (GSM-MAP)			P-TMSI (GSM-MAP)	
>IMSI (DS-41)			TIA/EIA/IS-2000-4	
>TMSI (DS-41)			TIA/EIA/IS-2000-4	
U-RNTI	C connected Mode			

Condition	Explanation
IsCN	This information element is included where the page is originated from the CN.
IdleMode	This IE is included for UE not having RRC Connection.
ConnectedMode	This IE is included for UE having RRC Connection.

CHOICE CN *Identity*	Condition under which the given *Identity* is chosen
IMSI	For idle mode pages
TMSI	For idle mode pages
P-TMSI	For idle mode pages
IMSI(DS-41)	For idle mode pages
TMSI(DS-41)	For idle mode pages

10.2.3.26 PDCP capability

Indicates which algorithms and which value range of their parameters are supported by the UE.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Supported algorithm types	M	0 to <maxAlgoTypeCount>	Enumerated (RFC2507)	
CHOICE *algorithm type*				
>RFC2507				
>>Maximum MAX_HEADER	O		integer (60..65535)	The largest header size in octets that may be compressed by the UE Default value is 65535.
>>Maximum TCP_SPACE	O		integer (3..255)	Maximum stored number of headers for TCP connections. Default value is 255.
>>Maximum NON_TCP_SPACE	O		integer (3..65535)	Maximum stored number of headers for non-TCP connections. Default value is 65535.

Range Bound	Explanation
MaxAlgoTypeCount	Maximum number of algorithm types specified in TS 25.323.

10.2.3.27 Power control capability

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Transmission power capability	M			

NOTE: The WG1 and WG4 discussion should be concluded before the contents of this IE can be finalised.

10.2.3.28 PRACH partitioning

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Access Service class		1 to 8		
>Available signature Start Index	M		Integer(0..15)	
>Available signature End Index	M		Integer(0..15)	
>Available sub-channel Start Index	M		Integer(0..11)	
>Available sub-channel End Index	M		Integer(0..11)	

The list of available signatures is renumbered from signature index 0 to signature index N-1, where N is the number of available signatures, starting with the lowest available signature number and continuing in sequence, in the order of increasing signature numbers.

- List of available signatures : 16 or less signatures are available.

  Ex : only signatures 0, 5, 10 and 15 are available, then :

  Signature 0 is : available signature index 0

  Signature 5 is : available signature index 1

  Signature 10 is : available signature index 2

  Signature 15 is : available signature index 3

The list of available access-slot sub-channels is renumbered from access-slot sub-channel index 0 to access-slot sub-channel index M-1, where M is the number of available access-slot sub-channels, starting with the lowest available access-slot sub-channel number and continuing in sequence, in the order of increasing access-slot sub-channel numbers.

- List of available Access Slot channels : 12 or less sub-channels are available.

  Ex : only sub-channels 0,1 ; 4,5 ; 8,9 are present, then :

  Sub-channel 0 is : available sub-channel index 0

  Sub-channel 1 is : available sub-channel index 1

  Sub-channel 4 is : available sub-channel index 2

  Sub-channel 5 is : available sub-channel index 3

  Sub-channel 8 is : available sub-channel index 4

  Sub-channel 9 is : available sub-channel index 5

One ASC has access to all the access-slot sub-channels between the Available sub-channel Start Index and the Available sub-channel End Index, and to all the signatures between the Available signature Start Index and the Available signature End Index.

NOTE: The above text may eventually be moved to a more appropriate location

10.2.3.29 Re-establishment timer

This information element indicates timer T314.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
T314	M			

10.2.3.30 Rejection cause

Cause for rejection of RRC connection establishment request.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Rejection cause	M		Enumerated(congestion, unspecified)	

10.2.3.31 Release cause

Cause for release of RRC connection.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Release cause	M		Enumerated (normal event, unspecified, pre-emptive release, congestion, re-establishment reject)	

10.2.3.32 RLC re-configuration indicator

This IE is used to re-configure AM RLC on c-plane.

10.2.3.33 Transmission probability (FDD)

Indicates the probability for a mobile to be allowed to transmit on a DCH controlled by DRAC procedure.

10.2.3.34 Transport channel support capability

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Maximum number of DCHs			Integer	
Support for Transport CH				

NOTE: The WG1 and WG4 discussion should be concluded before the contents of this IE can be finalised.

10.2.3.35 UE mode capability

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
System capability		0 to <maxSystemCount>	Enumerated (UMTS, GSM, Others)	
UMTS capability		0 to <maxModecount>	Enumerated (TDD, FDD)	
Chip rate capability				
Radio Frequency capability				
Variable duplex distance capability				

Range Bound	Explanation
MaxSystemCount	Maximum number of Systems supported by the UE
MaxModeCount	Maximum number of UMTS modes supported by the UE

NOTE: The WG1 and WG4 discussion should be concluded before the contents of this IE can be finalised.

10.2.3.36 UE radio capability

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Power control capability	M			
Code resource capability	M			
UE mode capability	M			
Transport CH support capability	O			
Ciphering capability	M			
Macro diversity capability	M			
FAUSCH usage support	O			Indicates true/false for "DCH allocation function", "USCH capability request function".
PDCP capability	O			IE shall be absent if PDCP is not supported by the UE.

NOTE: The overall discussion on UE capability parameters should be concluded before the contents of this information element can be finalised.

10.2.3.37 UE Timers and Counters in connected mode

This information element indicates timers and maximum values of each counter used in UE in connected mode.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
T301	M		Integer(1...8)	Value in seconds
N301	M		Integer(1..8)	
T302	M		Integer(1...8)	Value in seconds
N302	M		Integer(1..8)	
T303	M		Integer(1...8)	Value in seconds
N303	M		Integer(1..8)	
T304	M		Enumerated(200, 400...2000)	Value in milliseconds
N304	M		Integer(1..8)	
T307	M		Enumerated(5, 10..50)	Value in seconds
T308	M		Integer(40, 80...300)	Value in milliseconds
T309	M		Integer(1...8)	Value in seconds

10.2.3.38 UE Timers and Counters in idle mode

This information element indicates timers and maximum values of each counter used in UE in idle mode.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
T300	M		Integer(1...8)	Value in seconds
N300	M		Integer(1..8)	
T312	M			In sec
T313	M			In sec
N312	M			In sec
N313	M			In sec
N315	M			In sec

10.2.3.39 URA update cause

Indicates the cause for s URA update..

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
URA update cause	M		Enumerated(change of URA, periodic URA update, re-entered service area)	

10.2.3.40 U-RNTI

The U-RNTI (UTRAN Radio Network Temporary Identity) is allocated to an UE having a RRC connection and identifies the UE within UTRAN.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
SRNC identity	M		Integer(0..4095)	
S-RNTI	M		Integer(0..1048575)	

10.2.3.41 Wait time

Wait time defines the time period the UE has to wait before repeating the rejected procedure.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Wait time			Integer(1..16)	Wait time in seconds

10.2.4 Radio Bearer Information elements

10.2.4.1 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	Presence	Range	IE type and reference	Semantics description
Header compression information		0 to <Algorithm Count>		
PDCP PDU header	O		boolean	Whether a PDCP PDU header is existent or not. Default is TRUE.
>Algorithm type	M		Enumerated (RFC2507)	NOTE: The enumerated list contains currently only one specified type. Other values are FFS.
>Reconfiguration reset	O		boolean	Whether the algorithm shall be reset in the reconfiguration. Default value is TRUE.
>CHOICE *algorithm type*				
>>RFC2507				
>>>F_MAX_PERIOD	O		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	O		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	O		integer (60..65535)	The largest header size in octets that may be compressed. Default value is 168.
>>>TCP_SPACE	O		integer (3..255)	Maximum CID value for TCP connections. Default value is 15.
>>>NON_TCP_SPACE	O		integer (3..65535)	Maximum CID value for non-TCP connections. Default value is 15.
>>>EXPECT_REORDERING	O		boolean	Whether the algorithm shall reorder PDCP SDUs or not. Default value is TRUE (reordering expected).

Range Bound	Explanation
AlgorithmCount	The number of algorithm types configured for PDCP entity.

10.2.4.2 Predefined radio configuration identity

This information element identifies a pre- defined radio parameter configuration.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Predefined radio configuration identity	M		Enumerated (0..15)	

10.2.4.3 Radio bearer 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	Presence	Range	IE type and reference	Semantics description
Radio bearer activation time		0 to <maxReconRBs>		
>RB identity	M			
>RLC sequence number	M		Integer (0..4095)	RLC SN [TS 25.322]

10.2.4.4 RB identity

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

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
RB identity	M		Integer(0..31)	Values 0-3 shall only be used for signalling radio bearers

10.2.4.5 RB mapping info

A multiplexing option for each possible transport channel this RB can be multiplexed on.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Information for each multiplexing option		1 to <maxMuxOptionsCount>		
>Number of RLC logical channels		1 to 2		1 or 2 logical channels per RLC entity or radio bearer
>>Uplink transport channel type	M		Enumerated(DCH,RACH, CPCH,USCH)	CPCH is FDD only USCH is TDD only
>>Transport channel identity	O			This is the ID of a transport channel that this RB could be mapped onto.
>>Logical channel identity	O		Integer(1..16)	This parameter is used to distinguish logical channels multiplexed by MAC on a transport channel.
>>MAC logical channel priority	O		Enumerated(1..8)	This is priority between a user's different RBs (or logical channels). The different priorities for this user's RBs are mapped (through the MAC's C/T MUX) to the TFC selection algorithm. Priority 1 shall have the highest priority and priority 8 the lowest.
>Number of RLC logical channels		1 to 2		1 or 2 logical channels per RLC entity or radio bearer
>>Downlink transport channel type	M		Enumerated(DCH,FACH, DSCH)	
>>Transport channel identity	O			
>>Logical channel identity	O		Integer(1..16)	

Range Bound	Explanation
MaxMuxOptionsCount	Maximum number of allowed multiplexing options that can be sent is 8

10.2.4.6 RLC info

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Uplink RLC info				
>RLC mode	M		enumerated (Acknowledged, Non Acknowledged, Transparent)	
>Transmission RLC discard	C-*NonTrOp*			
>Transmission window size	C-*ACK*		Integer(1,8,16,32,128,256,512,768,1024,1536,2048,2560,3072,3584,4096)	Maximum number of RLC PUs sent without getting them acknowledged. This parameter is needed if acknowledged mode is used.
>Polling info	C-*ACKOp*			
Downlink RLC info				
>RLC mode	M		enumerated (Acknowledged, Non Acknowledged,Transparent)	Indicates if Acknowledged, Unacknowledged or Transparent mode RLC should be used.
>In-sequence delivery	M		Boolean	Indication if RLC should preserve the order of higher layer PDUs when these are delivered.
>Reception RLC discard timer	C-*timer*		Enumerated(0.1, 0.25, 0.5, 0.75, 1, 1.25, 1.5, 1.75, 2, 2.5, 3, 3.5, 4, 4.5, 5, 7.5)	Elapsed time in seconds before a SDU is discarded. Only present if timer based discard mode without explicit signalling is chosen.
>Receiving window size	C-*ACK*		Integer(1,8,16,32,128,256,512,768,1024,1536,2048,2560,3072,3584,4096)	Maximum number of RLC PUs allowed to be received. This parameter is needed if acknowledged mode is used.(Necessity is FFS.)
>Downlink RLC status Info	C-*ACKOp*			

Condition	Explanation
Timer	This IE is only sent if timer based discard is used without explicit signalling
NonTrOp	This IE is optional for UTRAN to send if IE "RLC mode" is "acknowledged" or "non-acknowledged"
AckOp	This IE is optional for UTRAN to send if IE "RLC mode" is "acknowledged"
Ack	This IE is only present if IE "RLC mode" is "acknowledged mode"

10.2.4.6.1 Transmission RLC Discard

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
SDU Discard Mode	M		Enumerated(Timer based explicit, Timer based no explicit, Max_DAT retransmissions, No_discard)	Different modes for discharge the RLC buffer on the transmitter side; Timer based with explicit signalling, Timer based without explicit signalling or Discard after Max_DAT retransmissions. For unacknowledged mode only Timer based without explicit signalling is applicable. If No_discard is used, reset procedure shall be done after Max_DAT retransmissions.
Timer_discard	C-timer		Enumerated(0.1, 0.25, 0.5, 0.75, 1, 1.25, 1.5, 1.75, 2, 2.5, 3, 3.5, 4, 4.5, 5, 7.5)	Elapsed time in seconds before a SDU is discarded.
Max_DAT	C-discard		Enumerated(1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 35, 40)	Number of retransmissions of a PU before a SDU is discarded.
Max_RST	C-no_discard		Enumerated(1, 4, 6, 8, 12 16, 24, 32)	The maximum number of retransmission of RESET PDU.

Condition	Explanation
Timer	This IE is only sent if timer based discard is used without explicit signalling
Discard	This IE is only sent when the SDU discard technique is to discard SDUs after a given number of PU re-transmissions
No_discard	This IE is only sent when the SDU discard is not used.

10.2.4.6.2 Polling info

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Timer_poll_prohibit	O		Enumerated(50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 700, 800, 900, 1000)	Minimum time between polls in ms
Timer_poll	O		Enumerated(50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 700, 800, 900, 1000)	Started when poll is transmitted. New poll when timer expires and no STATUS received. Time in ms
Poll_PU	O		Enumerated(1,2,4,8,16,32 ,64,128)	Poll at every Poll_PU PU
Poll_SDU	O		Enumerated(1,4,16,64)	Poll at every Poll_SDU SDU
Last transmission PU poll	M		Boolean	Indicates if poll at last PU in transmission buffer
Last retransmission PU poll	M		Boolean	Indicates if poll at last PU in retransmission buffer
Poll_Window	O		Enumerated(50,60,70,80, 85,90,95,100)	Poll at Poll_Window % of transmission window
Timer_poll_periodic	O		Enumerated(0.1,0.2, 0.3, 0.4, 0.5, 0.75, 1, 2)	Timer for periodic polling. Timer in seconds

NOTE: At least one or more parameters are necessary when polling info is sent.

10.2.4.6.3 Downlink RLC STATUS info

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Timer_Status_Prohibit	O		Enumerated(160, 320, 640, 1280)	Minimum time in ms between STATUS reports
Timer_EPC	O		Enumerated(50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 700, 800, 900, 1000)	Timer for EPC. Timer in ms
Missing PU Indicator	M		Boolean	Indicates if UE should send a STATUS report for each missing PU that is detected
Timer_STAUS_periodic	O		Enumerated(0.1,0.2, 0.3, 0.4, 0.5, 0.75, 1, 2)	Timer for periodic STATUS reports. Timer in seconds

10.2.5 Transport CH Information elements

10.2.5.1 Dynamic Control (FDD only)

Indicates if this transport channel is controlled by DRAC procedure or not.

10.2.5.2 Silent period duration before release (FDD only)

Indicates the maximum silent period duration before releasing the resource. This parameter may be merged with the Fkp-b parameter defined in the 'Transmission stop and resumption control' procedure defined in [1].

NOTE: [1] RAN/WG1 S1.14 document

10.2.5.3 Time duration before retry (FDD only)

Indicates the time duration before retrying to get the transmission permission on a DCH controlled by DRAC procedure, in case permission has not been granted.

10.2.5.4 Transmission time validity (FDD only)

Indicates the duration for which permission is granted on a DCH controlled by DRAC procedure.

10.2.5.5 Transparent mode signalling info

This information element points out a transport channel that is used for transparent mode signalling, and which type of message that is sent on the DCCH mapped on that channel.

There are two modes of this transparent mode signaling. Mode 1 controls all transport channels for one UE. Mode 2 only control a subset of the transport channels for one UE.

Information Element	Presence	Range	IE type and reference	Semantics description
Transport channel identity	M			Transport channel used for transparent mode signalling DCCH
CHOICE *Transparent signalling mode*				
>Mode 1				
>>Message type	M		Enumerated (TRANSPORT FORMAT COMBINATION CONTROL)	Indicates which type of message sent on the transparent mode signalling DCCH
Mode 2				
>>Controlled transport channels	M	1 to <MaxTrChCount>	Enumerated(1..64)	The transport channels that are effected by the rate control commands sent on this transparent mode DCCH

10.2.5.6 Transport channel identity

This information element is used to distinguish transport channels (both common and dedicated transport channels).

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Transport channel identity	M		Enumerated(1..64)	

10.2.5.7 Transport Format Combination Set

Indicates the allowed combinations of already defined Transport formats and the mapping between these allowed TFCs and the corresponding TFCI values.

For FDD, Where the UE is assigned access to one or more DSCH transport channels then the UTRAN has the choice of two methods for signalling the mapping between TFCI(field 2) values and the corresponding TFC:

Method #1 - TFCI range

The mapping is described in terms of a number of groups, each group corresponding to a given transport format combination (value of CTFC_DSCH). The CTFC_DSCH value specified in the first group applies for all values of TFCI(field 2) between 1 and the specified 'Max TFCI(field2) value'. The CTFC_DSCH value specified in the second group applies for all values of TFCI(field 2) between the 'Max TFCI(field2) value' specified in the last group plus one and the specified 'Max TFCI(field2) value' in the second group. The process continues in the same way for the following groups with the TFCI(field 2) value used by the UE in constructing its mapping table starting at the largest value reached in the previous group plus one.

Method #2 - Explicit

The mapping between TFCI(field 2) value and CTFC_DSCH is spelt out explicitly for each value of TFCI (field2).

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CHOICE *DSCH*				
>FDD without access to DSCH assigned or TDD				This choice is made if the UE is not assigned any DSCH transport channels
>>CHOICE TFCS representation	M			
>>>Complete reconfiguration		1 to MaxTFCcount		
>>>>CTFC		1 to MaxTFCcount	Integer(0..MaxCTFC-1)	The first instance of the parameter *Transport format combination* corresponds to Transport format combination 0, the second to transport format combination 1 and so on. Integer number calculated according to clause 14.
>>>>Gain Factor β_c	O		Integer (0.. 15)	For DPCCH or control part of PRACH
>>>>Gain Factor β_d	O		Integer (0..15)	For DPCCH or data part of PRACH
>>>Removal		1 to MaxDelTFCcount		
>>>>TFCI		1 to MaxDelTFCcount	Integer(0.. MaxTFCIValue)	Removal of TFCI. The integer number(s) is a reference to the transport format combinations to be removed.
>>>Addition		1 to MaxAddTFCcount		
>>>>AddCTFC		1 to MaxAddTFCcount	Integer(0.. MaxCTFC-1)	Addition of TFCI. The integer number(s) is the calculated transport format combination that is added. The new TFC(s) is inserted into the first available position(s) in the TFCI (counting from zero).
>>>>Gain Factor β_c	O		Integer (0.. 15)	For DPCCH or control part of PRACH
>>>>Gain Factor β_d	O		Integer (0..15)	For DPCCH or data part of PRACH
>FDD with access to DSCH				This choice is made if the UE

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
assigned				is assigned one or more DSCH transport channels
>>Length of TFCI2	M		Integer (1..9)	This IE indicates the length measured in number of bits of TFCI(field2)
>>Transport format combination_DCH		1 to <MaxTFCI_1_Combs>		The first instance of the parameter *Transport format combination_DCH* corresponds to TFCI (field 1) = 1, the second to TFCI (field 1) = 2 and so on.
>>>CTFC_DCH	M		Integer(0..MaxCTFC_DCH-1)	Integer number calculated according to clause 14. The calculation of CTFC ignores any DSCH transport channels which may be assigned
>>Choice *Signalling method*				
>>>TFCI range				
>>>>TFC mapping on DSCH		1 to <MaxNoTFCIGroups>		
>>>>>Max TFCI(field2) value	M		Integer(1..512)	This is the Maximum value in the range of TFCI(field2) values for which the specified CTFC_DSCH applies
>>>>>>CTFC_DSCH	M		Integer(0..MaxCTFC_DSCH-1)	Integer number calculated according to clause 14. The calculation of CTFC ignores any DCH transport channels which may be assigned
>>>Explicit				
>>>>Transport format combination_DSCH		1 to <MaxTFCI_2_Combs>		The first instance of the parameter *Transport format combination_DSCH* corresponds to TFCI (field2) = 1, the second to TFCI (field 2) = 2 and so on.
>>>>>CTFC_DSCH	M		Integer(0..MaxCTFC_DSCH-1)	Integer number calculated according to clause 14. The calculation of CTFC ignores any DCH transport channels which may be assigned

Range Bound	Explanation
MaxCTFC	Maximum value number of the CTFC value is calculated according to the following: $\sum_{i=1}^{I}(L_i - 1)P_i$ with the notation according to clause 14.
MaxTFCCount	Maximum number of Transport Format Combinations.
MaxTFCValue	The max value of the Transport Format Combinations that currently is defined for this UE.
MaxAddTFCIcount	Maximum number of Transport Format Combinations to be added.
MaxDelTFCcount	Maximum number of Transport Format Combinations to be removed.
MaxTFCI_1_Combs	Maximum number of TFCI (field 1) combinations (given by 2 raised to the power of the length of the TFCI (field 1))
MaxTFCI_2_Combs	Maximum number of TFCI (field 2) combinations (given by 2 raised to the power of the length of the TFCI (field 2))
MaxNoTFCIGroups	Maximum number of groups, each group described in

Range Bound	Explanation
	terms of a range of TFCI(field 2) values for which a single value of CTFC_DSCH applies
MaxCTFC_DCH	Maximum value of CTFC_DCH is calculated according to the following: $\sum_{i=1}^{I}(L_i - 1)P_i$ with the notation according to clause 14 where only the DCH transport channels are taken into account in the calculation.
MaxCTFC_DSCH	Maximum value of CTFC_DSCH is calculated according to the following: $\sum_{i=1}^{I}(L_i - 1)P_i$ with the notation according to clause 14 where only the DSCH transport channels are taken into account in the calculation..

10.2.5.8 Transport Format Combination Set Identity (TDD only)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
TFCS ID	M		Integer (0...3)	Indicates the identity of every TFCS within a UE
Shared Channel Indicator	O		Boolean	Indicates use of shared channels.

10.2.5.9 Transport Format Combination Subset

Indicates which Transport format combinations in the already defined Transport format combination set are allowed.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CHOICE Subset representation	M			
>Minimum allowed Transport format combination number			Integer(0..MaxTFCValue-1)	The integer number is a reference to the *Transport format combination,* which arrived at that position in the *Transport Format Combination Set.*
>Allowed transport format combination		1 to <maxTFCcount>	Integer(0..MaxTFCValue-1)	The integer number(s) is a reference to the *Transport format combination,* which arrived at that position in the *Transport Format Combination Set.*
>Non-allowed transport format combination		1 to <MaxTFCcount>	Integer(0..MaxTFCValue)	The integer number(s) is a reference to the *Transport format combination,* which arrived at that position in the *Transport Format Combination Set.*
>Restricted TrCH information		1 to <MaxRstTrCHcount>		
>>Restricted TrCH identity	M		Integer(0..MaxTrCHValue)	The integer number(s) is a reference to the transport channel that is restricted.
>>Allowed TFIs	O	1 to <MaxTFcount>	Integer(0..MaxTFValue)	The integer number(s) is a reference to the transport format that is allowed. If no elements are given, all transport formats or the TrCH with non-zero rate are restricted.

Range Bound	Explanation
MaxTFCcount	Maximum number of Transport Format Combinations that could be sent as the limited set that the UE is allowed to use is 1023.
MaxTFCValue	The max value of the Transport Format Combinations that currently is defined for this UE.
MaxRstTrCHcount	Maximum number of Transport Channels that could be restricted.
MaxTrCHValue	Maximum value of the Transport Channels that currently is defined for this UE.
MaxTFcount	Maximum number of the Transport Formats that is defined.
MaxTFValue	Maximum value of the Transport Formats that is defined.

