ETSI TS 125 331 V3.3.0 (2000-06)

Technical Specification

Universal Mobile Telecommunications System (UMTS); RRC Protocol Specification (3G TS 25.331 version 3.3.0 Release 1999)

Reference

RTS/TSGR-0225331UR2

Keywords

UMTS

ETSI

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Foreword

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Contents

Foreword

This Technical Specification (TS) has been produced by the 3rd Generation Partnership Project (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 the present document, 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".

[12] ICD-GPS-200: "Navstar GPS Space Segment/Navigation User Interface".

[13] RTCM-SC104: "RTCM Recommended Standards for Differential GNSS Service (v.2.2)".

[14] 3G TR 25.921: "Guidelines and Principles for protocol description and error handling".

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
IETF	Internet Engineering Task Force
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 2 and Figure 3 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

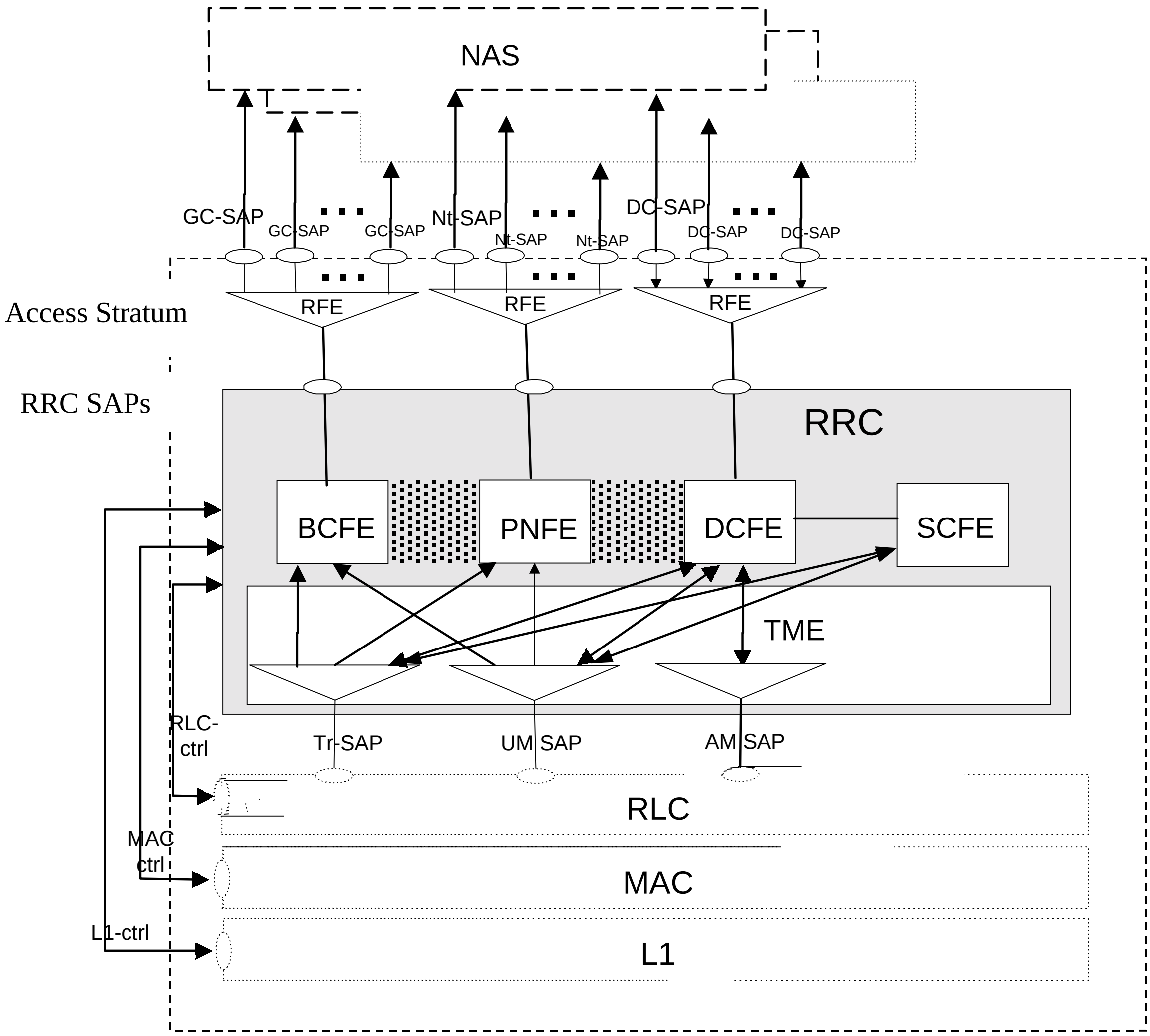


Figure 1: UE side model of RRC

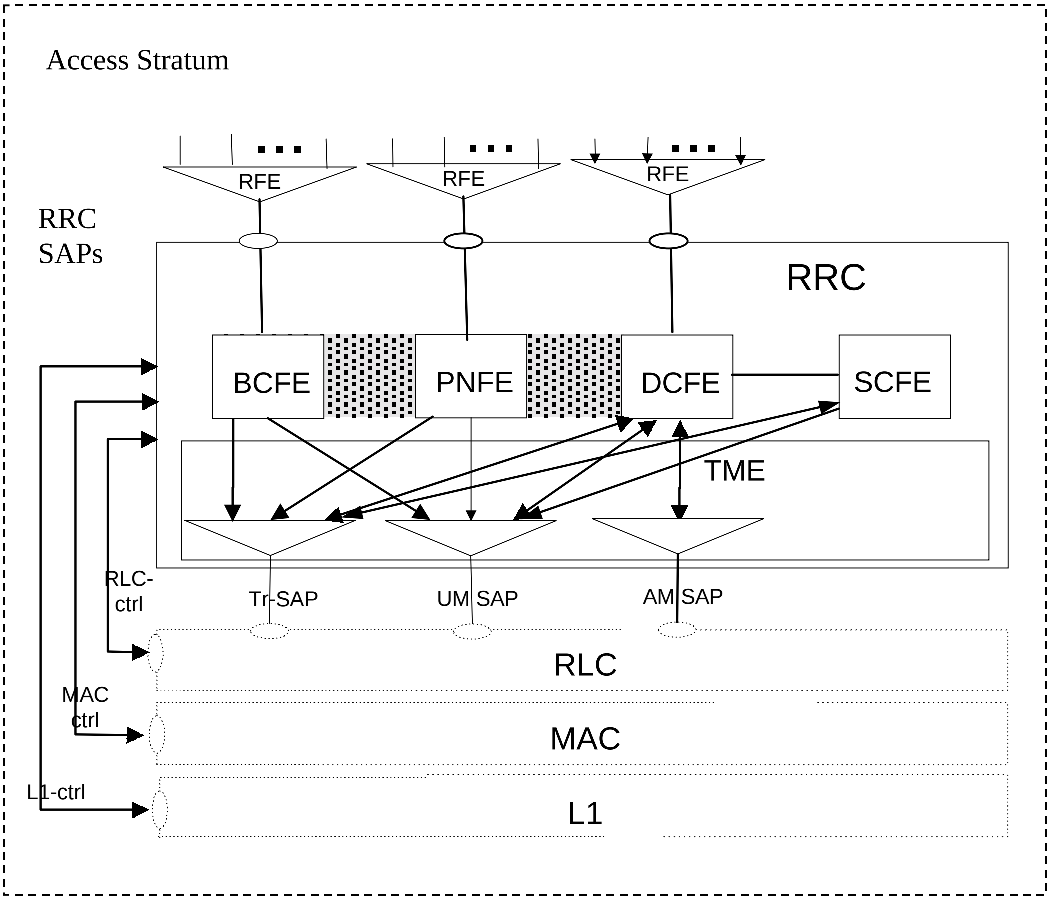


Figure 2: UTRAN side RRC model (DS-MAP system)

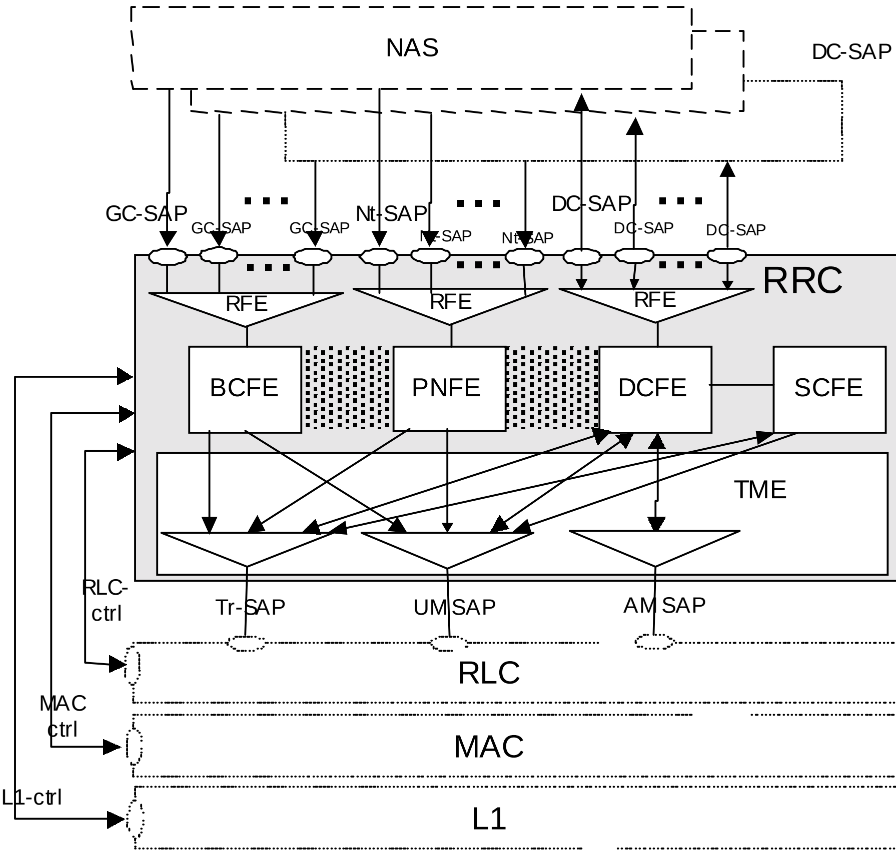


Figure 3: UTRAN side RRC model (DS-41 System)

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

Void.

6.2 Services expected from Layer 1

Void.

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

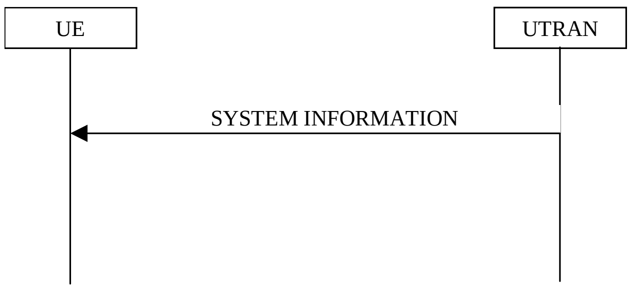


Figure 4: Broadcast of system information

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 optionally references to other system information blocks including scheduling information for those system information blocks. The referenced system information blocks must have the same area scope and use the same update mechanism as the parent system information block.

Some system information blocks may occur more than once with different content. In this case scheduling information is provided for each occurrence of the system information block. Presently this option is only allowed for system information block type 16.

Figure 5 illustrates the relationship between the master information block and the system information blocks in a cell.

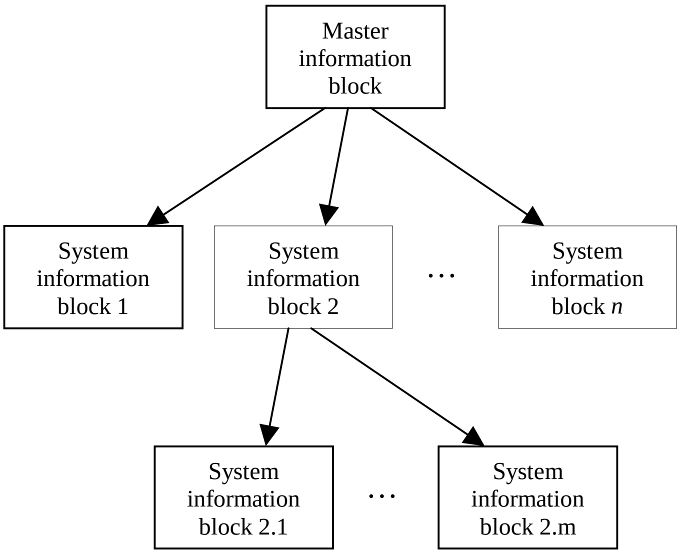


Figure 5: The overall structure of system information

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 selected. If system information blocks are stored for this cell, the UE shall check whether the value tag for the system information block in the entered cell is different compared to the stored value tag. If the area scope is *PLMN*, the UE shall check the value tag for the system information block when a new cell is selected. If the value tag for the system information block in the new cell is different compared to the value tag for the system information block in the old cell, the UE shall re-read the system information block.

System information blocks of which there are multiple occurrences each have their own independent value tag. The UE- shall re-read occurrence n if the value tag of this occurrence has changed.

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. 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 whether the system information block is broadcast on a BCH or a FACH transport channel.

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

The *modification of system information* column in table 8.1.1 specifies the update mechanisms applicable for a certain system information block. For system information blocks with a value tag, the UE shall update the information according to subclause 8.1.1.4.1 or 8.1.1.4.3. For system information blocks with an expiration timer, the UE shall update the information according to subclause 8.1.1.4.2.

Table 8.1.1: Specification of system information block characteristics

System information block	Area scope	UE mode/state	Transport channel	Scheduling information	Modification of system information	Additional requirements
Master information block	Cell	Idle mode, CELL_FACH, CELL_PCH, URA_PCH	BCH	SIB_POS = 0 FDD: SIB_REP = [8] TDD: SIB_REP = [8, 16, 32, 64] [SIB_OFF=2]	Value tag	
		CELL_FACH	FACH	Scheduling not applicable	Value tag	
System information block type 1	PLMN	Idle mode	BCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 2	PLMN	CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 3	Cell	Idle mode, (CELL_FACH, CELL_PCH, URA_PCH)	BCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 4	Cell	CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Value tag	If System information block type 4 is not broadcast in a cell, the connected mode UE shall read System information block type 3
System information block type 5	Cell	Idle mode, (CELL_FACH, CELL_PCH, URA_PCH)	BCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 6	Cell	CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Value tag	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, CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Expiration timer = SIB_REP	
System information block type 8	Cell	CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 9	Cell	Connected mode	BCH	Specified by the IE "Scheduling information"	Expiration timer = SIB_REP	

System information block type 10	Cell	CELL_DCH	FACH	Specified by the IE "Scheduling information"	Expiration timer = SIB_REP	This system information block shall only be acquired by UEs with support for simultaneous reception of one SCCPCH and one DPCH. If the system information block is not broadcast in a cell, the DRAC procedures do not apply in this cell. This system information block is used in FDD mode only.
System information block type 11	Cell	Idle mode (CELL_FACH, CELL_PCH, URA_PCH)	BCH	Specified by the IE "Scheduling information"	Value tag	This system information block is used in FDD mode only.
System information block type 12	Cell	CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Value tag	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. This system information block is used in FDD mode only.
System information block type 13	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 13.1	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 13.2	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 13.3	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 13.4	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 14	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Value tag	This system information block is used in TDD mode only.
System information block type 15	Cell	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 16	PLMN	Idle Mode, CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Value tag	For this system information block there may be multiple occurences

8.1.1.1.3 Segmentation and concatenation of system information blocks

A generic SYSTEM INFORMATION message is used to convey the system information blocks on the BCCH. A given BCCH may be mapped onto either a BCH- or a FACH transport channel according to table 8.1.1. The size of the SYSTEM INFORMATION message shall fit the size of a BCH- or a FACH transport block.

The RRC layer in UTRAN performs segmentation and concatenation of encoded system information blocks. If the encoded system information block is larger than the size of a SYSTEM INFORMATION message, it will be segmented and transmitted in several messages. If the encoded system information block is smaller than a SYSTEM INFORMATION message, UTRAN may concatenate 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 encodedsystem 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. No segment
2. First segment;
3. Subsequent segment;
4. Last segment;
5. Last segment + First segment;
6. Last segment + one or several Complete;
7. Last segment + one or several Complete + First segment;
8. One or several Complete;
9. One or several Complete + First segment..

The "No segment" combination is used when there is no master information block or system information block scheduled for a specific BCH transport block.

For system information blocks of which multiple occurences are used, the segments of different occurences can not be distinguished. Therefore, the different occurences should be scheduled in such a manner that they should always be transmitted sequentially; the previous occurence has to be finished completely before transmission of a new occurence is started.

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. When all segments have been received, the UE shall perform decoding of the complete master information block or system information block. For system information blocks of which multiple occurrences are used, each occurrence shall be re-assembled independently.

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 mod 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 support for simultaneous reception of one SCCPCH and one DPCH 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 6 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. By selection of a new PLMN the UE shall store information about the new PLMN in the variable SELECTED_PLMN.

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 the "PLMN type" in the variable SELECTED_PLMN has the value "GSM-MAP" and the IE "PLMN Type" has the value "GSM-MAP" or "GSM-MAP and ANSI-41", the UE shall. check the IE "PLMN identity" in the master information block and verify that it is the selected PLMN, stored as "PLMN identity" in the variable SELECTED_PLMN.
- If the "PLMN type" in the variable SELECTED_PLMN has the value "ANSI-41 "and the IE "PLMN Type" has the value "ANSI-41" or "GSM-MAP and ANSI-41", 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 with PLMN scope that are to be used by the UE in the variable VALUE_TAG. 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.
- Check and store the IE "value tag" for all system information blocks with cell scope that use value tags that are to be used by the UE. If, for any system information blocks, no IEs from corresponding system information block have been stored, the UE shall read and store the IEs of that system information block.
- For system information blocks of which multiple occurences are used, check and store the IE "value tag" for each occurence of the system information blocks to be used by the UE. If, for any occurrence of the system information blocks, the value tag is different from the value of the variable VALUE_TAG for the same occurence of the system information block or if no IEs from corresponding occurence of the system information block have been stored, the UE shall read and store the IEs of that system information block.
- Read and store the IEs of all system information blocks with cell scope that do not use value tags

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 FACH indicates the changes of system information block contents on BCH.

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 the corresponding "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 6 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;
- 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;
- start to send the first new master information block on the BCCH mapped on BCH instead of the old master information block and then the updated system information block on the BCCH instead of the old system 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 in the corresponding 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.

- at the indicated time, start to send first the new master information block on the BCCH mapped on BCH instead of the old master information block and then 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 if the "PLMN Type" in the variable SELECTED_PLMN has the value "GSM-MAP" and the IE "PLMN type" in the Master Information Block has the value "GSM-MAP" or "GSM-MAP and ANSI-41". The UE shall also:

- forward the content of the IE "NAS system info" to the non-access stratum entity indicated by the IE "CN domain identity";

- use the IE "CN domain specific DRX cycle length coefficient" to calculate frame number for the Paging Occasions and Page indicator as specified in TS 25.304.

- store the timer and constant values included in the IE "UE Timers and constant used in CELL_DCH". The values shall be used by the UE when entering state CELL_DCH.

- respect the values in the IE "UE Timers and constants in idle mode" for the relevant timers and counters

If in connected mode the UE shall not use the values of the IEs in this system information block (except for the timers and constant values given by the IE "UE Timers and constant in CELL_DCH").

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

- if in state CELL_FACH or CELL_PCH, start to perform periodical cell updates using the information in the IE "UE timers and constants";

- if in state URA_PCH, start to perform periodical URA updates using the information in the IEs "URA identity" and "UE timers and constants".

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.
- replace the TFS of the transport channel which has a same transport CH identity with the one stored in the UE if any.
- let the physical channel(s) of type PRACH given by the IE(s) "PRACH info" be the default in uplink.
- start to receive the physical channel of type AICH using the parameters given by the IE "AICH info" (FDD only) if given PRACH is used.
- start to receive the physical channel of type PICH using the parameters given by the IE "PICH info" if UE is in Idle mode or in CELL/URA_PCH state.
- start to monitor its paging occasions on the PICH if UE is in Idle mode or in CELL/URA_PCH state.
- start to receive the physical channel(s) of type Secondary CCPCH using the parameters given by the IE(s) "Secondary CCPCH info" if UE is in CELL_FACH state.
- in TDD: use the IE "Midamble configuration" for receiver configuration.

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.
- replace the TFS of the transport channel which has a same transport CH identity with the one stored in the UE if any.
- let the physical channel(s) of type PRACH given by the IE(s) "PRACH info" be the default in uplink. If 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 given PRACH is used. If the IE "AICH info" is not included, the UE shall read the corresponding IE in system information block type 5 and use that information (FDD only).

- start to receive the physical channel of type PICH using the parameters given by the IE "PICH info" if UE is in CELL/URA_PCH state. If the IE "PICH info" is not included, the UE shall read the corresponding IE in system information block type 5 and use that information.

- start to monitor its paging occasions on the PICH if UE is in CELL/URA_PCH state.

- start to receive the physical channel(s) of type Secondary CCPCH using the parameters given by the IE(s) "Secondary CCPCH info" if UE is in CELL_FACH state. If the IE "Secondary CCPCH info" is not included, the UE shall read the corresponding IE(s) in system information block type 5 and use that information.

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

This system information block type is used only for FDD.

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

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

8.1.1.5.9 System Information Block type 9

This system information block type is used only for FDD.

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

This system information block type is used only for FDD.

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;

- perform actions defined in subclause 14.6.

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 measurement type start a measurement using the set of IEs specified for that measurement type.

- associate each measurement with the identity number given by the IE "Measurement identity number".
- if included, store the IE "Intra-frequency reporting quantity" and the IE "Intra-frequency measurement reporting criteria" or "Periodical reporting criteria" in order to activate reporting when state CELL_DCH is entered.
- If IE "HCS Serving cell information" is included, this indicates that HCS is used, and UE shall do the following:
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Intra-frequency Cell Information", UE shall use the default values specified for the IE "HCS neighbouring cell information" for that cell.
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Intra-frequency Cell Information", UE shall for that cell use the same parameter values as used for the preceding IE "Intra-frequency Cell Information".
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-frequency Cell Information", UE shall use the default values specified for the IE "HCS neighbouring cell information" for that cell.
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-frequency Cell Information", UE shall for that cell use the same parameter values as used for the preceding IE "Inter-frequency Cell Information".
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-system Cell Information", UE shall use the default values specified for the IE "HCS neighbouring cell information" for that cell.
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-system Cell Information", UE shall for that cell use the same parameter values as used for the preceding IE "Inter-system Cell Information".
- If IE "HCS Serving cell information" is not included, this indicates that HCS is not used, and any occurrences of IE "HCS neighbouring cell information" in System Information Block Type 11 shall be neglected by UE.

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 measurement type start (or continue) a measurement using the set of IEs specified for that measurement type.
- remove the intra-frequency cells given by the IE "Removed intra-frequency cells" from the list of intra-frequency cells specified in system information block type 11. Add the intra-frequency cells given by the IE "New intra-frequency cells" to the list of intra-frequency cells specified in system information block type 11.
- if any of the IEs "Intra-frequency measurement quantity", "Intra-frequency reporting quantity for RACH reporting", "Maximum number of reported cells on RACH" or "Reporting information for state CELL_DCH" are not included in the system information block, read the corresponding IE(s) in system information block type 11 and use that information for the intra-frequency measurement.
- if included in this system information block or in system information block type 11, store the IE "Intra-frequency reporting quantity" and the IE "Intra-frequency measurement reporting criteria" or "Periodical reporting criteria" in order to activate reporting when state CELL_DCH is entered.
- remove the inter-frequency cells given by the IE "Removed inter-frequency cells" from the list of inter-frequency cells specified in system information block type 11. Add the inter-frequency cells given by the IE "New inter-frequency cells" to the list of inter-frequency cells specified in system information block type 11.
- if the IE "Inter-frequency measurement quantity" is not included in the system information block, read the corresponding IE in system information block type 11 and use that information for the inter-frequency measurement.

- remove the inter-system cells given by the IE "Removed inter-system cells" from the list of inter-system cells specified in system information block type 11. Add the inter-system cells given by the IE "New inter-system cells" to the list of inter-system cells specified in system information block type 11.
- if the IE "Inter-system measurement quantity" is not included in the system information block, read the corresponding IE in system information block type 11 and use that information for the inter-system measurement.
- if in state CELL_FACH, start traffic volume measurement reporting as specified in the IE "Traffic volume measurement reporting quantity".
- associate each measurement with the identity number given by the IE "Measurement identity number".
- If IE "HCS Serving cell information" is included, this indicates that HCS is used, and UE shall do the following:
    - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Intra-frequency Cell Information", UE shall use the default values specified for the IE "HCS neighbouring cell information" for that cell.
    - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Intra-frequency Cell Information", UE shall for that cell use the same parameter values as used for the preceding IE "Intra-frequency Cell Information".
    - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-frequency Cell Information", UE shall use the default values specified for the IE "HCS neighbouring cell information" for that cell.
    - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-frequency Cell Information", UE shall for that cell use the same parameter values as used for the preceding IE "Inter-frequency Cell Information".
    - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-system Cell Information", UE shall use the default values specified for the IE "HCS neighbouring cell information" for that cell.
    - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-system Cell Information", UE shall for that cell use the same parameter values as used for the preceding IE "Inter-system Cell Information".
- If IE "HCS Serving cell information" is not included, this indicates that HCS is not used, and any occurrences of IE "HCS neighbouring cell information" in System Information Block Type 12 shall be neglected by UE.

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 domain specific DRX cycle length coefficient", "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 "PLMN Type" in the variable SELECTED_PLMN has the value "ANSI-41" and the IE "PLMN type" in the Master Information Block has the value "ANSI-41" or " GSM-MAP and ANSI-41". The UE shall also:

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

8.1.1.5.14 System Information Block type 14

This system information block type is used only for TDD.

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

- use the IEs "Primary CCPCH Tx Power", "UL Interference", and "PRACH Constant value", "DPCH Constant value" and "PUSCH Constant value" to calculate PRACH/DPCH/PUSCH transmit power for TDD uplink open loop power control as defined in 8.5.9.