10.2.5.10 Transport Format Set (TFS)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CHOICE *Transport channel type*	M			
>Dedicated transport channels	M			
>>Dynamic Transport Format Information		1 to maxTFcount		The first instance of the parameter *Dynamic transport format information* correspond to Transport format 0 for this transport channel, the second to transport format 1 and so on.
>>>Number of Transport blocks	M		Integer(0..4095)	
>>>>CHOICE *Transparent mode RLC PDU size*				
>>>>>Size type 1				1 bit granularity
>>>>>>Size part 1	M		Enumerated(1..128)	
>>>>>Size type 2				8 bit granularity
>>>>>>Size part 1	M		Enumerated(136, 144..256)	
>>>>>>Size part 2	O		Integer (1..7)	Added to size part 1.
>>>>>Size type 3				16 bit granularity
>>>>>>Size part 1	M		Enumerated(272, 288..1024)	
>>>>>>Size part 2	O		Integer (1..15)	Added to size part 1.
>>>>>Size type 4				64 bit granularity
>>>>>>Size part 1	M		Enumerated(1088, 1152..4992)	
>>>>>>Size part 2	O		Integer (1..63)	Added to size part 1.
>>>>CHOICE *Acknowledged mode RLC PDU size*				
>>>>>Size type 1			Enumerated(24,32..272)	8 bit granularity
>>>>>Size type 2			Enumerated(304, 336..1040)	32 bit granularity
>>>>>Size type 3			Enumerated(1104, 1168..4944)	64 bit granularity
>>>>CHOICE *Unacknowledged mode RLC PDU size*				
>>>>>Size type 1			Enumerated(16,24..264)	8 bit granularity
>>>>>Size type 2			Enumerated(296,328..1032)	32 bit granularity 1-3 octets
>>>>>Size type 3			Enumerated(1096,1160..5000)	64 bit granularity 1-7octets
>>>CHOICE mode				
>>>>TDD				
>>>>>Transmission time interval	C-TTIdynamic	1 to <maxTTIcount>	Enumerated(10, 20, 40, 80)	
>>Semi-static Transport Format Information				
>>>Transmission time interval	C-TTIsemistatic		Enumerated(10, 20, 40, 80)	

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
>>>Type of channel coding			Enumerated(No coding, Convolutional, Turbo)	
>>>Coding Rate	C-Coding		Enumerated(1/2, 1/3)	
>>>Rate matching attribute			Integer(1..maxRM)	
>>>CRC size	M		Enumerated(0, 8, 12, 16, 24)	
>>>CHOICE mode				
>>>>TDD				
>>>>>2nd interleaving mode	O		Enumerated(Frame related, Timeslot related)	Frame or timeslot related interleaving. Default Frame related.
>Common transport channels				
>>Dynamic Transport Format Information		1 to maxTFcount		The first instance of the parameter *Dynamic transport format information* correspond to Transport format 0 for this transport channel, the second to transport format 1 and so on.
>>>Number of Transport blocks	M		Integer(0..4095)	
>>>CHOICE mode				
>>>>FDD				
>>>>>CHOICE *Transport block size*	C-Blocks			
>>>>>>Size type 1			Enumerated(48,56..296)	8 bit granularity
>>>>>>Size type 2			Enumerated(312, 328..1320)	16 bit granularity
>>>>>>Size type 3			Enumerated(1384, 1448..4968)	64 bit granularity
>>>>TDD				
>>>>>CHOICE *RLC mode*	C-Blocks			
>>>>>>CHOICE *Bit mode RLC PDU size*				
>>>>>>>Size type 1				1 bit granularity
>>>>>>>>Size part 1	M		Enumerated(1..128)	
>>>>>>>Size type 2				8 bit granularity
>>>>>>>>Size part 1	M		Enumerated(136, 144..256)	
>>>>>>>>Size part 2	O		Integer (1..7)	Bits Added to size part 1.
>>>>>>>Size type 3				16 bit granularity
>>>>>>>>Size part 1	M		Enumerated(272, 288..1024)	
>>>>>>>>Size part 2	O		Integer (1..15)	Bits Added to size part 1.
>>>>>>>Size type 4				64 bit granularity
>>>>>>>>Size part 1	M		Enumerated(1088, 1152..4992)	
>>>>>>>>Size part 2	O		Integer (1..63)	Bits Added to size part 1.
>>>>>>CHOICE *Octet mode*				

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
RLC PDU size				
>>>>>>>Size type 1				8 bit granularity
>>>>>>>>Size Part 1	M		Enumerated(16,24..272)	
>>>>>>>Size type 2				32 bit granularity
>>>>>>>>Size Part 1	M		Enumerated(304, 336..1040)	
>>>>>>>>Size Part 2	O		Integer (1..3)	Octets added to size part 1.
>>>>>>>Size type 3				64 bit granularity
>>>>>>>>Size Part 1	M		Enumerated(1104, 1168..4944)	
>>>>>>>>Size Part 2	O		Integer (1..7)	Octets added to size part 1.
>>>>>MAC Header Type	O		Integer (1..7)	Default is DCH MAC header type (only needed for TDD mode)
>>Semi-static Transport Format Information				
>>>Transmission time interval	C-TTIsemistatic		Enumerated(10, 20, 40, 80)	
>>>Type of channel coding	M		Enumerated(No coding, Convolutional, Turbo)	
>>>Coding Rate	C-Coding		Enumerated(1/2, 1/3)	
>>>Rate matching attribute	M		Integer(1..maxRM)	
>>>CRC size	M		Enumerated(0, 8, 12, 16, 24)	

Range Bound	Explanation
maxTTIcount	Denotes the amount of different TTI that are possible for that transport format.

Condition	Explanation
Blocks	This IE is only present if IE "Number of Transport Blocks" is greater than 0.
Coding	This IE is only present if IE "Type of channel coding" is "Convolutional"
TTIdynamic	This IE is mandatory if not defined as semistatic parameter. Otherwise it is absent.
TTIsemistatic	This IE is mandatory if not defined as dynamic parameter. Otherwise it is absent.

Range Bound	Explanation
MaxTFcount	Maximum number of different transport formats that can be included in the Transport format set for one transport channel is 32.
MaxRM	Maximum number that could be set as rate matching attribute for a transport channel is 256.

CHOICE *RLC mode*	Condition under which the given *RLC mode* is chosen
Bit mode RLC PDU size	The RLC entity mapped to this transport channels can generate bit specific RLC PDU sizes
Octet mode RLC PDU size	The RLC entity mapped to this transport channels can only generate octet aligned RLC PDU sizes

CHOICE *Transport channel type*	Condition under which the given *Transport channel type* is chosen
Dedicated transport channels	The transport channel that is configured with this TFS is of type DCH
Common transport channels	The transport channel that is configured with this TFS is of a type not equal to DCH

NOTE: The parameter "rate matching attribute" is in line with the RAN WG1 specifications. However, it is not currently in line with the description in 25.302.

10.2.6 Physical CH Information elements

10.2.6.1 AICH Info (FDD only)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Secondary scrambling code	O		Integer(0..14)	
Channelisation code	M		Integer(0..255)	SF is fixed and equal to 256
STTD indicator	M		Boolean	
AICH transmission timing	M		Enumerated (0, 1)	

10.2.6.2 AICH Power offset (FDD only)

This is the power per transmitted Acquisition Indicator minus power of the Primary CPICH.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
AICH Power offset	M			

10.2.6.3 ASC Info (TDD only)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Access Service Class 1 Support	O		Boolean	Each PRACH info IE in System Information is associated with an ASC info IE. Any one RACH can support multiple ASCs.
Access Service Class 2 Support	O		Boolean	
Access Service Class 3 Support	O		Boolean	

10.2.6.4 Block STTD indicator (TDD only)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Block STTD indicator	M		Boolean	

10.2.6.5 Constant value (FDD)

This constant value is used by the UE to calculate the initial output power on PRACH according to the Open loop power control procedure.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Constant value	M			

10.2.6.6 CPCH persistency values (FDD only)

This IE is dynamic and is used by RNC for load balancing and congestion control. This is broadcast often in the system information message.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CPCH set ID	M			Identifier for CPCH set info.
PV_CPCHn	M	1 to <maxCPCHs>		Persistency value for CPCHn. One PV for each CPCH channel in this CPCH set.

Range Bound	Explanation
MaxCPCHs	Maximum number of CPCH channels in a CPCH set (max=16 with 1 signature per channel)

10.2.6.7 CPCH set info (FDD only)

This IE may be broadcast in the System Information message or assigned by SRNC. It is pseudo-static in a cell.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CPCH set ID	M			Indicates the ID number for a particular CPCH set allocated to a cell.
AP preamble code	M			256 chip preamble code for AP in UL
AP-AICH channelisation code	M			256 chip channelisation code for AP-AICH in DL
AP access slot subchannel	O	1 to <maxSubChNum>	Enumerated (0,1,2,….11)	Lists the set of subchannels to be used for AP access preambles. Note: if not present, all subchannels are to be used without access delays.
CD preamble code	M			256 chip preamble code for CD in UL
CD-AICH channelisation code	M			256 chip channelisation code for CD-AICH in DL
CD access slot subchannel	O	1 to <maxSubChNum>	Enumerated (0,1,2,….11)	Lists the set of subchannels to be used for CD access preambles. Note: if not present, all subchannels are to be used without access delays.
CD signature code	O	1 to <maxSigNum>	Enumerated (0,1,2,….15)	Signature code for CPCH channel CD preamble in UL. Note: if not present, all signatures are available for use.
CPCH channel info	M	1 to <maxCPCHs>		
>UL scrambling code	M			For CPCH message part
>UL channelisation code	M			For CPCH message part
>DL channelisation code	M			For DPCCH in CPCH message part
>NF_max	M			Max packet length in frames for CPCH message partt
>AP signature code	M	1 to <maxSigNum>	Enumerated (0,1,2,….15)	AP preamble signature codes for selection of this CPCH channel.
>PCP length	M		Enumerated (0 access slots, 8 access slots)	Indicates length of power control preamble, 0 access slots (no preamble used) or 8 access slots

Range Bound	Explanation
MaxCPCHs	Maximum number of CPCH channels in a CPCH set (max=16 with 1 signature per channel)
MaxSubChNum	Maximum number of available sub channels (max = 12 subchannels defined)
MaxSigNum	Maximum number of available signatures (max = 16)

NOTE: Whether several CPCH Set Info with different QoS can be set in a cell is FFS.

10.2.6.8 Default DPCH Offset Value (FDD only)

Indicates the default offset value within interleaving size at a resolution of 512chip (1/5 slot) to offset CFN in the UE. This is used to distribute discontinuous transmission periods in time and also to distribute NodeB-RNC transmission traffics in time. Even though the CFN is offset by DOFF, the start timing of the interleaving will be the timing that "CFN mod (interleaving size)"=0 (e.g. interleaving size: 2,4,8) in both UE and SRNC.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Default DPCH Offset Value	M		Enumerated (0, 512, 1024..306688)	Number of chip, granularity of 512 chip. 0 to 599 times 512 chip.

10.2.6.9 Downlink DPCH info

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CHOICE *mode*				
>FDD				
>>DL channelisation code		1 to <maxChancount>		SF of the channelisation code of the data part for each DPCH
>>>Secondary scrambling code	O		Integer (0..14)	
>>>Spreading factor	M		Enumerated(4, 16, 32, 64, 128, 256, 512)	
>>>Code number	M		Integer(0..maxCodeNum)	
>>Fixed or Flexible Position	M		Enumerated (Fixed, Flexible)	
>>TFCI existence	M		Boolean	
>>Number of bits for Pilot bits	C-SF		Enumerated (2,4,8 bits)	
>>TX Diversity Mode	M			
>>SSDT Cell Id	O			
>TDD				
>>Activation Time	O		Integer (0...255)	Frame number start of allocation period. Default is activation time in UE information elements.
>>Duration	O		Integer (0...255)	Total number of frames. Default = 0 (for infinite)
>>TFCI coding	O		Enumerated(4,8,16,32)	Describes the way the TFCI bits are coded. Default: 1 TFCI bit coded with 4 bits. 2 TFCI bits coded with 8 bits. 3-5 TFCI bits coded with 16 bits. 6-10 TFCI bits coded with 32 bits.
>>Puncturing Limit	M			
>>Repetition period	O		Integer (1 ... Repetition period -1)	Repetition period of the DPCHs. Default value is 1.
>>Repetition length	O			Length of the allocation for each repetition period. Default value is 1.
>>Individual Timeslot info		1 to < max Timeslot		The first instance of the parameter Individual Timeslot

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
		count>		Info corresponds to the timeslot that shall be used first by the physical layer, the second to the timeslot that shall be used second and so on.
>>>channelisation code		1 to <max Codes count>	Enumerated ((1/1), (2/1), (2/2), (4/1)...(4/4), (8/1)...(8/8), (16/1)...(16/16))	The first instance of the parameter Channelisation code corresponds to the first DPCH in that timeslot that shall be used first by the physical layer, the second to the DPCH in that timeslot that shall be used second and so on.
>>>Timeslot	M		Integer (0...14)	Timeslot within a frame.
>>>TFCI presence	O		Boolean	If TFCI exists it shall be coded in the first DPCH in this timeslot. Default value is No TFCI.
>>>Burst type	O		Enumerated (Typ1, Typ2)	Short or long midamble for this timeslot. Default is burst type 1.
>>>Midamble shift	O		Integer (0...MaxMidambleShift – 1)	Midamble shift for this timeslot. Default is set by layer 1

Condition	Explanation
STTD	This IE is only sent if STTD is applied
SF	This IE is only sent if SF=128 or 256 is applied. If SF=256, value is 2,4 or 8 If SF=128, value is 4 or 8

Range Bound	Explanation
MaxChancount	Maximum number of channelisation codes used for DL DPCH
MaxCodeNum	Maximum number of codes for one spreading factor (SF) is equal to SF-1.
MaxTimeslotcount	Maximum number of timeslots used for DPCHs
MaxCodesCount	Maximum number of codes for one timeslots
MaxMidambleShift	Maximum number of Midamble Shifts

10.2.6.10 Downlink DPCH power control information

This information element indicates the range of SIR target values and the initial SIR target value to be set in the UE on this physical, channel for the downlink inner loop power control.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
DPC Mode	M		Enumerated (mode0, mode1)	
Initial SIR target value	M		Enumerated(-10, -9.5..20)	Initial SIR value to be used for the DL closed loop power control. Granularity of 0.5 dB.
Min SIR target value	M		Enumerated(-10, -9.5..20)	Minimum SIR value that can be set by the DL closed loop power control. Granularity of 0.5 dB.
Max SIR target value	M		Enumerated(-10, -9.5..20)	Maximum SIR value that can be set by the DL closed loop power control. Granularity of 0.5 dB.

10.2.6.11 Downlink Outer Loop Control

This information element indicates whether the UE is allowed or not to increase its downlink SIR target value above the current value.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
DL Outer loop control	M		Boolean	

10.2.6.12 DPCH compressed mode info (FDD only)

This information element indicates the parameters of the downlink compressed mode to be used by the UE in order to perform inter-frequency measurements.

Information Element/Group name	Presence	\Multi	IE type and reference	Semantics description
TGL	M		Enumerated(1..15)	Transmission Gap length expressed in number of slots
CFN	M		Enumerated(0..255)	Connection Frame Number when the first compressed frame starts
SN	M		Enumerated(0..14)	Slot number when the transmission gap starts (within the CFN)
TGP1	M		Enumerated(1..256)	The period of repetition of a set of consecutive frames containing up to 2 transmission gaps.
TGP2	O		Enumerated(1..256)	If TGP2 is included, TGP1 is used for the 1st and the consecutive odd gap periods and TGP2 is used for the even ones.
TGD	M		Enumerated(0..35)	Transmission gap distance indicates the number of frames between two consecutive transmission gaps within a transmission gap period. If there is only one transmission gap in the transmission gap period, this parameter shall be set to zero.
PD	M		Enumerated(1..35, Infinity)	The pattern duration is the total time of the compressed mode pattern (all consecutive TGPs) expressed in number of frames.
PCM	M		Enumerated ('mode 0', ' mode 1'.	Power control mode during the frame after the compressed frame. Indicates whether normal PC mode or compressed PC mode is applied
PRM	M		Enumerated ('mode 0', ' mode 1'.	Power resume mode is the uplink power control algorithm to be used to compute the initial transmit power after the compressed mode gap.
UL/DL mode	M		Enumerated ('DL only', 'UL/DL')	Defines whether only DL or combined UL/DL compressed mode is used.
Compressed mode method	M		Enumerated ('puncturing', 'SF/2', 'none')	Method for generating compressed mode gap
Scrambling code change	C if SF/2		Enumerated ('code change', 'no code change'.	Indicates whether the alternative scrambling code is used for compressed mode method 'SF/2'.
Downlink frame type	M		Enumerated ('A' or 'B')	
DeltaSIR	M		Enumerated(0, 0.5..7.5)	Delta in DL SIR target value to be set in the UE during the compressed frames

Information Element/Group name	Presence	\Multi	IE type and reference	Semantics description
				Granularity is 0.5 dB.
DeltaSIRafter	M		Enumerated(0, 0.5..7.5)	Delta in DL SIR target value to be set in the UE one frame after the compressed frames . Granularity is 0.5 dB.

Condition	Explanation
SF/2	This information element is only sent when the value of the "Compressed mode method" IE is "SF/2".

10.2.6.13 Dynamic persistence level

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Dynamic persistence level	M			

10.2.6.14 Frequency info

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CHOICE mode				
>FDD				
>>UARFCN uplink (Nu)	M		Enumerated(0..698)	[25.101]
>>UARFCN downlink (Nd)	O		Enumerated(175..623)	[25.101]
>TDD				
>>UARFCN (Nt)	M		Enumerated(0..698)	[25.102]
CHOICE *mode*				
>FDD				
>>Duplex distance	O			Default = 190 MHz
Chip rate	O			Default = 3.84 Mcps
Radio Access Mode	O		Enumerated (TDD, FDD)	Identifies whether the UTRA RF Channel Number corresponds to FDD or TDD.

10.2.6.15 Gated Transmission Control info (FDD only)

This IE is used to start or stop uplink(if possible)/downlink gated transmission of DPCCH.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Gating pattern	M		Enumerated (periodic, random-)	
Gating rate	M		Enumerated (Full rate,1/3 , 1/5 or 0(FFS))	Indicates gated transmission rate

10.2.6.16 Maximum allowed UL TX power

This information element indicates the maximum allowed uplink transmit power.

Information Element	Presence	Range	IE type and reference	Semantics description
Maximum allowed UL TX power			Enumerated(-50..33)	In dBm

10.2.6.17 PDSCH code mapping (FDD only)

This IE indicates the association between each possible value of TFCI(field 2) and the corresponding PDSCH channelisation code. There are three ways that the UTRAN must choose between in order to signal the mapping information, these are described below. The signalling capacity consumed by the different methods will vary depending on the way in which the UTRAN configures usage of the DSCH. In each case the location of the PDSCH code tree root is signalled. A given PDSCH channelisation code within the PDSCH code tree is then identified by spreading factor, SF_α and code number $(0..(SF_\alpha / SF_{root})-1)$, where SF_{root} is the SF of the root of the PDSCH code sub-tree.

Method #1 - Using code range

The mapping is described in terms of a number of groups, each group associated with a given spreading factor. The UE maps TFCI(field2) values to PDSCH codes in the following way. The PDSCH code used for TFCI(field 2) = 1 , is given by the SF and code number = 'PDSCH code start' of Group = 1. The PDSCH code used for TFCI(field 2) = 2 , is given by the SF and code number = 'PDSCH code start' + 1. This continues, with unit increments in the value of TFC mapping to unit increments in code number up until the point that code number = 'PDSCH code stop'. The process continues in the same way for the next group with the TFCI(field 2) value used by the UE when constructing its mapping table starting at the largest value reached in the previous group plus one. In the event that 'PDSCH code start' = 'PDSCH code stop' (as may occur when mapping the PDSCH root code to a TFCI (field 2) value) then this is to be interpreted as defining the mapping between the channelisation code and a single TFCI (i.e., TFCI(field 2) should not be incremented twice).

Method #2 - Using TFCI range

The mapping is described in terms of a number of groups, each group corresponding to a given PDSCH channelisation code. The PDSCH code specified in the first group applies for all values of TFCI(field 2) between 1 and the specified 'Max TFCI(field2)'. The PDSCH code specified in the second group applies for all values of TFCI(field 2) between the 'Max TFCI(field2) value' specified in the last group plus one and the specified 'Max TFCI(field2)' in the second group. The process continues in the same way for the following groups with the TFCI(field 2) value starting at the largest value reached in the previous group plus one.

Method #3 - Explicit

The mapping between TFCI(field 2) value and PDSCH channelisation code is spelt out explicitly for each value of TFCI (field2)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Root of PDSCH sub tree				
>Spreading factor	M		Enumerated(4, 8, 16, 32, 64, 128, 256, 512)	
>Code number	M		Integer(0..maxCodeNumComp-1)	
Choice *signalling method*				
>code range				
>>PDSCH code mapping		1 to <MaxNoCodeGroups>		
>>Spreading factor	M		Enumerated(4, 8, 16, 32, 64, 128, 256, 512)	
>>>PDSCH code start				
>>>>Code number	M		Integer(0..maxCodeNumDSCH-1)	
>>>PDSCH code stop				
>>>>Code number	M		Integer(0..maxCodeNumDSCH-1)	
>TFCI range				
>>DSCH mapping		1 to		

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
		<MaxNoTFCIGroups>		
>>>Max TFCI(field2) value	M		Integer(1..512)	This is the maximum value in the range of TFCI(field 2) values for which the specified PDSCH code applies
>>>PDSCH code				
>>>>Spreading factor	M		Enumerated(4, 8, 16, 32, 64, 128, 256, 512)	
>>>>>Code number	M		Integer(0..maxCodeNumDSCH-1)	
>Explicit				
>>>PDSCH code		1 to MaxTFCI_2_Combs		The first instance of the parameter *PDSCH code* corresponds to TFCI (field2) = 1, the second to TFCI(field 2) = 2and so on.
>>>>Spreading factor	M		Enumerated(4, 8, 16, 32, 64, 128, 256, 512)	
>>>>>Code number	M		Integer(0..maxCodeNumDSCH-1)	

Range Bound	Explanation
MaxCodeNumComp	Maximum number of codes at the defined spreading factor, within the complete code tree.
MaxCodeNumDSCH	Maximum number of codes at the defined spreading factor within the part of the code tree occupied by the PDSCH sub-tree.
MaxTFCI_2_Combs	Maximum number of TFCI (field 2) combinations (given by 2 raised to the power of the length of the TFCI field 2)
MaxNoTFCIGroups	Maximum number of groups, each group described in terms of a range of TFCI(field 2) values for which a single PDSCH code applies.
MaxNoCodeGroups	Maximum number of groups, each group described in terms of a range of PDSCH channelisation code values for which a single spreading factor applies.

10.2.6.18 PDSCH info (TDD only)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Activation time	M		Integer (0...255)	Frame number start of allocation period. Default is Activation time in UE information elements
Duration	M		Integer (0...255)	Total number of frames
Repetition Period	O		Integer (1, 2, 4, 8, 16, 32, 64)	Repetition period Default value is 1
Repetition length	O		Integer (1 ... Repetition length –1)	. Default value is 1
TFCI coding	O		Enumerated(4,8,16,32)	Describes the way the TFCI bits are coded. Default: 1 TFCI bit coded with 4 bits. 2 TFCI bits coded with 8 bits. 3-5 TFCI bits coded with 16 bits. 6-10 TFCI bits coded with 32 bits.
Puncturing Limit	M			
Individual Timeslot info		1 to <maxTimeslotcount>		The first instance of the parameter Individual Timeslot Info corresponds to the timeslot that shall be used first by the physical layer, the second to the timeslot that shall be used second and so on.
>channelisation codes	M	1 to <max codes count>	Enumerated ((1/1), (2/1), (2/2), (4/1)...(4/4), (8/1)...(8/8). (16/1)... (16/16))	The first instance of the parameter Channelisation code corresponds to the first PDSCH in that timeslot that shall be used first by the physical layer, the second to the PDSCH in that timeslot that shall be used second and so on.
>Timeslot	M		Integer (0...14)	Timeslot within a frame
TFCI existence	O		Boolean	If the TFCI exists it shall be coded in the first PDSCH in this timeslot. Default value is No TFCI.
>Burst Type	O		Enumerated (Typ1, Typ2)	Short or long midamble for this timeslot. Default is burst type 1.
>Midamble Shift	O		Integer (0... max Midamble Shift is –1)	Midamble shift for this timeslot. Layer 1 sets default.

Range Bound	Explanation
MaxTimeslotcount	Maximum number of timeslots used for PDSCHs
Max Codescount	Maximum number of codes for PDSCH

10.2.6.19 PDSCH with SHO DCH Info (FDD only)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
DSCH radio link identifier	M		Integer(0..511)	This parameter indicates on which radio link the user will be allocated resource on the DSCH. The CPICH scrambling code will be used for this purpose.
TFCI Combining set				This is used to indicate which of the downlink TFCI(field 2) transmissions made on the DPCCHs within the active set should be soft combined on the physical layer.
Radio link identifier		0 to <MaxCombineSet>	Integer(0..511)	The CPICH scrambling code is used for this purpose

Range Bound	Explanation
MaxCombineSet	Maximum number of radio links in the DCH active set transmitted from BS's under the CRNC from which the DSCH is being scheduled

10.2.6.20 PICH Info

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CHOICE *mode*				
>FDD				
>>Secondary scrambling code	O		Integer(0..14)	
>>Channelisation code	M		Integer(0..255)	SF is fixed and equal to 256
>>Number of PI per frame	M		Enumerated (18, 36 72 144)	
>>STTD indicator	M		Boolean	
>TDD				
>>Channelisation code	O		Enumerated ((1/1), (2/1), (2/2), (4/1)...(4/4), (8/1)...(8/8), (16/1)...(16/16))	Default is the channelisation code used by the SCCPCH carrying the associated PCH.
>>Timeslot	O		Integer(0...14)	Default is the timeslot used by the SCCPCH carrying the associated PCH.
>Burst type	O		Enumerated (Typ1,Typ2)	Default is the burst used by the SCCPCH carrying the associated PCH.
>>Midamble shift	O		Integer (0...maxMidambleShift – 1)	Default is the midamble shift used by the SCCPCH carrying the associated PCH.
Offset	O		Integer (0...Repetition period -1)	SFN mod Repetitionperiod = Offset.
>>Repetition period	O		Integer (1, 2, 4, 8, 16, 32, 64)	Repetition period of the PICH. Default value is 64.
>>Repetition length	O		Integer (2, 4,	Length of the allocation for

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
			8)	each repetition period. Default value is 2.
>>Paging indicator length	O		Integer (4, 8, 16)	Indicates the length of one paging indicator. Default is 4.

10.2.6.21 PICH Power offset (FDD only)

This is the power transmitted on the PICH minus power of the Primary CPICH.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
PICH Power offset	M			

10.2.6.22 PRACH info (for FAUSCH) (FDD only)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Fast access slot		1 to <maxAS>		
Preamble spreading code		1 to <maxPreambleSC>		
Preamble signature		1 to <maxPreambleSigs>		
FAUSCH usage				Indicates true/false for "use for DCH allocation", "use for USCH capability request".

Range Bound	Explanation
MaxAS	Number of access slots for the preambles (Every 16 chips)
MaxPreambleSC	Number of preamble spreading codes
MaxPreambleSigs	Number of allowed preamble signatures

10.2.6.23 PRACH info (for RACH)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Persistence factor N	M			0-1 step ffs
CHOICE *mode*				
>FDD				
>>Available Signature		1 to <maxSigNum>		
>>>Signature	M		Enumerated (0,1.2…..15)	
>>Available SF		1 to <maxSf>		
>>>SF	M		Enumerated (32,64,128,256 chip/sym)	
>>Scrambling code word number	M		Enumerated (0,1.2…..255)	
>>Puncturing Limit	M		Enumerated(0.40, 0.44..1)	Granularity of 0.04
>>Available Sub Channel number		1 to < maxSubChNum >		
>>>Sub Channel number	M		Enumerated (0,1,2,….11)	
>>>RACH message length	M		Enumerated (10 ms, 20 ms)	The 20 ms length is only used for minimum RACH payload (ffs)
>TDD				
>>Timeslot	M		Integer (0...14)	
>>Channelisation code	M		Enumerated ((8/1)...(8/8), (16/1)...(16/16)	1:1 mapping between spreading code and midamble shift
>>Max PRACH Midamble Shifts	O		Enumerated (4,8)	The maximum number of midamble shifts for the PRACH: 4 or 8. If no number is specified the default value 8 applies.
>>PRACH Midamble	O		Enumerated (1,2)	Direct or inverted midamble

Range Bound	Explanation
MaxSubChNum	Maximum number of available sub channels = 12
MaxSigNum	Maximum number of available signatures = 16
MaxSf	Maximum number of available SF = 4

10.2.6.24 PRACH power control info (FDD only)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
UL interference	M		Enumerated(-110..-70)	In dBm
Constant Value	M		Enumerated(-10..10)	In dBm
CHOICE mode				
>FDD				
>>Primary CPICH DL TX power	M		Enumerated(6..43)	In dBm
>>Power offsetΔP_0	M		Enumerated(-10..10)	Power step when no acquisition indicator is received. In dBm
>>Power offsetΔP_1	M		Enumerated(-10..10)	Power step when negative acquisition is received. In dBm
>>Power offset□Pp-m	M		Enumerated(-5..10)	Power offset between preamble and the message part. In dBm
>TDD				
>>Primary CCPCH DL Tx power	M			

NOTE: The usage of these parameters needs clarification and is also dependent on the WG1 RACH discussions.

10.2.6.25 PRACH power offset (FDD)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Power offset P0	M			Power step when no acquisition indicator is received.
Power offset P1	M			Power step when negative acquisition is received
Power offset P p-m	M			Power offset between preamble and the message part

10.2.6.26 Primary CCPCH DL TX Power (TDD only)

Information Element/group name	Presence	Range	IE type and reference	Semantics description
Primary CCPCH DL Tx Power	M		Enumerated(6..43)	In dBm and 1 dB granularity

10.2.6.27 Primary CCPCH info

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CHOICE *mode*				
>FDD				
>>STTD indicator	M		Boolean	
>TDD				
>>Timeslot	M		Integer (0...maxTScount)	PSCH timeslot
>>Cell parameters ID	C-MessageType		Integer (0...127)	For the cell parameter table
>>Sync case	C-MessageType		Enumerated (1, 2, 3)	Case 1,2, or 3
>>Offset	O		Integer (0... Repetition period-1)	SFN modulo Repetition period = offset. Default value is 0.
>>Repetition period	O		Integer (1, 2, 4, 8, 16, 32, 64)	Repetition period of the PCCPCH. Default value is 1.
>>Repetition length	O		Integer (1...Repetition period - 1)	Length of the allocation for each repetition. Default value is 1.
>>Block STTD indicator	O			

Condition	Explanation
C-MessageType	Mandatory in HANDOVER COMMAND message

Range Bound	Explanation
MaxTScount	In synchronisation case 2 and 3 MaxTScount is 6. In synchronisation case 1 MaxTScount is 14.

10.2.6.28 Primary CPICH DL Tx power (FDD)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Primary CPICH DL Tx Power	M		Enumerated(6..43)	In dBm and 1 dB granularity

10.2.6.29 Primary CPICH info (FDD only)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Primary scrambling code	M		Enumerated(0..511)	

10.2.6.30 PUSCH info (TDD only)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Activation time	M		Integer (0..255)	Frame number start of allocation period. Default is Activation time in UE information elements
Duration	M		Integer (0..255)	Total number of frames
Puncturing Limit	M			
TFCI coding	O		Enumerated(4,8,16,32)	Describes the way the TFCI bits are coded. Default: 1 TFCI bit coded with 4 bits. 2 TFCI bits coded with 8 bits. 3-5 TFCI bits coded with 16 bits. 6-10 TFCI bits coded with 32 bits.
Repetition Period	O		Integer (1, 2, 4, 8, 16, 32, 64)	Repetition period of the DPCHs. Default value 1
Repetition length	O		Integer (1 ... Repetition length –1)	Length of the allocation for each repetition period. Default value is 1
Individual Timeslot info		1 to <maxTimeslotcount>		The first instance of the parameter Individual Timeslot Info corresponds to the timeslot that shall be used first by the physical layer, the second to the timeslot that shall be used second and so on.
>channelisation code			Enumerated ((1/1), (2/1), (2/2), (4/1)...(4/4), (8/1)...(8/8), (16/1)... (16/16))	The first instance of the parameter Channelisation code corresponds to the first PUSCH in that timeslot that shall be used first by the physical layer, the second to the PUSCH in that timeslot that shall be used second and so on.
>Timeslot	M		Integer (0...14)	Timeslot number
TFCI existence	O		Boolean	If the TFCI exists it shall be coded in the first PUSCH in this timeslot. Default value is No TFCI.
>Burst Type	M		Enumerated (Typ1, Typ2)	Short or long midamble for this timeslot. Default is burst type 1.
>Midamble Shift	M		Integer (0...maxMidambleShift – 1)	Midamble shift for this timeslot. Layer 1 sets default.

Range Bound	Explanation
MaxPUSCHTimeslotcount	Maximum number of timeslots used for PUSCHs
MaxCodesCount	Maximum number of codes for PUSCH

10.2.6.31 PUSCH power control info (TDD only)

Interference level measured for a frequency at the UTRAN access point used by UE to set PUSCH output power.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
UL Maximum SIR	M		Enumerated (.1dB steps)	Maximum UE transmit power limit
UL target SIR	M			
UL Minimum SIR	O			

10.2.6.32 RF channel number priority

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
RF channel number priority	M			Enable the setting of priority of the UTRA RF Channel Number parameter, to facilitate efficient system/ cell/ channel identification and selection processes

NOTE: a Liaison has been sent to determine whether this IE is necessary

10.2.6.33 Secondary CCPCH info

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Selection Indicator	C-BCCH		Enumerated (On, Off)	
CHOICE *mode*				
>FDD				
>>Secondary scrambling code	O		Integer (0..14)	
>>STTD indicator	M		Boolean	
>>Spreading factor	M		Enumerated(4, 16, 32, 64, 128, 256)	
>>Code number	M		Integer(0..maxCodeNum)	
>>Pilot symbol existence	M		Boolean	
>>TFCI existence	M		Boolean	
>>Fixed or Flexible Position	M		Enumerated (Fixed, Flexible)	
>>Timing Offset	O			Time difference between PCCPCH
>TDD				
>>TFCI coding	O		Enumerated(4,8,16,32)	Describes the way the TFCI bits are coded. Default: 1 TFCI bit coded with 4 bits. 2 TFCI bits coded with 8 bits. 3-5 TFCI bits coded with 16 bits. 6-10 TFCI bits coded with 32 bits.
>>Repetition period	O		Integer (1, 2, 4, 8, 16, 32, 64)	Repetition period of the SCCPCH Default value is 1.
>>Repetition length	O		Integer (1...Repetitionperiod – 1)	Length of the allocation for each repetition. Default value is 1.
>>Offset	O		Integer (0...Repetition Period -1)	SFN modulo Repetition period = offset. Default value is 0.
>>lisation code		1 to < max Codes count >	Enumerated ((1/1), (2/1), (2/2), (4/1)...(4/4), (8/1)...(8/8), (16/1)...(16/16))	The first instance of the parameter Channelisation code corresponds to the first code in that timeslot that shall be used first by the physical layer, the second to the code in that timeslot that shall be used second and so on.
>>Time slot	M		Integer (0...14)	Timeslot within a frame
>>TFCI existence	O		Boolean	If the TFCI exists it shall be coded in the first code in this timeslot. Default is No TFCI
>>Burst type			Enumerated(Type1, Type2)	Long or short midamble used in this timeslot. Default is burst type 1
>>Midamble shift	O		Integer (0...max Midamble Shift-1)	Midamble shift of this timeslot. Layer 1 sets default.

Condition	Explanation
BCCH	This IE is only sent when BCCH is used

Range Bound	Explanation
MaxCodeNum	Maximum number of codes for one spreading factor (SF) is equal to SF-1.
MaxCodesCount	Maximum number of codes in one timeslot.

10.2.6.34 Secondary CPICH info (FDD only)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
DL scrambling code	C-*PrimCPICH*		Enumerated(0..511)	
Channelisation code	M		Enumerated(0..255)	

Condition	Explanation
PrimCPICH	This IE is only included if the DL scrambling code is different to that of the primary CPICH

10.2.6.35 SSDT cell identity (FDD only)

This IE is used to associate a cell identity with a given radio link

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Temporary id	M		Enumerated (a, b, …, h)	

10.2.6.36 SSDT indicator (FDD only)

This information element indicates the status (e.g. initiated/terminated) of the Site Selection

Diversity Transmit power control (SSDT). It is used to change the SSDT status. The parameter 'code word set' indicates how cell identities are coded (using many bits or few, values are long, medium, or short).

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
S field	M		Enumerated (1, 2 bits)	
Code Word Set	M		Enumerated (long, medium, short, SSDT off)	

NOTE: These parameters shall be set optinally associated with DL DPCH info but not for each RL.

10.2.6.37 TFC Control duration

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
TFC Control duration	M		Integer (1..16)	Defines the period in multiples of 10 ms frames for which the defined TFC sub-set is to be applied.

10.2.6.38 TFCI Combining Indicator (FDD only)

This IE indicates whether the TFCI (field 2) which will be transmitted on the DPCCH of a newly added radio link should be soft combined with the others in the TFCI (field 2) combining set. This IE is only sent when the UE is in Cell_DCH state with a DSCH transport channel assigned.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
TFCI combining indicator	M		Boolean	

10.2.6.39 Timing Advance (TDD only)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
UL Timing Advance	M		Integer (0..255)	

10.2.6.40 TPC combination index (FDD only)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
TPC combination index	M		Enumerated(0..5)	Radio links with the same index have TPC bits, which for the UE are known to be the same.

10.2.6.41 TX Diversity Mode (FDD only)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Mode	M		Enumerated (none, STTD, closed loop mode1, closed loop mode2)	Associated with DL DPCH info (but not for each RL)

NOTE: These parameters shall be set optinally associated with DL DPCH info but not for each RL.

10.2.6.42 UL interference (FDD)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
UL interference	M			

10.2.6.43 Uplink DPCH info

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CHOICE *mode*				
>FDD				
>>UL scrambling code				What short or long uplink scrambling code a certain UE should use
>>>Scrambling code type	M		Enumerated(short, long)	
>>>Scrambling code number	M		Integer(0..16 777215)	(24 bits)
>>Number of DPDCH	M		Integer(1.. maxDPDCH count)	
>>>DPDCH channelisation code	C-*Single*		Enumerated(4, 8, 16, 32, 64, 128, 256)	SF of the channelisation code for data part
>>TFCI existence	M	Boolean		
>>Number of FBI bits	O		Enumerated (1, 2 bits)	If neither SSDT nor FB Mode Transmit Diversity Signalling is supported, this parameter is not needed and the number of FBI bits is set to "0".
>>Puncturing Limit	M			
>TDD				
>>Puncturing Limit	M		Enumerated(0.40, 0.44..1)	Granularity of 0.04
>>TFCI coding	O		Enumerated(4,8,16,32)	Describes the way the TFCI bits are coded. Default: 1 TFCI bit coded with 4 bits. 2 TFCI bits coded with 8 bits. 3-5 TFCI bits coded with 16 bits. 6-10 TFCI bits coded with 32 bits.
>>Activation Time	O		Integer (0...255)	Frame number start of allocation period Default is the Activation time in the UE information elements
>>Duration	O		Integer (0...255)	Total number of frames Default = 0 (for infinite).
>>Repetition period	O		Integer (1,2,4,8,16,3 2,64)	SFN modulo 64 = repetition period. Default value is 1.
>>Repetition length	O		Integer (1... Repetition period – 1)	Length of the allocation for each repetition period. Default value is 1.
>>Individual timeslot info		1 to < max Timeslot count>		The first instance of the parameter Individual Timeslot Info corresponds to the timeslot that shall be used first by the physical layer, the second to the timeslot that shall be used second and so on.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
>>>channelisation code		1 to < max Codes count >	Enumerated ((1/1), (2/1), (2/2), (4/1)...(4/4), (8/1)...(8/8), (16/1)...(16/16))	Channelisation codes to be used in the uplink for DPCH
>>>Timeslot	M		Integer (0...14)	Timeslot of DPCH for each DPCH
>>>TFCI existence	O		Boolean	If the TFCI exists it shall be coded in the first DPCH in this timeslot. Default value is No TFCI.
>>>Burst	O		Enumerated (Type1, Type2)	Short or long midamble for this timeslot. Default is burst type 1
>>>Midamble shift	O		Integer(0...maxMidamble Shift – 1)	Midamble shift for thistimeslot. Default is set by layer 1.

Condition	Explanation
Single	This IE is included if IE "Number of DPDCH" is "1"

Range Bound	Explanation
MaxDPDCHcount	Maximum number of DPDCHs
MaxCodesCount	Maximum number of codes for one timeslot
MaxTimeslotcount	Maximum number of timeslots used for DPCHs

10.2.6.44 Uplink DPCH power control info

Parameters used by UE to set DPCH initial output power and to use for closed-loop power control.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CHOICE *mode*				
>FDD				
>>DPCCH Power offset	M		Enumerated(-164, -162..-6)	In dB
>>Power Control Algorithm	M		Enumerated (algorithm 1 or algorithm 2)	Specifies algorithm to be used by UE to interpret TPC commands
>>TPC step size	C-algorithm1		Enumerated (1dB, 2dB)	
>TDD				
>>UL Maximum SIR	M		Enumerated (.1dB steps)	Maximum UE transmit power limit
>>UL target SIR	O			
>>UL Minimum SIR	O			

Condition	Explanation
C-algorithm1	This IE shall be present when the PC algorithm equals algorithm 1

10.2.7 Measurement Information elements

10.2.7.1 CFN-SFN observed time difference (FDD only)

The measured time difference to cell indicates the time difference that is measured by UE between CFN in the UE and the SFN of the target neighbouring cell. It is notified to SRNC by Measurement Report message or Measurement Information Element in other RRC messages. This measurement is for FDD only

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CFN-SFN observed time difference	M		Enumerated(0..9830399)	Number of chip

10.2.7.2 Inter-frequency cell info

Contains the measurement object information for an inter-frequency measurement.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Frequency info	M			
Cell individual offset	O		Enumerated(-10, -9.5..10)	Granularity 0.5 dB
Reference time difference to cell	O		Enumerated((-153088, 152576 ..153088)	In chip. This is –299 to 299 times 512 chip in steps of 512 chip
CHOICE *mode*				
>FDD				
>>Primary CPICH info	O			Not required if measuring RSSI only
>>Primary CPICH Tx power	O			
>TDD				
>Primary CCPCH info	M			
>Primary CCPCH TX power	O			
Cell Selection and Reselection Info	O			
>Qmin	O		Integer (-20..0)	Ec/N0, [dB] Default = same as in serving cell
>Maximum allowed UL TX power	O			[dBm] UE_TXPWR_MAX_RACH in 25.304. Default = same as in serving cell
>Qoffset$_{s,n}$ [dB]	O		Integer(-20, -19.5..20)	[dB] Default = 0 dB. Used in Alternative 1 in TS 25.304

10.2.7.3 Inter-frequency measurement event results

This IE contains the measurement event results that are reported to UTRAN for inter-frequency measurements.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Event ID	M			
Frequency info				
Choice mode				
>FDD				
>>Primary CPICH info	O			
>TDD				
>>Primary CCPCH info	O			

10.2.7.4 Inter-frequency measurement quantity

The quantity the UE shall measure in case of inter-frequency measurement. It also includes the filtering of the measurements.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CHOICE *mode*				
>FDD				
>>CHOICE *reporting criteria*				
>>>Intra-frequency measurement quantity	M		Enumerated(CPICH Ec/N0, CPICH RSCP, CPICH SIR, Pathloss, UTRA Carrier RSSI)	Pathloss=Primary CPICH Tx power-CPICH RSCP CPICH SIR is FFS
>>>Measurement quantity for frequency quality estimate	M		Enumerated(CPICH Ec/N0, CPICH RSCP)	
>TDD				
>>CHOICE *reporting criteria*				
>>>Intra-frequency measurement quantity	M		Enumerated(Primary CCPCH RSCP, Pathloss, UTRA carrier RSSI)	Pathloss=Primary CCPCH Tx power-Primary CCPCH RSCP
>>>Measurement quantity for frequency quality estimate			Enumerated(Primary CCPCH RSCP)	

CHOICE *reporting criteria*	Condition under which the given *reporting criteria* is chosen
Intra-frequency measurement quantity	Used when intra-frequency measurement reporting criteria is used for this measurement
Measurement quantity for frequency quality estimate	Used when inter-frequency measurement reporting criteria is used for this measurement

10.2.7.5 Inter-frequency measurement reporting criteria

The triggering of the event-triggered reporting for an inter-frequency measurements. All events concerning inter-frequency measurements are labelled 2x where x is a,b,c..

Event 2a: Change of best frequency.

Event 2b: The estimated quality of the currently used frequency is below a certain threshold **and** the estimated quality of a non-used frequency is above a certain threshold.

Event 2c: The estimated quality of a non-used frequency is above a certain threshold

Event 2d: The estimated quality of the currently used frequency is below a certain threshold

Event 2e: The estimated quality of a non-used frequency is below a certain threshold

Event 2f: The estimated quality of the currently used frequency is above a certain threshold

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Parameters required for each event		0 to <maxEvent count>		
>Event ID	M		Enumerated (2a, 2b, 2c, 2d, 2e, 2f)	
>Treshold used frequency	C – clause 0			
>W used frequency	C – clause 0		Enumerated(0, 0.1..2.0)	Granularity 0.1
>Hysteresis	M		Enumerated(0, 0.5..14.5)	In event 2a, 2b, 2c, 2d, 2e, 2f Granularity 0.5 dB
>Time to trigger	M		Enumerated(0, 10, 20, 40, 60, 80, 100, 120, 160, 200, 240, 320, 640, 1280, 2560, 5000)	Indicates the period of time between the timing of event detection and the timing of sending Measurement Report. Time in ms.
>Amount of reporting	M		Enumerated(1, 2, 4, 8, 16, 32, 64,	
>Reporting interval	M		Enumerated(0, 0.25, 0.5, 1, 2, 4, 8, 16)	Indicates the interval of periodical reporting when such reporting is triggered by an event. A zero value indicates that event triggered periodical reporting shall not be applied. Interval in seconds
>Parameters required for each non-used frequency		**0 to <maxNon usedfrequ ency>**		
>>Threshold non used frequency	C – clause 1			
>>W non-used frequency	**C-clause 1**		Enumerated(0, 0.1..2.0)	Granularity 0.1

Condition	Explanation
Clause 0	This parameter is only sent in event 2a,2b, 2d,, 2f
Clause 1	This parameter is only sent in event 2a, 2b, 2c, 2e

10.2.7.6 Inter-frequency reporting quantity

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
SFN-SFN observed time difference	M		Boolean	Note 1
Cell Identity	M		Boolean	
UTRA Carrier RSSI	M		Boolean	
Frequency quality estimate	M		Boolean	
CHOICE *mode*				
>FDD				
>>CPICH Ec/N0	M		Boolean	
>>CPICH RSCP	M		Boolean	
>>Pathloss	M		Boolean	
>>CFN-SFN observed time difference	M		Boolean	Note 1
>TDD				
Primary CCPCH RSCP	M		Boolean	

NOTE 1: Feasibility of performing these measurements with compressed mode is unclear.