8.1.1.5.15 System Information Block type 15

If the UE is in idle or connected mode, and supports GPS location services and/or OTDOA location services it should store all relevant IEs included in this system information block. The UE shall also:

- if IEs containing scheduling information for other system information blocks are included, the UE shall act on those in a similar manner as specified for the scheduling information contained within the master information block.
- if LCS GPS assistance for SIB is included, and the UE has a full or reduced complexity GPS receiver:
  store the relevant information and apply ciphering as indicated in this IE (refer to 10.3.7.47 for details). The LCS GPS assistance SIB should be applied to SIB type 15.1, type 15.2 and type 15.3. If "Cipher On/Off" is included, it indicates whether ciphering is carried out or not.
- if LCS OTDOA assistance for SIB is included:
  store the relevant information (refer to 10.3.7.61 for details).

8.1.1.5.15.1 System Information Block type 15.1

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

- interpret a value of "1" of "UTRAN Time Flag" to mean that UTRAN timing information value (SFN) is present, and "0" to mean that only the Reference GPS TOW field value is provided.
- interpret a value of "1" of "NODE B Clock Drift Flag" to mean that NODE B Clock Drift information value is present, and "0" to mean that this IE value is not provided.
- if NODE B Clock Drift is included:
  use it as an estimate of the drift rate of the NODE B clock relative to GPS time.
  If this IE is not included:
  assume the value 0.
- use "Reference Location" as a prior knowledge of the approximate location of the UE.
- if SFN is included:
  use it as the relationship between GPS time and air-interface timing of the NODE B transmission in the serving cell.
- use "Reference GPS TOW" as GPS Time of Week which is the start of the frame with SFN=0.
- use "Status/Health" to indicate the status of the differential corrections.
- act on "DGPS information" IEs in a similar manner as specified in [13] except that the scale factors for PRC and RRC are different. In addition, the DGPS information IEs also include Delta PRC2 and Delta RRC2. Delta PRC2 is the difference in the pseudorange correction between the satellite's ephemeris identified by IODE and the previous ephemeris two issues ago IODE –2. Delta RRC2 is the difference in the pseudorange rate-of-change correction between the satellite's ephemeris identified by IODE and IODE-2. These two additional IEs shall extend the life of the raw ephemeris data up to 6 hours.

8.1.1.5.15.2 System Information Block type 15.2

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

- interpret "Transmission TOW" as a very coarse estimate of the current time, i.e., the approximate GPS time-of-week when the message is broadcast.
- interpret "SatID" as the satellite ID of the data from which this message was obtained.
- act on the rest of the IEs in a similar manner as specified in [12].

8.1.1.5.15.3 System Information Block type 15.3

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

- interpret "Transmission TOW" as a very coarse estimate of the current time, i.e., the approximate GPS time-of-week when the message is broadcast.
- interpret "SatMask" as the satellites that contain the pages being broadcast in this message.
- interpret "LSB TOW" as the least significant 8 bits of the TOW (Figure 20-2 of [12]).
- interpret "SFIO" as the least significant bit of the SubFrame (SF) ID for which the following word 3 through word 10 data applies. Zero indicates subframe ID = 4, and One indicates Subframe ID = 5.
- interpret "Data ID" as the Data ID field contained in the indicated subframe, word 3, most significant 2 bits, as defined by [12].
- interpret "Page No" as the Page ID of the indicated subframe for which the following Word 3 through Word 10 data applies.
- act on the rest of the IEs (Word 3 to Word 10) in a similar manner as specified in [12], excluding non-information bits, "Data ID" and "SV ID" from Word 3 (16 bits left), 2 bit "t" from Word 10 (22 bits left). Word 4 through Word 9 have 24 bits left.

8.1.1.5.16 System Information Block type 16

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:
  act on those in a similar manner as specified for the scheduling information contained within the master information block.
- compare for each predefined configuration the value tag of the stored predefined configuration, if any, with the preconfiguration value tag included in the PLMN value tag for the occurrence of the SIB with the same predefined configuration identity.
- in case the UE has no predefined configuration stored with the same identity or in case the predefined configuration value tag is different:
  store the predefined configuration information together with its identity and value tag.
  in case a predefined configuration with the same identity was stored:
  overwrite this one with the new configuration received via system information.
- store the predefined configurations for later use e.g. during handover to UTRAN.

The above handling applies regardless of whether the stored predefined configuration information has been obtained via UTRA or via another RAT.

The UE is not required to complete reading of all occurrences of system information block type 16 before initiating RRC connection establishment.

8.1.2 Paging

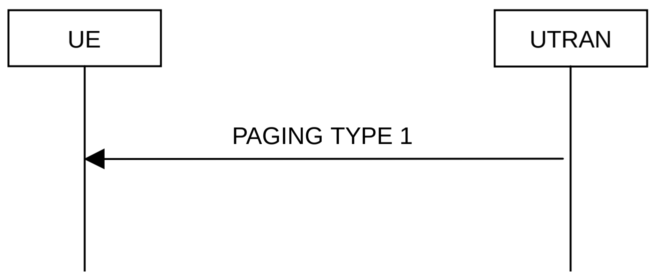


Figure 6: Paging

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 also on the IE "UTRAN DRX Cycle length coefficient" and the IE "DRX indicator", as specified in subclauses 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".
- 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 "UTRAN originator" 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

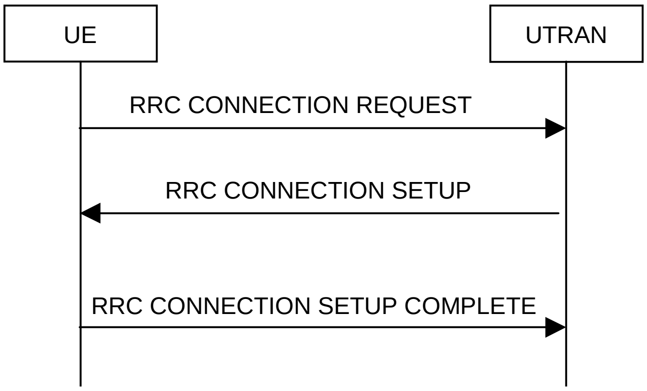


Figure 7: RRC Connection Establishment, network accepts RRC connection

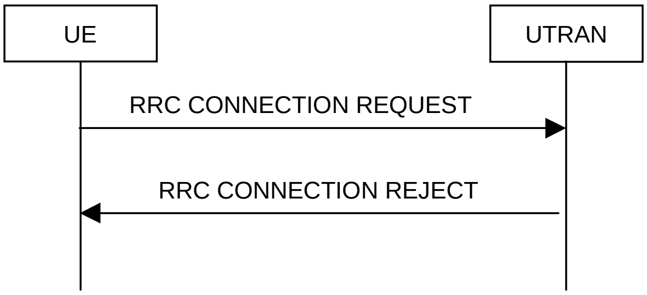


Figure 8: RRC Connection Establishment, network rejects RRC connection

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.

Upon initiation of the procedure, the UE shall set the variable PROTOCOL_ERROR_INDICATOR to FALSE.

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

The UE shall perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.15, and shall apply the given Access Service Class when accessing the RACH.

The UE shall set the IE "Establishment cause" according to indications from the upper layers.

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

The UE shall set the IE "Protocol error indicator" to the value of the variable PROTOCOL_ERROR_INDICATOR.

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. In the RRC CONNECTION REJECT message, the UTRAN may direct the UE to another UTRA carrier or to another system. After the RRC CONNECTION REJECT message has been sent, all context information for the UE may be deleted in UTRAN.

8.1.3.4 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.

The UE shall include START [TS 33.102] values to be used in ciphering and integrity protection for each CN domain.

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, set the "Status" in the variable INTEGRITY_ PROTECTION_INFO to "Not started", 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 Invalid RRC CONNECTION SETUP message

If the UE receives an RRC CONNECTION SETUP message:

- which contains an IE "Initial UE identity" with a value which is identical to the value of the IE "Initial UE identity" in the most recent RRC CONNECTION REQUEST message sent by the UE,

- but the RRC CONNECTION SETUP message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

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, set the variable PROTOCOL_ERROR_INDICATOR to TRUE, 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.

8.1.3.7 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 different, the UE shall ignore the rest of the message;

- if the values are identical, the UE shall stop timer T300 and perform the following actions:

If the IE "wait time" <> '0', and

If the IE "frequency info" is present and:

- if V300 is equal to or smaller than N300, the UE shall initiate cell selection on the designated UTRA carrier. After having selected and camped on a cell, the UE shall re-initiate the RRC connection establishment procedure. The UE shall suppress cell reselection to another carrier for at least the time stated in the IE "wait time";

- if a cell selection on the designated carrier fails, the UE shall wait at least the time stated in the IE "wait time", and then transmit a new RRC CONNECTION REQUEST message on the uplink CCCH of the original serving cell, 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 "inter-system info" is present and:

- If V300 is equal to or smaller than N300, the UE shall perform cell selection in the designated system. After having camped on a cell, the UE shall re-initiate the RRC connection establishment procedure. The UE shall suppress cell reselection to the original system for at least the time stated in the IE " wait time".

- If cell selection in the designated system fails, the UE shall wait at least the time stated in the IE "wait time", and then 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 neither the IEs "frequency info" nor "inter-system info" are 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" = '0', 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

8.1.3.8 Invalid RRC CONNECTION REJECT message

If the UE receives an RRC CONNECTION REJECT message:

- which contains an IE "Initial UE identity" with a value which is identical to the value of the IE "Initial UE identity" in the most recent RRC CONNECTION REQUEST message sent by the UE;
- but the RRC CONNECTION REJECT message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

If the IE "wait time" is <> 0, 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, except for the IE "Protocol error indicator" which shall be set to TRUE.
- 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 = 0 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.

8.1.3.9 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

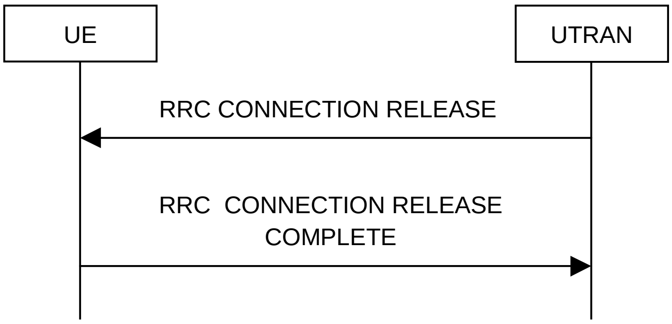


Figure 9: RRC Connection Release procedure

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 Invalid RRC CONNECTION RELEASE message

If the RRC CONNECTION RELEASE message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Ignore the invalid RRC CONNECTION RELEASE message;
- Transmit an RRC STATUS message on the uplink DCCH using AM RLC;
- Include the IE "Protocol error information" with contents according to clause 16;

- When the transmission of the RRC STATUS message has been confirmed by RLC, the UE shall resume normal operation as if the invalid RRC CONNECTION RELEASE message has not been received.

8.1.4.5 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

8.1.4.6 Successful transmission of the RRC CONNECTION RELEASE COMPLETE message in CELL_FACH 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.

8.1.4.7 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.

8.1.4.8 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.

8.1.4.9 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.

8.1.4.10 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

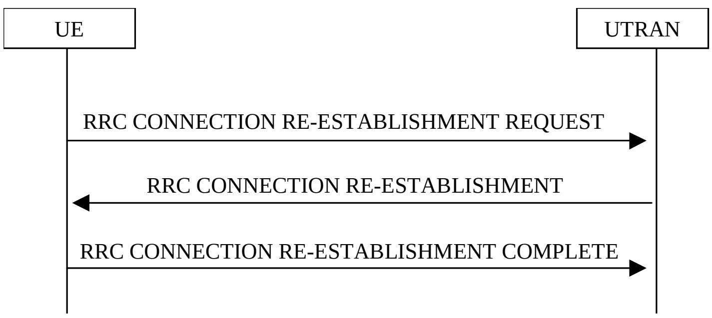


Figure 10: RRC Connection Re-establishment, successful case

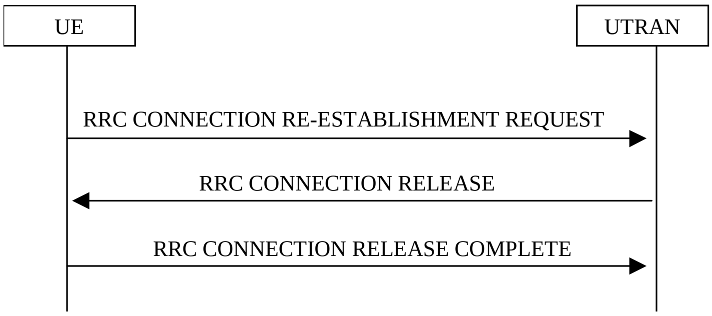


Figure 11: RRC Connection Re-establishment, failure case

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), detection of RLC unrecoverable error (amount of the retransmission of RESET PDU reaches the value of Max DAT and receives no ACK) in CELL_DCH state, the UE may initiate a new cell selection by transiting to CELL_FACH state.

If timer T314=0 and timer T315=0 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 timer T314=0 the UE shall:

- Release locally all radio bearers (except Signalling Radio Bearers) which are associated with T314. An indication may be sent to the non-access stratum.

If timer T315=0 the UE shall:

- Release locally all radio bearers (except Signalling Radio Bearers) which are associated with T315. An indication may be sent to the non-access stratum.

If T314>0, the UE shall start timer T314.

If T315>0, the UE shall start timer T315.

Upon initiation of the procedure, the UE shall set the variable PROTOCOL_ERROR_INDICATOR to FALSE.

The IE "AM_RLC error indication (for c-plane)" shall be set when the UE detects unrecoverable error (amount of the retransmission of RESET PDU reaches the value of Max DAT and receives no ACK) in an AM RLC entity for the signalling link. The IE "AM_RLC error indication (for u-plane)" shall be set when the UE detects unrecoverable error in an AM RLC entity (for u-plane) for u-plane link.

UE shall include "the maximum value in the currently used HFNs among CS and PS domains" plus "1" in IE "HFN" in RRC CONNECTION RE-ESTABLISHMENT REQUEST message.

8.1.5.3 Detection of "in service area"

If the UE detects "in service area"(see 8.5.10), it shall:

- Set the IE "U-RNTI" to the value stored in the UE.
- If the value of the variable PROTOCOL_ERROR_INDICATOR is TRUE, set the IE "Protocol error indicator" to TRUE and include the IE "Protocol error information" set to the value of the variable PROTOCOL_ERROR_INFORMATION.
- If the value of the variable PROTOCOL_ERROR_INDICATOR is FALSE, set the IE "Protocol error indicator" to FALSE.

- Include an IE "Measured Results on RACH", as specified in the IE "Intra-frequency reporting quantity for RACH reporting" and the IE "Maximum number of reported cells on RACH" in system information block type 12.
- Transmit an RRC CONNECTION RE-ESTABLISHMENT REQUEST message on the uplink CCCH and start timer T301.

8.1.5.4 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 on the downlink CCCH on FACH.

When the UTRAN detects AM_RLC unrecoverable error (amount of the retransmission of RESET PDU reaches the value of Max DAT and receives no ACK), it waits for RRC CONNECTION RE-ESTABLISHMENT REQUEST message from the UE and when the UTRAN receives it, UTRAN commands the UE to reset AM_RLC by sending RRC CONNECTION RE-ESTABLISHMENT message.

8.1.5.5 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 as specified below;
- Transmit a RRC CONNECTION RE-ESTABLISHMENT COMPLETE message on the uplink DCCH using AM RLC;
- If the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO is set, the UE shall include and set the IE "Radio bearer uplink ciphering activation time info" to the value of that variable;
- When the transmission of the RRC CONNECTION RE-ESTABLISHMENT COMPLETE message has been confirmed by RLC, the UE shall clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO and the procedure ends.

The UE shall use the contents of the RRC CONNECTION RE-ESTABLISHMENT message as specified in subclause 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.

8.1.5.6 T314 timeout

Upon expiry of timer T314 the UE shall:

If timer T301 is running,

- Continue awaiting response message from UTRAN

If timer T301 is not running and timer T315 is running,

- Release locally all radio bearers (except Signalling Radio Bearers) which are associated with T314. An indication may be sent to the non-access stratum.

If timers T301 and T315 are not running,

- 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 T315 timeout

Upon expiry of timer T315 the UE shall:

If timer T301 is running,

- Continue awaiting response message from UTRAN.

If timer T301 is not running and timer T314 is running,

- Release locally all radio bearers (except Signalling Radio Bearers) which are associated with T315. An indication may be sent to the non-access stratum.

If timers T301 and T314 are not running,

- 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.

8.1.5.8 Invalid RRC CONNECTION RE-ESTABLISHMENT message

If the UE receives an RRC CONNECTION RE-ESTABLISHMENT message, which contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

The UE shall check the value of V301, and

- If V301 is equal to or smaller than N301, the UE shall set the variable PROTOCOL_ERROR_INDICATOR to TRUE, 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

8.1.5.9 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:

If timers T314 and T315 are not running,

- 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 timer T314 has expired during the last T301 cycle and T315 is still running,

- Release locally all radio bearers (except Signalling Radio Bearers) which are associated with T314. An indication may be sent to the non-access stratum.

If timer T315 has expired during the last T301 cycle and T314 is still running,

- Release locally all radio bearers (except Signalling Radio Bearers) which are associated with T315. An indication may be sent to the non-access stratum.

The UE shall re-check whether it is still in "in service area" (see 8.5.10).

If the UE still finds "in service area", it shall:

- Set the IEs in the RRC CONNECTION RE-ESTABLISHMENT REQUEST message according to subclause 8.1.5.3.
- Transmit a new RRC CONNECTION RE-ESTABLISHMENT REQUEST message on the uplink CCCH and restart timer T301.

If the UE does not find "in service area", it shall:

- Continue searching for "in service area".

8.1.5.10 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

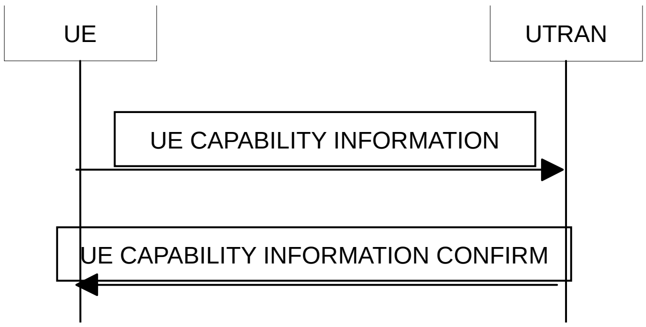


Figure 12: Transmission of UE capability information, normal flow

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 Invalid UE CAPABILITY INFORMATION CONFIRM message

If the UE receives a UE CAPABILITY INFORMATION CONFIRM message, which contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Stop timer T304;
- Transmit an RRC STATUS message on the uplink DCCH using AM RLC and include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION;
- When the transmission of the RRC STATUS message has been confirmed by RLC, the UE shall restart timer T304 and resume normal operation as if the invalid UE CAPABILITY INFORMATION CONFIRM message has not been received.

8.1.6.6 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

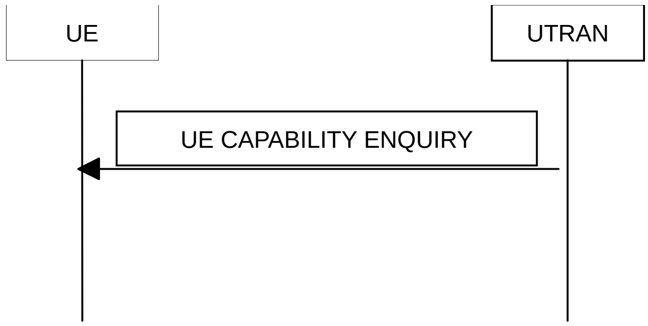


Figure 13: UE capability enquiry procedure, normal flow

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 subclause 8.1.6.

8.1.7.4 Invalid UE CAPABILITY ENQUIRY message

If the UE receives a UE CAPABILITY ENQUIRY message, which contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- transmit an RRC STATUS message on the uplink DCCH using AM RLC and include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION;
- when the transmission of the RRC STATUS message has been confirmed by RLC, the UE shall resume normal operation as if the invalid UE CAPABILITY ENQUIRY message has not been received.

8.1.8 Initial Direct transfer

Figure 14: 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 connections and signalling flows. It is also used to carry the initial higher layer (NAS) messages over the radio interface.

A signalling connection comprises one or several signalling flows. This procedure requests the establishment of a new flow, and triggers, depending on the routing and if no signalling connection exists for the chosen route for the flow, 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 flow. This request also includes a request for the transfer of a NAS message. When not stated otherwise elsewhere, the UE may also initiate the initial direct transfer procedure 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 on RB 2.

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 the value allocated by the UE for that particular flow.

In CELL_FACH state, the UE shall include IE "Measured results on RACH" into the INITIAL DIRECT TRANSFER message 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 flow.

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

If the IE "Measured results on RACH" is present in the message, the UTRAN should 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 15: 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 also initiate the downlink direct transfer procedure 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 3 or RB 4. The UTRAN should select the RB according to the following:

- If the non-access stratum indicates "low priority" for this message, RB 4 should be selected, if available. Specifically, for a GSM-MAP based CN, RB 4 should, if available, be selected when "SAPI 3" is requested. RB 3 should be selected when RB 4 is not available.

- If the non-access stratum indicates "high priority" for this message, RB 3 should be selected. Specifically, for a GSM-MAP based CN, RB 3 should be selected when "SAPI 0" is requested.

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 and the value of the IE"CN Domain Identity" 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.

8.1.9.4 Invalid DOWNLINK DIRECT TRANSFER message

If the UE receives a DOWNLINK DIRECT TRANSFER message, which contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Transmit an RRC STATUS message on the uplink DCCH using AM RLC and include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.

When the transmission of the RRC STATUS message has been confirmed by RLC, the UE shall resume normal operation as if the invalid DOWNLINK DIRECT TRANSFER message has not been received.

8.1.10 Uplink Direct transfer

Figure 16: 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 and upper layer indication is provided indicating that the NAS message belongs to an on-going signalling flow. When not stated otherwise elsewhere, the UE may also initiate the uplink direct transfer procedure 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 3 or RB 4. The UE shall select the RB according to the following:

- If the non-access stratum indicates "low priority" for this message, RB 4 shall be selected, if available. Specifically, for a GSM-MAP based CN, RB 4 shall, if available, be selected when "SAPI 3" is requested. RB 3 shall be selected when RB 4 is not available.
- If the non-access stratum indicates "high priority" for this message, RB 3 shall be selected. Specifically, for a GSM-MAP based CN, RB 3 shall be selected when "SAPI 0" is requested.

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

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 on RACH" is present in the message, the UTRAN should 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

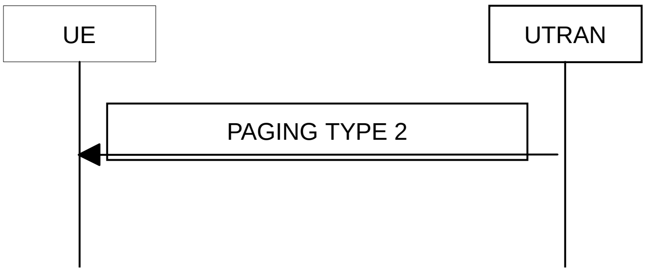


Figure 17: UE dedicated paging

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.

8.1.11.4 Invalid PAGING TYPE 2 message

If the UE receives a PAGING TYPE 2 message, which contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Transmit an RRC STATUS message on the uplink DCCH using AM RLC and include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.

- When the transmission of the RRC STATUS message has been confirmed by RLC, the UE shall resume normal operation as if the invalid PAGING TYPE 2 message has not been received.

8.1.12 Security mode control

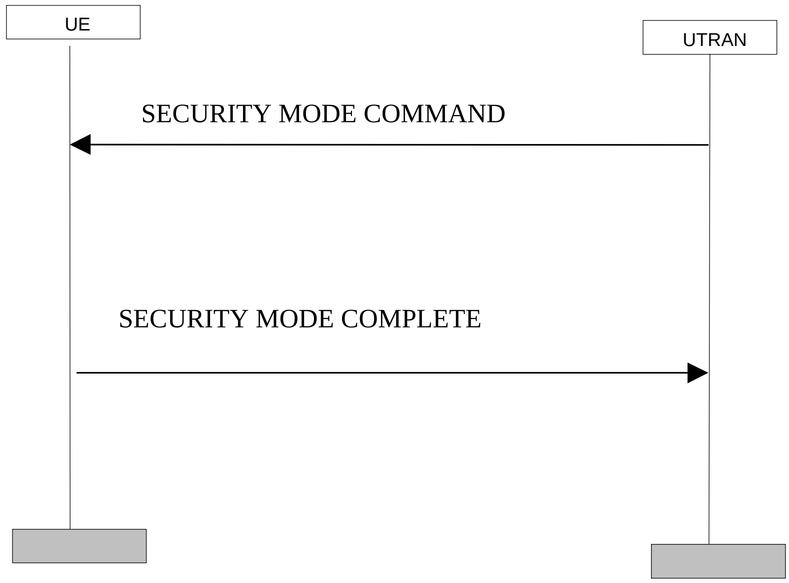


Figure 18: Security mode control procedure

8.1.12.1 General

The purpose of this procedure is to trigger the 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 should suspend all radio bearers belonging to the CN domain for which the security mode control procedure is initiated. Also the signalling radio bearers 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 using the present ciphering and/or integrity protection configuration.

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 should resume all the suspended radio bearers using RLC-AM or RLC-UM, that use the old ciphering configuration for the transmission of RLC PDUs with RLC sequence number less than the RLC sequence number indicated in the IE "Radio bearer downlink ciphering activation time info" sent to the UE, and the new ciphering configuration for the transmission of 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" sent to the UE.

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 "security capabilities" is the same as indicated by variable UE_CAPABILITY_TRANSFERRED, the UE shall suspend (from sequence numbers on, which are greater than or equal to each radio bearer's downlink ciphering activation time) all radio bearers using RLC-AM or RLC-UM that belong to the CN domain indicated in the IE "CN domain identity", received in the message SECURITY MODE COMMAND. The UE shall also suspend all the signalling radio bearers. When the radio bearers have been suspended, the UE shall send a SECURITY MODE COMPLETE message on the uplink DCCH in AM RLC, using the old ciphering and/or the new integrity protection configuration.