10.2.7.7 Inter-frequency SET UPDATE (FDD only)

Contains the changes of the active set associated with a non-used frequency. This information makes it possible to use events defined for Intra-frequency measurement within the same non-used frequency for Inter-frequency measurement reporting criteria. This information also controls if the UE should use autonomous updating of the active set associated with a non-used frequency.

Information Element/group name	Presence	Range	IE type and reference	Semantics description
UE autonomous update mode	M		Enumerated (On, On with no reporting, Off)	
Radio link addition information		0 to <MaxAddRLcount>		Radio link addition information required for each RL to add
>Primary CPICH info	C-Update			Note 1
Radio link removal information		0 to <MaxDelRLcount>		Radio link removal information required for each RL to remove
>Primary CPICH info	C-Update			Note 1

Condition	Explanation
Update	This IE is only present if IE"UE autonomous update mode" is set to "Off".

Range bound	Explanation
MaxAddRLcount	Maximum number of radio links which can be added
MaxDelRLcount	Maximum number of radio links which can be removed/deleted

NOTE 1: If it is assumed that CPICH downlink scrambling code is always allocated with sufficient reuse distances, CPICH downlink scrambling code will be enough for designating the different radio links.

10.2.7.8 Inter-system cell info

Contains the measurement object information for an inter-system measurement.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CHOICE *Radio Access Technology*				
>GSM				
>$Qaccept_{s,n}$	M		Integer (0..63)	Unit according to RXLEV, GSM TS 05.08
>Base transceiver Station Identity Code (BSIC)	M			GSM TS 03.03
>>Network Colour Code (NCC)	M		Integer (0..7)	
>>Base Station Colour Code (BCC)	M		Integer (0..7)	
>BCCH ARFCN	M		Integer (0..1023)	GSM TS 04.18
>>Output power	O			
>IS-2000				
>>System specific measurement info			enumerated (frequency, timeslot, colour code, output power, PN offset)	For IS-2000, use fields from TIA/EIA/IS-2000.5, Section 3. 7.3.3.2.27, *Candidate Frequency Neighbor List Message*

10.2.7.9 Inter-system measurement event results

This IE contains the measurement event results that are reported to UTRAN for inter-system measurements.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Event ID	M			
>>Frequency	M			
>>BSIC	M			

Condition	Explanation
GSM	This information element is only sent when the system being measured is a GSM system

10.2.7.10 Inter-system measurement quantity

The quantity the UE shall measure in case of inter-system measurement. It also includes the filtering of the measurements.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CHOICE mode				
>FDD				
>>Measurement quantity for UTRAN quality estimate	M		Enumerated(CPICH Ec/I0, CPICH RSCP)	
>TDD				
>>Measurement quantity for UTRAN quality estimate	M		Enumerated(Primary CCPCH RSCP)	
CHOICE *system*				
>GSM				
>>Measurement quantity	M		Enumerated(GSM Carrier RSSI, Pathloss)	
>>BSIC verification required	M		Boolean	Note 1
>IS2000				
>>TADD E_c/I_0	M		Integer(0..63)	Admission criteria for neighbours, see section 2.6.6.2.6 of TIA/EIA/IS-2000.5
>>TCOMP E_c/I_0	M		Integer(0..15)	Admission criteria for neighbours, see section 2.6.6.2.5.2 of TIA/EIA/IS-2000.5
>>SOFT SLOPE	O		Integer(0..63)	Admission criteria for neighbours, see section 2.6.6.2.3 and 2.6.6.2.5.2 of TIA/EIA/IS-2000.5
>>ADD_INTERCEPT	O		Integer(0..63)	Admission criteria for neighbours, see section 2.6.6.2.5.2 of TIA/EIA/IS-2000.5

NOTE 1 The possibility to use this IE is dependant on comments from SMG2.

Also, this IE must be set to "true" if IE "Observed time difference to GSM cell" in IE "Inter-system measurement reporting quantity "is set to "true".

CHOICE *system*	Condition under which the given *system* is chosen
GSM	Used when the system being measured is a GSM system

10.2.7.11 Inter-system measurement reporting criteria

The triggering of the event-triggered reporting for an inter-system measurement. All events concerning inter-system measurements are labelled 3x where x is a,b,c..

Event 3a: The estimated quality of the currently used UTRAN frequency is below a certain threshold **and** the estimated quality of the other system is above a certain threshold.

Event 3b: The estimated quality of other system is below a certain threshold

Event 3c: The estimated quality of other system is above a certain threshold

Event 3d: Change of best cell in other system

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Parameters required for each event		0 to <maxEvent count>		
>Event ID	M		Enumerated (3a, 3b, 3c, 3d)	
>Treshold own system	C – clause 0			
>W	C – clause 0			In event 3a
>Threshold other system	C – clause 1			In event 3a, 3b, 3c
>Hysteresis	M			
>Time to trigger	M			Indicates the period of time between the timing of event detection and the timing of sending Measurement Report.
>Amount of reporting	M			
>Reporting interval	M			Indicates the interval of periodical reporting when such reporting is triggered by an event. A zero value indicates that event triggered periodical reporting shall not be applied.

Condition	Explanation
Clause 0	This parameter is only sent in event 3a
Clause 1	This parameter is only sent in event 3a, 3b and 3c

10.2.7.12 Inter-system reporting quantity

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
UTRAN estimated quality	M		Boolean	
CHOICE *system*				
>GSM				
>>Pathloss	M		Boolean	
>>Observed time difference to GSM cell	M		Boolean	
>>GSM Carrier RSSI	M		Boolean	
>>BSIC	M		Boolean	

CHOICE *system*	Condition under which the given *system* is chosen
GSM	Used when the system being measured is a GSM system

10.2.7.13 Intra-frequency cell info

Contains the measurement object information for an intra-frequency measurement.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Cell individual offset	O		Enumerated(-10, -9.5..10)	Granularity 0.5 dB
Reference time difference to cell	O			
CHOICE *mode*				
>FDD				
>>Primary CPICH info	M			
>>Primary CPICH Tx power	O			
>>SFN Measurement Indicator	M		Boolean	
>>STTD Indicator	M		Boolean	
>TDD				
>>Primary CCPCH info	M			
>>Primary CCPCH Tx power	O			
>>DL CCTrCH info	O			List of TFCS ID's to measure
>>DL Timeslot info	O			List of timeslots to measure
Cell Selection and Reselection parameters	O			
>Qmin	O		Integer (-20..0)	Ec/N0 or SIR, [dB]. Note 1. Default = same as in serving cell
>Maximum allowed UL TX power	O			[dBm] UE_TXPWR_MAX_RACH in 25.304. Default = same as in serving cell
>$Qoffset_{s,n}$ [dB]	O		Integer(-20, -19.5..20)	[dB] Default = 0 dB. Used in Alternative 1 in TS 25.304

10.2.7.14 Intra-frequency measurement event results

This IE contains the measurement event results that are reported to UTRAN for intra-frequency measurements.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Event ID	M			
CHOICE *mode*				
>FDD				
>>Primary CPICH info	O			
>TDD				
>>Primary CCPCH info	O			

10.2.7.15 Intra-frequency measurement quantity

The quantity the UE shall measure in case of intra-frequency measurement. It also includes the filtering of the measurements.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CHOICE *mode*				
>FDD				
>>Measurement quantity	M		Enumerated(CPICH Ec/N0, CPICH RSCP, CPICH SIR, Pathloss)	Pathloss=Primary CPICH Tx power-CPICH RSCP Note 1
>TDD				
>>Measurement quantity	M		Enumerated(Primary CCPCH RSCP, Pathloss, Timeslot ISCP)	Pathloss=Primary CCPCH Tx power-Primary CCPCH RSCP

NOTE: If CPICH SIR can be used has not been concluded in WG4

10.2.7.16 Intra-frequency measurement reporting criteria

The triggering of the event-triggered reporting for an intra-frequency measurement. All events concerning intra-frequency measurements are labelled 1x where x is a, b, c….

Event 1a: A Primary CPICH enters the Reporting Range (FDD only)

Event 1b: A Primary CPICH leaves the Reporting Range (FDD only)

Event 1c: A Non-active Primary CPICH becomes better than an active Primary CPICH (FDD only)

Event 1d: Change of best cell [Note 1] (FDD only)

Event 1e: A Primary CPICH becomes better than an absolute threshold (FDD only)

Event 1f: A Primary CPICH becomes worse than an absolute threshold (FDD only)

Event 1g: Change of best cell in TDD

Event 1h: DL CCTrCH below a certain threshold (TDD only)

Event 1i: Timeslot ISCP below a certain threshold (TDD only)

Event 1j: Timeslot ISCP above a certain threshold (TDD only)

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Parameters required for each event		0 to <maxEvent count>		
>Event ID	M		Enumerated (1a,1b,1c,1d, 1e,1f,1g,1h,1 I,1j)	
>Triggering condition	C - clause 0		enumerated(Active set cells, Monitored set cells, Active set cells and monitored set cells)	Indicates which cells that can trigger the event
>Reporting Range	C - clause 1		Enumerated(0, 0.5..14.5)	In event 1a,1b. Granularity 0.5 dB
>Cells forbidden to affect Reporting range	C – clause 1	0 to <maxCells Forbidden>		In event 1a,1b
>>CHOICE *mode*				
>>>FDD				
>>>>Primary CPICH info	M			
>>>TDD				
>>>>Primary CCPCH info	M			
>W	C – clause 1		Enumerated(0, 0.1..2.0)	Granularity 0.1
>Hysteresis	C & O - clause 2		Enumerated(0, 0.5..7.5)	In event 1a, 1b, 1c,1d, 1g, 1h, 1i or 1j. Granularity 0.5 dB
>Reporting deactivation >threshold	C - clause 3		Enumerated(0..7)	In event 1a Indicates the maximum number of cells allowed in the active set in order for event 1a to occur. Value 0 indicates "not applicable".
>Replacement activation threshold	C - clause 4		Enumerated(0..7)	In event 1c Indicates the minimum number of cells allowed in the active set in order for event

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
				1c to occur. Value 0 indicates "not applicable".
>Time to trigger	M		Enumerated(0, 10, 20, 40, 60, 80, 100, 120, 160, 200, 240, 320, 640, 1280, 2560, 5000)	Indicates the period of time between the timing of event detection and the timing of sending Measurement Report. Time in ms
>Amount of reporting	M		Enumerated(1, 2, 4, 8, 16, 32, 64, Infinity)	Measurement is "released" after the indicated amount of reporting from the UE itself.
>Reporting interval	M		Enumerated(0, 0.25, 0.5, 1, 2, 4, 8, 16)	Indicates the interval of periodical reporting when such reporting is triggered by an event. A zero value indicates that event triggered periodical reporting shall not be applied. Interval in seconds

Condition	Explanation
Clause 0	This parameter is only sent in event 1a,1b, 1e, 1f
Clause 1	This parameter is only sent in event 1a,1b
Clause 2	This parameter is only sent in event 1a,1b, 1c,1d, 1g, 1h, 1i, 1j
Clause 3	This parameter is only sent in event 1a
Clause 4	This parameter is only sent in event 1c

Range Bound	Explanation
MaxCellsForbidden	Maximum number of cells that can be forbidden to affect reporting range

NOTE 1: When best PCCPCH in active set changes, all active cells are reported.

10.2.7.17 Intra-frequency reporting quantity

Contains the reporting quantity information for an intra-frequency measurement.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
For active set cells				
>SFN-SFN observed time difference	M		Enumerated(No report, type 1, type 2)	
>Cell Identity	M		Boolean	
CHOICE *mode*				
>>FDD				
>>>CPICH Ec/N0	M		Boolean	
>>>CPICH RSCP	M		Boolean	
>>>CPICH SIR	M		Boolean	Note 1
>>>Pathloss	M		Boolean	
>>>CFN-SFN observed time difference	M		Boolean	
>>TDD				
>>>DL CCTrCH SIR	M		Boolean	
Timeslot ISCP	M		Boolean	
Primary CCPCH RSCP	M		Boolean	
>>>Pathloss	M		Boolean	
For monitored set cells				
>SFN-SFN observed time difference	M		Enumerated(No report, type 1, type 2)	
>Cell Identity	M		Boolean	
>CHOICE *mode*				
>>FDD				
>>>CPICH Ec/N0	M		Boolean	
>>>CPICH RSCP	M		Boolean	
>>>CPICH SIR	M		Boolean	Note 1
>>>Pathloss	M		Boolean	
>>>CFN-SFN observed time difference	M		Boolean	
>>TDD				
>>>DL CCTrCH SIR	M		Boolean	
>>>Timeslot ISCP	M		Boolean	
>>>Primary CCPCH RSCP	M		Boolean	
>>>Pathloss	M		Boolean	

NOTE 1: If CPICH SIR can be used has not been concluded in WG4

10.2.7.18 Intra-frequency reporting quantity for RACH reporting

Contains the reporting quantity information for an intra-frequency measurement report, which is sent on the RACH.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
SFN-SFN observed time difference	M		Enumerated(No report, type 1, type 2)	
CHOICE *mode*				
>FDD				
>>CHOICE quantity				
>>>CPICH Ec/N0			NULL	
>>>CPICH RSCP			NULL	
>>>CPICH SIR			NULL	Note 1
>>>Pathloss			NULL	
>TDD				
>>Timeslot ISCP				
>>Primary CCPCH RSCP				

NOTE 1: If CPICH SIR can be used has not been concluded in WG4

10.2.7.19 Maximum number of reported cells on RACH

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Number of reported cells	M		Enumerated (no report, current cell, current cell + best neighbour, current cell+2 best neighbours, …, current cell+6 best neighbours)	

10.2.7.20 Measured results

Contains the measured results of the quantity indicated optionally by Reporting Quantity in Measurement Control. "Measured results" can be used for both event trigger mode and periodical reporting mode.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Intra-frequency measurement results		0 to <maxIntraCells>		
Cell Identity	O			
SFN-SFN observed time difference	O			
CHOICE *mode*				
>FDD				
>>Primary CPICH info	M			
>>CPICH Ec/N0	O		Enumerated(-20..0)	In dB
>>CPICH RSCP	O		Enumerated(-115..-40)	In dBm
>>CPICH SIR	O		Enumerated(-10..20)	In dB Note 1
>>Pathloss	O		Enumerated(46..158)	In dB
>>CFN-SFN observed time difference	O			
>TDD				
>>Primary CCPCH info	M			
>>Primary CCPCH RSCP	O			
>>DL CCTrCH SIR		0 to <maxCCTrCHcount>		SIR measurements for each DL CCTrCH
>>>Timeslot		0 to <maxTSperCCTrCHcount		All timeslots on which the CCTrCH is mapped on
>>>>ISCP	O			
>>>>RSCP	O			
>>DL Timeslot ISCP		0 to <maxTStoMEASURE count>		ISCP measurements for each timeslot indicated by the UTRAN
>>>ISCP	O			
Inter-frequency measurement results		0 to <maxNumFreq>		
>UTRA carrier	M			
>UTRA carrier RSSI	O		Enumerated(-95..-30)	In dBm
>Inter-frequency cell measurement results		0 to <maxInterCells>		
>>Cell Identity	O			
>>SFN-SFN observed time difference	O			
>>CHOICE *mode*				
>>>FDD				
>>>>Primary CPICH info	M			
>>>>CPICH Ec/N0	O		Enumerated(-20..0)	In dB
>>>>CPICH RSCP	O		Enumerated(-115..-40)	In dBm
>>>>Pathloss	O		Enumerated(46..158)	In dB
>>>>CFN-SFN observed time difference	O			
>>>TDD				

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
>>>>Primary CCPCH info	M			
>>>>Primary CCPCH RSCP	O			
Inter-system measurement results		0 to <maxInterSys>		
CHOICE *system*				
>GSM				
>>Frequency	M			
>>GSM carrier RSSI	O		Enumerated(0..63)	RXLEV GSM TS 05.08
>>Pathloss	O		Enumerated(46..158)	In dB
>>BSIC	O		Bitstring(6)	GSM TS 03.03
>>Observed time difference to GSM cell	O		Enumerated(0..4095*3060/(4096*13)	In steps of 3060/(4096*13) ms
Traffic volume measurement results		0 to <MaxTraf>		
>RB Identity	M			
RLC buffers payload	O		Enumerated(0, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2K, 4K, 8K, 16K, 32K, 64K, 128K, 256K, 512K, 1024K)	In bytes And Kbytes = N*1024 bytes
>Average RLC buffer payload	O		Enumerated(0, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2K, 4K, 8K, 16K, 32K, 64K, 128K, 256K, 512K, 1024K)	In bytes And Kbytes = N*1024 bytes
>Variance of RLC buffer payload	O		Enumerated(0, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2K, 4K, 8K, 16K)	In bytes And Kbytes = N*1024 bytes
Quality measurement results				
BLER measurement results		0 to <MaxBLER>		
>Transport channel identity	M			
>DL Transport Channel BLER	O		Enumerated(0, 0.02 ..5.10)	dB%=-Log10(Transport channel BLER) Granularity 0.02
DL Physical Channel BER	O		Enumerated(0, 0.02 ..5.10)	dB%=-Log10(Physical channel BER) Granularity 0,02
SIR	O		Enumerated(-10..20)	In dB
UE Internal measurement results				
UE Position	O			
CHOICE *mode*				
>FDD				
>>UE Transmitted Power	O		Enumerated(-50..33)	UE transmitted power In dBm

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
>TDD				
UE transmitted Power	O	0 to <maxUsed UplTScount >		UE transmitted power for each used timeslot (TDD)

Range Bound	Explanation
MaxCCTrCHcount	Maximum number of DL CCTrCH allocated to an UE
MaxTSperCCTrCHcount	Maximum number of TS on which a single DL CCTrCH is mapped on
maxTStoMEASUREcount	Maximum number of TS on which the UE has to measure
maxUsedUplTScount	Maximum number of TS used for UL transmissions
MaxIntraCells	Maximum number of Intra-frequency cells that can be included in a measurement report
MaxNumFreq	Maximum number of frequencies with intra-frequency cells that can be included in a measurement report
MaxInterCells	Maximum number of Inter-frequency cells for one frequency that can be included in a measurement report
MaxInterSys	Maximum number of Inter-system cells that can be included in a measurement report
MaxTraf	Maximum number of radio bearers with traffic volume measurements that can be included in a measurement report
MaxBLER	Maximum number of transport channels with BLER measurements that can be included in a measurement report

NOTE 1: If CPICH SIR can be used has not been concluded in WG4

10.2.7.21 Measurement Command

Information Element	Presence	Range	IE type and reference	Semantics description
Measurement command	M		Enumerated(Setup,Modify ,Release)	

10.2.7.22 Measurement Identity Number

A reference number that is used by the UTRAN at modification and release of the measurement, and by the UE in the measurement report.

10.2.7.23 Measurement reporting mode

Contains the type of Measurement Report transfer mode and the indication of periodical/event trigger.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Measurement Report Transfer Mode	M		enumerated (Acknowledged mode RLC, Unacknowledged mode RLC)	
Periodical Reporting / Event Trigger Reporting Mode	M		enumerated (Periodical reporting, Event trigger)	

NOTE 1: The work in order to support the CPICH Rx SIR measurement is in progress in RAN WG4 and may impact the use of that measurement in this document

10.2.7.24 Measurement results on RACH

Information Element/group name	Presence	Range	IE type and reference	Semantics description
Measurement result for current cell				
CHOICE *mode*				
>FDD				
>>CHOICE measurement quantity				
>>>CPICH Ec/N0			Enumerated(-20..0)	In dB
>>>CPICH RSCP			Enumerated(-115..-40)	In dBm
>>>CPICH SIR			Enumerated(-10..20)	In dB Note 1
>>>Pathloss			Enumerated(46..158)	In dB
>TDD				
>>Timeslot ISCP				
>>Primary CCPCH RSCP				
Measurement results for neighbouring cells		0 to 6		
>SFN-SFN observed time difference	O			
>CHOICE *mode*				
>>FDD				
>>>Primary CPICH info	M			
>>>CHOICE measurement quantity				
>>>>CPICH Ec/N0			Enumerated(-20..0)	In dB
>>>>CPICH RSCP			Enumerated(-115..-40)	In dBm
>>>>CPICH SIR			Enumerated(-10..20)	In dB Note 1
>>>>Pathloss			Enumerated(46..158)	In dB
>>TDD				
>>>Primary CCPCH info	M			
>>>Primary CCPCH RSCP				

NOTE 1: If CPICH SIR can be used has not been concluded in WG4

10.2.7.25 Measurement Type

Information Element	Presence	Range	IE type and reference	Semantics description
Measurement Type	M		Enumerated(Intra-frequency, Inter-frequency, Inter-system, Traffic volume, Quality, UE internal)	

10.2.7.26 Measurement validity

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Resume/release	M		Enumerated('resume', 'release')	Indicates whether a given measurement identifier should be released after transitions to CELL_DCH and/or transitions from CELL_DCH state.
UE state	C – if Resume		Enumerated('CELL_DCH' , 'all states except CELL_DCH', 'all states')	Indicates the states, in which measurement reporting shall be conducted. The values 'all states except CELL_DCH' and 'all states' are used for measurement type 'traffic volume reporting'.

Condition	Explanation
Resume	If "Resume/Release" = Resume

10.2.7.27 Observed time difference to GSM cell

NOTE: Only the section is made.

10.2.7.28 Periodical reporting criteria

Contains the periodical reporting criteria information. It is necessary only in the periodical reporting mode.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Amount of reporting	O		Enumerated(1, 2, 4, 8, 16, 32, 64, Infinity)	Measurement is "released" after the indicated amount of reporting from the UE itself
Reporting interval	O		Enumerated(0, 0.25, 0.5, 1, 2, 3, 4, 6, 8, 12, 16, 20, 24, 28, 32, 64)	Indicates the interval of periodical report. Interval in seconds

10.2.7.29 Quality measurement event results (FFS)

NOTE: Only the section is made.

10.2.7.30 Quality measurement object (FFS)

NOTE: Only the section is made.

10.2.7.31 Quality measurement quantity (FFS)

NOTE: Only the section is made.

10.2.7.32 Quality measurement reporting criteria (FFS)

NOTE: Only the section is made.

10.2.7.33 Quality reporting quantity

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
DL Transport Channel BLER for each transport channel	M		Boolean	
DL Physical channel BER	M		Boolean	
SIR	M		Boolean	

10.2.7.34 Reference time difference to cell

The reference time difference to cell indicates the time difference between the primary CCPCH of the current cell and the primary CCPCH of a neighbouring cell. It is notified to UE by System Information or Measurement Control message.

In case of macro-diversity the reference is the primary CCPCH of one the cells used in the active set.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CHOICE *accuracy*				
>40 chips				
>>Reference time difference	M		Enumerated(0..40..38400)	
>256 chips				
>>Reference time difference	M		Enumerated(0..256..38400)	
>2560 chips				
>>Reference time difference	M		Enumerated(0..2560..3840 0)	

NOTE: Exactly how the reference cell is pointed out in this case in the messages is FFS.

10.2.7.35 SFN Measurement Indicator

Indicates whether the UE should read cell SFN of the target neighbour cell or not.

10.2.7.36 SFN-SFN observed time difference

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
CHOICE *type*				
>Type 1			Enumerated(0..983 0399)	Number of chip
>Type 2			Enumerated(-1279, -1278.5..1280)	Number of chip Granularity of 0.5 chip

10.2.7.37 Traffic volume measurement event results

Contains the event result for a traffic volume measurement.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Transport Channel ID	M		Enumerated(1..64)	
Event type	O		Enumerated(Overflow, Underflow)	

10.2.7.38 Traffic volume measurement object

Contains the measurement object information for a traffic volume measurement.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Target Transport Channel ID	M		Enumerated(1..64)	

10.2.7.39 Traffic volume measurement quantity

Contains the measurement quantity information for a traffic volume measurement.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Measurement quantity	M		Enumerated(RLC buffer payload, Average RLC buffer payload, Variance of RLC buffer payload)	

10.2.7.40 Traffic volume measurement reporting criteria

Contains the measurement reporting criteria information for a traffic volume measurement.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Parameters sent for each transport channel		1 to <maxTrCH count>		
>Transport Channel ID	M		Enumerated(1..64)	
>Upper Threshold	M		Enumerated(8,16,32,64,128,256,512,1024,1536,2048,3072,4096,6144,8192)	Threshold in bytes
>Lower Threshold	O		Enumerated(8,16,32,64,128,256,512,1024,1536,2048,3072,4096,6144,8192)	Threshold in bytes
Time to trigger	M		Enumerated(0, 10, 20, 40, 60, 80, 100, 120, 160, 200, 240, 320, 640, 1280, 2560, 5000)	Indicates the period of time between the timing of event detection and the timing of sending Measurement Report. Time in ms
Pending time after trigger	M		Enumerated(0.25, 0.5, 1, 2, 4, 8, 16)	Indicates the period of time during which it is forbidden to send any new measurement reports with the same measurement ID even if the triggering condition is fulfilled again. Time in seconds
Tx interruption after trigger	M		Enumerated(0.25, 0.5, 1, 2, 4, 8, 16)	Indicates whether or not the UE shall block DTCH transmissions on the RACH after a measurement report is triggered. Time in seconds
Amount of reporting	M		Enumerated(1, 2, 4, 8, 16, 32, 64, Infinity)	Measurement is "released" after the indicated amount of reporting from the UE itself.
Reporting interval	M		Enumerated(0, 0.25, 0.5, 1, 2, 4, 8, 16)	Indicates the interval of periodical report during the event is in the detected state. Interval in seconds.

Range Bound	Explanation
MaxTrCHcount	Maximum number of transport channels = 64

10.2.7.41 Traffic volume reporting quantity

Contains the reporting quantity information for a traffic volume measurement.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
RLC buffer payload for each RB	M		Boolean	
Average RLC buffer payload for each RAB	M		Boolean	
Variance of RLC buffer payload for each RAB	M		Boolean	

10.2.7.42 UE internal measurement quantity

The quantity the UE shall measure in case of UE internal measurement.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Measurement quantity	M		Enumerated(UE Transmitted Power, UTRA Carrier RSSI)	

10.2.7.43 UE internal measurement reporting criteria

The triggering of the event-triggered reporting for a UE internal measurement. All events concerning UE internal measurements are labelled 6x where x is a, b, c…. In TDD, the events 6a - 6d are measured and reported on timeslot basis.

Event 6a: The UE Transmitted Power becomes larger than an absolute threshold

Event 6b: The UE Transmitted Power becomes less than an absolute threshold

Event 6c: The UE Transmitted Power reaches its minimum value

Event 6d: The UE Transmitted Power reaches its maximum value

Event 6e: The UE RSSI reaches the UE's dynamic receiver range

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Parameters sent for each UE internal measurement event		1 to <maxEvent count>		
>Event ID	M		Enumerated(6a,6b,6c,6d, 6e)	
>Time-to-trigger	M		Enumerated(0, 10, 20, 40, 60, 80, 100, 120, 160, 200, 240, 320, 640, 1280, 2560, 5000)	Indicates the period of time between the timing of event detection and the timing of sending Measurement Report. Time in ms
>UE Transmitted power Tx power threshold	C - clause 1		Enumerated(-50..33)	In event 6a, 6b. Power in dBm

Condition	Explanation
Clause 1	This parameter is only sent in event 6a,6b

10.2.7.44 UE Internal reporting quantity

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
UE Transmitted Power	M		Boolean	
UE Position	M		Boolean	

10.2.8 Other Information elements

10.2.8.1 BCCH modification info

Indicates modification of the System Information on BCCH.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
MIB Value tag	M		Value tag	
BCCH Modification time	O		Integer (0, 2, 4, .. 4094)	All even SFN values are allowed.

10.2.8.2 Cell Value tag

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Cell Value tag	M		Enumerated (1..4)	

10.2.8.3 Inter-system message

This Information Element contains one or several messages that are structured and coded according to the specification used for the system type indicated by the first parameter.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
System type	M		Enumerated (GSM,1..15)	
Message(s)	M	1..<maxInterSysMessages>	Bitstring (1..512)	Formatted and coded according to specification for the indicated system type. See Note 1

Range Bound	Explanation
MaxInterSysMessages(=4)	Maximum number of Inter System Messages to send

NOTE 1: For inter-system handovers to IS 2000 system, this field shall consist of the Universal Handoff Direction message, described in Section 3.7.3.3.2.36 of TIA/EIA IS-2000.5

10.2.8.4 MIB Value tag

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
MIB Value tag	M		Enumerated (1..8)	

10.2.8.5 PLMN Value tag

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
PLMN Value tag	M		Enumerated (1..256)	

10.2.8.6 Scheduling information

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
SIB type	M			
PLMN Value tag	C - Blocktype			
Cell Value tag	C - Blocktype			
Scheduling	O			
>SEG_COUNT	O		SEG_COUNT	
>SIB_REP	M		Enumerated (4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048)	Repetition period for the SIB in frames
>SIB_POS	M		Enumerated (0, 2, 4, 6, ..Rep-2)	Position of the first segment
>SIB_POS offset info	O			
>>SIB_OFF	M	Segcount-1	Enumerated (2, 4, 6, ..32)	Offset of subsequent segments

Condition	Explanation
Blocktype	The presence of this IE depends on the value of the preceding SIB type. This IE is mandatory if the specification of the SIB of that SIB type includes as first IE the corresponding Value tag IE.

Option	Default value
SIB_POS offset info	If the SIB_POS offset info is not present, the receiver shall understand that all segments are consecutive, i.e., that the SIB_OFF would have been 0, 1, 2, …
SEG_COUNT	If not present, the number of segments is one.
Scheduling	If not present, the SIB is not sent in the area scope.

Range Bound	Explanation
Segcount	The value of the SEG_COUNT IE
Rep	The value of the SIB_REP IE

10.2.8.7 SEG COUNT

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
SEG_COUNT	M		Integer (1..16)	Number of segments in the system information block

10.2.8.8 Segment index

Each system information segment has an individual segment index.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Segment index	M		Integer (0..15)	Segments of a system information block are numbered starting with 0 for the first part.

10.2.8.9 Segment type

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Segment type	M		Enumerated (First segment, Subsequent segment, Last segment, Complete)	

10.2.8.10 SIB data

Contains the result of the IE 'SIB Content' after segmentation.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
SIB data	M		Bit string (1..MaxLength)	

Range Bound	Explanation
MaxLength	Maximum length of a BCH- or FACH transport block used for broadcast of system information.

10.2.8.11 SIB type

The SIB type identifies a specific system information block.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
SIB type	M		Enumerated	

The list of values to encode is:

Master information block,

System Information Type 1,

System Information Type 2,

System Information Type 3,

System Information Type 4,

System Information Type 5,

System Information Type 6,

System Information Type 7

System Information Type 8,

System Information Type 9,

System Information Type 10,

System Information Type 11,

System Information Type 12

10.2.8.12 SI Padding

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
Padding	M		Bit string (1..MaxLength)	

All the bits of the 'SI Padding' IE shall be set to a fixed value in emission. However, it is not an error for the receiver to receive any other value for those bits.

Range Bound	Explanation
MaxLength	Maximum length of a BCH- or FACH transport block used for broadcast of system information.

10.2.9 ANSI-41 Information elements

10.2.9.1 ANSI-41 Global Service Redirection information

This Information Element contains ANSI-41 Global Service Redirection information.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
ANSI-41 Global Service Redirection information	M		Bit string (size (1..MaxLength))	Formatted and coded according to the 3GPP2 document "G3G CDMA DS on ANSI-41"

10.2.9.2 ANSI-41 NAS system information

This Information Element contains ANSI-41 system information.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
NAS (ANSI-41) system information	M		Bit string (size (1..MaxLength))	Formatted and coded according to the 3GPP2 document "G3G CDMA DS on ANSI-41"

10.2.9.3 ANSI-41 Private Neighbor List information

This Information Element contains ANSI-41 Private Neighbor List information.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
ANSI-41 Private Neighbor List information	M		Bit string (size (1..MaxLength))	Formatted and coded according to the 3GPP2 document "G3G CDMA DS on ANSI-41"

10.2.9.4 ANSI-41 RAND information

This Information Element contains ANSI-41 RAND information.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
ANSI-41 RAND information	M		Bit string (size (1..MaxLength))	Formatted and coded according to the 3GPP2 document "G3G CDMA DS on ANSI-41"

10.2.9.5 ANSI-41 User Zone Identification information

This Information Element contains ANSI-41 User Zone Identification information.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
ANSI-41 User Zone Identification information	M		Bit string (size (1..MaxLength))	Formatted and coded according to the 3GPP2 document "G3G CDMA DS on ANSI-41"

10.2.9.6 MIN_P_REV

This Information Element contains minimum protocol revision level.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
MIN_P_REV	M			Minimum protocol revision level

10.2.9.7 NID

This Information Element contains Network identification.

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
NID	M			Network identification

10.2.9.8 P_REV

This Information Element contains protocol revision level

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
P_REV	M			Protocol revision level

10.2.9.9 SID

This Information Element contains System identification

Information Element/Group name	Presence	Range	IE type and reference	Semantics description
SID	M			System identification

11 Message and Information element abstract syntax (with ASN.1)

This chapter contains definitions for RRC PDUs and IEs using a subset of ASN.1 as specified in I2.01. PDU and IE definitions are grouped into separate ASN.1 modules.

NOTE: The proposal is to keep both chapter 10 and 11 (at least until all messages and information elements are fully discussed and agreed by 3GPP RAN WG2). Chapter 10 is intended to give an abstract description (in English) of the messages and information elements whereas chapter 11 should contain the exact normative definitions with all necessary details.

12 Message transfer syntax

Transfer syntax for RRC PDUs is derived from their abstract syntax definitions by use of Packed Encoding Rules, unaligned (X.691). If special encoding is used, it is indicated in the ASN.1 description. How it is used is defined in TR 25.921, clause 11.2.

13 Protocol timers, counters and other parameters

13.1 Timers for UE

Timer	Value Range (seconds)	Relations	Start	Stop	At expiry
T300			Transmission of RRC CONNECTION REQUEST	Reception of RRC CONNECTION SETUP	Retransmit RRC CONNECTION REQUEST if V300 =< N300, else go to Idle mode
T301			Transmission of RRC CONNECTION REESTABLISHMENT REQUEST	Reception of RRC CONNECTION REESTABLISHMENT	Retransmit RRC CONNECTION REESTABLISH REQUEST if V301 =< N301, else go to Idle mode
T302			Transmission of CELL UPDATE	Reception of CELL UPDATE CONFIRM	Retransmit CELL UPDATE if V302 =< N302, else, go to Idle mode
T303			Transmission of URA UPDATE	Reception of URA UPDATE CONFIRM	Retransmit URA UPDATE if V303 =< N303, else go to Idle mode
T304			Transmission of UE CAPABILITY INFORMATION	Reception of UE CAPABILITY INFORMATION CONFIRM	Retransmit UE CAPABILITY INFORMATION if V304 =< N304, else initiate RRC connection reestablishment
T305			Entering CELL_FACH or CELL_PCH state. Reception of CELL UDPATE CONFIRM.	Entering another state.	Transmit CELL UPDATE if T307 is not activated.
T306			Entering URA_PCH state. Reception of URA UDPATE CONFIRM.	Entering another state.	Transmit URA UPDATE if T307 is not activated.
T307			When the timer T305 or T306 has expired and the UE detects "out of service area".	When the UE detects "in service area". Or, initiate cell update or URA update procedure depending on state	Transit to idle mode
T308			Transmission of RRC CONNECTION RELEASE COMPLETE	Not stopped	Transmit RRC CONNECTION RELEASE COMPLETE if V308 =< N308, else go to idle mode.
T309			Upon reselection of a cell belonging to another radio access system from connected mode	Successful establishment of a connection in the new cell	Resume the connection to UTRAN
T310			Transmission of PUSCH CAPACITY REQUEST	Reception of PHYSICAL SHARED CHANNEL ALLOCATION	Transmit PUSCH CAPACITY REQUEST if V310 =< N310, else procedure stops.

Timer	Value Range (seconds)	Relations	Start	Stop	At expiry
T311			Reception of PHYSICAL SHARED CHANNEL ALLOCATION message with the parameter "PUSCH Allocation Pending" set to "pending".	Reception of PHYSICAL SHARED CHANNEL ALLOCATION message with parameter "PUSCH Allocation Pending" set to "not pending".	UE may initiate a PUSCH capacity request procedure.
T312	Integer (1..16)		When the UE starts to establish dedicated CH	When the UE detects consecutive N312 "in sync" indication from L1.	The criteria for physical channel establishment failure is fulfilled
T313	Integer (1..16)		When the UE detects consecutive N313 "out of sync" indication from L1.	When the UE detects consecutive N315 "in sync" indication from L1.	The criteria for Radio Link failure is fulfilled
T314	Integer (0..4095)		When the UE detects that it is out of sync.	When the UE detects suitable cell and RRC Connection Re-establishment Request message is sent.	Transit to idle mode

13.2 Counters for UE

Counter	Reset	Incremented	When reaching max value
V300	When initiating the procedure RRC connection establishment	Upon expiry of T300.	When V300 > N300, the UE enters idle mode.
V301	When initiating the procedure RRC connection reestablishment	Upon expiry of T301.	When V301 > N301, the UE enters idle mode.
V302	When initiating the procedure Cell update	Upon expiry of T302	When V302 > N302 the UE enters idle mode.
V303	When initiating the procedure URA update	Upon expiry of T303	When V302 > N303 the UE enters idle mode.
V304	When sending the first UE CAPABILITY INFORMATION message.	Upon expiry of T304	When V304 > N304 the UE initiates the RRC connection re-establishment procedure

Counter	Reset	Decremented	When reaching zero
V308	When sending the first RRC CONNECTION RELEASE COMPLETE message in a RRC connection release procedure.	Upon expiry of T308	When V308 =0 the UE stops re-transmitting the RRC CONNECTION RELEASE COMPLETE message.

Counter	Reset	Incremented	When reaching max value
V310	When sending the first PUSCH CAPACITY REQUEST message in a PUSCH capacity request procedure	Upon expiry of T310	When V310 > N310 the UE stops re-transmitting the PUSCH CAPACITY REQUEST message.

13.3 UE constants and parameters

Constant	Value	Usage
N300		Maximum number of retransmissions of the RRC CONNECTION REQUEST message
N301		Maximum number of retransmissions of the RRC CONNECTION REESTABLISHMENT REQUEST message
N302		Maximum number of retransmissions of the CELL UPDATE message
N303		Maximum number of retransmissions of the URA UPDATE message
N304		Maximum number of retransmissions of the UE CAPABILITY INFORMATION message
N310		Maximum number of retransmission of the PUSCH CAPACITY REQUEST message
N312	Integer (1..1024)	Maximum number of successive "in sync" received from L1.
N313	Integer (1..1024)	Maximum number of successive "out of sync" received from L1.
N315	Integer (1..1024)	Maximum number of successive "in sync" received from L1 during T313 is activated.

14 Specific functions

14.1 Intra-frequency measurements

14.1.1 Intra-frequency measurement quantities

1 Downlink E_c/I_0 (chip energy per total received channel power density)

2 Downlink path loss.

3 Downlink received signal code power (RSCP) after despreading.

4 Downlink signal-to-interference ratio (SIR) after despreading on a specific DL physical channel (RSCP/ISCP)

NOTE: If CPICH SIR can be used has not been concluded in TSG-RAN WG4

5 Averaged signal-to-interference ratio (SIR) for all DL codes belonging to one TS and to one CCTrCH

6 ISCP measured on Timeslot basis

14.1.2 Intra-frequency reporting events for FDD

Within the measurement reporting criteria field in the Measurement Control message the UTRAN notifies the UE which events should trigger a measurement report. Examples of intra-frequency reporting events that would be useful for intra-frequency handover evaluation are given below. Note that normally the UEs do not need to report all these events. The listed events are the toolbox from which the UTRAN can choose the reporting events that are needed for the implemented handover evaluation function, or other radio network functions.

All the illustrated events are measured with respect to any of the measurement quantities given in section 14.1.1. The measurement objects are the monitored primary common pilot channels (CPICH). The reporting events are marked with vertical arrows in the figures below.

NOTE: The events below are numbered 1A, 1B, 1C,… since all intra-frequency reporting events would be labelled 1X, inter-frequency reporting events would be labelled 2X, and so on for the other measurement types.

14.1.2.1 Reporting event 1A: A Primary CPICH enters the reporting range

When event 1A is ordered by UTRAN in a measurement control message, the UE shall send a measurement report when a primary CPICH enters the reporting range as defined by the following formula:

$$10 \cdot LogM_{New} \geq W \cdot 10 \cdot Log\left(\sum_{i=1}^{N_A} M_i\right) + (1-W) \cdot 10 \cdot LogM_{Best} - (R + H_{1a}),$$

The variables in the formula are defined as follows:

$\boldsymbol{M_{New}}$ is the measurement result of the cell entering the reporting range.

$\boldsymbol{M_i}$ is a measurement result of a cell in the active set.

$\boldsymbol{N_A}$ is the number of cells in the current active set.

$\boldsymbol{M_{Best}}$ is the measurement result of the strongest cell in the active set.

$\boldsymbol{W}$ is a parameter sent from UTRAN to UE.

$\boldsymbol{R}$ is the reporting range

$\boldsymbol{H_{1a}}$ is the hysteresis parameter for the event 1a.

The addition window of cells in event 1A is configured with the **reporting range** parameter ($\boldsymbol{R}$) common to many reporting events and an optional **hysteresis** parameter ($\boldsymbol{H_{1a}}$), which can be used to distinguish the addition window from reporting windows related to other measurement events.

The occurrence of event 1A is conditional on a **report deactivation threshold** parameter. This parameter indicates the maximum number of cells allowed in the active set for measurement reports to be triggered by event 1A to be transmitted.

Event 1A may be enhanced with an addition timer, which is configured with the **time-to-trigger** parameter (see section 14.1.4.2). If a time-to-trigger value is used, a cell must continuously stay within the reporting range for the given time period, before the UE shall send a measurement report.

14.1.2.2 Reporting event 1B: A primary CPICH leaves the reporting range

When this event is ordered by UTRAN in a measurement control message, the UE shall send a measurement report when a primary CPICH leaves the reporting range as defined by the following formula:

$$10 \cdot LogM_{Old} \leq W \cdot 10 \cdot Log\left(\sum_{i=1}^{N_A} M_i\right) + (1-W) \cdot 10 \cdot LogM_{Best} - (R + H_{1b}),$$

The variables in the formula are defined as follows:

$\boldsymbol{M_{Old}}$ is the measurement result of the cell leaving the reporting range.

$\boldsymbol{M_i}$ is a measurement result of a cell in the active set.

$\boldsymbol{N_A}$ is the number of cells in the current active set.

$\boldsymbol{M_{Best}}$ is the measurement result of the strongest cell in the active set.

$\boldsymbol{W}$ is a parameter sent from UTRAN to UE.

$\boldsymbol{R}$ is the reporting range

$\boldsymbol{H_{1b}}$ is the hysteresis parameter for the event 1b.

The drop window of cells in event 1B is configured with the **reporting range** parameter ($\boldsymbol{R}$) common to many reporting events and an optional **hysteresis** parameter ($\boldsymbol{H_{1b}}$), which can be used to distinguish the drop window from reporting windows related to other measurement events.

Event 1B may be enhanced with a drop timer, which is configured with the **time-to-trigger** parameter. If the timer is used, the weakening cell must continuously stay below the reporting range for the given time period before the UE may send a measurement report.

14.1.2.3 Reporting event 1C: A non-active primary CPICH becomes better than an active primary CPICH

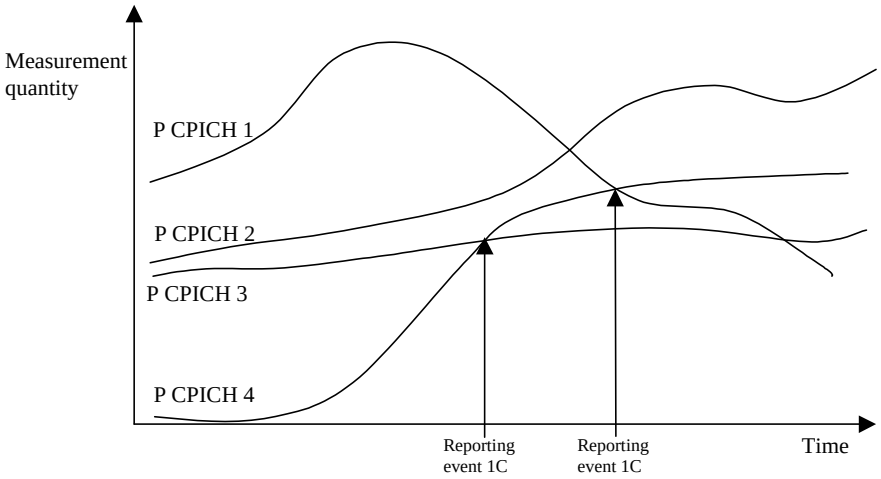


Figure 47: A primary CPICH that is not included in the active set becomes better than a primary CPICH that is in the active set

In this example the cells belonging to primary CPICH 1, 2 and 3 are supposed to be in the active set, but the cell transmitting primary CPICH 4 is not (yet) in the active set.

If a primary CPICH that is not included in the active set becomes better than a primary CPICH that is in the active set, and event 1C has been ordered by UTRAN, this event shall trigger a report to be sent from the UE.

This event may be used for replacing cells in the active set. It is activated if the number of active cells is equal to or greater than a **replacement activation threshold** parameter that UTRAN signals to the UE in the MEASUREMENT CONTROL message. This parameter indicates the minimum number of cells required in the active set for measurement reports triggered by event 1C to be transmitted.