If a new integrity protection key has been received, the new key shall be used and the integrity protection "downlink HFN" shall be set to 0 at the RRC sequence indicated in IE "Downlink integrity protection activation info" included in the IE "Integrity protection mode info". In the uplink the UE shall start using the new key and set "uplink HFN" to 0 at at the RRC sequence indicated in IE "Uplink integrity protection activation info" included in the IE "Integrity protection mode info".

If the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO is set, the UE shall include and set the IE "Radio bearer uplink ciphering activation time info" to the value of that variable.

If a new ciphering key is available, the new ciphering key shall be used and the uplink and downlink ciphering hyperframe number shall be set to zero for the signalling radio bearers and the radio bearers used by the CN indicated in the IE "CN domain identity".

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, clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO 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, UTRAN shall use

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

- the old ciphering configuration for received RLC PDUs with RLC sequence number less than the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent by the UE.
- the new ciphering configuration for received RLC PDUs with RLC sequence number greater than or equal to the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent by the UE.

for radio bearers using RLC-TM:

- the new ciphering configuration for the received RLC PDUs at the CFN as indicated in the IE "Activation time for DPCH" in the IE "Ciphering mode info".

and the procedure ends.

8.1.12.7 Invalid SECURITY MODE COMMAND message

If the SECURITY MODE COMMAND message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Transmit a SECURITY MODE FAILURE message on the uplink DCCH using AM RLCand set the IE "failure cause" the cause value "protocol error".

- Include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.

- When the transmission of the SECURITY MODE FAILURE message has been confirmed by RLC, the UE shall resume normal operation as if the invalid SECURITY MODE COMMAND message has not been received and the procedure ends.

8.1.13 Signalling connection release procedure

Figure 19: Signalling connection release procedure, normal case

8.1.13.1 General

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

8.1.13.2 Initiation of SIGNALLING CONNECTION RELEASE by the UTRAN

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.

8.1.13.3 Reception of SIGNALLING CONNECTION RELEASE by the UE

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

8.1.13.4 Invalid SIGNALLING CONNECTION RELEASE message

If the UE receives a SIGNALLING CONNECTION RELEASE message, which contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Transmit an RRC STATUS message on the uplink DCCH using AM RLC and include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.

- When the transmission of the RRC STATUS message has been confirmed by RLC, the UE shall resume normal operation as if the invalid SIGNALLING CONNECTION RELEASE message has not been received.

8.1.14 Signalling connection release request procedure

Figure 20: Signalling connection release request procedure, normal case

8.1.14.1 General

The signalling connection release request procedure is used by the UE to request from the UTRAN that one or more of its flow identifiers should be released. The procedure may initiate the signalling connection release or RRC connection release procedure.

8.1.14.2 Initiation

The UE shall initiate the signalling connection release procedure, if it receives a request from the higher layers to release one or more signalling sessions.

To initiate the procedure, the UE transmits a SIGNALLING CONNECTION RELEASE REQUEST message on DCCH using AM RLC. When the transmission of SIGNALLING CONNECTION RELEASE REQUEST message has been confirmed by RLC, the UE shall delete the released flow identifier(s).

The IE "Flow Identifier" indicates the signalling flow identities which are requested to be released in the UTRAN.

8.1.14.3 Reception of SIGNALLING CONNECTION RELEASE REQUEST by the UTRAN

Upon reception of a SIGNALLING CONNECTION RELEASE REQUEST message, the UTRAN may initiate the RRC connection release procedure, if the UE has requested the release of all its remaining signalling connections. If all remaining signalling connections are not requested to be released, the UTRAN may initiate the signalling connection release procedure.

8.1.15 Counter check

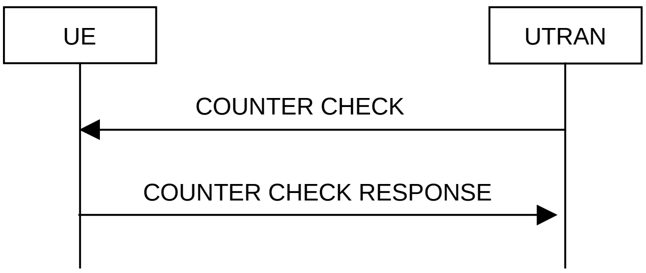


Figure 21: Counter check procedure

8.1.15.1 General

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

8.1.15.2 Initiation

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

8.1.15.3 Timer expiry at UTRAN

If a timer started at UTRAN when sending the COUNTER CHECK message expires before a response from the UE is received, the UTRAN should release the RRC connection.

8.1.15.4 Reception of a COUNTER CHECK message by the UE

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

If the number of radio bearers using UM or AM RLC mode or any of the COUNT-C MSB values is different the mismatching COUNT-C values shall be included in a COUNTER CHECK RESPONSE message.

The UE shall send the COUNTER CHECK RESPONSE message on the uplink DCCH.

8.1.15.5 Reception of the COUNTER CHECK RESPONSE message by UTRAN

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

If the UTRAN receives a COUNTER CHECK RESPONSE message that contains one or several COUNT-C values, it should compare the COUNT-C values in the message to the COUNT-C values which were used in forming the COUNTER CHECK message.

If there is no difference or if the difference is acceptable, the procedure ends. The limits for an acceptable difference are defined to the UTRAN by the visited network.

If there is a difference that is not acceptable, UTRAN should initiate the release of the RRC connection.

8.1.15.6 Invalid COUNTER CHECK message

If the UE receives a COUNTER CHECK message which contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Transmit an RRC STATUS message on the uplink DCCH using AM RLC and include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.

- When the transmission of the RRC STATUS message has been confirmed by RLC, the UE shall resume normal operation as if the invalid COUNTER CHECK message has not been received.

8.2 Radio Bearer control procedures

8.2.1 Radio bearer establishment

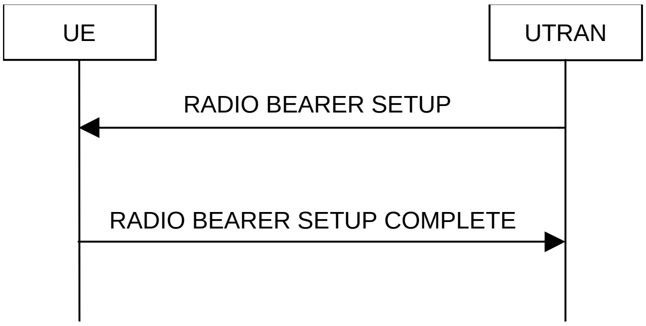


Figure 22: Radio Bearer Establishment, normal case

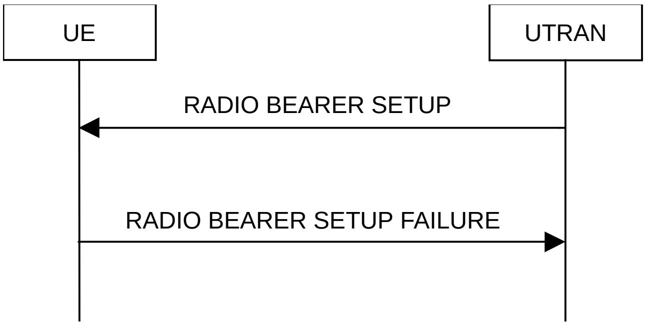


Figure 23: Radio Bearer Establishment, UE reverts to old configuration

8.2.1.1 General

The purpose with this procedure is to establish new radio bearer(s). Each radio bearer established by the procedure belongs to one of the following categories:

a signalling radio bearer, i.e. used for control plane signalling;

a radio bearer that implements a radio access bearer (RAB) or RAB subflow(s) in the user plane.

While establishing radio bearers, 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 should:

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

If the Radio Bearer Establishment procedure is simultaneous with SRNS relocation procedure, and ciphering and/or integrity protection are activated, transmit new ciphering and/or integrity protection information to be used after reconfiguration.

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

If the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO is set, the UE shall include and set the IE "Radio bearer uplink ciphering activation time info" to the value of that variable.

When the transmission of the RADIO BEARER SETUP COMPLETE message has been confirmed by RLC the UE shall resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers, the UE shall clear the variable ORDERED_CONFIG, clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO and the procedure ends.

The UE shall store the received UE Information Elements, RB Information Elements, TrCH Information Elements and PhyCH information elements 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 the new radio bearer(s), if the variable CIPHERING_STATUS is set to "Started", initialise ciphering on those radio bearers using the current hyperframe number. For non-transparent mode radio bearers this hyperframe number is the highest used HFN (during the lifetime of the current cipher/integrity key set) incremented by one. All transparent mode radio bearers have a common hyperframe number (in the MAC layer), which is not incremented due to addition of new transparent radio bearer(s);
- in case of non-transparent mode radio bearers transmit the current hyperframe number to UTRAN in RADIO BEARER SETUP COMPLETE message;
- 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 3 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.

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

- Associate the new radio bearers with the radio access bearer that is identified by the IE "RAB info".
- Check whether that radio acces bearer exists in the variable ESTABLISHED_RABS.

  If the radio access bearer exists the UE shall:

  - store information about the radio bearer under the radio access bearer entry in the variable ESTABLISHED_RABS.

If the radio access bearer does not exist the UE shall:

  - store information about the new radio access bearer in the variable ESTABLISHED_RABS
  - store information about the radio bearer under the radio access bearer entry in the variable ESTABLISHED_RABS.
  - indicate the establishment of the radio access bearer to the upper layer entity using the IE "CN domain identity", forwarding the content of the IE "RAB identity".

- For each new radio bearer, the UE shall:
  - create a new RAB subflow for the radio access bearer.
  - Number the RAB subflow in the order of when the radio bearers within the radio access bearers where created.
  - Store the number of the RAB subflow in the variable ESTABLISHED_RABS.
- Indicate the establishment of each new RAB subflow to the upper layer entity using the IE "CN domain identity".

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.

In FDD, if the IE 'PDSCH code mapping' is included but the IE 'PDSCH with SHO DCH Info' is not included and if the DCH has only one link in its active set then the UE shall act upon the 'PDSCH code mapping' IE as specified in subclause 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 or unacceptable configuration in the UE

If UTRAN instructs the UE to use a configuration, which it does not support or if the variable UNACCEPTABLE_CONFIGURATION is set to TRUE, 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". If the radio bearer setup procedure affects several radio bearers, the UE may include the identities of the radio bearers for which the procedure would have been succesful into the RADIO BEARER SETUP FAILURE message.

When the transmission of the RADIO BEARER SETUP FAILURE message has been confirmed by RLC, the UE shall resume data transmission on RB 3 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 3 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.

If the radio bearer setup procedure affects several radio bearers, the UE may include the identities of the radio bearers for which the procedure would have been succesful into the RADIO BEARER SETUP FAILURE message.

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.

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

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 Subsequently received RADIO BEARER SETUP messages

If the variable ORDERED_CONFIG is set because of a RADIO BEARER SETUP message previously received, the UE shall

- ignore the subsequently received RADIO BEARER SETUP message
- keep the configuration as before the subsequent RADIO BEARER SETUP message was received.

8.2.1.9 Incompatible simultaneous reconfiguration

If the variable ORDERED_CONFIG is set (because of any message other than RADIO BEARER SETUP) 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 a RADIO BEARER SETUP FAILURE message on the DCCH using AM RLC. The UE shall set the IE "failure cause" to "incompatible simultaneous reconfiguration". When the transmission of RADIO BEARER SETUP FAILURE message has been confirmed by RLC the procedure ends.

8.2.1.10 Invalid RADIO BEARER SETUP message

If the variable ORDERED_CONFIG is not set and the RADIO BEARER SETUP message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- transmit a RADIO BEARER SETUP FAILURE message on the uplink DCCH using AM RLCand set the IE "failure cause" the cause value "protocol error";
- include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION;
- when the transmission of the RADIO BEARER SETUP FAILURE message has been confirmed by RLC, the UE shall resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers.

The UE shall resume normal operation as if the invalid RADIO BEARER SETUP message has not been received and the procedure ends.

8.2.2 Radio bearer reconfiguration

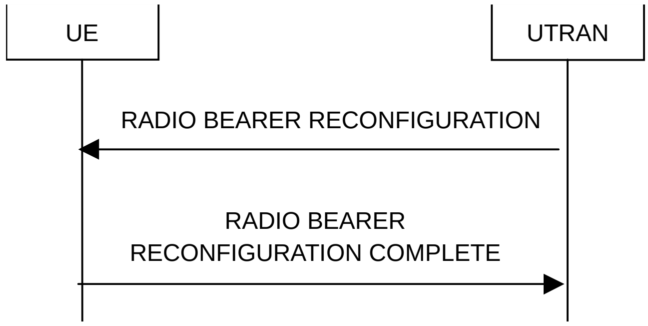


Figure 24: Radio bearer reconfiguration, normal flow

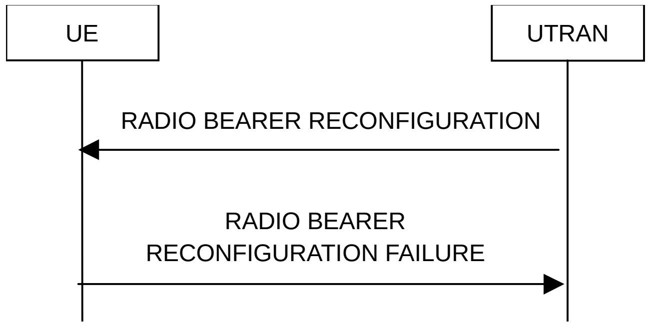


Figure 25: Radio bearer reconfiguration, failure case

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

To initiate the procedure, UTRAN should:

- configure new radio links in any new physical channel configuration and start transmission and reception on the new radio links;
- transmit a RADIO BEARER RECONFIGURATION message on the downlink DCCH using AM or UM RLC.

If the Radio Bearer Reconfiguration procedure is simultaneous with SRNS relocation procedure, and ciphering and/or integrity protection are activated, transmit new ciphering and/or integrity protection information to be used after reconfiguration.

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

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

If transport channels are added or deleted in uplink and/or downlink, the UTRAN should:

- Send the RB Mapping Info for the new configuration

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 UE Information Elements, RB Information Elements, TrCH Information Elements and PhyCH information elements 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 3 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.

In FDD, if the IE 'PDSCH code mapping' is included but the IE 'PDSCH with SHO DCH Info' is not included and if the DCH has only one link in its active set then the UE shall act upon the 'PDSCH code mapping' IE as specified in subclause 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" in TDD or "Primary CPICH info" in FDD and the IE "New C-RNTI" are included, the UE shall:

- Select the cell indicated by the IE "Primary CCPCH info" in TDD or "Primary CPICH info" in FDD;

- 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.

If the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO is set, the UE shall include and set the IE "Radio bearer uplink ciphering activation time info" to the value of that variable.

When the transmission of the RADIO BEARER RECONFIGURATION COMPLETE message has been confirmed by RLC, the UE shall clear the variable ORDERED_CONFIG, clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO and the UE shall resume data transmission on each radio bearer fulfilling the following criteria:

- The radio bearer identity is RB 3 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 UE Information Elements, RB Information Elements, TrCH Information Elements and PhyCH information elements 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:

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

In FDD, 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 Subclause 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 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.

If the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO is set, the UE shall include and set the IE "Radio bearer uplink ciphering activation time info" to the value of that variable.

When the transmission of the RADIO BEARER RECONFIGURATION COMPLETE message has been confirmed by RLC, the UE shall clear the variable ORDERED_CONFIG, clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO 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..

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

8.2.2.6 Unsupported or unacceptable configuration in the UE

If the UTRAN instructs the UE to use a configuration, which it does not support or if the variable UNACCEPTABLE_CONFIGURATION is set to TRUE, 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";
- if the radio bearer reconfiguration procedure affects several radio bearers, the UE may include the identities of the radio bearers for which the procedure would have been succesful into the RADIO BEARER RECONFIGURATION FAILURE message.

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 3 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";
- if the radio bearer reconfiguration procedure affects several radio bearers, the UE may include the identities of the radio bearers for which the procedure would have been succesful into the RADIO BEARER RECONFIGURATION FAILURE message;
- when the transmission of the RADIO BEARER RECONFIGURATION FAILURE message has been confirmed by RLC, the UE shall resume data transmission on RB 3 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 Subsequently received RADIO BEARER RECONFIGURATION messages

If the variable ORDERED_CONFIG is set because of a RADIO BEARER RECONFIGURATION message previously received, the UE shall

- ignore the subsequently received RADIO BEARER RECONFIGURATION message
- keep the configuration as before the subsequent RADIO BEARER RECONFIGURATION message was received.

8.2.2.14 Incompatible simultaneous reconfiguration

If the variable ORDERED_CONFIG is set (because of any message other than RADIO BEARER RECONFIGURATION) 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 a RADIO BEARER RECONFIGURATION FAILURE message on the DCCH using AM RLC. The UE shall set the IE "failure cause" to "incompatible simultaneous reconfiguration". When the transmission of RADIO BEARER RECONFIGURATION FAILURE message has been confirmed by RLC the procedure ends.

8.2.2.15 Invalid RADIO BEARER RECONFIGURATION message

If the variable ORDERED_CONFIG is not set and the RADIO BEARER RECONFIGURATION message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Transmit a RADIO BEARER RECONFIGURATION FAILURE message on the uplink DCCH using AM RLCand set the IE "failure cause" the cause value "protocol error".
- Include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.
- When the transmission of the RADIO BEARER RECONFIGURATION FAILURE message has been confirmed by RLC, the UE shall resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers. The UE shall resume normal operation as if the invalid RADIO BEARER RECONFIGURATION message has not been received and the procedure ends.

8.2.3 Radio bearer release

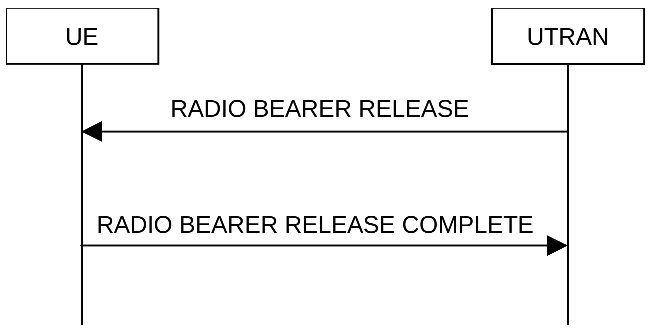


Figure 26: Radio Bearer Release, normal case

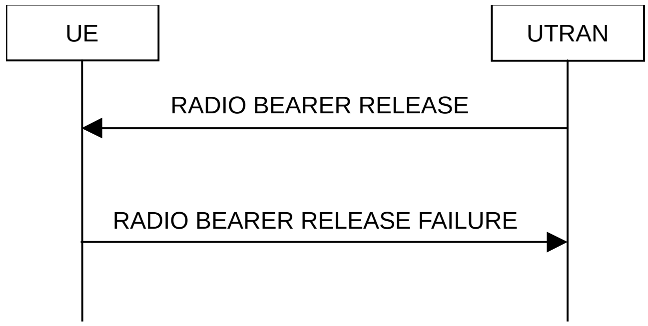


Figure 27: Radio Bearer Release, UE reverts to old configuration

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 UE Information Elements, RB Information Elements, TrCH Information Elements and PhyCH information elements 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;
- indicate release of the RAB subflow stored in the variable ESTABLISHED_RABS to the upper layer entity corresponding to the CN domain identity stored in the variable ESTABLISHED_RABS;
- delete the information about the radio bearer from the variable ESTABLISHED_RABS.

  When all radio bearers belonging to the same radio access bearer have been released, the UE shall:

  - indicate release of the radio access bearer to the upper layer entity using the CN domain identity together with the RAB identity stored in the variable ESTABLISHED_RABS;
  - delete all information about the radio access bearer from the variable ESTABLISHED_RABS.

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 3 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.

In FDD, if the IE 'PDSCH code mapping' is included but the IE 'PDSCH with SHO DCH Info' is not included and if the DCH has only one link in its active set then the UE shall act upon the 'PDSCH code mapping' IE as specified in subclause 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" in TDD or "Primary CPICH info" in FDD and C-RNTI to a given cell is included, the UE shall select the cell indicated by the IE "Primary CCPCH info" in TDD or "Primary CPICH info" in FDD.
- 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. If the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO is set, the UE shall include and set the IE "Radio bearer uplink ciphering activation time info" to the value of that variable.

When the transmission of the RADIO BEARER RELEASE COMPLETE message has been confirmed by RLC the UE shall clear the variable ORDERED_CONFIG, clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO, the UE shall resume data transmission on RB 3 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 or unacceptable configuration in the UE

If UTRAN instructs the UE to use a configuration, which it does not support or if the variable UNACCEPTABLE_CONFIGURATION is set to TRUE, 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". If the radio bearer release procedure affects several radio bearers, the UE may include the identities of the radio bearers for which the procedure would have been succesful into the RADIO BEARER RELEASE FAILURE message.

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 3 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 3 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;
- if the radio bearer release procedure affects several radio bearers, the UE may include the identities of the radio bearers for which the procedure would have been succesful into the RADIO BEARER RELEASE FAILURE message.

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.

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

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 Subsequently received RADIO BEARER RELEASE messages

If the variable ORDERED_CONFIG is set because of a RADIO BEARER RELEASE message previously received, the UE shall

- ignore the subsequently received RADIO BEARER RELEASE message
- keep the configuration as before the subsequent RADIO BEARER RELEASE message was received.

8.2.3.10 Incompatible simultaneous reconfiguration

If the variable ORDERED_CONFIG is set (because of any message other than RADIO BEARER RELEASE) 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 a RADIO BEARER RELEASE FAILURE message on the DCCH using AM RLC. The UE shall set the IE "failure cause" to "incompatible simultaneous reconfiguration". When the transmission of RADIO BEARER RELEASE FAILURE message has been confirmed by RLC the procedure ends.

8.2.3.11 Invalid RADIO BEARER RELEASE message

If the variable ORDERED_CONFIG is not set and the RADIO BEARER RELEASE message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Transmit a RADIO BEARER RELEASE FAILURE message on the uplink DCCH using AM RLCand set the IE "failure cause" the cause value "protocol error".
- Include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.
- When the transmission of the RADIO BEARER RELEASE FAILURE message has been confirmed by RLC, the UE shall resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers. The UE shall resume normal operation as if the invalid RADIO BEARER RELEASE message has not been received and the procedure ends.

8.2.4 Transport channel reconfiguration

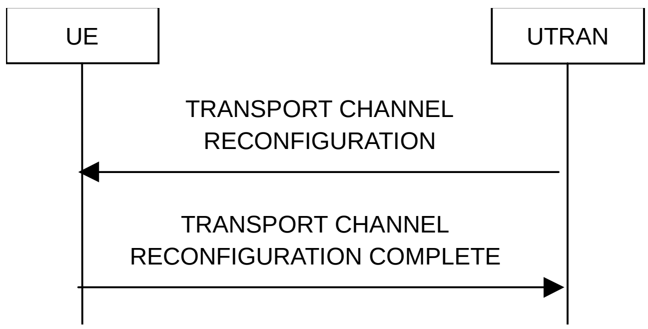


Figure 28: Transport channel reconfiguration, normal flow

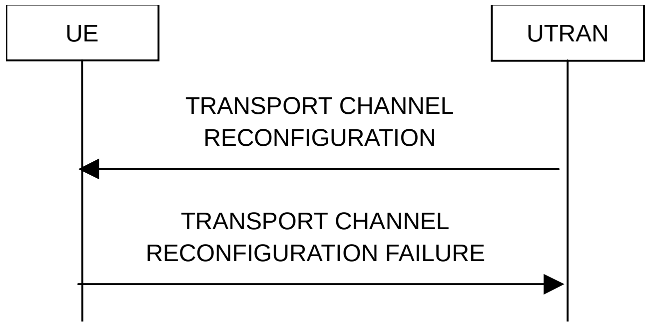


Figure 29: Transport channel reconfiguration, failure case

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

To initiate the procedure, UTRAN should:

- 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 the Transport Channel Reconfiguration procedure is simultaneous with SRNS relocation procedure, and ciphering and/or integrity protection are activated, transmit new ciphering and/or integrity protection information to be used after reconfiguration.

If transport channels are added, reconfigured or deleted in uplink and/or downlink, 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 UE Information Elements, RB Information Elements, TrCH Information Elements and PhyCH information elements 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 3 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.

In FDD, if the IE 'PDSCH code mapping' is included but the IE 'PDSCH with SHO DCH Info' is not included and if the DCH has only one link in its active set then the UE shall act upon the 'PDSCH code mapping' IE as specified in subclause 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" in TDD or "Primary CPICH info" in FDD and IE "New C-RNTI" to a given cell is included, the UE shall

- Select the cell indicated by the IE "Primary CCPCH info" in TDD or "Primary CPICH info" in FDD.
- 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 variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO is set, the UE shall include and set the IE "Radio bearer uplink ciphering activation time info" to the value of that variable.

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 3 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 UE Information Elements, RB Information Elements, TrCH Information Elements and PhyCH information elements 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.

In FDD, 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 subclause 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.

If the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO is set, the UE shall include and set the IE "Radio bearer uplink ciphering activation time info" to the value of that variable.

When the transmission of the TRANSPORT CHANNEL RECONFIGURATION COMPLETE message has been confirmed by RLC, the UE shall clear the variable ORDERED_CONFIG, clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO 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.

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

8.2.4.6 Unsupported or unacceptable configuration in the UE

If the UTRAN instructs the UE to use a configuration, which it does not support or if the variable UNACCEPTABLE_CONFIGURATION is set to TRUE, 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 3 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 3 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 search and initiate the cell update procedure.

8.2.4.12 Subsequently received TRANSPORT CHANNEL RECONFIGURATION messages

If the variable ORDERED_CONFIG is set because of a TRANSPORT CHANNEL RECONFIGURATION message previously received, the UE shall

- ignore the subsequently received TRANSPORT CHANNEL RECONFIGURATION message
- keep the configuration as before the subsequent TRANSPORT CHANNEL RECONFIGURATION message was received.

8.2.4.13 Incompatible simultaneous reconfiguration

If the variable ORDERED_CONFIG is set (because of any message other than TRANSPORT CHANNEL RECONFIGURATION) 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 a TRANSPORT CHANNEL RECONFIGURATION 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 CHANNEL RECONFIGURATION FAILURE message has been confirmed by RLC the procedure ends.