14.1.2.4 Reporting event 1D: Change of best cell

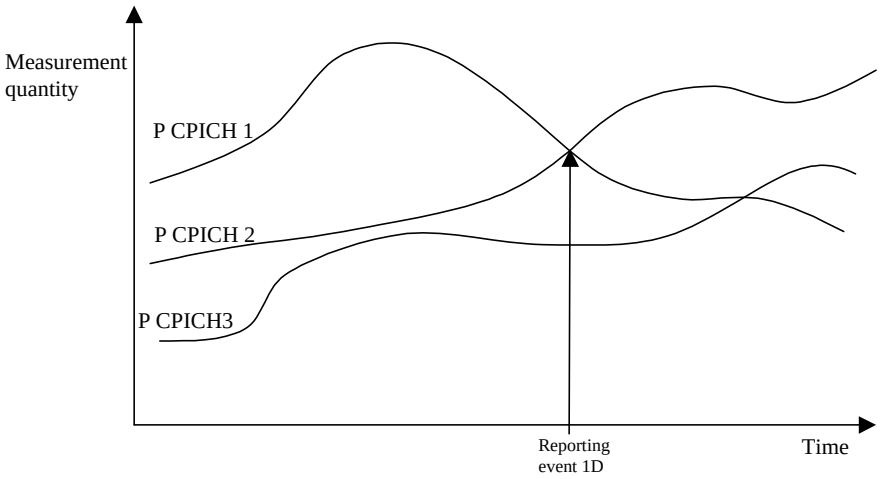


Figure 48: A primary CPICH becomes better than the previously best primary CPICH

If any of the primary CPICHs within the reporting range becomes better than the previously best primary CPICH, and event 1D has been ordered by UTRAN then this event shall trigger a report to be sent from the UE. The corresponding report contains (at least) the new best primary CPICH.

14.1.2.5 Reporting event 1E: A Primary CPICH becomes better than an absolute threshold

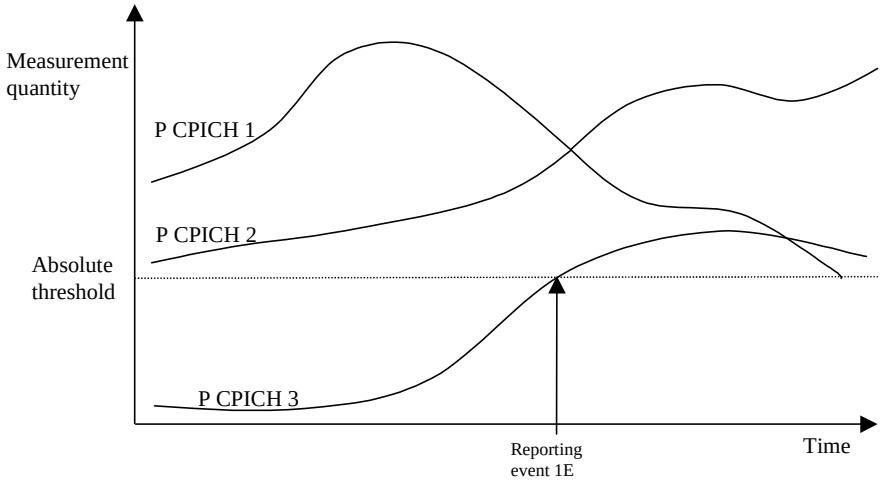


Figure 49: Event-triggered report when a Primary CPICH becomes better than an absolute threshold

When this event is ordered by UTRAN in a measurement control message the UE shall send a report when the Measurement quantity of a Primary CPICH becomes better than an absolute threshold. The corresponding report contains (at least) the involved Primary CPICH.

14.1.2.6 Reporting event 1F**:** A Primary CPICH becomes worse than an absolute threshold

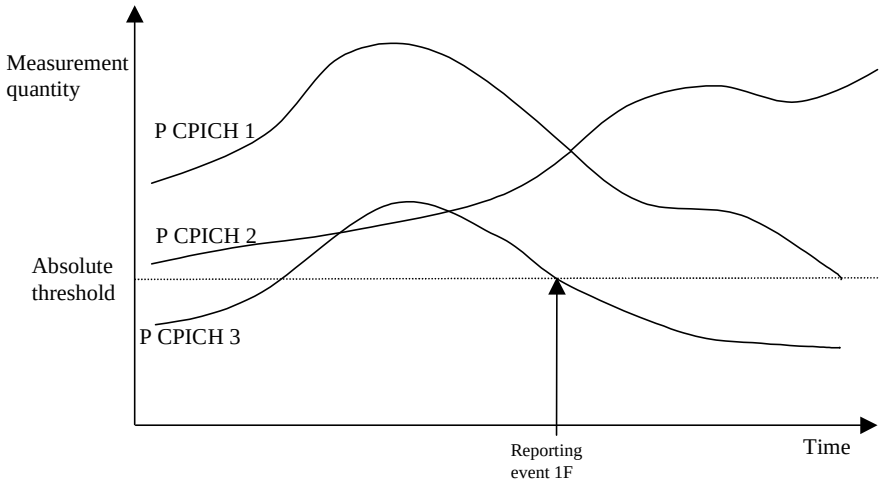


Figure 50: Event-triggered report when a Primary CPICH becomes worse than an absolute threshold

When this event is ordered by the UTRAN in a measurement control message the UE shall send a report when a primary CPICH becomes worse than an absolute threshold. The corresponding report contains (at least) the involved Primary CPICH.

14.1.3 Intra-frequency reporting events for TDD

14.1.3.1 Change of best cell

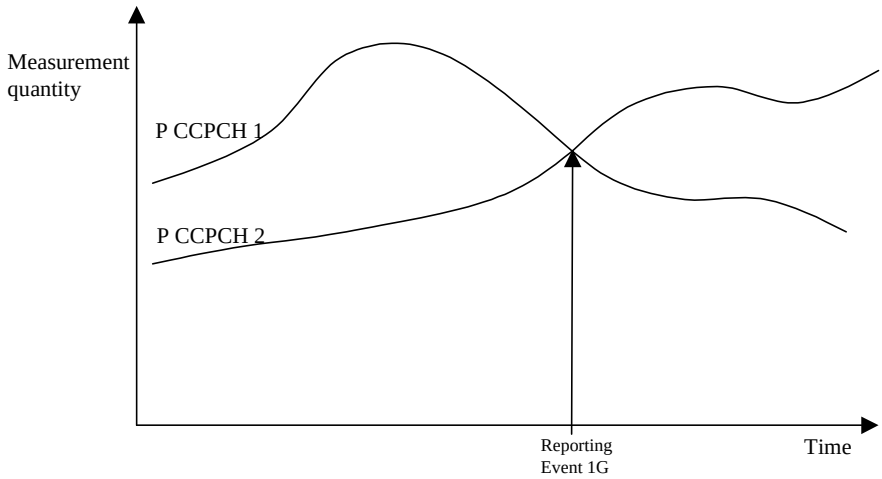


Figure 51: A primary CCPCH becomes better than the previous best primary CCPCH

If any of the primary CCPCHs becomes better than the previously best primary CCPCH, and event 1G has been ordered by UTRAN then this event shall trigger a report to be sent from the UE. The corresponding report contains (at least) the new best primary CCPCH.

14.1.3.2 DL CCTrCH below a certain threshold

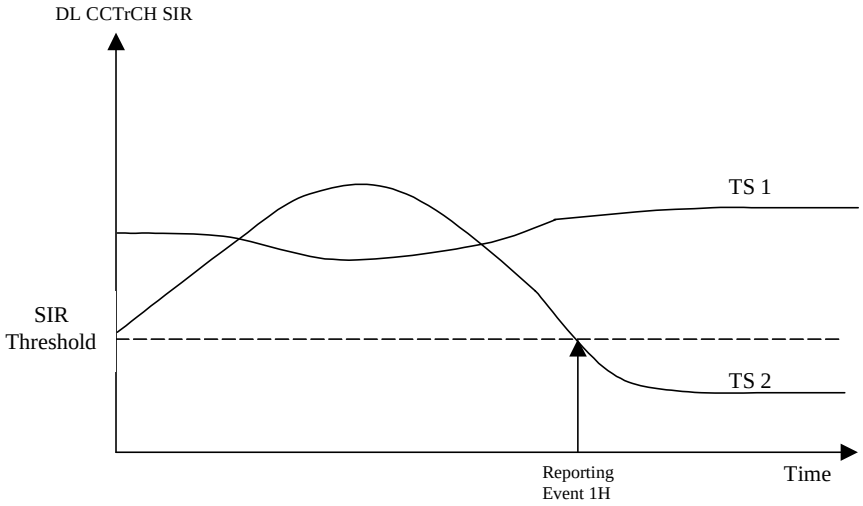


Figure 52: A SIR value of a timeslot becomes worse than an absolute threshold

14.1.3.3 Timeslot ISCP below a certain threshold

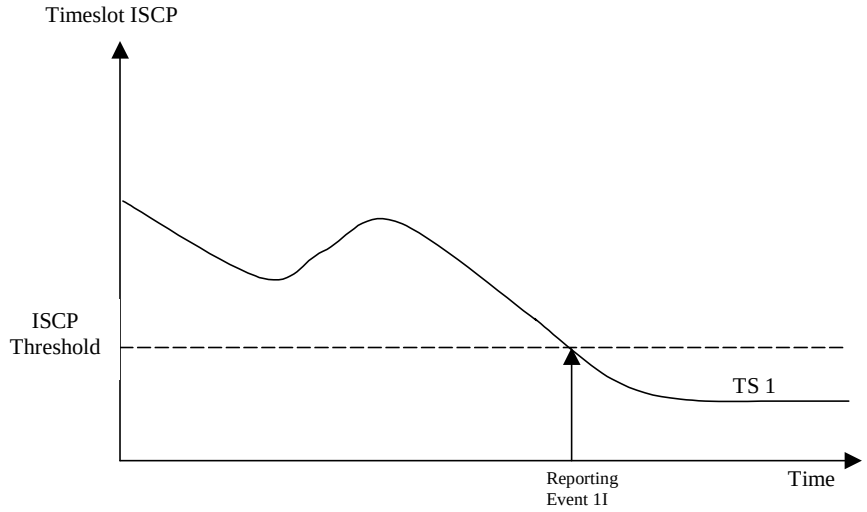


Figure 53: An ISCP value of a timeslot becomes worse than an absolute threshold

14.1.3.4 Timeslot ISCP above a certain threshold

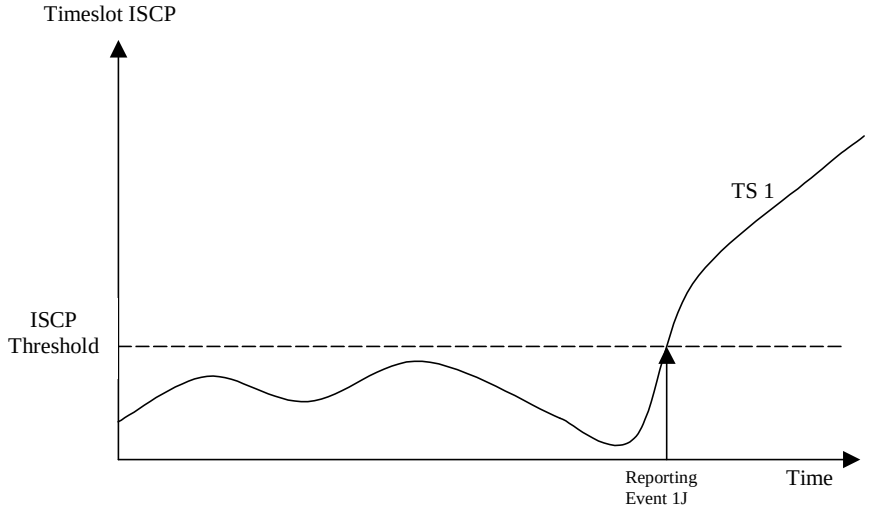


Figure 54: An ISCP value of a timeslot becomes better than a certain threshold

14.1.4 Event-triggered periodic intra-frequency measurement reports

14.1.4.1 Cell addition failure (FDD only)

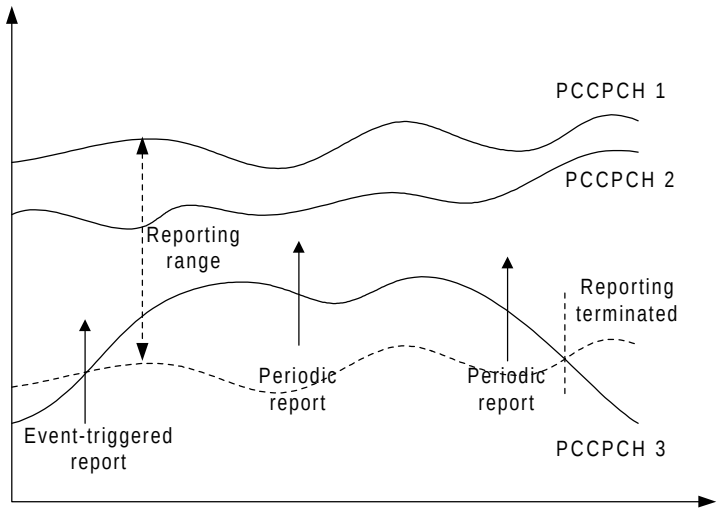


Figure 55: Periodic reporting triggered by event 1A

When a cell enters the reporting range and triggers event 1A, the UE shall transmit a MEASUREMENT REPORT to the UTRAN and typically this may result in an update of the active set. However, in some situations the UTRAN may be unable to add a strong cell to the active set typically due to capacity shortage for example.

The UE shall continue reporting after the initial report by reverting to periodical measurement reporting if the reported cell is not added to the active set. This is illustrated in Figure 55. During periodic reporting the UE shall transmit MEASUREMENT REPORT messages to the UTRAN at predefined intervals. The reports shall include reporting information of the cells in the current active set and of the monitored cell(s) in the reporting range.

Event-triggered periodic measurement reporting shall be terminated either when there are no longer any monitored cell(s) within the reporting range or when the UTRAN has added cells to the active set so that it includes the maximum number of cells (defined by the **reporting deactivation threshold** parameter), which are allowed for event 1A to be triggered.

The reporting period is assigned by the UTRAN. If the reporting period is set to zero event-triggered measurement reporting shall not be applied.

NOTE: The figure should be updated to reflect that the measurements are made on the CPICH rather than PCCPCH

14.1.4.2 Cell replacement failure (FDD only)

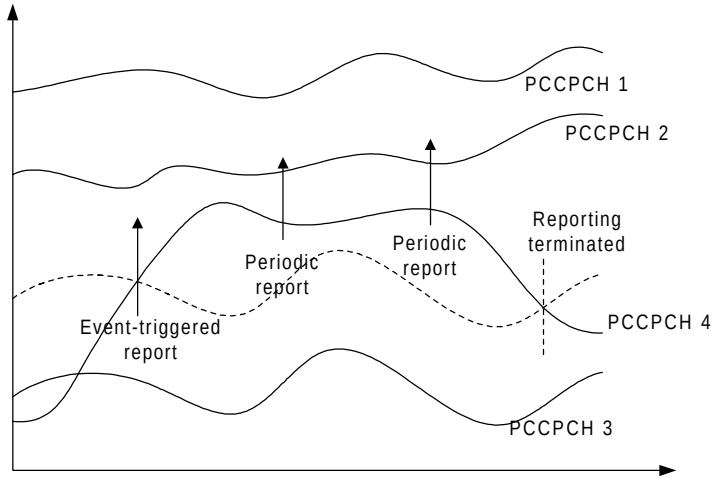


Figure 56: Periodic reporting triggered by event 1C

When a cell enters the replacement range and triggers event 1C, the UE shall transmit a MEASUREMENT REPORT to the UTRAN and typically this may result in the replacement of the weakest active cell. If the UTRAN is unable to replace the cell due to for example capacity shortage, it is beneficial to receive continuous reports in this case as well.

The UE shall revert to periodical measurement reporting if the UTRAN does not update the active set after the transmission of the measurement report. This is illustrated in Figure 56. During periodic reporting the UE shall transmit MEASUREMENT REPORT messages to the UTRAN at predefined intervals. The reports shall include reporting information of the cells in the current active set and of the monitored cell(s) in the replacement range.

Event-triggered periodic measurement reporting shall be terminated either when there are no longer any monitored cell(s) within the replacement range or when the UTRAN has removed cells from the active set so that there are no longer the minimum amount of active cells for event 1C to be triggered (as defined by the **replacement activation threshold** parameter).

The reporting period is assigned by the UTRAN. If the reporting period is set to zero, event-triggered measurement reporting shall not be applied.

NOTE: The figure should be updated to reflect that the measurements are made on the CPICH rather than PCCPCH

14.1.4.3 Timeslot replacement failure (TDD only)

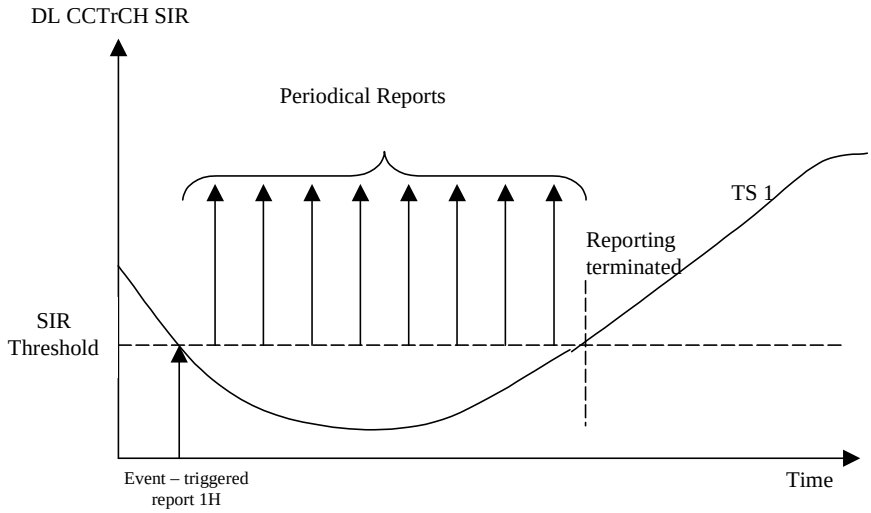


Figure 57: Periodic reporting triggered by event 1H

When the averaged SIR value of one timeslot belonging to a DL CCTrCH triggers event 1H, the UE shall transmit a MEASUREMENT REPORT to the UTRAN and typically this may result to a change of the used downlink timeslots. However, in some situations the DCA algorithm in the UTRAN can not change the timeslots due to capacity shortage for example.

The UE shall continue reporting after the initial report by reverting to periodical measurements reporting, see Figure 57. During periodic reporting the UE shall transmit MEASUREMENT REPORT messages to UTRAN at predefined intervals. The report shall include interference measurements of selected downlink timeslots of the current cell to support the DCA algorithm.

The event-triggered periodic measurement reporting shall be terminated either when the DCA algorithm has replaced the worse downlink timeslot or when the reason for the event 1H, which has triggered the periodical measurement reporting, are not given anymore.

The reporting period is assigned by the UTRAN. IF the reporting period is set to zero event-triggered periodic measurements reporting shall not be applied.

14.1.5 Mechanisms available for modifying intra-frequency measurement reporting behaviour

14.1.5.1 Hysteresis

To limit the amount of event-triggered reports, a hysteresis parameter may be connected with each reporting event given above. The value of the hysteresis is given to the UE in the Reporting criteria field of the Measurement Control message.

In the example in Figure 58, the hysteresis ensures that the event 1D (FDD) or IG(TDD) (primary CPICH(FDD)/CCPCH(TDD) 2 becomes the best cell) is not reported until the difference is equal to the hysteresis value. The fact that primary CPICH(FDD)/CCPCH(TDD) 1 becomes best afterwards is not reported at all in the example since the primary CPICH(FDD)/CCPCH(TDD) 1 does not become sufficiently better than the primary CPICH(FDD)/CCPCH(TDD) 2.

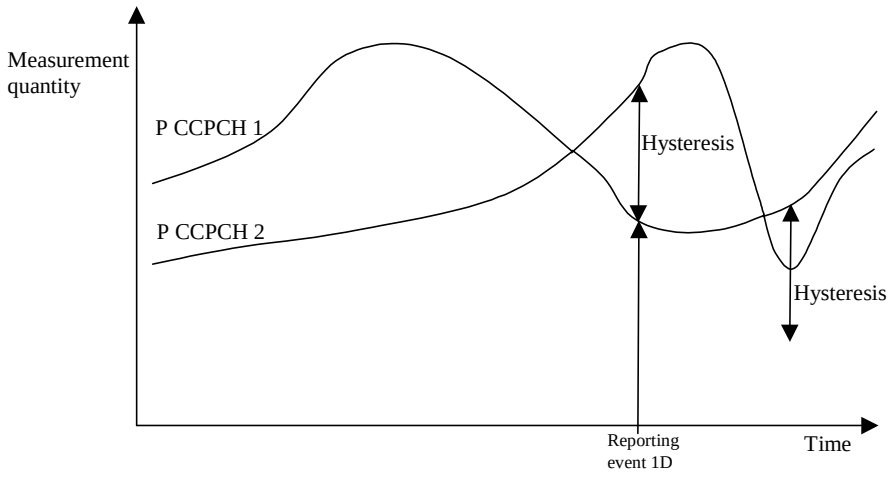


Figure 58: Hysteresis limits the amount of measurement reports

14.1.5.2 Time-to-trigger

To limit the measurement signalling load, a time-to-trigger parameter could be connected with each reporting event given above. The value of the time-to-trigger is given to the UE in the Reporting criteria field of the Measurement Control message.

The effect of the time-to-trigger is that the report is triggered only after the conditions for the event have existed for the specified time-to-trigger. In the following FDD example in Figure 59, the use of time-to-trigger means that the event (primary CPICH 3 enters the reporting range) is not reported until is has been within the range for the time given by the time-to-trigger parameter.

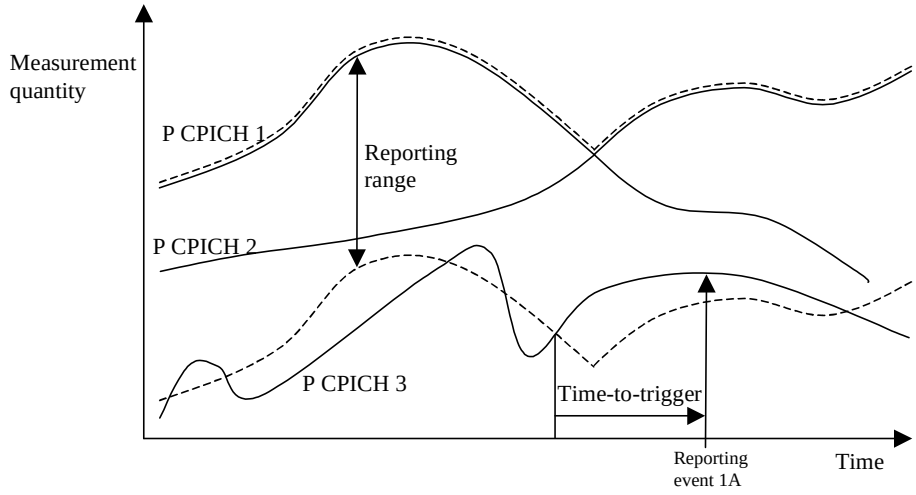


Figure 59: Time-to-trigger limits the amount of measurement reports

In the following TDD example in Figure 60, the use of time-to-trigger means that the event (Timeslot ISCP upon certain threshold) is not reported until it has been upon the threshold for the time given by the time-to trigger parameter.