8.2.4.14 Invalid TRANSPORT CHANNEL RECONFIGURATION message

If the variable ORDERED_CONFIG is not set and the TRANSPORT CHANNEL RECONFIGURATION message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Transmit a TRANSPORT CHANNEL RECONFIGURATION FAILURE message on the uplink DCCH using AM RLCand set the IE "failure cause" the cause value "protocol error".
- Include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.
- When the transmission of the TRANSPORT CHANNEL RECONFIGURATION FAILURE message has been confirmed by RLC, the UE shall resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers. The UE shall resume normal operation as if the invalid TRANSPORT CHANNEL RECONFIGURATION message has not been received and the procedure ends.

8.2.5 Transport format combination control

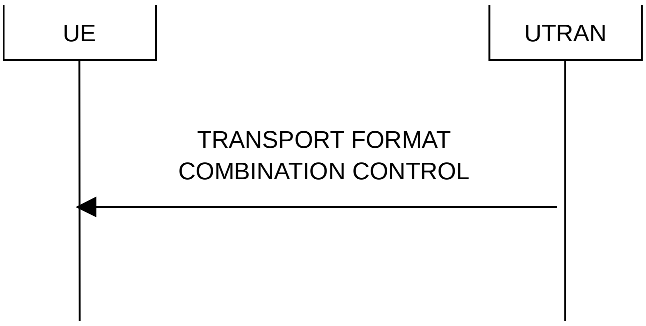


Figure 30: Transport format combination control, normal flow

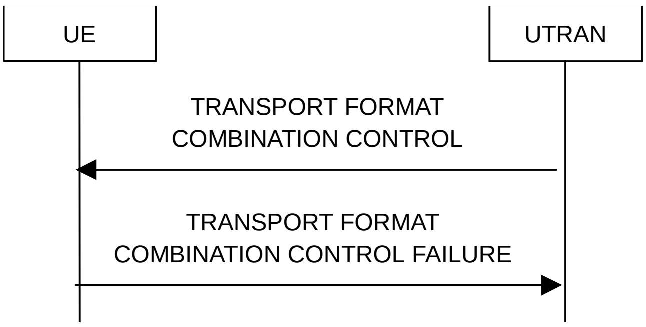


Figure 31: Transport format combination control, failure case

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, UM or TM 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 (subclause 8.2.1);
- Radio bearer release (subclause 8.2.3);
- Radio bearer reconfiguration (subclause 8.2.2);
- Transport channel reconfiguration (subclause 8.2.4);
- Physical channel reconfiguration (subclause 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 specified TFC set or sub-set shall 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.

In all cases, the TFC set or TFC sub-set specified in the message shall be used in:

- Frame n+5, when frame n+5 also corresponds to the first 10 ms frame following the framing boundary between transport blocks with the largest TTI which are configured on the uplink CCTrCH; n is the downlink DPCH frame (with 10 ms resolution) during which the UE received the complete RRC "Transport Format Combination Control" message,
- Or if the above condition is not met, the first 10 ms frame following the first framing boundary after frame n+5, where the framing boundary is that between the transport blocks with the largest TTI which are configured on the uplink CCTrCH.

8.2.5.4 Incompatible simultaneous reconfiguration

If the variable ORDERED_CONFIG is set because of any message other than TRANSPORT FORMAT COMBINATION CONTROL, 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.

8.2.5.5 Invalid TRANSPORT FORMAT COMBINATION CONTROL message

If the variable ORDERED_CONFIG is not set and the TRANSPORT FORMAT COMBINATION CONTROL message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Transmit a TRANSPORT FORMAT COMBINATION CONTROL FAILURE message on the uplink DCCH using AM RLC and set the IE "failure cause" the cause value "protocol error".

- Include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.

- When the transmission of the TRANSPORT FORMAT COMBINATION CONTROL FAILURE message has been confirmed by RLC, the UE shall resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers. The UE shall resume normal operation as if the invalid TRANSPORT FORMAT COMBINATION CONTROL message has not been received and the procedure ends.

8.2.6 Physical channel reconfiguration

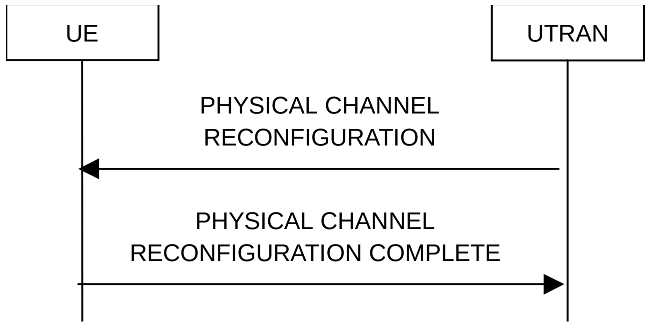


Figure 32: Physical channel reconfiguration, normal flow

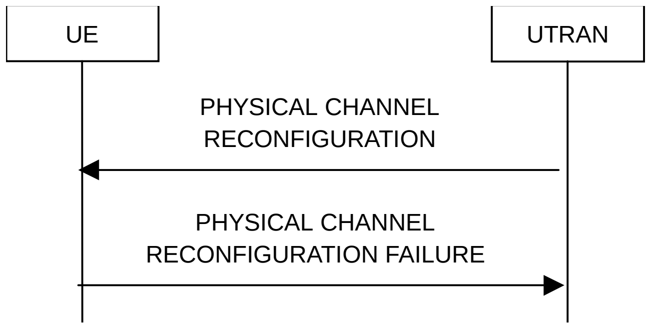


Figure 33: Physical channel reconfiguration, failure case

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.

If the Physical Channel Reconfiguration procedure is simultaneous with SRNS relocation procedure, and ciphering and/or integrity protection are activated, transmit new ciphering and/or integrity protection information to be used after reconfiguration.

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 UE Information Elements, RB Information Elements, TrCH Information Elements and PhyCH information elements 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 3 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.

In FDD, if the IE 'PDSCH code mapping' is included but the IE 'PDSCH with SHO DCH Info' is not included and if the DCH has only one link in its active set then the UE shall act upon the 'PDSCH code mapping' IE as specified in subclause 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" in TDD or "Primary CPICH info" in FDD and IE "New C-RNTI" to a given cell is included, the UE shall:

- Select the cell indicated by the IE "Primary CCPCH info" in TDD or "Primary CPICH info" in FDD.
- 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.

If the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO is set, the UE shall include and set the IE "Radio bearer uplink ciphering activation time info" to the value of that variable.

When the transmission of the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message has been confirmed by RLC, the UE shall clear the variable ORDERED_CONFIG, clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO, the UE shall resume data transmission on RB 3 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, clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO 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 UE Information Elements, RB Information Elements, TrCH Information Elements and PhyCH information elements 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.

In FDD, 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 subclause 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.

If the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO is set, the UE shall include and set the IE "Radio bearer uplink ciphering activation time info" to the value of that variable.

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, clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO 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.

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

8.2.6.6 Unsupported or unacceptable configuration in the UE

If the UE instructs the UE to use a configuration, which it does not support or if the variable UNACCEPTABLE_CONFIGURATION is set to TRUE, 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 Subsequently received PHYSICAL CHANNEL RECONFIGURATION messages

If the variable ORDERED_CONFIG is set because of a PHYSICAL CHANNEL RECONFIGURATION message previously received, the UE shall

- ignore the subsequently received PHYSICAL CHANNEL RECONFIGURATION message
- keep the configuration as before the subsequent PHYSICAL CHANNEL RECONFIGURATION message was received.

8.2.6.13 Incompatible simultaneous reconfiguration

If the variable ORDERED_CONFIG is set (because of any message other than PHYSICAL CHANNEL RECONFIGURATION) 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 a PHYSICAL CHANNEL RECONFIGURATION FAILURE message on the DCCH using AM RLC. The UE shall set the IE "failure cause" to "incompatible simultaneous reconfiguration". When the transmission of PHYSICAL CHANNEL RECONFIGURATION FAILURE message has been confirmed by RLC the procedure ends.

8.2.6.14 Invalid PHYSICAL CHANNEL RECONFIGURATION message

If the variable ORDERED_CONFIG is not set and the PHYSICAL CHANNEL RECONFIGURATION message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Transmit a PHYSICAL CHANNEL RECONFIGURATION FAILURE message on the uplink DCCH using AM RLCand set the IE "failure cause" the cause value "protocol error".
- Include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.
- When the transmission of the PHYSICAL CHANNEL RECONFIGURATION FAILURE message has been confirmed by RLC, the UE shall resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers. The UE shall resume normal operation as if the invalid PHYSICAL CHANNEL RECONFIGURATION message has not been received and the procedure ends.

8.2.7 Physical Shared Channel Allocation [TDD only]

Figure 34: 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 ALLOCATION" message via the SHCCH, to allocate PUSCH or PDSCH resources to exactly one CCTrCH. The C-RNTI shall be included for UE identification. In CELL_DCH state, the message may also be transmitted on DCCH mapped to DCH transport channel. When transmitted on DCCH, there is no need to include the C-RNTI.

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 the C-RNTI is included. If the UE is addressed by the message, i.e using C-RNTI or the message is received on a physical resource that is assigned to only this UE, the UE shall evaluate the message and use the IEs as specified below.

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

- decode the IE " Allocation Activation Time" and the IE "Allocation Duration", to determine the time interval for which the allocation shall be valid;
- configure Layer 1 according to the PDSCH information received in allocation message or in BCCH SIB#6 (as default if not specified in allocation message), for the specified time interval received in allocation message;
- 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 IE "PUSCH info" is included, the UE shall:

- decode the IE " Allocation Activation Time" and the IE "Allocation Duration", to determine the time interval for which the allocation shall be valid;
- configure Layer 1 according to the PUSCH information received in allocation message or in BCCH SIB#6 (as default if not specified in allocation message), for the specified time interval received in allocation message;
- 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 "Uplink Timing Advance" the UE shall configure the Layer 1 with the new Timing Advance.

NOTE: If UE has just entered a new cell and SIB#6 USCH or DSCH information has not yet been scheduled, USCH/DSCH information is specified in allocation message.

8.2.8 PUSCH capacity request [TDD only]

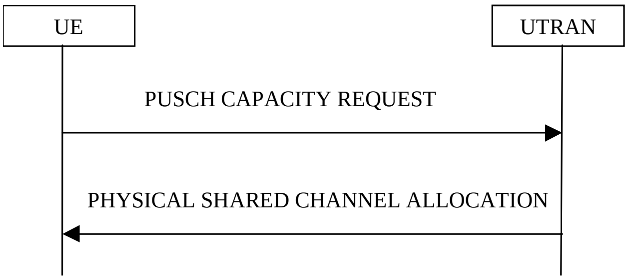


Figure 35: PUSCH Capacity request procedure

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, and/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.

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 request physical resources (PUSCH) for an USCH channel.

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

- Timer T311 is not running.
- 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 if the message is sent on RACH;
- 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 "Timeslot ISCP" and "Primary CCPCH RSCP".

The timeslots for which "Timeslot ISCP" may be reported shall have been configured with a previous PHYSICAL SHARED CHANNEL ALLOCATION message.

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 - provided 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

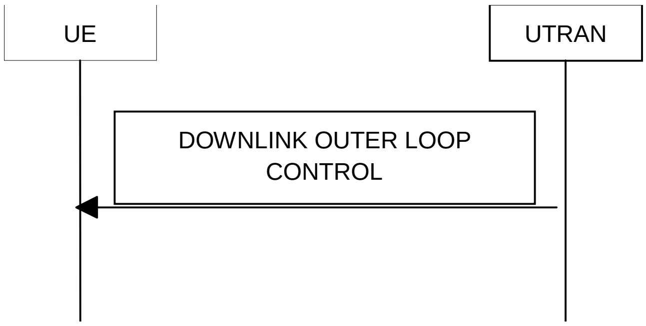


Figure 36: Downlink Outer Loop Control, normal flow

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 SIR target value above its current value, the UTRAN should set the "Downlink Outer Loop Control" IE to "Increase not allowed".

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

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 perform actions specified in 8.5.7 unless otherwise specified below.

The UE shall read the IE "Downlink Outer Loop Control".

If the IE "Downlink Outer Loop Control" is set to "Increase not allowed", the UE shall prevent its DL SIR target value from increasing above the current value.

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

8.2.9.4 Invalid DOWNLINK OUTER LOOP CONTROL message

If the UE receives a DOWNLINK OUTER LOOP CONTROL message, which contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Transmit an RRC STATUS message on the uplink DCCH using AM RLC and include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.

- When the transmission of the RRC STATUS message has been confirmed by RLC, the UE shall resume normal operation as if the invalid DOWNLINK OUTER LOOP CONTROL message has not been received.

8.2.10 Uplink Physical Channel Control

Figure 37: Uplink Physical Channel Control

8.2.10.1 General

The uplink physical channel control procedure is used to control the uplink outer loop power control and timing advance running in the UE in TDD.

8.2.10.2 Initiation

The UTRAN initiates the procedure by transmitting the UPLINK PHYSICAL CHANNEL CONTROL message on the downlink DCCH using AM or UM RLC in order to update parameters for uplink open loop power control in the UE for one CCTrCH or to inform the UE about a new timing advance value to be applied. Especially, uplink interference information measured by the UTRAN can be included for the uplink timeslots used for the CCTrCH.

8.2.10.3 Reception of UPLINK PHYSICAL CHANNEL CONTROL message by the UE

Upon reception of the UPLINK PHYSICAL CHANNEL CONTROL message, the UE shall act upon all received information elements as specified in 8.5.7.

If Uplink DPCH Power Control Info, Constant Value, or list of UL Timeslot Interference IE's are transmitted, this information shall be taken into account by the UE for uplink open loop power control as specified in 8.5.9.

8.3 RRC connection mobility procedures

8.3.1 Cell update

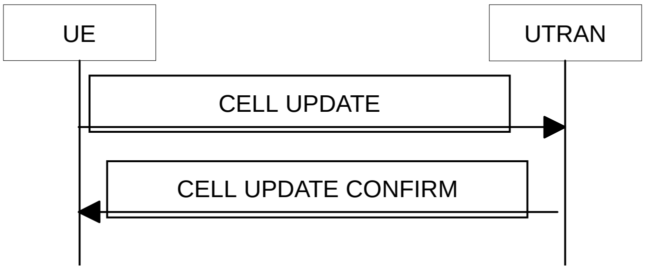


Figure 38: Cell update procedure, basic flow

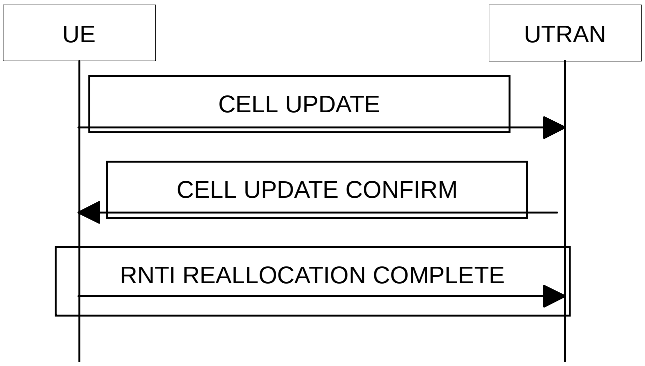


Figure 39: Cell update procedure with RNTI reallocation

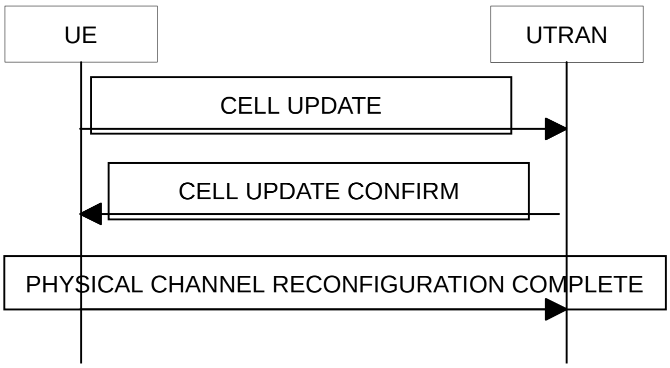


Figure 40: Cell update procedure with physical channel reconfiguration

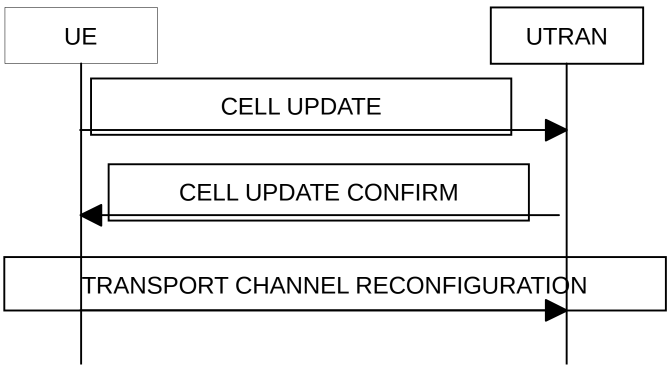


Figure 41: Cell update procedure with transport channel reconfiguration

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 reset the AM RLC entities for the signalling link and the u-plane link. The UE can use a CELL UPDATE message to notify the unrecoverable error (Amount of the retransmission of RESET PDU reaches the value of Max DAT and receives no ACK) in an AM RLC entity for the signalling link.

NOTE: PHYSICAL/TRANSPORT 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:

- Upon initiation of the procedure, the UE shall set the variable PROTOCOL_ERROR_INDICATOR to FALSE.
- 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 (periodic cell update).
- In transition to CELL_DCH to CELL_FACH by receiving RB control message with no indication which cell to camp, the UE should select a cell and perform the cell update procedure (RB control response).
- In CELL_PCH state and URA_PCH state, the UE shall initiate the cell update procedure if it wants to transmit UL data (UL data transmission).
- 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 (paging response).
- moving to CELL_FACH state, if not already in that state.
- consider stored C-RNTI to be invalid until CELL UPDATE CONFIRM message is received when UE detects a new cell.
- suspend data transmission on RB 3 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 RB control response: "RB control response";
- In case of UL data transmission: "UL data transmission";
- In case of paging response: "paging response".

If the value of the variable PROTOCOL_ERROR_INDICATOR is TRUE, the UE shall set the IE "Protocol error indicator" to TRUE and include the IE "Protocol error information" set to the value of the variable PROTOCOL_ERROR_INFORMATION.

If the value of the variable PROTOCOL_ERROR_INDICATOR is FALSE, the UE shall set the IE "Protocol error indicator" to FALSE.

The IE "AM_RLC error indication" shall be set when the UE detects unrecoverable error (amount of the retransmission of RESET PDU reaches the value of Max DAT and receives no ACK) in an AM RLC entity for the signalling link. The IE "AM_RLC error indication (for u-plane)" shall be set when the UE detects unrecoverable error in an AM RLC entity (for u-plane) for for u-plane link.

UE shall include "the maximum value in the currently used HFNs among CS and PS domains" + "1" in IE "HFN" in CELL UPDATE message.

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 unrecoverable error (Amount of the retransmission of RESET PDU reaches the value of Max DAT and receives no ACK), it waits for CELL UPDATE message from the UE and when the UTRAN receives it, UTRAN commands the UE to reset AM_RLC by sending CELL UPDATE CONFIRM message. This procedure can be used not only in the case of AM_RLC unrecoverable error but also in the case that UTRAN wants to reset 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 (old C-RNTI or U-RNTI may be used for MAC header), the UE shall stop timer T302.

The UE shall delete old C-RNTI when a new C-RNTI is allocated. If not allocated, use old C-RNTI as a valid C-RNTI.

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 IE "DRX indicator" in the CELL UPDATE CONFIRM message is not set to "no DRX", no RRC response message is sent to the UTRAN.

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", following actions are taken;

- If cell update is due to "periodical cell update", no RRC response message is sent to the UTRAN.
- If cell update is due to "UL data transmission" or "paging response" and if there is no difference in TFS and/or TFCS stored in UE compared to PRACH/SCCPCH indicated in the broadcast system information, PHYSICAL CHANNEL RECONFIGURATION COMPLETE message is sent to the UTRAN using the PRACH indicated in the broadcast system information.
- If cell update is due to "UL data transmission" or "paging response" and if there is a difference in TFS and/or TFCS stored in UE compared to PRACH/SCCPCH indicated in the broadcast system information,, TRANSPORT CHANNEL RECONFIGURATION COMPLETE message is sent to the UTRAN using the PRACH indicated in the broadcast system information.
- No case for cell update due to "cell reselection" or "RB control response".

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 following actions are taken:

- If cell update is due to "periodical cell update", transmit an RNTI REALLOCATION COMPLETE message on the uplink DCCH using the PRACH stored in the UE.
- If cell update is due to "cell reselection", "UL data transmission" or "paging response" and if there is no difference in TFS and/or TFCS stored in UE compared to PRACH/SCCPCH indicated in the broadcast system information, PHYSICAL CHANNEL RECONFIGURATION COMPLETE message is sent to the UTRAN using the PRACH indicated in the broadcast system information.
- If cell update is due to "UL data transmission" or "paging response" and if there is a difference in TFS and/or TFCS stored in UE compared to PRACH/SCCPCH indicated in the broadcast system information,, TRANSPORT CHANNEL RECONFIGURATION COMPLETE message is sent to the UTRAN using the PRACH indicated in the broadcast system information.
- If cell update is due to "RB control response", transmit a RB control response message on the uplink DCCH using the PRACH indicated in the broadcast system information.

If the CELL UPDATE CONFIRM message includes the IE "RLC reset indicator (for C-plane)" the UE shall reset the AM RLC entities on C-plane.

If the CELL UPDATE CONFIRM message includes the IE "RLC reset indicator (for U-plane)" the UE shall reset the AM RLC entities on U-plane.

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".
- If cell update is due to "periodical cell update", "cell reselection", "UL data transmission" or "paging response", transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on the uplink DCCH using the PRACH indicated in CELL UPDATE CONFIRM message.
- If cell update is due to "RB control response", transmit a RB control response message on the uplink DCCH using the PRACH indicated in the broadcast system information.

The UE shall enter a state according to subclause 8.5.8 applied on the CELL UPDATE CONFIRM message.

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 and PRACH/SCCPCH information.

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 3 and upward, if RLC-AM or RLC-UM is used on those radio bearers.

8.3.1.6 Invalid CELL UPDATE CONFIRM message

If the UE receives an CELL UPDATE CONFIRM message, which contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

The UE shall check the value of V302 and

- If V302 is smaller or equal than N302, the UE shall set the variable PROTOCOL_ERROR_INDICATOR to TRUE, 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 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

8.3.1.8 Reception of the RNTI REALLOCATION COMPLETE message by the UTRAN

See subclause 8.3.3.4.

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

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

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

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

8.3.2 URA update

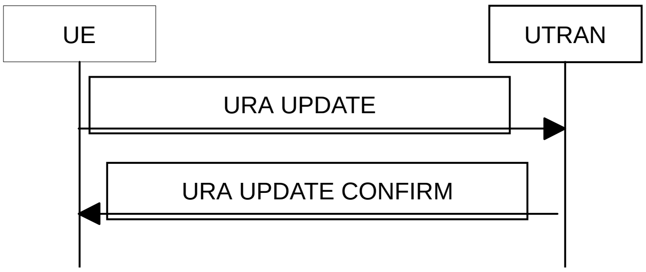


Figure 42: URA update procedure, basic flow

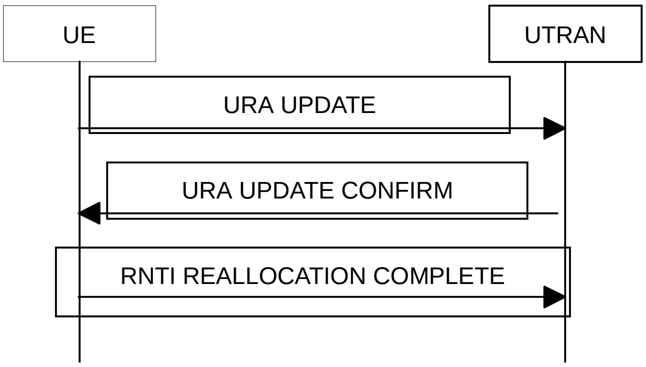


Figure 43: URA update procedure with RNTI reallocation

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:

- Upon initiation of the procedure, the UE shall set the variable PROTOCOL_ERROR_INDICATOR to FALSE.
- 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".

If the value of the variable PROTOCOL_ERROR_INDICATOR is TRUE, the UE shall set the IE "Protocol error indicator" to TRUE and include the IE "Protocol error information" set to the value of the variable PROTOCOL_ERROR_INFORMATION.

If the value of the variable PROTOCOL_ERROR_INDICATOR is FALSE, the UE shall set the IE "Protocol error indicator" to FALSE.

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 Invalid URA UPDATE CONFIRM message

If the UE receives an URA UPDATE CONFIRM message, which contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

The UE shall check the value of V303 and:

- If V303 is smaller or equal than N303, the UE shall set the variable PROTOCOL_ERROR_INDICATOR to TRUE, retransmit a URA UPDATE message on the uplink CCCH, restart timer T303 and increase counter V303. The UE shall 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 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.

8.3.2.9 Reception of the RNTI REALLOCATION COMPLETE message by the UTRAN

See subclause 8.3.3.4.

8.3.3 RNTI reallocation

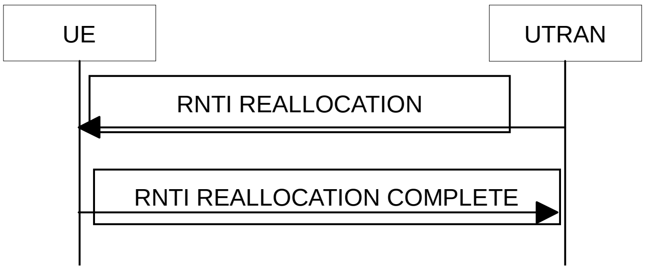


Figure 44: RNTI reallocation procedure, normal flow

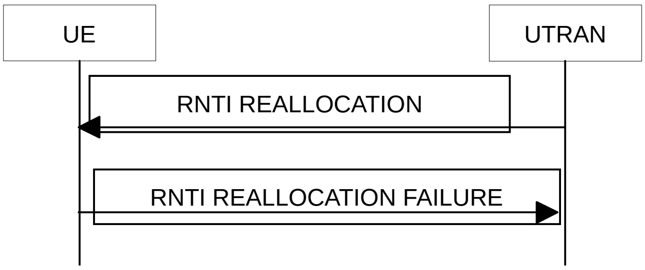


Figure 45: RNTI reallocation procedure, failure case

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.

8.3.3.5 Invalid RNTI REALLOCATION message

If the RNTI REALLOCATION message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- transmit a RNTI REALLOCATION FAILURE message on the uplink DCCH using AM RLCand set the IE "failure cause" the cause value "protocol error";
- include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.
- When the transmission of the RNTI REALLOCATION FAILURE message has been confirmed by RLC, the UE shall resume normal operation as if the invalid RNTI REALLOCATION message has not been received and the procedure ends.

8.3.4 Active set update in soft handover

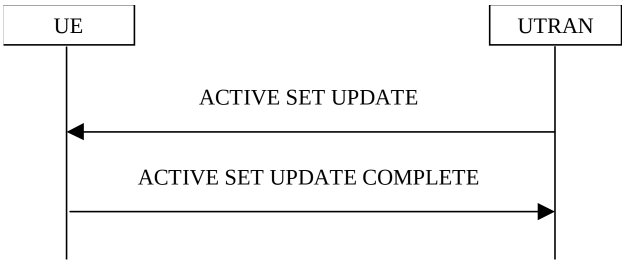


Figure 46: Active Set Update procedure, successful case

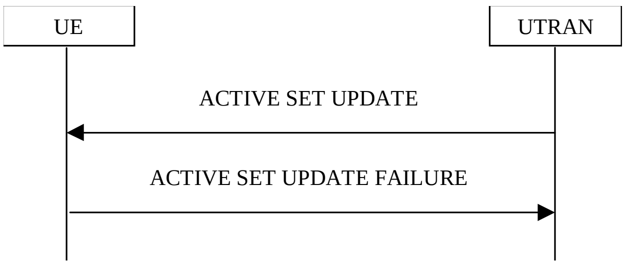


Figure 47: Active Set Update procedure, failure case

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. This procedure is only used in FDD mode.

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 the IE "Primary CPICH 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": IE "Primary CPICH 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;

- if the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO is set, the UE shall include and set the IE "Radio bearer uplink ciphering activation time info" to the value of that variable;

- 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, the UE shall clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO 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 Subsequently received ACTIVE SET UPDATE messages

If the variable ORDERED_CONFIG is set because of an ACTIVE SET UPDATE message previously received, the UE shall

- ignore the subsequently received ACTIVE SET UPDATE message

- keep the configuration as before the subsequent ACTIVE SET UPDATE message was received.

8.3.4.8 Incompatible simultaneous reconfiguration

If any of the variables ORDERED_CONFIG or ORDERED_ASU are set because of any message other than ACTIVE SET UPDATE, the UE shall:

- Transmit an ACTIVE SET UPDATE FAILURE message on the DCCH using AM RLC. The UE shall set the IE "failure cause" to "incompatible simultaneous reconfiguration".

- When the transmission of the ACTIVE SET UPDATE FAILURE 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.

8.3.4.9 Invalid ACTIVE SET UPDATE message

If none of the variables ORDERED_CONFIG or ORDERED_ASU are set and the ACTIVE SET UPDATE message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Transmit a ACTIVE SET UPDATE FAILURE message on the uplink DCCH using AM RLCand set the IE "failure cause" the cause value "protocol error".

- Include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.

- When the transmission of the ACTIVE SET UPDATE FAILURE message has been confirmed by RLC, the UE shall resume normal operation as if the invalid ACTIVE SET UPDATE message has not been received and the procedure ends.

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

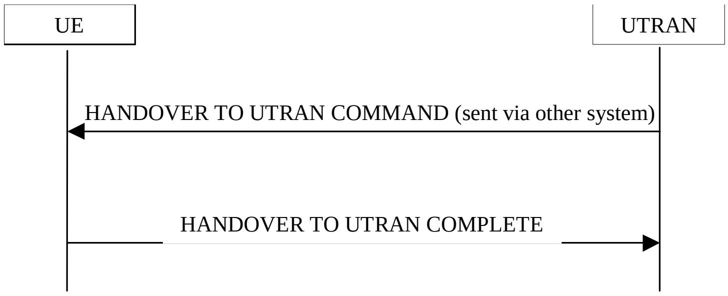


Figure 48: Inter system handover to UTRAN, successful case

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.

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

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".

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

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

8.3.6.4 Invalid Handover to UTRAN command message

If the UE receives a HANDOVER TO UTRAN COMMAND message, which contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Resume the connection used before the handover to the source radio access system;
- Indicate a failure to the source radio access system, using "protocol error" as cause for the failure;
- If possible, transmit an RRC STATUS message to the other radio access system, and include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION;
- Other details may be specified in the specifications related to the source radio access system.

8.3.6.5 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.

8.3.6.6 Reception of message HANDOVER TO UTRAN COMPLETE by the UTRAN

Upon receiving a HANDOVER TO UTRAN 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

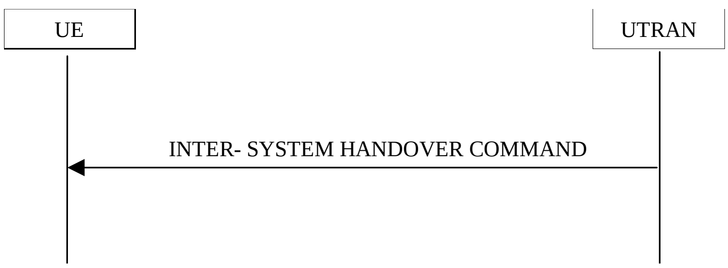


Figure 49: Inter system handover from UTRAN, successful case

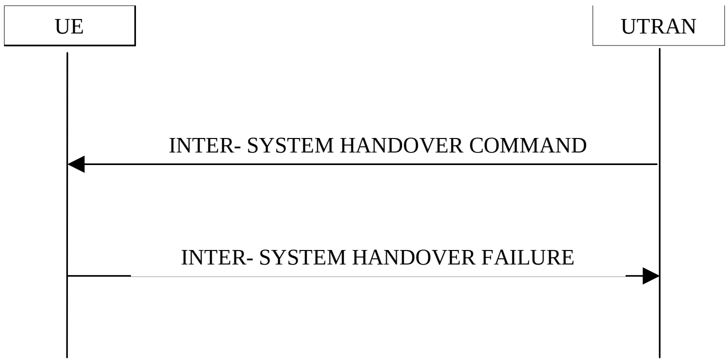


Figure 50: Inter system handover from UTRAN, failure case

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.
- For each IE "Remaining radio access bearer", associate the radio access bearer given by the IE "RAB info" to the radio resources in the target system given by the IE "Inter system message". Other information for making the association may be included in the IE "Inter system message" and requirements may be stated in the specifications relevant for the target system [FFS].
- 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.

NOTE 3: Currently only one radio access bearer can be associated with the IE "Inter-system message", and this association is limited to the radio acces bearers in the CS domain. It is assumed that all the radio access bearers in the PS domain, if any, remain after the handover.

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 Invalid INTER-SYSTEM HANDOVER COMMAND message

If the INTER-SYSTEM HANDOVER COMMAND message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Transmit a INTER-SYSTEM HANDOVER FAILURE message on the uplink DCCH using AM RLCand set the IE "failure cause" the cause value "protocol error".
- Include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.
- When the transmission of the INTER-SYSTEM HANDOVER FAILURE message has been confirmed by RLC, the UE shall resume normal operation as if the invalid INTER-SYSTEM HANDOVER COMMAND message has not been received and the procedure ends.

8.3.7.7 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_PCH.

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 three 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.**
3. Cells, which are not included in the active set, and are detected by the UE without receiving a neighbour list from the UTRAN belong to the **detected set.** Intra-frequency measurements of the unlisted set is required only from UEs in CELL_DCH state.

NOTE: The cells of the monitored set are not excluded from the detected 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 clause 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 clause 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. The UE may also be requested by the UTRAN to report unlisted cells, which it has detected. The triggering event for the UE to send a MEASUREMENT REPORT message is that a detected cell exceeds an absolute threshold.

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

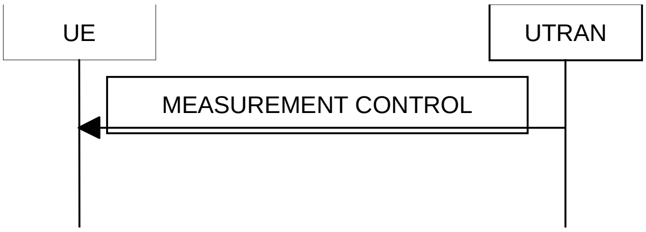


Figure 51: Measurement Control, normal case

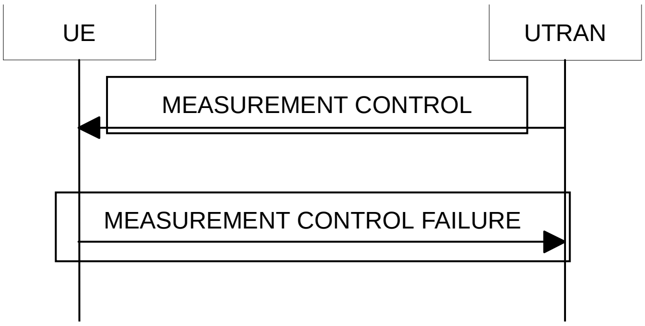


Figure 52: Measurement Control, UE reverts to old measurements

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 may use several "Measurement identity number" within a same "Measurement type". In case of setting several "Measurement identity numbers" within a same "Measurement type", "Measurement object" can be set differently for each measurement with different "Measurement identity numbers". If no "Measurement object" is indicated for additional measurement within a same "Measurement type" in case of "Measurement type" = "Intra-frequency", it implies that only active set cells are the "Measurement objects".

When a current measurement is modified or released, UTRAN should set the IE "Measurement identity number" to a value, which is used for the current measurement. In case of modifying IEs within a "Measurement identity number", it is not needed for UTRAN to indicate the IEs other than modifying IEs, and the UE continuously uses the current values of the IEs which are not modified.

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

  For measurement types "inter-system measurement" or "inter-frequency measurement",

  - begin measurements according to the stored control information for this measurement identity number on condition that the corresponding compressed mode pattern sequence stored in variable TGPS_IDENTITY is active or unless it is simultaneously activated; or

  For any other measurement type,

  - begin measurements according to the stored control information for this measurement identity number.

See clause 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.

If the IE "DPCH Compressed Mode Status Info" is present, the UE shall:

- activate the pattern sequence stored in variable TGPS_IDENTITY corresponding to each IE "TGPSI" for which the "TGPS status flag" is set to "activate" and begin the inter-frequency and/or inter-system measurements corresponding to the pattern sequence measurement purpose of each activated pattern sequence;
- deactivate the pattern sequence stored in variable TGPS_IDENTITY corresponding to each IE "TGPSI" for which the "TGPS status flag" is set to "deactivate" and terminate the inter-frequency and/or inter-system measurements corresponding to the pattern sequence measurement purpose of each deactivated pattern sequence;

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 Invalid MEASUREMENT CONTROL message

If the MEASUREMENT CONTROL message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- transmit a MEASUREMENT CONTROL FAILURE message on the uplink DCCH using AM RLCand set the IE "failure cause" the cause value "protocol error";
- include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION;
- when the transmission of the MEASUREMENT CONTROL FAILURE message has been confirmed by RLC, the UE shall resume normal operation as if the invalid MEASUREMENT CONTROL message has not been received and the procedure ends.

8.4.1.6 Reception of the MEASUREMENT CONTROL FAILURE message by the UTRAN

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

8.4.1.7 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").

The UE shall not measure on other frequencies except at the measurement occasions given in 8.5.13.

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").

The UE shall not measure on other systems except at the measurement occasions given in 8.5.13.

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").

8.4.1.8 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 in CELL_DCH state 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 performed cell reselection whilst out of CELL_DCH state, the UE shall not resume the measurement.

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").

8.4.1.9 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").

8.4.1.10 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

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").

The UE shall not measure on other frequencies except at the measurement occasions given in 8.5.13.

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").

The UE shall not measure on other systems except at the measurement occasions given in 8.5.13.

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").

8.4.1.11 Measurements when measurement object is no longer valid

Traffic volume measurement

If UE is no longer using the transport channel that is specified in "traffic volume measurement object", UE shall ignore any measurements that are assigned to that transport channel. If none of the transport channels that are specified in "traffic volume measurement object" is being used, UE shall release that particular measurement and its measurement ID.

8.4.2 Measurement report

Figure 53: 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 clause 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.

If the variable SELECTED_CN in the UE has the value "ANSI-41", the UE shall choose "UE id type" in the IE "Initial UE identity" according to the procedure specified in the 3GPP2 document "3GPP2 C.P0004-A".

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 subclause 8.1, perform measurements according to the measurement control procedure specified in subclause 8.4 and, if registered, be prepared to receive paging and notification messages according to the paging procedure in subclause 8.2.

If IE "PLMN identity" within variable SELECTED_PLMN has the value "GSM-MAP", the UE shall delete any NAS system information received in connected mode, acquire the NAS system information in system information block type 1, and proceed according to 8.5.7.1.2.

The UE shall compare the 20 most significant bits of the hyper frame numbers in each CN domain for each radio bearer (including signalling radio bearers) that has existed during the connection, after possible authentication and ciphering/integrity key change. Even if a radio bearer has been released, its HFN must be temporarily saved until another HFN instance (of the radio bearers towards the same CN domain) exceeds the saved value or until ciphering/integrity keys for this domain are changed. The UE shall store into the USIM the 20 most significant bits of the highest HFN in each CN domain.

8.5.3 Open loop power control upon establishment of DPCCH

This procedure is used in FDD mode only.

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 sync" 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 subclause 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 CELL_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

UE updates CN domain specific DRX cycle length coefficient as specified in [4]. The UE shall use it to calculate the CN domain specific 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 CN domain specific DRX cycle length for that 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 CN domain specific 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

Void.

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 UTRAN DRX cycle length, 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.

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.

The DRX cycle length to use in connected mode is the shortest of the following:

- UTRAN DRX cycle length;
- CN domain specific DRX cycle length stored for any CN domain, when using Discontinuous Reception (DRX) in CELL_PCH and URA_PCH state.

The CN domain specific DRX cycle length stored for any CN domain is only used in Cell_PCH state and URA_PCH state if the UE is registered to that CN domain and no signalling connection exist to that CN domain.

8.5.7.3.3 DRX Indicator

If the IE "DRX Indicator" is set to 'DRX with cell updating', the UE shall:

- if the IE "UTRAN DRX cycle length coefficient" is included in the same message, use the IE "UTRAN DRX Cycle length coefficient" for calculating Paging Occasion and PICH Monitoring Occasion as specified in 8.5.7.3.2 in CELL_PCH state.

If the IE "DRX Indicator" is set to 'DRX with URA updating', the UE shall:

- if the IE "UTRAN DRX cycle length coefficient" is included in the same message, use the IE "UTRAN DRX Cycle length coefficient" for calculating Paging occasion and PICH Monitoring Occasion as specified in 8.7.3.2 in URA_PCH state.

If the IE "DRX Indicator" set to 'no DRX' the UE shall:

- if the IE "UTRAN DRX cycle length coefficient" is included in the same message, ignore that IE;
- 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" as part of the new ciphering configuration. The new ciphering configuration shall be applied as specified below.

   1.2 Set the variable CIPHERING_STATUS to "Started".

2. If the IE "Ciphering mode command" has the value "stop", the UE shall:

   2.1 Stop ciphering. The new ciphering configuration shall be applied as specified below.

   2.2 Set the variable CIPHERING_STATUS to "Not started".

3. The new ciphering configuration, in case of the IE "Ciphering mode command" has the value "start/restart" or "stop", shall be applied as follows:

   3.1 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.

3.2 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":

3.2.1 Suspend data transmission on the radio bearer

3.2.2 Store the current RLC send state variable, VT(S), for that radio bearer in the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO.

3.2.3 When the data transmission of that radio bearer is resumed, the UE shall switch to the new ciphering configuration according to the following:

3.2.3.1 Use the old ciphering configuration for the transmitted resp. received RLC PDUs with RLC sequence number less than the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent to UTRAN resp. in the received IE "Radio bearer downlink ciphering activation time info" received from UTRAN.

3.2.3.2 Use the new ciphering configuration for the transmitted resp. received RLC PDUs with RLC sequence number greater than or equal to the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent to UTRAN resp. in the received IE "Radio bearer downlink ciphering activation time info" received from UTRAN.

3.2.3.3 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.

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" and the "Status" in the variable INTEGRITY_ PROTECTION_INFO has the value "Not started", the UE shall:
  - set the "Status" in the variable INTEGRITY_ PROTECTION_INFO to the value "Started";
  - perform integrity protection on the received message as descibed in subclause 8.5.12.1;
  - use the algorithm (UIA [TS 33.102]) indicated by the IE "Integrity protection algorithm" contained in the IE "Integrity protection mode info";
  - use the IE "Integrity protection initialisation number", contained in the IE "Integrity protection mode info" as the value of FRESH [TS 33.102].
- If IE "Integrity protection mode command" has the value "modified" and the "Status" in the variable INTEGRITY_ PROTECTION_INFO has the value "Started", the UE shall:
  - restart integrity protection in the downlink at the RRC sequence number indicated by the IE "Signalling radio bearer integrity protection activation info", included in the IE "Integrity protection mode info";
  - perform integrity protection on the received message as described in subclause 8.5.12.1;
  - if present, use the algorithm indicated by the IE "Integrity protection algorithm" (UIA [TS 33.102]);
  - set the values of the IE "Uplink integrity protection activation 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, $M_{TTI} \le N \le MaxSFN - K$, 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 $0 \le K \le N-1$ 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 $K+mN \le MaxSFN$.

The parameters N and K are broadcast as system information.

8.5.7.3.7 UL Timing Advance

If the IE "UL Timing Advance" is present, the UE shall:

- evaluate and apply the timing advance value for UL transmissions.

8.5.7.3.8 Integrity check info

If the IE "Integrity check info is present" the UE shall act as described in subclause 8.5.12.1.

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.

For downlink CCTrCHs if no TFCS is stored in the UE the UE shall consider all possible transport format combinations and calculate the possible TFCI values according to the IE transport format combination set.

For downlink CCTrCHs if a TFCS is stored in the UE and

- if the IE "Transport format combination set" is not included and transport channels are deleted in the message, the UE shall:
  - remove the affected transport format combinations from the transport format combination set, recalculate the TFCI values and start to respect those transport format combinations
- if the IE "Transport format combination set" is not included and transport channels are added in the message, the UE shall:
  - consider all possible new combinations to be valid and recalculate the TFCI values and start to respect those transport format combinations. In TDD the new transport format combinations are considered to belong to the TFCS with the ID 1 of DCH type.
- if the IE "Transport format combination set" is not included and transport channels are replaced the UE shall:
  - consider all possible transport format combinations to be valid and calculate the TFCI values accordingly.

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.

The maximum UE transmitter power is defined as the lower of the maximum output power of the UE power class and the maximum allowed UL TX power indicated in this IE. The maximum UE transmitter power shall not be exceeded.

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.

and in cases where the TFCI for the user in question has a 'hard' split (meaning that TFCI(field 1) and TFCI (field 2) have their own individual block coding):

- 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

In FDD, 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.

In TDD, if the IE "Uplink DPCH power control info" is included the UE shall:

- use the parameters specified in the IE for open loop power control as defined in 8.5.9.

8.5.7.6.11 Secondary CPICH info

If the IE Secondary CPICH info is included, the UE:

- May use the channelisation code according to IE "channelisation code", with scrambling code according to IE "DL scrambling code" in the IE "Secondary CPICH info", for channel estimation of that radio link;

- May use the pilot bits on DPCCH for channel estimation.

8.5.7.6.12 Primary CPICH usage for channel estimation

If the IE "Primary CPICH usage for channel estimation" is included and has the value "Primary CPICH may be used" the UE:

- may use the Primary CPICH for channel estimation;

- may use the pilot bits on DPCCH for channel estimation.

If the IE "Primary CPICH usage for channel estimation" is included and has the value "Primary CPICH shall not be used" the UE:

- shall not use the Primary CPICH for channel estimation;

- may use the Secondary CPICH for channel estimation

- may use the pilot bits on DPCCH for channel estimation.

8.5.7.6.13 DPCH frame offset

If the IE "DPCH frame offset" is included the UE shall:

- use its value to determine the beginning of the DPCH frame

8.5.7.6.14 DPCH Compressed mode info

If the IE "DPCH compressed mode info" is included, and if the IE group "transmission gap pattern sequence configuration parameters" are included, the UE

- shall check, that none of the parallel transmission gap pattern sequences create transmission gaps in the same frame by using the compressed mode method 'puncturing'.

If the configuration creates this kind of overlap, the UE

- shall set the variable UNACCEPTABLE_CONFIGURATION to TRUE;
- shall retain all previously stored compressed mode pattern sequences.

Otherwise, the UE

- shall set the variable UNACCEPTABLE_CONFIGURATION to FALSE;
- shall delete all previously stored compressed mode pattern sequences;
- shall store each pattern sequence to the variable TGPS_IDENTITY according to the IE "TGPSI";
- shall store into the variable TGPS_IDENTITY the configuration information defined by IE group" transmission gap pattern sequence configuration parameters "; and
- shall activate the stored pattern sequence corresponding to each IE "TGPSI" for which the "TGPS status flag" is set to "activate" and begin the inter-frequency and/or inter-system measurements corresponding to the pattern sequence measurement purpose of each activated pattern sequence;

  If the IE "DPCH compressed mode info" is included, and if the IE group "transmission gap pattern sequence configuration parameters" is not included, the UE shall

  - shall activate the stored pattern sequence corresponding to each IE "TGPSI" for which the "TGPS status flag" is set to "activate" and begin the inter-frequency and/or inter-system measurements corresponding to the pattern sequence measurement purpose of each activated pattern sequence;
  - shall deactivate the stored pattern sequence corresponding to each IE "TGPSI" for which the "TGPS status flag" is set to "deactivate" and terminate the inter-frequency and/or inter-system measurements corresponding to the pattern sequence measurement purpose of each deactivated pattern sequence;

8.5.7.6.15 Repetition period, Repetition length, Offset

The following description applies to TDD only.

The frame allocation can be derived by following rules:

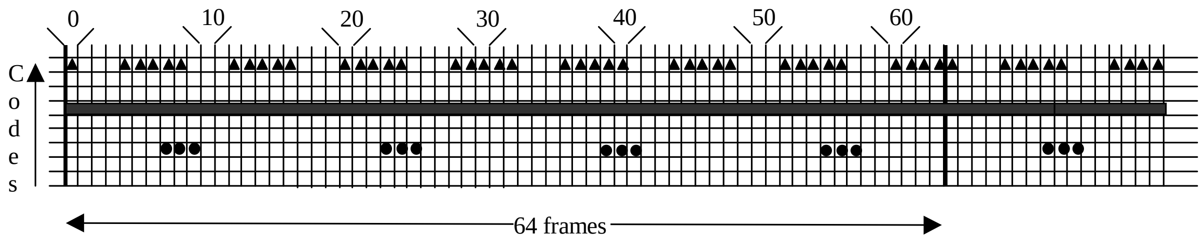
If no IE "Offset" is explicitely given the parameter "Offset" to be used is calculated by the following equation:

$$\text{Activation time mod Repetition period} = \text{Offset.}$$

Frames from CFN CFN_{off} to CFN_{off} + Repetition length belong to the allocation with CFN_{off} fulfilling the following equation:

$$CFN_{off} \text{ mod Repetition period} = \text{Offset.}$$

Example of usage:



▲ physic. channel (Code 7; Repetition period=8; Repetition length=5; Activation time = 4 => Offset = 4 => CFN_{off} = 4, 12, 20, 28, 36, 44, 52, 60)

■ physic. channel (Code 5; Repetition Period=1 => Repetition length=0; Offset = 0 => CFN_{off} = 0, 1, 2, 3, 4, ... (continuous allocation))

● physic. channel (Code 3; Repetition period=16; Repetition length=3; Activation time = 23 =>Offset = 7 => CFN_{off} = 7, 23, 39, 55)

Figure 54: Examples for frame allocations in TDD

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.

8.5.7.7.2 Filter coefficient

If the IE "Filter coefficient" is received the UE shall apply filtering of the measurements for that measurement quantity according to the formula below. This filtering shall be performed by the UE before UE event evaluation. The UE shall also filter the measurements reported in the IE "Measured results" or the IE "Measurement results on RACH". The filtering shall not be performed for cell-reselection in connected or idle mode.

The filtering shall be performed according to the following formula.

$$F_n = (1-a)\cdot F_{n-1} + a\cdot M_n$$

The variables in the formula are defined as follows:

$\boldsymbol{F_n}$ is the updated filtered measurement result

$\boldsymbol{F_{n-1}}$ is the old filtered measurement result

$\boldsymbol{M_n}$ is the latest received measurement result from physical layer measurements, the unit used for $\boldsymbol{M_n}$ is the same unit as the reported unit in the MEASUREMENT REPORT message or the unit used in the event evaluation.

$\boldsymbol{a} = 1/2^{(k/2)}$, where k is the parameter received in the IE "Filter coefficient". Nota that if $\boldsymbol{a}$ is set to 1 that will mean no layer 3 filtering.

In order to initialize the averaging filter, $\boldsymbol{F_0}$ is set to $\boldsymbol{M_1}$ when the first measurement result from the physical layer measurement is received.

The physical layer measurement results are sampled once every measurement period. The measurement period and the accuracy for a certain measurement is defined in 3G TS 25.133.

8.5.7.7.3 Intra-frequency/Inter-frequency/Inter-system cell info list

If one of these IEs is received, and "Removed ***** cells" or/and "New ****** cells" is present in the received IE, UE shall update measurement objects for that measurement accordingly.

If one of these IEs is included, but neither "Removed ***** cells" nor "New ****** cells" is included, UE shall not change the information on that measurement object. (This case is applied only when Measurement Command = "Modify".)