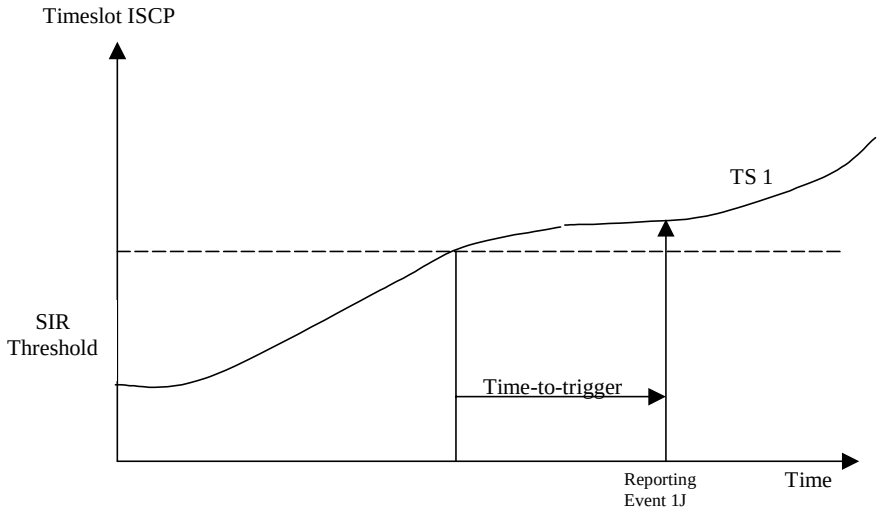


Figure 60: Time-to-trigger limits the amount of measurement reports

Note that the time-to-trigger could be combined with hysteresis, i.e. a hysteresis value is added to the measurement quantity before evaluating if the time-to-trigger timer should be started.

14.1.5.3 Cell individual offsets

For each cell that is monitored, an offset can be assigned with inband signalling. The offset can be either positive or negative. The offset is added to the measurement quantity before the UE evaluates if an event has occurred. The UE receives the cell individual offsets for each primary CPICH(FDD)/CCPCH(TDD) in the measurement object field of the MEASUREMENT CONTROL message.

For the FDD example, in Figure 61, since an offset is added to primary CPICH 3, it is the dotted curve that is used to evaluate if an event occurs. Hence, this means that measurement reports from UE to UTRAN are triggered when primary CPICH plus the corresponding offset, i.e. the dotted curve, leaves and enters the reporting range and when it gets better than primary CPICH 1 (if these events have been ordered by UTRAN). This offset mechanism provides the network with an efficient tool to change the reporting of an individual primary CPICH.

By applying a positive offset, as in Figure 61, the UE will send measurement reports as if the primary CPICH is offset *x* dB better than what it really is. This could be useful if the operator knows that a specific cell is interesting to monitor more carefully, even though it is not so good for the moment. In the example in Figure 61, the operator might know by

experience that in this area primary CPICH 3 can become good very quickly (e.g. due to street corners) and therefore that it is worth reporting more intensively. Depending on the implemented handover evaluation algorithm, this may result in the cell with primary CPICH 3 being included in the active set earlier than would have been the case without the positive offset.

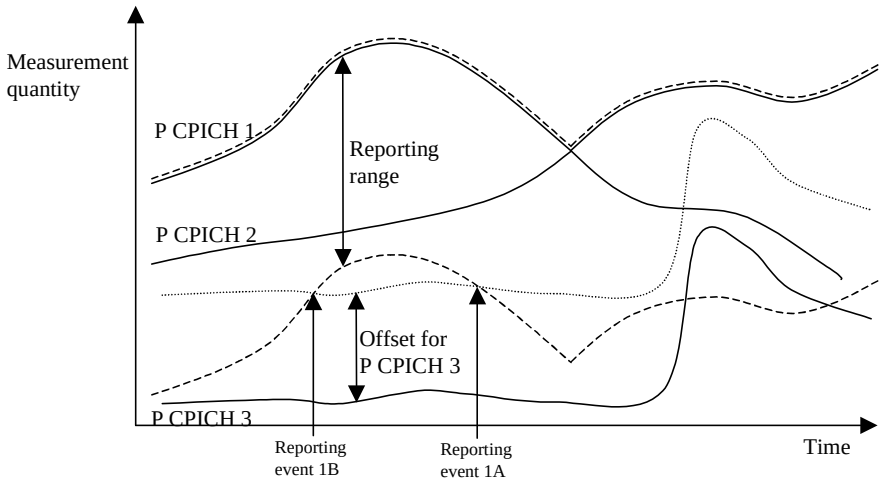


Figure 61: A positive offset is applied to primary CPICH 3 before event evaluation in the UE

For the TDD example, in Figure 62, an offset is added to primary CCPCH2, it is the dotted curve that is used to evaluate if the primary CCPCH2 becomes better than primary CCPCH1 (ordered by the UTRAN).

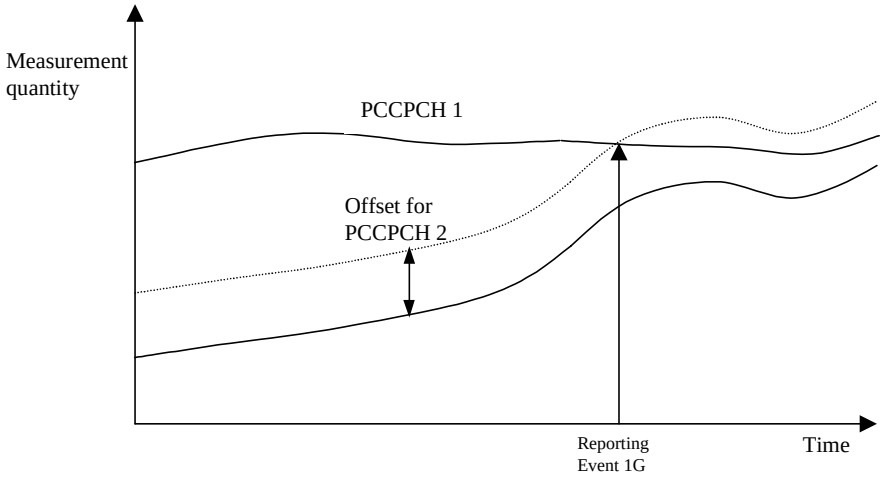


Figure 62: A positive offset is applied to primary CCPCH 2

Correspondingly, the operator can choose to apply a negative offset to a primary CCPCH. Then the reporting on that primary CCPCH is limited and the corresponding cell may be, at least temporarily excluded from the active set or as a target cell for handover.

The cell individual offset can be seen as a tool to move the cell border. It is important to note that the offset is added before triggering events, i.e. the offset is added by the UE before evaluating if a measurement report should be sent as opposed to offsets that are applied in the network and used for the actual handover evaluation.

14.1.5.4 Forbid a Primary CPICH to affect the reporting range (FDD only)

The reporting range affects the reporting events 1A and 1B presented above. The reporting range is defined relative to the best Primary CPICH. However, there could be cases where it is good to forbid a specific Primary CPICH to affect the reporting range. For example in Figure 63 the network has requested the UE to not let Primary CPICH 3 affect the reporting range. This mechanism could be effective if the operator knows by experience that the quality of Primary CPICH 3 is very unstable in a specific area and therefore should not affect the reporting of the other Primary CPICHs.

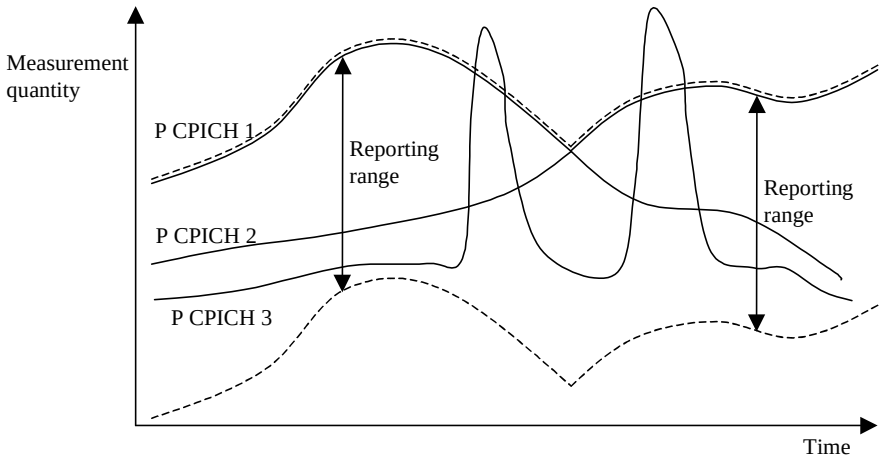


Figure 63: Primary CPICH 3 is forbidden to affect the reporting range

14.1.6 Report quantities

In the event-triggered measurement reports, mandatory information connected to the events is always reported. For instance, at the event "a primary CPICH(FDD)/CCPCH(TDD) enters the reporting range" the corresponding report identifies the primary CPICH(FDD)/CCPCH(TDD) that entered the range.

However, besides this mandatory information, UTRAN should be able to optionally require additional measurement information in the report to support the radio network functions in UTRAN. Furthermore, it will allow the UTRAN to use the UE as a general tool for radio network optimisation if necessary.

Examples of report quantities that may be appended to the measurement reports are:

NOTE: This list is general and does also apply for reports of other measurement types than the intra-frequency type. The list is not final.

- Downlink transport channel block error rate
- Downlink transport channel bit error rate
- Downlink E_c/I_0 on primary CPICH(FDD)/CCPCH(TDD) (e.g. used for initial DL power setting on new radio links.)

Time difference between the received primary CPICH(FDD)/CCPCH(TDD) frame-timing from the target cell and the earliest received existing DPCH path. [Note: This measurement is identified in 25.211 [2] (denoted T_m in chapter 7)]

- UE transmit power
- UE position (FFS)
- Downlink SIR (RSCP/ISCP) on the traffic channels after RAKE combining (FFS)
- Downlink SIR (RSCP/ISCP) on primary CPICH(FDD)/CCPCH(TDD) (e.g. used for initial DL power setting on new radio links.)(FFS)

14.2 Inter-frequency measurements

The frequency quality estimate used in events 2a, 2b 2c, 2d and 2e is defined as

$$Q_{carrier\ j} = 10 \cdot LogM_{carrier\ j} = W_j \cdot 10 \cdot Log\left(\sum_{i=1}^{N_{A\,j}} M_{i\,j}\right) + (1 - W_j) \cdot 10 \cdot LogM_{Best\ j},$$

The variables in the formula are defined as follows:

$Q_{frequency\ j}$ is the estimated quality of the active set on frequency j

$M_{frequency\ j}$ is the estimated quality of the active set on frequency j.

$M_{i\ j}$ is a measurement result of cell i in the active set on frequency j.

$N_{A\ j}$ is the number of cells in the active set on frequency j.

$M_{Best\ j}$ is the measurement result of the strongest cell in the active set on frequency j

W_j is a parameter sent from UTRAN to UE and used for frequency j

14.2.1 Inter-frequency reporting events for FDD

Within the measurement reporting criteria field in the MEASUREMENT CONTROL message UTRAN notifies the UE which events should trigger the UE to send a MEASUREMENT REPORT message. Examples of inter-frequency reporting events that would be useful for inter-frequency handover evaluation are given below. Note that normally the UEs do not need to report all these events. The listed events are the toolbox from which the UTRAN can choose the reporting events that are needed for the implemented handover evaluation function, or other radio network functions.

All events are evaluated with respect to one of the measurement quantities given in section 14.x.x. The measurement objects are the monitored primary common pilot channels (CPICH). A "non-used frequency" is a frequency that the UE have been ordered to measure upon but are not used of the active set. A "used frequency" is a frequency that the UE have been ordered to measure upon and is also currently used for the connection.

14.2.1.1 Event 2a: Change of best frequency.

If any of the non- used frequencies quality estimate becomes better than the currently used frequency quality estimate, and event 2a has been ordered by UTRAN then this event shall trigger a report to be sent from the UE when the hysteresis and time to trigger conditions is fulfilled. The corresponding report contains (at least) the best primary CPICH on the non-used frequency that triggered the event.

14.2.1.2 Event 2b: The estimated quality of the currently used frequency is below a certain threshold **and** the estimated quality of a non-used frequency is above a certain threshold.

When this event is ordered by UTRAN in a MEASUREMENT CONTROL message the UE shall send a report when the estimated quality of the currently used frequency is below the value of the IE " Threshold used frequency" and the estimated quality of a non-used frequency is above the value of the IE "Threshold non-used frequency" and the hysteresis and time to trigger conditions are fulfilled. The corresponding report contains at least the best primary CPICH on the non-used frequency that triggered the event.

14.2.1.3 Event 2c: The estimated quality of a non-used frequency is above a certain threshold

When this event is ordered by UTRAN in a MEASUREMENT CONTROL message the UE shall send a report when the estimated quality of a non-used frequency is above the value of the IE "Threshold non-used frequency" and the hysteresis and time to trigger conditions are fulfilled. The corresponding report contains at least the best primary CPICH on the non-used frequency.

14.2.1.4 Event 2d: The estimated quality of the currently used frequency is below a certain threshold

When this event is ordered by UTRAN in a MEASUREMENT CONTROL message the UE shall send a report when the estimated quality of the currently used frequency is below the value of the IE " Threshold used frequency" and the hysteresis and time to trigger conditions are fulfilled. The corresponding report contains at least the best primary CPICH on the used frequency.

14.2.1.5 Event 2e: The estimated quality of a non-used frequency is below a certain threshold

When this event is ordered by UTRAN in a MEASUREMENT CONTROL message the UE shall send a report when the estimated quality of a non-used frequency is below the value of the IE "Threshold non-used frequency" and the hysteresis and time to trigger conditions are fulfilled. The corresponding report contains at least the best primary CPICH on the non-used frequency.

14.2.1.6 Event 2 f: The estimated quality of the currently used frequency is above a certain threshold

When this event is ordered by UTRAN in a MEASUREMENT CONTROL message the UE shall send a report when the estimated quality of the currently used frequency is above the value of the IE " Threshold used frequency" and the hysteresis and time to trigger conditions are fulfilled. The corresponding report contains at least the best primary CPICH on the used frequency.

14.3 Inter-system measurements

The estimated quality of the active set in UTRAN in events 3a is defined as

$$Q_{UTRAN} = 10 \cdot LogM_{UTRAN} = W \cdot 10 \cdot Log\left(\sum_{i=1}^{N_A} M_i\right) + (1-W) \cdot 10 \cdot LogM_{Best},$$

The variables in the formula are defined as follows:

$\boldsymbol{Q_{UTRAN}}$ is the estimated quality of the active set on the currently used UTRAN frequency

$\boldsymbol{M_{UTRAN}}$ is the estimated quality of the active set on currently used UTRAN frequency expressed in another unit.

$\boldsymbol{M_i}$ is a measurement result of cell i in the active set.

$\boldsymbol{N_A}$ is the number of cells in the active set.

$\boldsymbol{M_{Best}}$ is the measurement result of the strongest cell in the active set.

$\boldsymbol{W}$ is a parameter sent from UTRAN to UE

14.3.1 Inter-System reporting events for FDD

Within the measurement reporting criteria field in the MEASUREMENT CONTROL message the UTRAN notifies the UE which events should trigger the UE to send a MEASUREMENT REPORT message. Examples of inter-system reporting events that would be useful for inter-system handover evaluation are given below. Note that normally the UEs do not need to report all these events. The listed events are the toolbox from which the UTRAN can choose the reporting events that are needed for the implemented handover evaluation function, or other radio network functions.

All events are measured with respect to one of the measurement quantities given in section 14.x.x The measurement objects are the monitored primary common pilot channels (CPICH) for UTRAN and objects specific for other systems. A "used UTRAN frequency" is a frequency that the UE have been ordered to measure upon and is also currently used for the connection to UTRAN. "Other system" is e.g. GSM.

14.3.1.1 Event 3a: The estimated quality of the currently used UTRAN frequency is below a certain threshold **and** the estimated quality of the other system is above a certain threshold.

When this event is ordered by UTRAN in a MEASUREMENT CONTROL message the UE shall send a report when the estimated quality of the currently used frequency is below the value of the IE " Threshold own system" and the hysteresis and time to trigger conditions are fulfilled and the estimated quality of the other system is above the value of the IE " Threshold other system" and the hysteresis and time to trigger conditions are fulfilled. The corresponding report contains information specific for the other system and the best primary CPICH on the used frequency.

14.3.1.2 Event 3b: The estimated quality of other system is below a certain threshold

When this event is ordered by UTRAN in a measurement control message the UE shall send a report when the estimated quality of the other system is below the value of the IE " Threshold other system" and the hysteresis and time to trigger conditions are fulfilled. The corresponding report contains information specific for the other system and the best primary CPICH on the non-used frequency.

14.3.1.3 Event 3c: The estimated quality of other system is above a certain threshold

When this event is ordered by UTRAN in a measurement control message the UE shall send a report when the estimated quality of the other system is above the value of the IE " Threshold other system" and the hysteresis and time to trigger conditions are fulfilled. The corresponding report contains information specific for the other system and the best primary CPICH on the non-used frequency.

14.3.1.4 Event 3d: Change of best cell in other system

If any of the quality estimates for the cells in the other system becomes better than the quality estimate for the currently best cell in the other system, and event 3d has been ordered by UTRAN then this event shall trigger a report to be sent from the UE when the hysteresis and time to trigger conditions is fulfilled. The corresponding report contains (at least) information the best cell in the other system.

14.4 Traffic Volume Measurements

14.4.1 Traffic Volume Measurement Quantity

For traffic volume measurements in the UE only one quantity is measured. This quantity is RLC buffer payload in number of bytes. In order to support a large variation of bit rates and RLC buffer size capabilities, a non-linear scale should be used *[NOTE: details are FFS]*. Since, the expected traffic includes both new and retransmitted RLC payload units all these should be included in the payload measure. It should also be noted that traffic volume measurements are only applicable for acknowledged and unacknowledged mode.

According to what is stated in the Measurement Control message, the UE should support measuring of buffer payload for a specific RB, RBs multiplexed onto the same Transport channel and the total UE buffer payload (the same as one transport channel for a UE that uses RACH).

14.4.2 Traffic Volume reporting events

Traffic volume can be reported in two different ways, periodical and event triggered. For periodical reporting the UE simply measures the number of bytes for the transport channel (i.e. the RLC buffers of the RBs multiplexed onto that transport channel) stated in the measurement control message and reports the traffic volume at the given time instants. Event triggered reporting is performed when a threshold is exceeded.

The reporting quantities that should be included in the report are stated in the measurement control message. This could for example be which RBs or RLC buffers to include when sending the payload to the network.

14.4.2.1 Reporting event 4 A: RLC buffer payload exceeds an absolute threshold

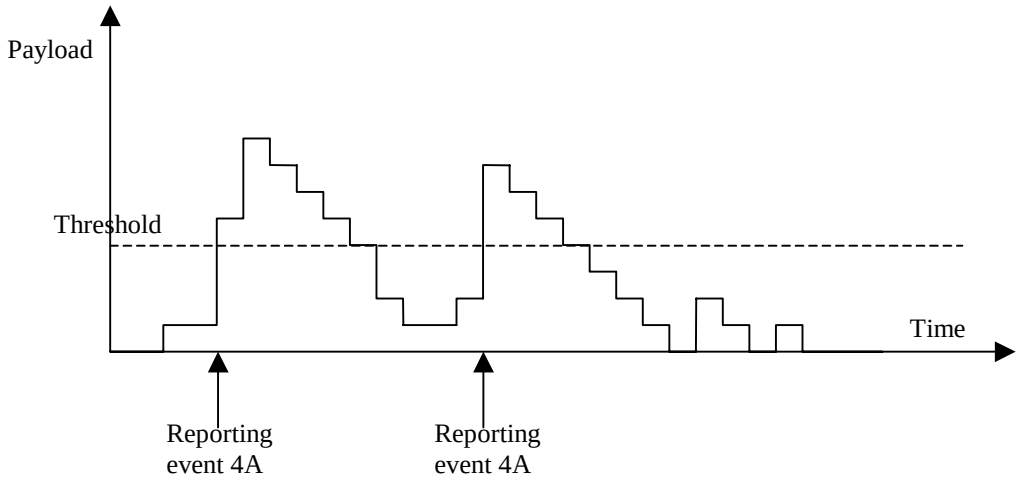


Figure 64: Event triggered report when RLC buffer payload exceeds a certain threshold

If the monitored payload exceeds an absolute threshold, this is an event that could trigger a report. The corresponding report contains at least which transport channel triggered the report.

14.4.3 Traffic volume reporting mechanisms

Traffic volume measurement triggering could be associated with both a *time-to-trigger* and a *pending time after trigger*. The time-to-trigger is used to get time domain hysteresis, i.e. the condition must be fulfilled during the time-to-trigger time before a report is sent. Pending time after trigger is used to limit consecutive reports when one traffic volume measurement report already has been sent. This is described in detail below.

14.4.3.1 Pending time after trigger

This timer is started in the UE when a measurement report has been triggered. The UE is then forbidden to send any new measurement reports with the same measurement ID during this time period even when the triggering condition is fulfilled again. Instead the UE waits until the timer has suspended. If the payload is still above the threshold when the timer has expired the UE sends a new measurement report. Otherwise it waits for a new triggering.

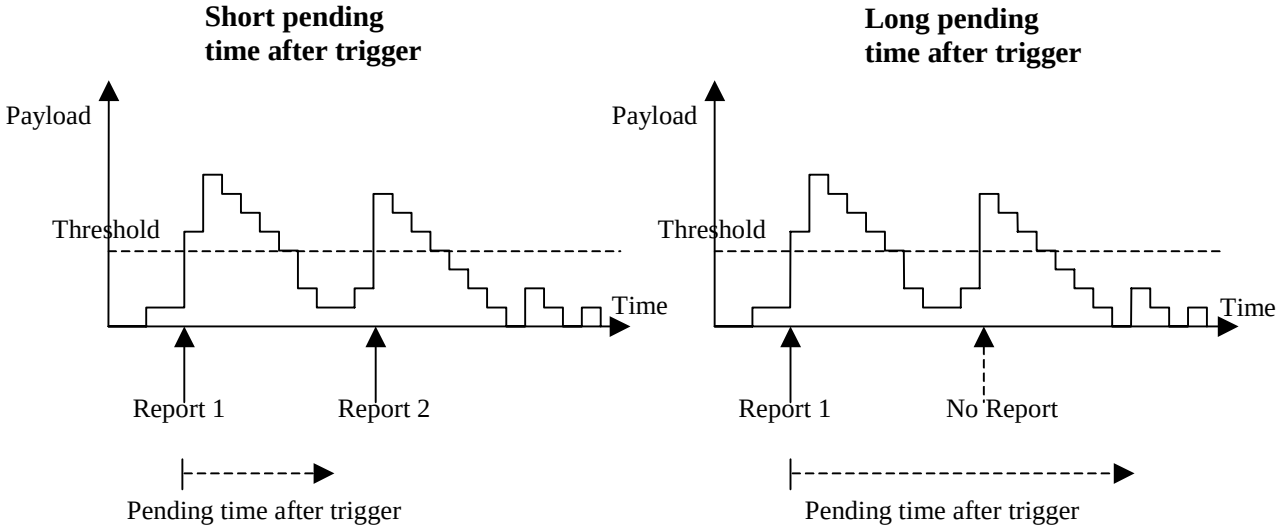


Figure 65: Pending time after trigger limits the amount of consecutive measurement reports

Figure 65 shows that by increasing the pending time after trigger a triggered second event does not result in a measurement report.

14.4.4 Interruption of user data transmission

A UE in CELL_FACH substate may be instructed by the UTRAN to cease transmission of user data on the RACH after a measurement report has been triggered. Before resuming transmission of user data,

- the UE shall receive from the UTRAN either a message allocating a dedicated physical channel, and make a transition to CELL_DCH state, OR
- the UE shall receive an individually assigned measurement control message indicating that interruption of user data transmission is not be applied.

The transmission of signalling messages on the signalling bearer shall not be interrupted.

14.5 UE internal measurements

14.5.1 UE internal measurement quantities

For UE internal measurements the following measurement quantities exist:

1. UE transmission (Tx) power, for TDD measured on a timeslot basis.
2. UE received signal strength power (RSSI)

14.5.2 UE internal measurement reporting events

In the Measurement reporting criteria field in the Measurement Control messages, the UTRAN notifies the UE of which events should trigger a measurement report. UE internal measurement reporting events that can trigger a report are given below. The reporting events are marked with vertical arrows in the figures below. All events can be combined with time-to-trigger. In that case, the measurement report is only sent if the condition for the event has been fulfilled for the time given by the time-to-trigger parameter

NOTE: The reporting events are numbered 6A, 6B, 6C,.. where 6 denotes that the event belongs to the type UE internal measurements.