If one of these IEs is not received when IE is absent, UE shall re-order same measurement type by measurement ID in ascending order, and use the preceding ID's measurement object information. (For example, suppose UE is assigned 3 measurement IDs (suppose they were ID10, 11, and 15) for intra-frequency measurement, and UE did not receive "Intra-frequency cell info" for Measurement ID 15. When performing the measurement assigned with 15, UE shall use the measurement object information associated with Measurement ID 11).

8.5.7.7.4 Inter-system measurement quantity

If the IE "Inter-system measurement quantity" is received and CHOICE system is GSM, the UE shall check the parameter "BSIC verification required".

If BSIC verification required is set to "required" the UE shall only report measurement quantities for GSM cells with a "verified" BSIC.

If BSIC verification required is set to "not required" the UE shall report measurement quantities for GSM cells both with "verified" and "non-verified" BSIC.

The requirements for a cell to be considered "verified" or "non-verified" can be found in TS 25.133.

8.5.7.8 Other information elements

Void.

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 set to "DRX with Cell updating" THEN

 The UE shall move to CELL_PCH state

ELSIF "DRX indicator" is set to "DRX with URA updating" THEN

 The UE shall move to URA_PCH state

ELSIF "DRX indicator" is set to "noDRX" THEN

 The UE shall move to CELL_FACH state

END

8.5.9 Open loop power control

For FDD and prior to PRACH or PCPCH 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 or PCPCH 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, DPCH and USCH continuously while the physical channel is active:

$P_{PRACH} = L_{PCCPCH} + I_{BTS}$ + RACH Constant value

And for uplink dedicated physical channels:

$P_{DPCH} = \alpha L_{PCCPCH} + (1-\alpha)L_0 + I_{BTS} + SIR_{TARGET}$ + DPCH Constant value

And for uplink shared physical channels:

$P_{USCH} = \alpha L_{PCCPCH} + (1-\alpha)L_0 + I_{BTS} + SIR_{TARGET}$ + USCH Constant value

Where:

P_{PRACH}, P_{DPCH}, & P_{USCH}: Transmitter power level in dBm,

L_{PCCPCH}: Measure representing path loss in dB (reference transmit power "Primary CCPCH Tx Power" is broadcast on BCH in system information block 14).

L_0: Long term average of path loss in dB

I_{BTS}: Interference signal power level at cell's receiver in dBm ("UL Interference" is broadcast on BCH in system information block 14 for each active uplink timeslot).

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. This value is individually signaled to UEs in UL DPCH Power Control Info and PUSCH Power Control Info IEs.

RACH Constant value: This value is broadcast on BCH and shall be read on system information block 14.

DPCH Constant value: This value is broadcast on BCH and shall be read on system information block 14.

USCH Constant Value: This value is broadcast on BCH and shall be read on system information block 14.

8.5.10 Detection of in service area

When a suitable cell is found based on the description in subclause 5.2.2.1 of TS25.304, the UE considers it as an "in service area".

8.5.11 Hyper Frame Number

The hyper frame number (HFN) in the IE "Hyper frame number" is used to initialise both the ciphering sequence number (COUNT-C) and the integrity sequence number (COUNT-I) for the ciphering and integrity protection algorithms, respectively. There is a COUNT-C per radio bearer (uplink/downlink) and a COUNT-I per signalling radio bearer (uplink/downlink). COUNT-C and COUNT-I are defined in Security Architecture, TS 33.102.

COUNT-C is initialised: COUNT-C = HFN (the LSB not part of the HFN in COUNT-C are set to zero).

COUNT-I is initialised: COUNT-I = HFN (the LSB not part of the HFN in COUNT-I are set to zero).

8.5.12 Integrity protection

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

HANDOVER TO UTRAN COMPLETE

PAGING TYPE 1

PUSCH CAPACITY REQUEST

PHYSICAL SHARED CHANNEL ALLOCATION

RRC CONNECTION REQUEST

RRC CONNECTION SETUP

RRC CONNECTION SETUP COMPLETE

RRC CONNECTION REJECT

SYSTEM INFORMATION (BROADCAST INFORMATION)

SYSTEM INFORMATION CHANGE INDICATION

TRANSPORT FORMAT CONTROL

NOTE: MEASUREMENT REPORT needs to be studied when used on UM as in some cases there could be synchronisation problems with the RRC SN.

For CCCH and each signalling radio bearer, the UE shall use two integrity protection hyper frame numbers,

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

and two message sequence numbers,

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

The above information is stored in the variable INTEGRITY_PROTECTION_INFO per CCCH and signalling radio bearer (RB 0-4).

8.5.12.1 Integrity protection in downlink

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

- check the value of the IE "RRC message sequence number" included in the IE "Integrity check info". If the RRC message sequence number is lower than or equal to the "Downlink RRC Message sequence number" for RB#n in the variable INTEGRITY_PROTECTION_INFO, the UE shall increment "Downlink HFN" for RB#n in the variable INTEGRITY_PROTECTION_INFO with one.
- calculate an expected message authentication code in accordance with 8.5.12.3.

- compare the expected message authentication code with the value of the received IE "message authentication code" contained in the IE 'Integrity check info'.
  - If the expected message authentication code and the received message authentication code are the same, the integrity check is successful.
  - If the calculated expected message authentication code and the received message authentication code differ, the message shall be discarded.

If the UE receives an RRC message on signalling radio bearer with identity n, the "Status" in the variable INTEGRITY_ PROTECTION_INFO has the value "Started" and the IE 'Integrity check info' is not present the UE shall discard the message.

8.5.12.2 Integrity protection in uplink

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

- increment "Uplink RRC Message sequence number" for RB#n in the variable INTEGRITY_PROTECTION_INFO with 1. When "Uplink RRC Message sequence number" for RB#n in the variable INTEGRITY_PROTECTION_INFO becomes 0, the UE shall increment "Uplink HFN" for RB#n in the variable INTEGRITY_PROTECTION_INFO with 1
- calculate the message authentication code in accordance with 8.5.12.3
- replace the "Message authentication code" in the IE "Integrity check info" in the message with the calculated message authentication code.
- replace the "RRC Message sequence number" in the IE "Integrity check info" in the message with contents set to the new value of the "Uplink RRC Message sequence number" for RB#n in the variable INTEGRITY_PROTECTION_INFO

8.5.12.3 Calculation of message authentication code

The UE shall calculate the message authentication code in accordance with 3G TS 33.102. The input parameter MESSAGE (TS 33.102) for the integrity algorithm shall be constructed by:

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

8.5.13 Measurement occasion calculation

When in CELL_FACH state the UE shall perform inter-frequency and inter system measurements during the frame with the SFN value fulfilling the following equation:

((SFN div N) mod M_REP = C_RNTI mod M_REP

where

N is the TTI of FACH div 10ms

M_REP = 2^k

k = k_UTRA – k_Inter_Rat_tot

The UE is allowed to measure on other occasions in case the UE moves out of service area or in case it can simultaneously perform the ordered measurements.

k_Inter_Rat_tot is the sum of all the k_Inter_Rat values corresponding to a system that the UE supports in addition to UTRA, and that have neighbours present in the measurement control message on system information sent from the current cell.

C_RNTI is the C-RNTI value of the UE

k_UTRA and k_Inter_Rat is read on system information in SIB 11 or 12 in the "FACH measurement occasion info" IE.

8.5.14 Establishment of Access Service Classes

The PRACH resources (i.e. access slots and preamble signatures for FDD, timeslot (with specific frame allocation) and channelisation code for TDD) may be divided between different Access Service Classes in order to provide different priorities of RACH usage. It is possible for more than one ASC or for all ASCs to be assigned to the same access slot/signature space in FDD or frame allocation in TDD.

Access Service Classes shall be numbered in the range $0 \le i \le$ NumASC ≤ 7 (i.e. the maximum number of ASCs is NumASC+1 = 8). An ASC is defined by an identifier, i, that defines a certain partition of the PRACH resources and an associated persistence value P_i. A set of ASC parameters consists of NumASC+1 such parameters (i, P_i), i = 0, …, NumASC.

PRACH partitions shall be established using the information element "PRACH partition". The persistence values P_i to be associated with each ASC shall be derived from the dynamic persistence level N = 1,…, 8 which is broadcast in SIB 5, and the persistence scaling factors s_i, broadcast in SIB 5 and possibly also in SIB 6, as follows:

$P(N) = 2^{-(N-1)}$

ASC # *i*	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
P_i	1	P(N)	s_2 P(N)	s_3 P(N)	s_4 P(N)	s_5 P(N)	s_6P(N)	s_7 P(N)

Scaling factors s_i are provided optionally for i = 2,…, NumASC, where NumASC+1 is the number of ASCs as defined by PRACH partitioning. If no scaling factors are broadcast, default value 1 shall be used if NumASC ≥ 2.

If $k \ge 1$ scaling factors are broadcast and NumASC ≥ k+2 then the last scaling factor s_{k+1} shall be used as default for the ASCs where $i > k$ +1.

The set of ASC parameters is provided to MAC with the CMAC-Config-REQ primitive (see TS 25.321), the PRACH partitioning is provided to PHY using the CPHY-TrCH-Config-REQ primitive (see TS 25.302).

The ASC enumeration shall be such that it corresponds to the order of priority (ASC 0 = highest priority, ASC 7 = lowest priority). ASC 0 shall be used in case of Emergency Call or for reasons with equivalent priority.

At radio bearer setup/reconfiguration each involved logical channel is assigned a MAC Logical channel Priority (MLP) in the range 1,…,8. When the MAC sublayer is configured for RACH transmission in the UE, these MLP levels shall be employed for ASC selection on MAC.

8.5.15 Mapping of Access Classes to Access Service Classes

Access Classes shall only be applied at initial access, i.e. when sending an RRC CONNECTION REQUEST message. A mapping between Access Class (AC) and Access Service Class (ASC) shall be indicated by the information element "AC-to-ASC mapping" in SIB 5. The correspondence between AC and ASC shall be indicated as follows.

AC	**0 - 9**	**10**	**11**	**12**	**13**	**14**	**15**
ASC	1^{st} IE	2^{nd} IE	3^{rd} IE	4^{th} IE	5^{th} IE	6^{th} IE	7^{th} IE

In the table, "n^{th} IE" designates an ASC number i in the range 0 - 7 to AC.

For the random access, the parameters implied by the respective ASC shall be employed. In case the UE is member of several ACs it shall select the ASC for the highest AC number. In connected mode, AC shall not be applied.

8.5.16 PLMN Type Selection

The UE shall perform PLMN selection and reselection as stated in 3G TS 25.304 and store the identifier of the chosen PLMN in the variable SELECTED_PLMN as follows:

- If a GSM-MAP type of PLMN is selected, the UE shall set the "PLMN Type" in the variable SELECTED_PLMN to "GSM-MAP"and store the PLMN identity of that PLMN.
- If an ANSI-41 type of PLMN is selected, the UE shall set the "PLMN Type" in the variable SELECTED_PLMN to "ANSI-41" and store the System identification (SID) of that PLMN.

9 Protocol states

9.1 RRC States and State Transitions including GSM

Figure 55 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.

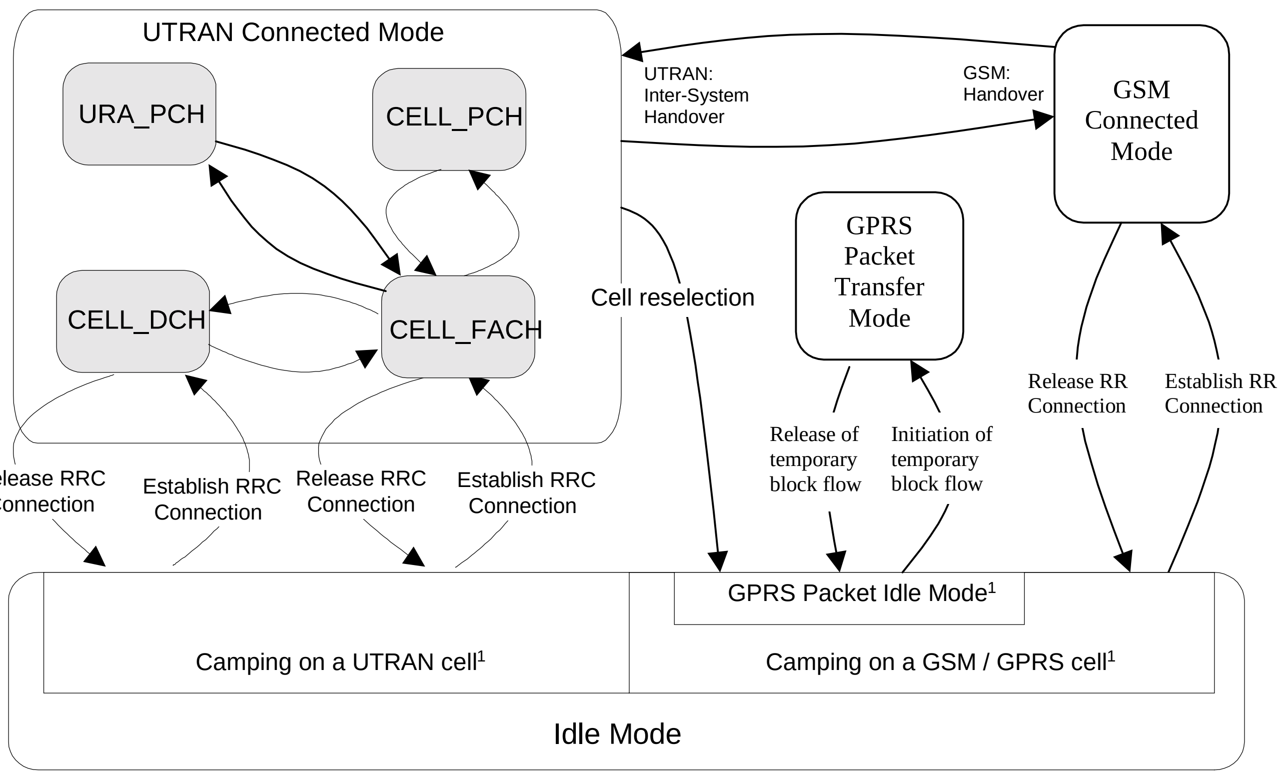


Figure 55: RRC States and State Transitions including GSM
[1: The indicated division within Idle Mode is only included for clarification and shall not be interpreted as states.]

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. If PDSCH or PUSCH are used for TDD, a FACH transport channel may be assigned to the UE for reception of physical shared channel allocation messages.

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.

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)

FDD UEs with certain capabilities shall read system information broadcast on FACH.

TDD UEs 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.

9.3.2 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.

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

10.1 General

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 10.2.

Functional definitions of the information elements are then described in subclause 10.3.

Information elements are marked as either MP- Mandatory present, MD - Mandatory with default value, OP - Optional, CV - Conditional on value or CH -Conditional on history (see Table 10.1 with information extracted from [14]).

Table 10.1: Meaning of abbreviations used in RRC messages and information elements

Abbreviation	Meaning
MP	Mandatory present A value for that information is always needed, and no information is provided about a particular default value. If ever the transfer syntax allows absence (e.g., due to extension), then absence leads to an error diagnosis.
MD	Mandatory with default value A value for that information is always needed, and a particular default value is mentioned (in the 'Semantical information' column). This opens the possibility for the transfer syntax to use absence or a special pattern to encode the default value.
CV	Conditional on value A value for that information is needed (presence needed) or unacceptable (absence needed) when some conditions are met that can be evaluated on the sole basis of the content of the message. If conditions for presence needed are specified, the transfer syntax must allow for the presence of the information. If the transfer syntax allows absence, absence when the conditions for presence are met leads to an error diagnosis. If conditions for absence needed are specified, the transfer syntax must allow to encode the absence. If the information is present and the conditions for absence are met, an error is diagnosed. When neither conditions for presence or absence are met, the information is treated as optional, as described for 'OP'.
CH	Conditional on history A value for that information is needed (presence needed) or unacceptable (absence needed) when some conditions are met that must be evaluated on the basis of information obtained in the past (e.g., from messages received in the past from the other party). If conditions for presence needed are specified, the transfer syntax must allow for the presence of the information. If the transfer syntax allows absence, absence when the conditions for presence are met leads to an error diagnosis. If conditions for absence needed are specified, the transfer syntax must allow to encode the absence. If the information is present and the conditions for absence are met, an error is diagnosed. When neither conditions for presence or absence are met, the information is treated as optional, as described for 'OP'.
OP	Optional The presence or absence is significant and modifies the behaviour of the receiver. However whether the information is present or not does not lead to an error diagnosis.

10.1.1 Protocol extensions

In this specification, two kind of protocol extensions are distinguished:

- extension of an information element with additional values or choices;
- extension of a message with additional information elements.

This standard fully specifies the behaviour of the UE, conforming to this revision of the standard, upon receiving a not comprehended future extension. The details of this error handling behaviour are provided in clause 16.

NOTE: By avoiding the need for partial decoding (skipping uncomprehended IEs to continue decoding the remainder of the message), the RRC protocol extension mechanism also avoids the overhead of length determinants for extensions.

10.1.1.1 Extension of an information element with additional values or choices

In future releases of this protocol, some of the value ranges and choices may be extended. For these value ranges and choices, one or more additional values are reserved. The size of the encoded information element shall not depend on whether or not the values reserved for extension are used. Information elements applicable to choices reserved for future releases of the protocol, shall be added to the end of the message.

For each of the values and choices reserved for future extension, the behaviour of a UE conforming to this revision of the standard is defined within the message and information element specifications provided in subclause 10.1 and 10.2. The UE may either apply a defined value, ignore the information element and/ or reject the request entire message. Which action applies is indicated within the "semantics" column of the tables specifying the messages and information elements as the "criticality" ("default", "ignore" or "reject").

10.1.1.2 Extension of a message with additional information elements

In future releases of this protocol, RRC messages may be extended with new information elements. These additional information elements shall always be included at the end of the message.

UTRAN is able to control the behaviour of a UE receiving a message extended with a not comprehended additional information element by indicating for each extension the "criticality" which may be "ignore" or "reject". Therefore UTRAN indicates the criticality for extensions provided in all messages it sends towards the UE, with the exception of broadcast messages. In the direction from UE to UTRAN, not criticality information is included for protocol extensions added at the end of a message. This is shown in the following table. Furthermore, the table indicates at which level extensions are included for the SYSTEM INFORMATION message.

Type	Message
Extensions and criticality	ACTIVE SET UPDATE 10.2.1 CELL UPDATE CONFIRM 10.2.5 DOWNLINK DIRECT TRANSFER 10.2.8 DOWNLINK OUTER LOOP CONTROL 10.2.9 HANDOVER TO UTRAN COMMAND 10.2.10 INTER SYSTEM HANDOVER COMMAND 10.2.13 MEASUREMENT CONTROL 10.2.15 PAGING TYPE 1 10.2.18 PAGING TYPE 2 10.2.19 PHYSICAL CHANNEL RECONFIGURATION 10.2.20 PHYSICAL SHARED CHANNEL ALLOCATION 10.2.23 RADIO BEARER RECONFIGURATION 10.2.25 RADIO BEARER RELEASE 10.2.28 RADIO BEARER SETUP 10.2.31 RNTI REALLOCATION 10.2.34 RRC CONNECTION RE- ESTABLISHMENT 10.2.37 RRC CONNECTION REJECT 10.2.40 RRC CONNECTION RELEASE 10.2.41 RRC CONNECTION SETUP 10.2.44 SECURITY MODE COMMAND 10.2.47 SIGNALLING CONNECTION RELEASE 10.2.50 SIGNALLING CONNECTION RELEASE REQUEST 10.2.51 TRANSPORT CHANNEL RECONFIGURATION 10.2.54 TRANSPORT FORMAT COMBINATION CONTROL 10.2.57 UE CAPABILITY ENQUIRY 10.2.59 UE CAPABILITY INFORMATION CONFIRM 10.2.61 UPLINK PHYSICAL CHANNEL CONTROL 10.2.63 URA UPDATE CONFIRM 10.2.65
Extensions	ACTIVE SET UPDATE COMPLETE 10.2.2 ACTIVE SET UPDATE FAILURE 10.2.3 CELL UPDATE 10.2.4 INITIAL DIRECT TRANSFER 10.2.12 INTER SYSTEM HANDOVER FAILURE 10.2.14 MEASUREMENT CONTROL FAILURE 10.2.16 MEASUREMENT REPORT 10.2.17 PHYSICAL CHANNEL RECONFIGURATION COMPLETE 10.2.21 PHYSICAL CHANNEL RECONFIGURATION FAILURE 10.2.22 PUSCH CAPACITY REQUEST 10.2.24 RADIO BEARER RECONFIGURATION COMPLETE 10.2.26 RADIO BEARER RECONFIGURATION FAILURE 10.2.27 RADIO BEARER RELEASE COMPLETE 10.2.29 RADIO BEARER RELEASE FAILURE 10.2.30 RADIO BEARER SETUP COMPLETE 10.2.32 RADIO BEARER SETUP FAILURE 10.2.33 RNTI REALLOCATION 10.2.34 RNTI REALLOCATION FAILURE 10.2.36 RRC CONNECTION RE- ESTABLISHMENT COMPLETE 10.2.38 RRC CONNECTION RE- ESTABLISHMENT REQUEST 10.2.39 RRC CONNECTION RE- ESTABLISHMENT REJECT 10.2.40 RRC CONNECTION RELEASE COMPLETE 10.2.42 RRC CONNECTION REQUEST 10.2.43 RRC CONNECTION SETUP COMPLETE 10.2.45 RRC STATUS 10.2.46 SECURITY MODE COMPLETE 10.2.48 SECURITY MODE FAILURE 10.2.49 Master Information Block 10.2.52.6.1 System Information Block type 1 to System Information Block type 16 10.2.52.6.2 to 10.2.52.6.18 SYSTEM INFORMATION CHANGE INDICATION 10.2.53 TRANSPORT CHANNEL RECONFIGURATION COMPLETE 10.2.55 TRANSPORT CHANNEL RECONFIGURATION FAILURE 10.2.56 TRANSPORT FORMAT COMBINATION CONTROL FAILURE 10.2.58 UE CAPABILITY INFORMATION 10.2.60 UPLINK DIRECT TRANSFER 10.2.62 URA UPDATE 10.2.64

None	SYSTEM INFORMATION 10.2.52 First Segment 10.2.52.1 Subsequent or last Segment 10.2.52.3 Complete SIB 10.2.52.5 SIB content 10.2.52.6.1

NOTE 1: For the SYSTEM INFORMATION message protocol extensions are only possible at the level of system information blocks. If extension is needed at the level of SYSTEM INFORMATION, another message should be defined.

The "Extensions and criticality" may include both critical and non- critical extensions. Within the encoded message, the critical extensions shall always appear before non-critical extensions.

NOTE 2: The above implies that a UE may stop decoding upon the first not comprehended IE it encounters.

The UE shall comprehend all information elements within a message upto the revision of the protocol it supports for the concerned message.

10.2 Radio Resource Control messages

In connected mode, RB 0,1,2, 3 and optionally 4 are available for usage by RRC messages using RLC-TM, RLC-UM and RLC-AM on the DCCH and CCCH. The UE and UTRAN shall select radio bearer for RRC messages using RLC-TM, RLC-UM or RLC-AM on the DCCH and CCCH, according to the following:

- RB 0 shall be used for all messages sent on the CCCH.
- RB 1 shall be used for all messages sent on the DCCH, when using RLC unacknowledged mode (RLC-UM).
- RB 2 shall be used for all messages sent on the DCCH, when using RLC acknowledged mode (RLC-AM), except for the INITIAL DIRECT TRANSFER, DOWNLINK DIRECT TRANSFER and UPLINK DIRECT TRANSFER messages.
- RB 3 or 4 shall be used by the DOWNLINK DIRECT TRANSFER (RB3) and UPLINK DIRECT TRANSFER messages sent on the DCCH in RLC acknowledged mode (RLC-AM), as specified in subclause 8.1.8., 8.1.9 and 8.1.10.
- For RRC messages on the DCCH using RLC transparent mode (RLC-TM), the transparent signalling DCCH shall be used.

10.2.1 ACTIVE SET UPDATE

NOTE: Only for FDD.

This message is used by UTRAN to add, replace or delete radio links in the active set of the UE.

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN → UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Integrity protection mode info	OP		Integrity protection mode info 10.3.3.18	
Ciphering mode info	OP		Ciphering mode info 10.3.3.5	
Activation time	MD		Activation time 10.3.3.1	Default value is "now".
New U-RNTI	OP		U-RNTI 10.3.3.45	
CN information elements				
CN Information info	OP		CN Information info 10.3.1.3	
RB information elements				
RB with PDCP information list	OP	1 to <maxRBallRABs>		This IE is needed for each RB having PDCP in the case of lossless SRNS relocation
>RB with PDCP information	MP		RB with PDCP information 10.3.4.19	
Phy CH information elements				
Uplink radio resources				
Maximum allowed UL TX power	MD		Maximum allowed UL TX power 10.3.6.33	Default value is the existing "maximum UL TX power.
Downlink radio resources				
Radio link addition information	OP	1 to <maxRL-1>		Radio link addition information required for each RL to add
>Radio link addition information	MP		Radio link addition information 10.3.6.59	
Radio link removal information	OP	1 to <maxRL>		Radio link removal information required for each RL to remove
> Radio link removal information	MP		Radio link removal information 10.3.6.60	
TX Diversity Mode	MD		TX Diversity Mode 10.3.6.74	Default value is the existing TX diversity mode.
SSDT information	OP		SSDT information 10.3.6.67	

10.2.2 ACTIVE SET UPDATE COMPLETE

NOTE: For FDD only.

This message is sent by UE when active set update has been completed.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.16	
RB Information elements				
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.10	
RB with PDCP information list	OP	1 to <maxRBallRABs>		This IE is needed for each RB having PDCP in the case of lossless SRNS relocation
>RB with PDCP information	MP		RB with PDCP information 10.3.4.19	

10.2.3 ACTIVE SET UPDATE FAILURE

NOTE: Only for FDD.