14.5.2.1 Reporting event 6A: The UE Tx power becomes larger than an absolute threshold

When this event is ordered by UTRAN in a measurement control message, the UE shall send a measurement report when the UE transmission power (for TDD within a single TS) becomes larger than a predefined threshold. The corresponding report identifies the threshold that was exceeded.

14.5.2.2 Reporting event 6B: The UE Tx power becomes less than an absolute threshold

When this event is ordered by UTRAN in a measurement control message, the UE shall send a measurement report when the UE transmission power (for TDD within a single TS) becomes less than a predefined threshold. The corresponding report identifies the threshold that the UE Tx power went below.

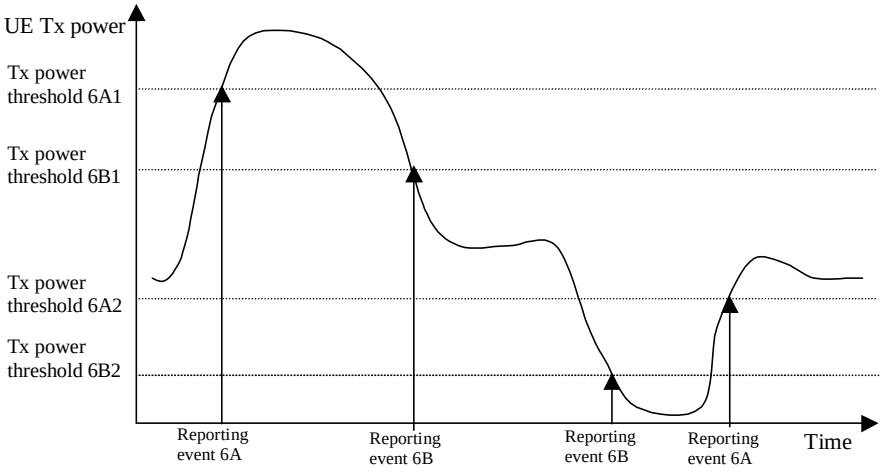


Figure 66: Event-triggered measurement reports when the UE Tx power becomes larger or less than absolute thresholds

14.5.2.3 Reporting event 6C: The UE Tx power reaches its minimum value

When this event is ordered by UTRAN in a measurement control message, the UE shall send a measurement report when the UE Tx power reaches its minimum value, for TDD its minimum value on a single timeslot.

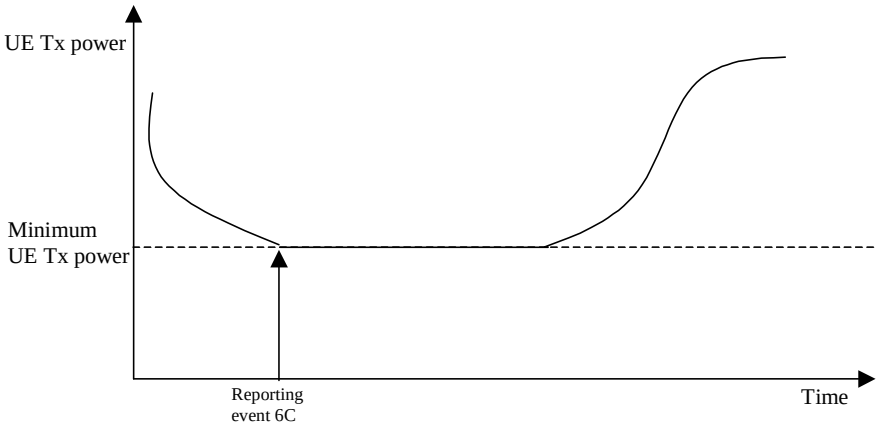


Figure 67: Event-triggered measurement report when the UE Tx power reaches its minimum value

14.5.2.4 Reporting event 6D: The UE Tx power reaches its maximum value

When this event is ordered by UTRAN in a measurement control message, the UE shall send a measurement report when the UE Tx power reaches its maximum value, for TDD its maximum value on a single timeslot.

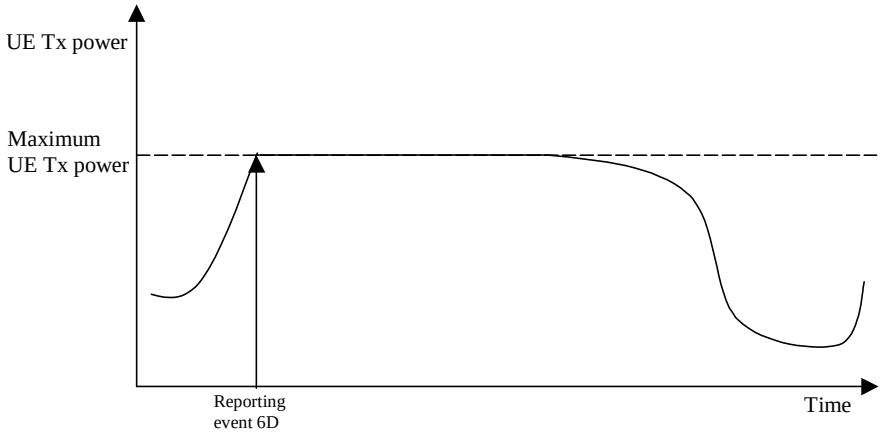


Figure 68: Event-triggered report when the UE Tx power reaches its maximum value

14.5.2.5 Reporting event 6E: The UE RSSI reaches the UE's dynamic receiver range

When this event is ordered by UTRAN in a measurement control message, the UE shall send a measurement report when the UE RSSI reaches the UE's dynamic receiver range.

14.6 Dynamic Resource Allocation Control of Uplink DCH (FDD only)

The network uses this procedure to dynamically control the allocation of resources on an uplink DCH, this is achieved by sending transmission probability and maximum data rate information elements.

This procedure is initiated with a SYSTEM INFORMATION message from the NW RRC and applies to all UEs having uplink DCHs that are dynamically controlled by this procedure. Such uplink DCHs could be established through RB establishment procedure, RB reconfiguration procedure, RB release procedure or Transport Channel Reconfiguration procedure by using a 'Dynamic Control' parameter to indicate that the DCH is controlled by the DRAC procedure.

This function is launched by UE upon reception of a SYSTEM INFORMATION message comprising DRAC parameters (ptr, Max. bit rate).

1. The UE randomly selects p □ [0,1].
2. The UE then checks its permission: if $p<p_{tr}$ the permission is granted for $T_{validity}$ frames, otherwise the UE waits for T_{retry} frames before re-attempting access.
3. A new subset of TFCS is sent to MAC, according to the permission result and to maximum bit rate granted. This subset of TFCS shall only affect DCH that are controlled by this procedure.

Transmission time validity, Time duration before retry and Silent period duration before release are indicated to the UE together with the "Dynamic Control' parameter (i.e. at the establishment of a DCH controlled by this procedure) and may eventually be changed through RB reconfiguration.

When the UE is in soft handover, the UE may have to listen to the CCCH system information of 1 or several cells in the Active Set in order to react to the most stringent parameters, e.g. the lowest product ptr*max bit rate. In case of conflict in the reception of multiple FACH, the UE shall listen to the FACH with a priority order corresponding to the rank of cells in its Active Set (i.e. the FACH of the best received cells should be listened to first).

Whether the support for DRAC function is dependent on the UE capability or UE service capability is FFS

14.7 Downlink outer loop power control

This function is implemented in the UE in order to set the Eb/No target value used for the downlink closed loop power control. This Eb/No value is set according to some quality measurements performed in the UE, in order to maintain the quality requirements (FER or BER).

The UE shall set the Eb/No within the range allocated by the RNC when the physical channel has been set up or reconfigured. It shall not increase the Eb/No target value before the closed loop power control has converged on the current value. The UE may estimate whether the closed loop power control has converged on the current value, by comparing the averaged measured Eb/No to the Eb/No target value.

If the UE has received a DL outer loop control message from UTRAN indicating that the Eb/No target value shall not be increased above the current value, it shall record the current value as the maximum allowed value for the outer loop power control function, until it receives a new DL outer loop control message from UTRAN indicating that the restriction is removed.

14.8 Calculated Transport Format Combination

The Calculated Transport Format Combination (CTFC) is a tool for efficient signalling of transport format combinations.

Let *I* be the number of transport channels that are included in the transport format combination. Each transport channel $TrCH_i$, i = 1, 2, …, *I*, has L_i transport formats, i.e. the transport format indicator TFI_i can take L_i values, $TFI_i \in \{0,1,2,...,L_i - 1\}$.

Define $P_i = \prod_{j=0}^{i-1} L_j$ *, where i = 1, 2, …, I, and* $L_0 = 1$.

Let $TFC(TFI_1, TFI_2, \ldots, TFI_I)$ be the transport format combination for which $TrCH_1$ has transport format TFI_1, $TrCH_2$ has transport format TFI_2, etc. The corresponding $CTFC(TFI_1, TFI_2, \ldots, TFI_I)$ is then computed as:

$$CTFC(TFI_1, TFI_2, \ldots, TFI_I) = \sum_{i=1}^{I} TFI_i \cdot P_i .$$

For dedicated CH, "I" in "TrCHi" is numbered from the smallest number of TrCH identity for DCH in an ascendant order.

For downlink common CH, "I" in "TrCHi" is numbered in a listed order in a SYSTEM INFORMATION message.

14.9 UE autonomous update of active set on non-used frequency (FDD only)

Within the measurement reporting criteria field in the MEASUREMENT CONTROL message the UTRAN notifies the UE which events should trigger a measurement report. For inter frequency measurements it is possible to specify intra-frequency measurements reporting events for support of maintenance of a active set associated with a non-used frequency, a "virtual active set". A "non-used frequency" is a frequency that the UE has been ordered to measure upon but are not used by the active set. A "used frequency" is a frequency that the UE has been ordered to measure upon and is also currently used for the connection.

The autonomous update is controlled by the IE "UE autonomous update mode" that can be set to the following values.

- On: Do the autonomous updates of the "virtual active set" according to the described rules below and also report the events that trigger the update of the "virtual active set".
- On with no reporting: Do the autonomous updates of the "virtual active set" according to the described rules below.
- Off : Only report the events and do no updates of the "virtual active set" unless ordered to do so by the IE " Inter-frequency set update".

If the IE "UE autonomous update mode" is set to "on" or "on with no reporting" the UE shall evaluate the following intra-frequency events and update the "virtual active set" associated with the frequency measured upon, according to the following rules:

- Event 1a shall make the UE add the primary CPICH that enters the reporting range to the "virtual active set".
- Event 1b shall make the UE remove a primary CPICH that leaves the reporting range from the "virtual active set".
- Event 1c shall make the UE replace a active primary CPICH in the "virtual active set" with a non-active primary CPICH that have become better than the active primary CPICH.

14.10 Provision and reception of RRC Initialisation Information between RNCs

When relocation of SRNS is decided to be executed, the RRC shall build the state information, which contains the RRC, RLC and MAC related RRC message information elements, which currently specify the state of the RRC. This RRC INITIALISATION INFORMATION shall be sent by the source RNC to the target RNC to enable transparent relocation of the RRC and lower layer protocols. Correspondingly, the RRC in the target RNC shall receive the RRC INITIALISATION INFORMATION and update its state parameters accordingly to facilitate a transparent relocation of SRNS for the UE.

14.10.1 RRC Initialisation Information

Information Element	Presence	Multi	IE type and reference	Semantics description
Non RRC IEs				
State of RRC	M		Enumerated (CELL_DCH, CELL_FACH,CELL_PCH, URA_PCH)	
State of RRC procedure	M		Enumerated (await no RRC message, await RRC Connection Re-establishment Complete, await RB Setup Complete, await RB Reconfiguration Complete, await RB Release Complete, await Transport CH Reconfiguration Complete, await Physical CH Reconfiguration Complete, await Active Set Update Complete, await Handover Complete, others)	
Variable RLC parameters	M			
Security related Variable parameters	M			
Implementation specific parameters	O		Bitstring (1..512)	
RRC IEs				
UE Information elements				
U-RNTI				
C-RNTI				
UE radio Capability				
Ciphering mode info				
Other Information elements				
Inter System message (inter system classmark)				
UTRAN Mobility Information elements				
URA Identifier				
CN Information Elements				
CN Domain Identity				
NAS System Info				
Measurement Related Information elements				
For each ongoing measurement reporting				
Measurement Identity Number				
Measurement Command				
Measurement Type				
Measurement Reporting Mode				
Additional Measurement Identity number				
CHOICE Measurement				
Intra-frequency				
Intra-frequency cell info				
Intra-frequency measurement quantity				
Intra-frequency measurement reporting quantity				
Maximum number of reporting				

Information Element	Presence	Multi	IE type and reference	Semantics description
cells				
Measurement validity				
CHOICE report criteria				
Intra-frequency measurement reporting criteria				
Periodical reporting				
No reporting				
Inter-frequency				
Inter-frequency cell info				
Inter-frequency measurement quantity				
Inter-frequency measurement reporting quantity				
Maximum number of reporting cells				
Measurement validity				
CHOICE report criteria				
Inter-frequency measurement reporting criteria				
Periodical reporting				
No reporting				
Inter-system				
Inter-system cell info				
Inter-system measurement quantity				
Inter-system measurement reporting quantity				
Maximum number of reporting cells				
Measurement validity				
CHOICE report criteria				
Inter-system measurement reporting criteria				
Periodical reporting				
No reporting				
Traffic Volume				
Traffic volume measurement Object				
Traffic volume measurement quantity				
Traffic volume measurement reporting quantity				
CHOICE report criteria				
Traffic volume measurement reporting criteria				
Periodical reporting				
No reporting				
Quality				
Quality measurement Object				
Quality measurement quantity				
Quality measurement reporting quantity				
CHOICE report criteria				
Quality measurement reporting criteria				
Periodical reporting				
No reporting				
UE internal				
UE internal measurement quantity				

Information Element	Presence	Multi	IE type and reference	Semantics description
UE internal measurement reporting quantity				
CHOICE report criteria				
UE internal measurement reporting criteria				
Periodical reporting				
No reporting				
Radio Bearer Information Elements				
For each Radio Bearer				
RB Identity				
RLC Info				
RB mapping info				
Transport Channel Information Elements				
TFCS (UL DCHs)				
TFCS (DL DCHs)				
TFC subset (UL DCHs)				
TFCS (USCHs)				
TFCS (DSCHs)				
TFC subset (USCHs)				
For each uplink transport channel				
Transport channel identity				
TFS				
DRAC Information				
Dynamic Control				
Transmission Time validity				
Time duration before retry				
Silent Period duration before release				
For each downlink transport channel				
Transport channel identity				
TFS				
Physical Channel Information Elements				
Frequency info				
Uplink DPCH power control info				
SSDT Indicator				FFS
CPCH SET info				
Gated Transmission Control info				FFS
Default DPCH Offset value				
Uplink radio resource information				
Choice channel requirement				
Uplink DPCH info				
PUSCH info				
PRACH info (for RACH)				
PRACH info (for FAUSCH)				
Downlink Radio Resource Information				
Downlink DPCH power control info				
Downlink DPCH compressed mode info				
Downlink Information				
Primary CCPCH Info				
Downlink DPCH info				
PDSCH info				
Secondary CCPCH info				

15 Primitives between RRC and upper layers

16 Handling of unknown, unforeseen and erroneous protocol data

This section specifies procedures for the handling of unknown, unforeseen, and erroneous protocol data by the receiving entity. These procedures are called "error handling procedures".

17 SDL

This section describes the functionality of the protocol in descriptive SDL.

18 Appendices: Examples of operation

Annex A (informative): Change history

Change history					
TSG-RAN#	Version	CR	Tdoc RAN	New Version	Subject/Comment
RAN_05	-	-	RP-99524	3.0.0	(10/99) Approved at TSG-RAN #5 and placed under Change Control
RAN_06	3.0.0	001	RP-99650	3.1.0	(12/99) Modification of RRC procedure specifications
RAN_06	3.0.0	005	RP-99654	3.1.0	Introduction of Information Element for Power Control Algorithm
RAN_06	3.0.0	007	RP-99654	3.1.0	RRC parameters for SSDT
RAN_06	3.0.0	009	RP-99656	3.1.0	Inclusion of information elements for integrity protection
RAN_06	3.0.0	010	RP-99656	3.1.0	Security mode control procedure
RAN_06	3.0.0	011	RP-99656	3.1.0	Updates of the system information procedure
RAN_06	3.0.0	012	RP-99656	3.1.0	Inter-frequency measurements and reporting
RAN_06	3.0.0	013	RP-99656	3.1.0	Inter-system measurements and reporting
RAN_06	3.0.0	014	RP-99656	3.1.0	Additional measurements in RRC measurement messages
RAN_06	3.0.0	015	RP-99656	3.1.0	Value range for Measurement Information Elements
RAN_06	3.0.0	016	RP-99656	3.1.0	Message contents for inter system handover to UTRAN
RAN_06	3.0.0	017	RP-99652	3.1.0	Inclusion of ciphering information elements
RAN_06	3.0.0	018	RP-99651	3.1.0	Corrections and editorial changes
RAN_06	3.0.0	019	RP-99654	3.1.0	Algorithm for CTCF Calculation
RAN_06	3.0.0	025	RP-99651	3.1.0	Logical CH for RRC Connection Re-establishment
RAN_06	3.0.0	026	RP-99719	3.1.0	Gain Factors
RAN_06	3.0.0	027	RP-99654	3.1.0	Parameters for CELL UPDATE CONFIRM message
RAN_06	3.0.0	028	RP-99651	3.1.0	Cell Update Cause
RAN_06	3.0.0	029	RP-99654	3.1.0	RRC Initialisation Information
RAN_06	3.0.0	034	RP-99656	3.1.0	Open loop power control for PRACH
RAN_06	3.0.0	038	RP-99652	3.1.0	Addition of the UE controlled AMR mode adaptation
RAN_06	3.0.0	039	RP-99651	3.1.0	Information elements for RLC reset
RAN_06	3.0.0	040	RP-99656	3.1.0	Support for DS-41 Initial UE Identity
RAN_06	3.0.0	042	RP-99656	3.1.0	Integration of Cell Broadcast Service (CBS)
RAN_06	3.0.0	044	RP-99654	3.1.0	Gated transmission of DPCCH
RAN_06	3.0.0	045	RP-99656	3.1.0	Modification to the Transport Format Combination Control message
RAN_06	3.0.0	046	RP-99656	3.1.0	New Information elements and modifications to messages required in order to support configuration and re-configuration of the DSCH in FDD mode
RAN_06	3.0.0	047	RP-99654	3.1.0	Editorial Corrections and Alignments with Layer 1 specifications
RAN_06	3.0.0	048	RP-99654	3.1.0	Information elements for TDD shared channel operation
RAN_06	3.0.0	049	RP-99656	3.1.0	Description of CN dependent IEs in Master Information Block
RAN_06	3.0.0	050	RP-99650	3.1.0	UE capability information elements
RAN_06	3.0.0	051	RP-99656	3.1.0	UTRAN response time to uplink feedback commands of TX diversity control
RAN_06	3.0.0	052	RP-99654	3.1.0	New and corrected CPCH parameters
RAN_06	3.0.0	053	RP-99654	3.1.0	Compressed mode parameters without gating
RAN_06	3.0.0	054	RP-99654	3.1.0	Transport format combination set and transport format combination subset
RAN_06	3.0.0	055	RP-99656	3.1.0	Information elements for cell selection and reselection
RAN_06	3.0.0	056	RP-99654	3.1.0	Corrections and Alignments of the RRC to the L1 for TDD
RAN_06	3.0.0	057	RP-99656	3.1.0	Introduction of a SCCH procedure
RAN_06	3.0.0	061	RP-99656	3.1.0	Support for DS-41 Paging UE Identity
RAN_06	3.0.0	062	RP-99656	3.1.0	Support for cdma2000 Hard Handover
RAN_06	3.0.0	063	RP-99656	3.1.0	Provide necessary signalling to support FDD DSCH
RAN_06	3.0.0	064	RP-99654	3.1.0	RRC procedure interactions
RAN_06	3.0.0	066	RP-99654	3.1.0	Transfer of UE capabilities
RAN_06	3.0.0	067	RP-99654	3.1.0	Selection of initial UE identity
RAN_06	3.0.0	069	RP-99657	3.1.0	UE capability verification in the security mode control procedure
RAN_06	3.0.0	070	RP-99657	3.1.0	DPCH initial power
RAN_06	3.0.0	071	RP-99657	3.1.0	Actions when entering idle mode
RAN_06	3.0.0	072	RP-99657	3.1.0	Specification of inter-frequency and inter-system reporting events for FDD
RAN_06	3.0.0	073	RP-99657	3.1.0	Signalling radio bearers
RAN_06	3.0.0	074	RP-99654	3.1.0	CN information elements
RAN_06	3.0.0	076	RP-99654	3.1.0	UE information elements
RAN_06	3.0.0	077	RP-99657	3.1.0	Radio bearer, transport channel and physical channel information elements
RAN_06	3.0.0	078	RP-99654	3.1.0	Other information elements
RAN_06	3.0.0	079	RP-99657	3.1.0	RRC signalling for PDCP

Change history					
TSG-RAN#	Version	CR	Tdoc RAN	New Version	Subject/Comment
RAN_06	3.0.0	080	RP-99654	3.1.0	Content of Measurement Control Messages
RAN_06	3.0.0	081	RP-99654	3.1.0	RRC Information Elements to support Block STTD transmission diversity in TDD
RAN_06	3.0.0	082	RP-99657	3.1.0	Signalling connection release
RAN_06	3.0.0	083	RP-99657	3.1.0	Addition of cell access restriction information elements to System Information
RAN_06	3.0.0	085	RP-99655	3.1.0	RRC Connection Establishment parameters
RAN_06	3.0.0	092	RP-99657	3.1.0	Support of UE autonomous update of a active set on a non-used frequency
RAN_06	3.0.0	095	RP-99657	3.1.0	TPC combining for power control
RAN_06	3.0.0	096	RP-99653	3.1.0	Editorial Modification of IEs in RRC messages
RAN_06	3.0.0	097	RP-99655	3.1.0	Selection of SCCPCH
RAN_06	3.0.0	098	RP-99655	3.1.0	RRC Initialisation Information
RAN_06	3.0.0	100	RP-99657	3.1.0	Support of physical channel establishment and failure criteria in the UE
RAN_06	3.0.0	102	RP-99655	3.1.0	RRC Connection Re-establishment
RAN_06	3.0.0	106	RP-99657	3.1.0	System information on FACH
RAN_06	3.0.0	108	RP-99657	3.1.0	SAPs and Primitives for DS-41 mode
RAN_06	3.0.0	109	RP-99655	3.1.0	TX Diversity Mode for Dedicated Channel
RAN_06	3.0.0	110	RP-99657	3.1.0	RACH message length signaling on System Information
RAN_06	3.0.0	113	RP-99657	3.1.0	Routing of NAS messages in UTRAN
RAN_06	3.0.0	116	RP-99655	3.1.0	TBS Identification in TFS
RAN_06	3.0.0	117	RP-99657	3.1.0	Merging the hard handover and some radio bearer control procedures
RAN_06	3.0.0	120	RP-99653	3.1.0	Selected RRC message transfer syntax
RAN_06	3.0.0	121	RP-99657	3.1.0	Efficient rate command signalling

History

Document history		
V3.1.0	January 2000	Publication