This message is sent by UE if the update of the active set has failed, e.g. because the radio link is not a part of the active set.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Failure cause	MP		Failure cause and error information 10.3.3.12	

10.2.4 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
U-RNTI	MP		U-RNTI 10.3.3.45	
Integrity check info	CH		Integrity check info 10.3.3.15	
Hyper frame number	MP		Hyper frame number 10.3.3.13	
AM_RLC error indication(for c-plane)	MP		Boolean	TRUE indicates AM_RLC unrecoverable error occurred on c-plane in the UE
AM_RLC error indication(for u-plane)	MP		Boolean	TRUE indicates AM_RLC unrecoverable error occurred on u-plane in the UE
Cell update cause	MP		Cell update cause 10.3.3.3	
Protocol error indicator	MD		Protocol error indicator 10.3.3.28	Default value is FALSE
Measurement information elements				
Measured results on RACH	OP		Measured results on RACH 10.3.7.70	
Other information elements				
Protocol error information	CV-*ProtErr*		Protocol error information 10.3.8.10	

Condition	Explanation
ProtErr	If the IE "Protocol error indicator" has the value "TRUE"

10.2.5 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE Information Elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Integrity protection mode info	OP		Integrity protection mode info 10.3.3.18	
Ciphering mode info	OP		Ciphering mode info 10.3.3.5	
New U-RNTI	OP		U-RNTI 10.3.3.45	
New C-RNTI	OP		C-RNTI 10.3.3.8	
DRX Indicator	MP		DRX Indicator 10.3.3.10	
UTRAN DRX cycle length coefficient	MD		UTRAN DRX cycle length coefficient 10.3.3.47	Default value is the existing DRX cycle length coefficient
RLC reset indicator (for C-plane)	MD		RLC reset indicator 10.3.3.35	
RLC reset (for U-plane)	MD		RLC reset indicator 10.3.3.35	
CN Information Elements				
CN Information info	OP		CN Information info 10.3.1.3	
UTRAN Information Elements				
URA identity	OP		URA identity 10.3.2.6	
RB information elements				
RB with PDCP information list	OP	1 to <maxRBallRABs>		This IE is needed for each RB having PDCP in the case of lossless SRNS relocation
>RB with PDCP information	MP		RB with PDCP information 10.3.4.19	
PhyCH information elements				
Uplink radio resources				
Maximum allowed UL TX power	MD		Maximum allowed UL TX power 10.3.6.33	Default value is the existing maximum UL TX power

PRACH Info (for RACH)	OP		PRACH Info (for RACH) 10.3.6.44	
Downlink radio resources				
Downlink information for one radio link	OP		Downlink information for each radio link 10.3.6.23	

10.2.6 COUNTER CHECK

This message is used by the UTRAN to indicate the current COUNT-C MSB values associated to each radio bearer utilizing UM or AM RLC mode and to request the UE to compare these to its COUNT-C MSB values and to report the comparison results to UTRAN.

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element/Group name	Presence	Multi	IE type and reference	Semantics description
Message Type	MP			
UE information elements				
Integrity check info	MP		Integrity check info 10.3.3.15	
RB information elements				
RB COUNT-C MSB information	MP	1 to < maxRBallRABs >		For each RB (excl SRBs) using UM or AM RLC.
>RB COUNT-C MSB information	MP		RB COUNT-C MSB information 10.3.4.11	

10.2.7 COUNTER CHECK RESPONSE

This message is used by the UE to respond to a COUNTER CHECK message.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Presence	Multi	IE type and reference	Semantics description
Message Type	MP			
UE information elements				
Integrity check info	MP		Integrity check info 10.3.3.15	
RB information elements				
RB COUNT-C information	OP	1 to < maxRBallRABs >		For each RB (excl SRBs) using UM or AM RLC whose COUNT-C MSB values did not match with the values received from the UTRAN.
>RB COUNT-C information	MP		RB COUNT-C information 10.3.4.12	

10.2.8 DOWNLINK DIRECT TRANSFER

This message is sent by UTRAN to transfer higher layer messages.

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN -> UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
CN information elements				
CN Domain Identity	MP		Core Network Domain Identity 10.3.1.1	
NAS message	MP		NAS message 10.3.1.8	

10.2.9 DOWNLINK OUTER LOOP CONTROL

This message is sent to suspend and resume the setting of the SIR target value for downlink outer loop power control.

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
PhyCH information elements				
Downlink Outer Loop Control	MP		Downlink Outer Loop Control 10.3.6.25	Indicates whether the UE is allowed or not to increase its SIR-target value above its current value
Downlink DPCH power control information	MD		Downlink DPCH power control information 10.3.6.19	Default value is the existing "Downlink DPCH power control information"

10.2.10 HANDOVER TO UTRAN COMMAND

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

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

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

Direction: UTRAN → UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
New U-RNTI	MP		U-RNTI Short 10.3.3.46	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
Ciphering algorithm	OP		Ciphering algorithm 10.3.3.4	
RAB info	MP		RAB info 10.3.4.8	One RAB is established
CHOICE specification mode	MP			
>Complete specification				
UE information elements				
>>Re-establishment timer	MP		Re-establishment timer 10.3.3.30	
RB information elements				
>>Signalling RB information to setup list	MP	1 to <maxSRBsetup>		For each signalling radio bearer established
>>>Signalling RB information to setup	MP		Signalling RB information to setup 10.3.4.21	
>>RB information to setup list	MP	1 to <maxRBperRAB>		
>>>RB information to setup	MP		RB information to setup 10.3.4.17	
Uplink transport channels				
>>UL Transport channel information common for all transport channels	MP		UL Transport channel information common for all transport channels 10.3.5.24	
>>Added or Reconfigured TrCH information	MP	1 to <maxTrCH>		
>>>Added or Reconfigured UL TrCH information	MP		Added or Reconfigured UL TrCH information 10.3.5.2	
Downlink transport channels				
>>DL Transport channel information common for all transport channels	MP		DL Transport channel information common for all transport channels 10.3.5.6	

>>Added or Reconfigured TrCH information	MP	1 to <maxTrCH>		
>>>Added or Reconfigured DL TrCH information	MP		Added or Reconfigured DL TrCH information 10.3.5.1	
Uplink radio resources				
>>Uplink DPCH info	MP		Uplink DPCH info 10.3.6.76	
Downlink radio resources				
>>CHOICE *mode*	MP			
>>>FDD				
>>>>Downlink information common for all radio links	MP		Downlink information common for all radio links 10.3.6.20	
>>>>Downlink PDSCH information	OP		Downlink PDSCH information 10.3.6.26	
>>>>CPCH SET Info	OP		CPCH SET Info 10.3.6.10	
>>>TDD				(no data)
>>Downlink information per radio link	MP	1 to <maxRL>		
>>>Downlink information for each radio link	MP		Downlink information for each radio link 10.3.6.23	
>Preconfiguration				
>>Predefined configuration identity	MP		Predefined configuration identity 10.3.4.5	
>>Uplink DPCH info	MP		Uplink DPCH info Post10.3.6.77	
Downlink radio resources				
>>CHOICE *mode*				
>>>FDD				
>>>>Downlink information common for all radio links			Downlink information common for all radio links Post 10.3.6.21	
>>>TDD				(no data)
>>Downlink information per radio link	MP	1 to <maxRL>		Send downlink information for each radio link to be set-up. In TDD MaxRL is 1.
>>>Downlink information for each radio link	MP		Downlink information for each radio linkPost 10.3.6.24	
Frequency info	MP		Frequency info 10.3.6.30	

Maximum allowed UL TX power	MP		Maximum allowed UL TX power 10.3.6.33	
CHOICE mode	MP			
>FDD				(no data)
>TDD				
>>Primary CCPCH Tx Power	MP		Primary CCPCH Tx Power 10.3.6.50	

10.2.11 HANDOVER TO UTRAN COMPLETE

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

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
START list	CH	1 to <maxCNdomains>		START [TS 33.102] values for all CN domains. The IE is mandatory if it has not been transferred prior to the handover.
>CN domain identity	MP		CN domain identity 10.3.1.1	
>START	CH		Hyper frame number 10.3.3.13	The IE is mandatory if it has not been transferred prior to the handover

10.2.12 INITIAL DIRECT TRANSFER

This message is used to initiate a signalling connection or to establish a new signalling flow based on indication from the upper layers, and to transfer NAS messages.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE -> UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
CN information elements				
Service Descriptor	MP		Service Descriptor 10.3.1.17	
Flow Identifier	MP		Flow Identifier 10.3.1.4	Allocated by UE for a particular flow
CN domain identity	MP		CN domain identity 10.3.1.1	
NAS message	MP		NAS message 10.3.1.8	
Measurement information elements				
Measured results on RACH	OP		Measured results on RACH 10.3.7.70	

10.2.13 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
Integrity check info	CH		Integrity check info 10.3.3.15	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
RAB info	OP		RAB info 10.3.4.8	Remaining radio access bearer if any
Inter-System message	MP		Inter-System message 10.3.8.6	

10.2.14 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Other information elements				
Inter-System handover failure	OP		Inter-System handover failure 10.3.8.5	

10.2.15 MEASUREMENT CONTROL

This message is sent by UTRAN to setup, modify or release a measurement in the UE.

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Measurement Information elements				
Measurement Identity Number	MP		Measurement Identity Number 10.3.7.73	
Measurement Command	MP		Measurement Command 10.3.7.71	
Measurement Reporting Mode	OP		Measurement Reporting Mode 10.3.7.74	
Additional measurements list	OP		Additional measurements list 10.3.7.1	
CHOICE Measurement type	CV *command*			
>Intra-frequency measurement			Intra-frequency measurement 10.3.7.36	
>Inter-frequency measurement			Inter-frequency measurement 10.3.7.16	
>Inter-system measurement			Inter-system measurement 10.3.7.27	
>LCS measurement			LCS measurement 10.3.7.57	
>Traffic Volume measurement			Traffic Volume measurement 10.3.7.93	
>Quality measurement			Quality measurement 10.3.7.81	
>UE internal measurement			UE internal measurement 10.3.7.102	
Physical channel information elements				
DPCH compressed mode status info	OP		DPCH compressed mode status info 10.3.6.28	

Condition	Explanation
Command	The IE is mandatory if the "Measurement command" IE is set to "Setup", optional if the "Measurement command" IE is set to "modify", otherwise the IE is not needed.

10.2.16 MEASUREMENT CONTROL FAILURE

This message is sent by UE, if it can not initiate a measurement as instructed by UTRAN.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Failure cause	MP		Failure cause and error information 10.3.3.12	

10.2.17 MEASUREMENT REPORT

This message is used by UE to transfer measurement results to the UTRAN.

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Measurement Information Elements				
Measurement identity number	MP		Measurement identity number 10.3.7.73	
Measured Results	OP		Measured Results 10.3.7.69	
Additional Measured results	OP	1 to <maxAdditionalMeas>		
>Measured Results	MP		Measured Results 10.3.7.69	
Event results	OP		Event results 10.3.7.7	

10.2.18 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE Information elements				
Paging record list	OP	1 to <maxPage 1>		
>Paging record	MP		Paging record 10.3.3.24	
Other information elements				
BCCH modification info	OP		BCCH modification info 10.3.8.1	

If the encoded message does not fill a transport block, the RRC layer shall add padding according to subclause 12.1.

10.2.19 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Paging cause	MP		Paging cause 10.3.3.23	
CN Information elements				
CN domain identity	MP		CN domain identity 10.3.1.1	
Paging Record Type Identifier	MP		Paging Record Type Identifier 10.3.1.10	

10.2.20 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE Information Elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Integrity protection mode info	OP		Integrity protection mode info 10.3.3.18	
Ciphering mode info	OP		Ciphering mode info 10.3.3.5	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
New U-RNTI	OP		U-RNTI 10.3.3.45	
New C-RNTI	OP		C-RNTI 10.3.3.8	
DRX Indicator	MP		DRX Indicator 10.3.3.10	
UTRAN DRX cycle length coefficient	MD		UTRAN DRX cycle length coefficient 10.3.3.47	Default value is the existing value of UTRAN DRX cycle length coefficient
CN Information Elements				
CN Information info	OP		CN Information info 10.3.1.3	
RB information elements				
RB with PDCP information list	OP	1 to <maxRBallRABs>		This IE is needed for each RB having PDCP in the case of lossless SRNS relocation
>RB with PDCP information	MP		RB with PDCP information 10.3.4.19	
PhyCH information elements				
Frequency info	MD		Frequency info 10.3.6.30	Default value is the existing value of frequency information
Uplink radio resources				
Maximum allowed UL TX power	MD		Maximum allowed UL TX power 10.3.6.33	Default value is the existing value of the maximum allowed UL TX power
CHOICE *channel requirement*	OP			At least one criticality=reject spare value needed for future extension
>Uplink DPCH info			Uplink DPCH info 10.3.6.76	

>PRACH Info (for RACH)			PRACH Info (for RACH) 10.3.6.44	
Downlink radio resources				
CHOICE *mode*	MP			
>FDD				
>>Downlink information common for all radio links	OP		Downlink information common for all radio links 10.3.6.20	
>>Downlink PDSCH information	OP		Downlink PDSCH information 10.3.6.26	
>>CPCH SET Info	OP		CPCH SET Info 10.3.6.10	
> TDD				(no data)
Downlink information per radio link list	OP	1 to <maxRL>		Send downlink information for each radio link
>Downlink information for each radio link	MP		Downlink information for each radio link 10.3.6.23	

10.2.21 PHYSICAL CHANNEL RECONFIGURATION COMPLETE

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

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.16	
CHOICE mode	MP			
>FDD				(no data)
>TDD				
>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.82	
RB Information elements				
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.10	
RB with PDCP information list	OP	1 to <maxRBallRABs>		This IE is needed for each RB having PDCP in the case of lossless SRNS relocation
>RB with PDCP information	MP		RB with PDCP information 10.3.4.19	

10.2.22 PHYSICAL CHANNEL RECONFIGURATION FAILURE

This message is sent by UE if the configuration given by UTRAN is unacceptable or if the UE failed to assign, replace or release a set of physical channel(s).

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message type	MP		Message type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Failure cause	MP		Failure cause and error information 10.3.3.12	

10.2.23 PHYSICAL SHARED CHANNEL ALLOCATION

NOTE: Only for TDD.

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 UM on SHCCH, UM on DCCH

Logical channel: SHCCH or DCCH

Direction: UTRAN → UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message type	
C-RNTI	OP		C-RNTI 10.3.3.8	
Uplink timing advance	MD		Uplink Timing Advance 10.3.6.82	Default value is the existing value for uplink timing advance
Allocation period info	OP		Allocation period info 10.3.6.4	
PUSCH capacity allocation info	OP		PUSCH Capacity Allocation info 10.3.6.55	
PDSCH info	OP		PDSCH info 10.3.6.37	
Timeslot list	OP	1 to maxTS		
>Timeslot number	MP		Timeslot number 10.3.6.72	Timeslot numbers, for which the UE shall report the timeslot ISCP in PUSCH CAPACITY REQUEST message.

10.2.24 PUSCH CAPACITY REQUEST

NOTE: Only for TDD.

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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
C-RNTI	OP		C-RNTI 10.3.3.8	
Traffic Volume	MP		Traffic Volume, measured results list 10.3.7.92	
Timeslot list	OP	1 to maxTS		
>Timeslot number	MP		Timeslot number 10.3.6.72	
>Timeslot ISCP	MP			
Primary CCPCH RSCP	OP			

10.2.25 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE Information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Integrity protection mode info	OP		Integrity protection mode info 10.3.3.18	
Ciphering mode info	OP		Ciphering mode info 10.3.3.5	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
New U-RNTI	OP		U-RNTI 10.3.3.45	
New C-RNTI	OP		C-RNTI 10.3.3.8	
DRX Indicator	MP		DRX Indicator 10.3.3.10	
UTRAN DRX cycle length coefficient	MD		UTRAN DRX cycle length coefficient 10.3.3.47	Default value is the existing value of UTRAN DRX cycle length coefficient
CN information elements				
CN Information info	OP		CN Information info 10.3.1.3	
RB information elements				
RB information to reconfigure list	MP	1to <maxRB>		
>RB information to reconfigure	MP		RB information to reconfigure 10.3.4.15	
RB information to be affected list	OP	1 to <maxRB>		
>RB information to be affected	MP		RB information to be affected 10.3.4.14	
TrCH Information Elements				
Uplink transport channels				

UL Transport channel information common for all transport channels	OP		UL Transport channel information common for all transport channels 10.3.5.24	
Deleted TrCH information list	OP	1 to <maxTrCH>		
> Deleted UL TrCH information	MP		Deleted UL TrCH information 10.3.5.5	
Added or Reconfigured TrCH information list	OP	1 to <maxTrCH>		
>Added or Reconfigured UL TrCH information	MP		Added or Reconfigured UL TrCH information 10.3.5.2	
CHOICE *mode*	OP			
>FDD				
>>CPCH set ID	OP		CPCH set ID 10.3.5.3	
>> Added or Reconfigured TrCH information for DRAC list	OP	1 to <maxTrCH>		
>>>DRAC static information	MP		DRAC static information 10.3.5.7	
>TDD				(no data)
Downlink transport channels				
DL Transport channel information common for all transport channels	OP		DL Transport channel information common for all transport channels 10.3.5.6	
Deleted TrCH information list	OP	1 to <maxTrCH>		
>Deleted DL TrCH information	MP		Deleted DL TrCH information 10.3.5.4	
Added or Reconfigured TrCH information list	OP	1 to <maxTrCH>		
>Added or Reconfigured DL TrCH information	MP		Added or Reconfigured DL TrCH information 10.3.5.1	
PhyCH information elements				
Frequency info	MD		Frequency info 10.3.6.30	Default value is the existing value of frequency information
Uplink radio resources				
Maximum allowed UL TX power	MD		Maximum allowed UL TX power 10.3.6.33	Default value is the existing maximum UL TX power
CHOICE *channel requirement*	OP			At least one spare choice (criticality = reject) required

>Uplink DPCH info			Uplink DPCH info 10.3.6.76	
>PRACH Info (for RACH)			PRACH Info (for RACH) 10.3.6.44	
Downlink radio resources				
CHOICE *mode*	MP			
>FDD				
>>Downlink information common for all radio links	OP		Downlink information common for all radio links 10.3.6.20	
>>Downlink PDSCH information	OP		Downlink PDSCH information 10.3.6.26	
>>CPCH SET Info	OP		CPCH SET Info 10.3.6.10	
>TDD				(no data)
Downlink information per radio link list	OP	1 to <maxRL>		
>Downlink information for each radio link	MP		Downlink information for each radio link 10.3.6.23	

10.2.26 RADIO BEARER RECONFIGURATION COMPLETE

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

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.16	
CHOICE mode	MP			
>FDD				(no data)
>TDD				
>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.82	
RB Information elements				
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.10	
RB with PDCP information list	OP	1 to <maxRBallRABs>		This IE is needed for each RB having PDCP in the case of lossless SRNS relocation
>RB with PDCP information	MP		RB with PDCP information 10.3.4.19	

10.2.27 RADIO BEARER RECONFIGURATION FAILURE

This message is sent by UE if the configuration given by UTRAN is unacceptable or if the UE failed to establish the physical channel(s).

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Failure cause	MP		Failure cause and error information 10.3.3.12	
RB information elements				
Radio bearers for which reconfiguration would have succeeded	OP	1.to.<max RB>	RB identity, 10.3.4.13	

10.2.28 RADIO BEARER RELEASE

This message is used by UTRAN to release a radio bearer. It can also include modifications to the configurations of transport channels and/or physical channels.

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UTRAN → UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE Information Elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Integrity protection mode info	OP		Integrity protection mode info 10.3.3.18	
Ciphering mode info	OP		Ciphering mode info 10.3.3.5	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
New U-RNTI	OP		U-RNTI 10.3.3.45	
New C-RNTI	OP		C-RNTI 10.3.3.8	
DRX Indicator	MP		DRX Indicator 10.3.3.10	
UTRAN DRX cycle length coefficient	MD		UTRAN DRX cycle length coefficient 10.3.3.47	Default value is the existing value of UTRAN DRX cycle length coefficient
CN Information Elements				
CN Information info	OP		CN Information info 10.3.1.3	
RB Information Elements				
RB information to release list	MP	1 to <maxRB>		
>RB information to release	MP		RB information to release 10.3.4.16	
RB information to be affected list	OP	1 to <maxRB>		
>RB information to be affected	MP		RB information to be affected 10.3.4.14	
TrCH Information Elements				
Uplink transport channels				
UL Transport channel information common for all transport channels	OP		UL Transport channel information common for all transport channels 10.3.5.24	
Deleted TrCH information list	OP	1 to <axTrCH>		
>Deleted UL TrCH information	MP		Deleted UL TrCH information 10.3.5.5	

Added or Reconfigured TrCH information list	OP	1 to <maxTrCH>		
>Added or Reconfigured UL TrCH information	MP		Added or Reconfigured UL TrCH information 10.3.5.2	
CHOICE *mode*	OP			
>FDD				
>>CPCH set ID	OP		CPCH set ID 10.3.5.3	
>> Added or Reconfigured TrCH information for DRAC list	OP	1 to <maxTrCH>		
>>>DRAC static information	MP		DRAC static information 10.3.5.7	
>TDD				(no data)
Downlink transport channels				
DL Transport channel information common for all transport channels	OP		DL Transport channel information common for all transport channels 10.3.5.6	
Deleted TrCH information list	OP	1 to <maxTrCH>		
>Deleted DL TrCH information	MP		Deleted DL TrCH information 10.3.5.4	
Added or Reconfigured TrCH information list	OP	1 to <maxTrCH>		
>Added or Reconfigured DL TrCH information	MP		Added or Reconfigured DL TrCH information 10.3.5.1	
PhyCH information elements				
Frequency info	MD		Frequency info 10.3.6.30	Default value is the existing value of frequency information
Uplink radio resources				
Maximum allowed UL TX power	MD		Maximum allowed UL TX power 10.3.6.33	Default value is the existing maximum UL TX power
CHOICE *channel requirement*	OP			At least one spare choice (criticality = reject) required
>Uplink DPCH info			Uplink DPCH info 10.3.6.76	
>PRACH Info (for RACH)			PRACH Info (for RACH) 10.3.6.44	
Downlink radio resources				
CHOICE *mode*	MP			
>FDD				
>>Downlink information common for all radio links	OP		Downlink information common for all radio links 10.3.6.20	

>>Downlink PDSCH information	OP		Downlink PDSCH information 10.3.6.26	
>>CPCH SET Info	OP		CPCH SET Info 10.3.6.10	
>TDD				(no data)
Downlink information per radio link list	OP	1 to <maxRL>		Send downlink information for each radio link to be set-up
>Downlink information for each radio link	MP		Downlink information for each radio link 10.3.6.23	

10.2.29 RADIO BEARER RELEASE COMPLETE

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

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	Integrity check info is included if integrity protection is applied
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.16	
CHOICE mode	MP			
>FDD				(no data)
>TDD				
>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.82	This information element shall be present in case of handover procedure Calculated timing advance value for the new cell after handover in a synchronous TDD network
RB Information elements				
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.10	

10.2.30 RADIO BEARER RELEASE FAILURE

This message is sent by UE if the configuration given by UTRAN is unacceptable or if radio bearer can not be released.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Failure cause	MP		Failure cause and error information 10.3.3.12	
RB information elements				
Radio bearers for which reconfiguration would have succeeded	OP	1.to.<max RB>	RB identity, 10.3.4.13	

10.2.31 RADIO BEARER SETUP

This message is sent by UTRAN to the UE to establish new radio bearer(s). It can also include modifications to the configurations of transport channels and/or physical channels.

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UTRAN → UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE Information Elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Integrity protection mode info	OP		Integrity protection mode info 10.3.3.18	
Ciphering mode info	OP		Ciphering mode info 10.3.3.5	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
New U-RNTI	OP		U-RNTI 10.3.3.45	
New C-RNTI	OP		C-RNTI 10.3.3.8	
DRX Indicator	MP		DRX Indicator 10.3.3.10	
UTRAN DRX cycle length coefficient	MD		UTRAN DRX cycle length coefficient 10.3.3.47	Default value is the existing value of UTRAN DRX cycle length coefficient
CN Information Elements				
CN Information info	OP		CN Information info 10.3.1.3	
RB Information Elements				
Signalling RB information to setup list	OP	1 to <maxSRBsetup>		For each signalling radio bearer established
>Signalling RB information to setup	MP		Signalling RB information to setup 10.3.4.21	
RAB information to setup list	MP	1 to <maxRABsetup>		For each RAB established
>RAB information for setup	MP		RAB information for setup 10.3.4.9	
RB information to be affected list	OP	1 to <maxRB>		
>RB information to be affected	MP		RB information to be affected 10.3.4.14	
TrCH Information Elements				
Uplink transport channels				

UL Transport channel information common for all transport channels	OP		UL Transport channel information common for all transport channels 10.3.5.24	
Deleted TrCH information list	OP	1 to <maxTrCH>		
>Deleted UL TrCH information	MP		Deleted UL TrCH information 10.3.5.5	
Added or Reconfigured TrCH information list	OP	1 to <maxTrCH>		
>Added or Reconfigured UL TrCH information	MP		Added or Reconfigured UL TrCH information 10.3.5.2	
CHOICE *mode*	OP			
>FDD				
>>CPCH set ID	OP		CPCH set ID 10.3.5.3	
>> Added or Reconfigured TrCH information for DRAC list	OP	1 to <maxTrCH>		
>>>DRAC static information	MP		DRAC static information 10.3.5.7	
>TDD				(no data)
Downlink transport channels				
DL Transport channel information common for all transport channels	OP		DL Transport channel information common for all transport channels10.3.5.6	
Deleted TrCH information list	OP	1 to <maxTrCH>		
>Deleted DL TrCH information	MP		Deleted DL TrCH information 10.3.5.4	
Added or Reconfigured TrCH information list	OP	1 to <maxTrCH>		
>Added or Reconfigured DL TrCH information	MP		Added or Reconfigured DL TrCH information 10.3.5.1	
PhyCH information elements				
Frequency info	MD		Frequency info 10.3.6.30	Default value is the existing value of frequency information
Uplink radio resources				
Maximum allowed UL TX power	MD		Maximum allowed UL TX power 10.3.6.33	Default value is the existing maximum UL TX power
CHOICE *channel requirement*	OP			At least one spare choice (criticality = reject) required

>Uplink DPCH info			Uplink DPCH info 10.3.6.76	
>PRACH Info (for RACH)			PRACH Info (for RACH) 10.3.6.44	
Downlink radio resources				
CHOICE *mode*	MP			
>FDD				
>>Downlink information common for all radio links	OP		Downlink information common for all radio links10.3.6.20	
>>Downlink PDSCH information	OP		Downlink PDSCH information10.3.6.26	
>>CPCH SET Info	OP		CPCH SET Info 10.3.6.10	
>TDD				(no data)
Downlink information per radio link list	OP	1 to <maxRL>		Send downlink information for each radio link
>Downlink information for each radio link	MP		Downlink information for each radio link 10.3.6.23	

10.2.32 RADIO BEARER SETUP COMPLETE

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

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.16	
CHOICE mode	OP			
>FDD				(no data)
>TDD				
>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.82	This information element shall be present in case of handover procedure. Calculated timing advance value for the new cell after handover in a synchronous TDD network
Hyper frame number	OP		Hyper frame number 10.3.3.13	This information element is not needed for transparent mode RBs
RB Information elements				
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.10	

10.2.33 RADIO BEARER SETUP FAILURE

This message is sent by UE, if it does not support the configuration given by UTRAN.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Failure cause	MP		Failure cause and error information 10.3.3.12	
RB information elements				
Radio bearers for which reconfiguration would have succeeded	OP	1.to.<max RB>	RB identity, 10.3.4.13	

10.2.34 RNTI REALLOCATION

This message is used by UTRAN to allocate a new RNTI to a UE.

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE Information Elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Integrity protection mode info	OP		Integrity protection mode info 10.3.3.18	
Ciphering mode info	OP		Ciphering mode info 10.3.3.5	
New U-RNTI	OP		U-RNTI 10.3.3.45	
New C-RNTI	OP		C-RNTI 10.3.3.8	
DRX Indicator	MP		DRX Indicator 10.3.3.10	
UTRAN DRX cycle length coefficient	MD		UTRAN DRX cycle length coefficient 10.3.3.47	Default value is the existing value of UTRAN DRX cycle length coefficient
CN Information Elements				
CN Information info	OP		CN Information info 10.3.1.3	
RB Information elements				
RB with PDCP information list	OP	1 to <maxRBallRABs>		This IE is needed for each RB having PDCP in the case of lossless SRNS relocation
>RB with PDCP information	MP		RB with PDCP information 10.3.4.19	

10.2.35 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.16	
RB Information elements				
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.10	
RB with PDCP information list	OP	1 to <maxRBallRABs>		This IE is needed for each RB having PDCP in the case of lossless SRNS relocation
>RB with PDCP information	MP		RB with PDCP information 10.3.4.19	

10.2.36 RNTI REALLOCATION FAILURE

This message is sent to indicate a failure to act on a received RNTI REALLOCATION message.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Failure cause	MP		Failure cause and error information 10.3.3.12	

10.2.37 RRC CONNECTION RE-ESTABLISHMENT

This message is sent by UTRAN in order to re-establish an RRC connection.

RLC-SAP: UM

Logical channel: CCCH, DCCH

Direction: UTRAN → UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE Information Elements				
U-RNTI	CV-CCCH		U-RNTI 10.3.3.45	
Integrity check info	CH		Integrity check info 10.3.3.15	
Integrity protection mode info	OP		Integrity protection mode info 10.3.3.18	
Ciphering mode info	OP		Ciphering mode info 10.3.3.5	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
New U-RNTI	OP		U-RNTI 10.3.3.45	
New C-RNTI	OP		C-RNTI 10.3.3.8	
DRX Indicator	MP		DRX Indicator 10.3.3.10	
UTRAN DRX cycle length coefficient	MD		UTRAN DRX cycle length coefficient 10.3.3.47	Default value is the existing value of UTRAN DRX cycle length coefficient
RLC reset indicator (for C-plane)	MP		RLC reset indicator 10.3.3.35	
RLC reset indicator (for U-plane)	MP		RLC reset indicator 10.3.3.35	
CN Information Elements				
CN Information info	OP		CN Information info 10.3.1.3	
RB Information Elements				
Signalling RB information to setup list	OP	1 to <maxSRBsetup>		For each signalling radio bearer established
>Signalling RB information to setup	MP		Signalling RB information to setup 10.3.4.21	
RAB information for setup list	OP	1 to <maxRABsetup>		For each RAB established
>RAB information for setup	MP		RAB information for setup 10.3.4.9	
RB information to release list	OP	1 to <maxRB>		

>RB information to release	MP		RB information to release 10.3.4.16	
RB information to reconfigure list	OP	1 to <maxRB>		
>RB information to reconfigure	MP		RB information to reconfigure 10.3.4.15	
RB information to be affected list	OP	1 to <maxRB>		
>RB information to be affected	MP		RB information to be affected 10.3.4.14	
TrCH Information Elements				
Uplink transport channels				
UL Transport channel information common for all transport channels	OP		UL Transport channel information common for all transport channels 10.3.5.24	
Deleted TrCH information list	OP	1 to <maxTrCH>		
>Deleted UL TrCH information	MP		Deleted UL TrCH information 10.3.5.5	
Added or Reconfigured TrCH information list	OP	1 to <maxTrCH>		
>Added or Reconfigured UL TrCH information	MP		Added or Reconfigured UL TrCH information 10.3.5.2	
CHOICE *mode*	OP			
>FDD				
>>CPCH set ID	OP		CPCH set ID 10.3.5.3	
>> Added or Reconfigured TrCH information for DRAC list	OP	1 to <maxTrCH>		
>>>DRAC static information	MP		DRAC static information 10.3.5.7	
>TDD				(no data)
Downlink transport channels				
DL Transport channel information common for all transport channels	OP		DL Transport channel information common for all transport channels 10.3.5.6	
Deleted TrCH information list	OP	1 to <maxTrCH>		

>Deleted DL TrCH information	MP		Deleted DL TrCH information 10.3.5.4	
Added or Reconfigured TrCH information list	OP	1 to <maxTrCH>		
>Added or Reconfigured DL TrCH information	MP		Added or Reconfigured DL TrCH information 10.3.5.1	
PhyCH information elements				
Frequency info	MD		Frequency info 10.3.6.30	Default value is the existing value of frequency information
Uplink radio resources				
Maximum allowed UL TX power	MD		Maximum allowed UL TX power 10.3.6.33	Default value is the existing maximum UL TX power
CHOICE *channel requirement*	OP			At least one spare choice (criticality = reject) required
>Uplink DPCH info			Uplink DPCH info 10.3.6.76.	
>PRACH Info (for RACH)			PRACH Info (for RACH) 10.3.6.44	
Downlink radio resources				
CHOICE *mode*				
>FDD				
>>Downlink information common for all radio links	OP		Downlink information common for all radio links 10.3.6.20	
>>Downlink PDSCH information	OP		Downlink PDSCH information 10.3.6.26	
>>CPCH SET Info	OP		CPCH SET Info 10.3.6.10	
>TDD				(no data)
Downlink information per radio link list	OP	1 to <maxRL>		Send downlink information for each radio link to be set-up
>Downlink information for each radio link	MP		Downlink information for each radio link 10.3.6.23	

Condition	Explanation
CCCH	This IE is only sent when CCCH is used

10.2.38 RRC CONNECTION RE-ESTABLISHMENT COMPLETE

This message is used by UE to confirm the re-establishment of an RRC connection.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.16	
CHOICE mode	OP			
>FDD				(no data)
>TDD				
>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.82	This information element shall be present in case of handover procedure. Calculated timing advance value for the new cell after handover in a synchronous TDD network
Hyperframe number	MP		Hyper Frame Number 10.3.3.13	
RB Information elements				
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.10	
RB with PDCP information list	OP	1 to <maxRBallRABs>		This IE is needed for each RB having PDCP in the case of lossless SRNS relocation
>RB with PDCP information	MP		RB with PDCP information 10.3.4.19	

10.2.39 RRC CONNECTION RE-ESTABLISHMENT REQUEST

This message is used by UE to request for the re-establishment of an RRC connection.

RLC-SAP: TM

Logical channel: CCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
U-RNTI	MP		U-RNTI 10.3.3.45	
Integrity check info	CH		Integrity check info 10.3.3.15	
Hyper frame number	MP		Hyper frame number 10.3.3.13	
AM_RLC error indication(for C-plane)	MP		Boolean	TRUE indicates AM_RLC unrecoverable error occurred on c-plane in the UE
AM_RLC error indication(for U-plane)	MP		Boolean	TRUE indicates AM_RLC unrecoverable error occurred on u-plane in the UE
Protocol error indicator	MD		Protocol error indicator 10.3.3.28	Default value is FALSE
Measurement information elements				
Measured results on RACH	OP		Measured results on RACH 10.3.7.70	
Other information elements				
Protocol error information	CV-*ProtErr*		Protocol error information 10.3.8.10	

Condition	Explanation
ProtErr	If the IE "Protocol error indicator" has the value "TRUE"

10.2.40 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Initial UE identity	MP		Initial UE identity 10.3.3.14	
Rejection cause	MP		Rejection cause 10.3.3.31	
Wait time	MP		Wait time 10.3.3.48	
Redirection info	OP		Redirection info 10.3.3.29	

10.2.41 RRC CONNECTION RELEASE

This message is sent by UTRAN to release the RRC connection. The message also releases the signalling connection and all radio bearers between the UE and UTRAN.

RLC-SAP: UM or TM

Logical channel: CCCH orDCCH

Direction: UTRAN→UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
U-RNTI	CV-CCCH		U-RNTI 10.3.3.45	
Integrity check info	CH		Integrity check info 10.3.3.15	Integrity check info is included if integrity protection is applied
Number of RRC Message Transmissions	CH Cell_DCH		Number of RRC Message Transmissions 10.3.3.22	
Release cause	MP		Release cause 10.3.3.32	

Condition	Explanation
CCCH	This IE is only sent when CCCH is used.
Cell_DCH	This IE is present when UE is in CELL_DCH state.

10.2.42 RRC CONNECTION RELEASE COMPLETE

This message is sent by UE to confirm that the RRC connection has been released.

RLC-SAP: AM or UM or TM

Logical channel: CCCH or DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
U-RNTI	CV-CCCH		U-RNTI 10.3.3.45	
Integrity check info	CH		Integrity check info 10.3.3.15	

Condition	Explanation
CCCH	This IE is only sent when CCCH is used.

10.2.43 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Initial UE identity	MP		Initial UE identity 10.3.3.14	
Establishment cause	MP		Establishment cause 10.3.3.11	
Protocol error indicator	MD		Protocol error indicator 10.3.3.28	Default value is FALSE
Measurement information elements				
Measured results on RACH	OP		Measured results on RACH 10.3.7.70	

If the encoded message does not fill a transport block, the RRC layer shall insert padding according to subclause 12.1.

10.2.44 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE Information Elements				
Initial UE identity	MP		Initial UE identity 10.3.3.14	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
New U-RNTI	MP		U-RNTI 10.3.3.45	
New C-RNTI	OP		C-RNTI 10.3.3.8	
UTRAN DRX cycle length coefficient	MP		UTRAN DRX cycle length coefficient 10.3.3.47	
Capability update requirement	MD		Capability update requirement 10.3.3.2	Default value is defined in subclause 10.3.3.3
RB Information Elements				
Signalling RB information to setup list	MP	4 to 5		Information for signalling radio bearers, in the order RB 0 up to 4.
>Signalling RB information to setup	MP		Signalling RB information to setup 10.3.4.21	
TrCH Information Elements				
Uplink transport channels				
UL Transport channel information common for all transport channels	OP		UL Transport channel information common for all transport channels 10.3.5.24	
Added or Reconfigured TrCH information list	MP	1 to <maxTrCH>		
>Added or Reconfigured UL TrCH information	MP		Added or Reconfigured UL TrCH information 10.3.5.2	
Downlink transport channels				
DL Transport channel information common for all transport channels	OP		DL Transport channel information common for all transport channels 10.3.5.6	

Added or Reconfigured TrCH information list	MP	1 to <maxTrCH>		
>Added or Reconfigured DL TrCH information	MP		Added or Reconfigured DL TrCH information 10.3.5.1	
PhyCH information elements				
Frequency info	MD		Frequency info 10.3.6.30	Default value is the existing value of frequency information
Uplink radio resources				
Maximum allowed UL TX power	MD		Maximum allowed UL TX power 10.3.6.33	Default value is the existing maximum UL TX power
CHOICE *channel requirement*	OP			At least one spare choice (criticality = reject) required
>Uplink DPCH info			Uplink DPCH info 10.3.6.76	
>PRACH Info (for RACH)			PRACH Info (for RACH) 10.3.6.44	
Downlink radio resources				
CHOICE *mode*	MP			
>FDD				
>>Downlink information common for all radio links	OP		Downlink information common for all radio links 10.3.6.20	
>TDD				(no data)
Downlink information per radio link list	OP	1 to <MaxRL>		Send downlink information for each radio link to be set-up
>Downlink information for each radio link	MP		Downlink information for each radio link 10.3.6.23	

10.2.45 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
START list	MP	1 to <maxCNdomains>		START [TS 33.102] values for all CN domains.
>CN domain identity	MP		CN domain identity 10.3.1.1	
>START	MP		Hyper frame number 10.3.3.13	START value to be used in this CN domain.
UE information elements				
UE radio access capability	MP		UE radio access capability 10.3.3.40	
UE system specific capability	OP		Inter-system message 10.3.8.6	

10.2.46 RRC STATUS

This message is sent to indicate a protocol error.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	Integrity check info is included if integrity protection is applied
Other information elements				
Protocol error information	MP		Protocol error information 10.3.8.10	

10.2.47 SECURITY MODE COMMAND

This message is sent by UTRAN to start or reconfigure ciphering and/or integrity protection parameters.

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN to UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	Integrity check info is included if integrity protection is applied
Security capability	MP		Security capability10.3.3.36	
Ciphering mode info	OP		Ciphering mode info 10.3.3.5	Only present if ciphering shall be controlled
Integrity protection mode info	OP		Integrity protection mode info10.3.3.18	Only present if integrity protection shall be controlled
CN Information elements				
CN domain identity	MP		CN domain identity 10.3.1.1	Indicates which cipher and integrity protection keys are is applicable

10.2.48 SECURITY MODE COMPLETE

This message is sent by UE to confirm the reconfiguration of ciphering and/or integrity protection.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	Integrity check info is included if integrity protection is applied
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.16	
RB Information elements				
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.10	

10.2.49 SECURITY MODE FAILURE

This message is sent to indicate a failure to act on a received SECURITY MODE CONTROL message.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Failure cause	MP		Failure cause and error information 10.3.3.12	

10.2.50 SIGNALLING CONNECTION RELEASE

This message is used to notify the UE that one of its ongoing signalling connections to a CN domain has been released.

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	Integrity check info is included if integrity protection is applied
CN information elements				
Signalling Flow related information list	MP	1 to <maxSignallingFlow>		Flow identifier to be provided for each signalling flow to be released.
>Flow Identifier	MP		Flow Identifier 10.3.1.4	

Multi Bound	Explanation
MaxFlowId	Maximum number of flow identifiers

10.2.51 SIGNALLING CONNECTION RELEASE REQUEST

This message is used by the UE to request for the release of one or more signalling connections to a CN domain.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Need	Multi	IE type and reference	Semantics description
Message Type	MP		Message type	
CN information elements				
Signalling Flow related information		1 to <maxFlowID>		Flow identifier to be provided for each signalling flow to be released.
>Flow Identifier	MP		Flow Identifier 10.3.1.4	Allocated by UE for a particular session

Multi Bound	Explanation
MaxFlowId	Maximum number of flow identifiers

10.2.52 SYSTEM INFORMATION

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message type	OP		Message type	The message type is mandatory on the FACH, and absent on the BCH
SFNprime	CV channel		Integer(0..4094 by step of 2)	SFN=SFNprime (for first 10ms frame of 20ms TTI), SFN=SFNprime+1 (for last 10ms frame of 20ms TTI)
CHOICE Segment combination	MP			
>Combination 1				(no data)
>Combination 2				
>>First Segment	MP		First Segment, 10.2.52.1	
>Combination 3				
>>Subsequent Segment	MP		Subsequent Segment, 10.2.52.3	
>Combination 4				
>>Last segment	MP		Last segment, 10.2.52.4	
>Combination 5				
>>Last segment	MP		Last Segment 10.2.52.4	
>>First Segment	MP		First Segment (short), 10.2.52.2	
>Combination 6				
>>Last Segment	MP		Last Segment, 10.2.52.4	
>>Complete list		1 to maxSIBsegm		Note 1
>>>Complete			Complete SIB, 10.2.52.5	
>Combination 7				
>>Last Segment	MP		Last Segment, 10.2.52.4	
>>Complete list	MP	1..16		Note 1
>>>Complete	MP		Complete SIB, 10.2.52.5	
>>First Segment	MP		First Segment (short), 10.2.52.2	
>Combination 8				
>>Complete list	MP	1 to maxSIBsegm		Note 1
>>>Complete	MP		Complete SIB, 10.2.52.5	
>Combination 9				
>>Complete list	MP	1..16		Note 1

>>>Complete	MP		Complete SIB, 10.2.52.5	
>>First Segment	MP		First Segment (short), 10.2.52.2	

If the encoded message does not fill a transport block, the RRC layer shall insert padding according to subclause 12.1. Padding is needed e.g. if the remaining space is insufficient to start a new First Segment (which requires several bits for SIB type, SEG_COUNT and SIB data).

NOTE 1: If Combination 6 - 9 contains a Master information block Master information shall be located as the first IE in the list.

10.2.52.1 First Segment

This segment type is used to transfer the first segment of a segmented system information block. The IE is used when the first segment fills the entire transport block (Combination 1).

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Other information elements				
SIB type	MP		SIB Type, 10.3.8.17	
SEG_COUNT	MP		SEG COUNT, 10.3.8.13	
SIB data fixed	MP		SIB data fixed, 10.3.8.15	

10.2.52.2 First Segment (short)

This segment type is used to transfer the first segment of a segmented system information block. The IE is used when the first segment is concatenated after other segments in a transport block (Combination 5, 7 and 9).

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Other information elements				
SIB type	MP		SIB Type, 10.3.8.17	
SEG_COUNT	MP		SEG COUNT, 10.3.8.13	
SIB data variable	MP		SIB data variable, 10.3.8.16	

10.2.52.3 Subsequent Segment

This segment type is used to transfer a subsequent segment of a segmented system information block.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Other information elements				
SIB type	MP		SIB Type, 10.3.8.17	
Segment index	MP		Segment Index, 10.3.8.14	
SIB data fixed	MP		SIB data fixed, 10.3.8.15	

10.2.52.4 Last Segment

This segment type is used to transfer the last segment of a segmented system information block.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Other information elements				
SIB type	MP		SIB Type, 10.3.8.17	
Segment index	MP		Segment Index, 10.3.8.14	
SIB data variable	MP		SIB data variable, 10.3.8.15	

10.2.52.5 Complete SIB

This segment type is used to transfer a non-segmented system information block.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Other information elements				
SIB type	MP		SIB Type, 10.3.8.17	
SIB data variable	MP		data, 10.2.52.6 SIB data variable, 10.3.8.16	

10.2.52.6 System Information Blocks

The IE "SIB data" within the IEs, "First Segment", "Subsequent or last Segment" and "Complete SIB" contains either complete system information block or a segment of a system information block. The actual system information blocks are defined in the following clauses.

10.2.52.6.1 Master Information Block

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Other information elements				
MIB Value tag	MP		MIB Value tag 10.3.8.7	
CN information elements				
Supported PLMN types	MP		PLMN Type 10.3.1.12	
PLMN Identity	CV GSM		PLMN Identity 10.3.1.11	
ANSI-41 information elements				
ANSI-41 Core Network Information	CV ANSI-41		ANSI-41 Core Network Information 10.3.9.1	
References to other system information blocks	MP		References to other system information blocks 10.3.8.11	

Condition	Explanation
GSM	The IE is mandatory if the IE "Supported PLMN Types" is set to 'GSM-MAP' or 'GSM-MAP AND ANSI-41', and not needed otherwise
ANSI-41	The IE is mandatory if the IE "Supported PLMN Types" is set to 'ANSI-41' or 'GSM-MAP AND ANSI-41', and not needed otherwise

10.2.52.6.2 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 and in CELL_DCH.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
References to other system information blocks	OP		References to other system information blocks 10.3.8.10	Only system information blocks with area scope "PLMN" and update mechanism "value tag" may be referenced.
CN information elements				
CN common GSM-MAP NAS system information	MP		NAS system information (GSM-MAP) 10.3.1.9	
CN domain system information list	MP	1 to <maxCNdomains>		Send CN information for each CN domain.
>CN domain system information	MP		CN domain system information 10.3.1.2	
UE information				
UE Timers and constants in CELL_DCH	MP		UE Timers and constants in CELL_DCH 10.3.3.41	
UE Timers and constants in idle mode	MP		UE Timers and constants in idle mode 10.3.3.43	

10.2.52.6.3 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/Group name	Need	Multi	Type and reference	Semantics description
References to other system information blocks	OP		References to other system information blocks 10.3.8.10	Only system information blocks with area scope "PLMN" and update mechanism "value tag" may be referenced.
UTRAN mobility information elements				
URA identity list	MP	1 ..<maxURA>		
>URA identity	MP		URA identity 10.3.2.6	
UE information elements				
UE Timers and constants in connected mode	MP		UE Timers and constants in connected mode 10.3.3.42	

10.2.52.6.4 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/Group name	Need	Multi	Type and reference	Semantics description
References to other system information blocks	OP		References to other system information blocks 10.3.8.10	Only system information blocks with area scope "Cell" and update mechanism "value tag" may be referenced.
UTRAN mobility information elements				
Cell identity	MP		Cell identity 10.3.2.2	
Cell selection and re-selection info	MP		Cell selection and re-selection info for SIB3/4 10.3.2.3	
Cell Access Restriction	MP		Cell Access Restriction 10.3.2.1	

10.2.52.6.5 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/Group name	Need	Multi	Type and reference	Semantics description
References to other system information blocks	OP		References to other system information blocks 10.3.8. 10	Only system information blocks with area scope "Cell" and update mechanism "value tag" may be referenced.
UTRAN mobility information elements				
Cell identity	MP		Cell identity 10.3.2.2	
Cell selection and re-selection info	MP		Cell selection and re-selection info for SIB3/4 10.3.2.3	
Cell Access Restriction	MP		Cell Access Restriction 10.3.2.1	

10.2.52.6.6 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/Group name	Need	Multi	Type and reference	Semantics description
References to other system information blocks	OP		References to other system information blocks 10.3.8.11	Only system information blocks with area scope "Cell" and update mechanism "value tag" may be referenced.
PhyCH information elements				
CHOICE *mode*	MP			
>FDD				
>>PICH Power offset	MP		PICH Power offset 10.3.6.42	
>>AICH Power offset	MP		AICH Power offset 10.3.6.3	
>TDD				
>>PUSCH system information	OP		PUSCH system information 10.3.6.57	
>>PDSCH system information	OP		PDSCH system information 10.3.6.38	
>>Midamble configuration	MD		Midamble configuration 10.3.6.34	Default value is defined in 10.3.6.29

Primary CCPCH info	OP		Primary CCPCH info 10.3.6.49	Note 1
PRACH system information list	MP		PRACH system information list 10.3.6.47	
Secondary CCPCH system information	MP		Secondary CCPCH system information 10.3.6.62	
CBS DRX Level 1 information	CV CTCH		CBS DRX Level 1 information 10.3.8.3	

NOTE 1: DL scrambling code of the Primary CCPCH is the same as the one for Primary CPICH (FDD only).

Condition	Explanation
CTCH	The IE is mandatory if the IE "CTCH indicator" is equal to TRUE for at least one FACH, otherwise the IE is not needed in the message

10.2.52.6.7 System Information Block type 6

The system information block type 6 contains parameters for the configuration of the common and shared physical channels to be used in connected mode. The block may also contain scheduling information for other system information blocks.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
References to other system information blocks	OP		References to other system information blocks 10.3.8.11	Only system information blocks with area scope "Cell" and update mechanism "value tag" may be referenced.
PhyCH information elements				
CHOICE *mode*	MP			
>FDD				
>>PICH Power offset	MP		PICH Power offset 10.3.6.42	
>>AICH Power offset	MP		AICH Power offset 10.3.6.3	
>>CSICH Power offset	OP		CSICH Power offset 10.3.6.12	
>TDD				
>>PUSCH system information	OP		PUSCH system information 10.3.6.57	
>>PDSCH system information	OP		PDSCH system information 10.3.6.38	
>>Midamble configuration	MD		Midamble configuration 10.3.6.34	Default value is defined in 10.3.6.29

Primary CCPCH info	OP		Primary CCPCH info 10.3.6.49	Note 1
PRACH system information list	MP		PRACH system information list 10.3.6.47	
Secondary CCPCH system information	MP		Secondary CCPCH system information 10.3.6.62	
CBS DRX Level 1 information	CV CTCH		CBS DRX Level 1 information 10.3.8.3	

NOTE 1: DL scrambling code of the Primary CCPCH is the same as the one for Primary CPICH (FDD only).

Condition	Explanation
CTCH	The IE is mandatory if the IE "CTCH indicator" is equal to TRUE for at least one FACH, otherwise the IE is not needed

10.2.52.6.8 System Information Block type 7

The system information block type 7 contains the fast changing parameters UL interference and Dynamic persistence level

Information Element/Group name	Need	Multi	Type and reference	Semantics description
References to other system information blocks	OP		References to other system information blocks 10.3.8. 10	Only system information blocks with area scope "Cell" and update mechanism "expiration timer" may be referenced.
CHOICE mode	MP			
>FDD				
>>UL interference	MP		UL interference 10.3.6.75	
>TDD				(no data)
PhyCH information elements				
PRACHs listed in system information block type 5	MP	1 to<maxPRACH>		The order of the PRACHs is the same as in system information block type 5.
>Dynamic persistence level	MP		Dynamic persistence level 10.3.6.29	
PRACHs listed in system information block type 6	OP	1 to <maxPRACH>		The order of the PRACHs is the same as in system information block type 6.
>Dynamic persistence level	MP		Dynamic persistence level 10.3.6.29	

10.2.52.6.9 System Information Block type 8

NOTE: Only for FDD.

The system information block type 8 contains static CPCH information to be used in the cell.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
References to other system information blocks	OP		References to other system information blocks 10.3.8.10	Only system information blocks with area scope "Cell" and update mechanism "value tag" may be referenced.
UE information				
CPCH parameters	MP		CPCH parameters 10.3.3.7	
PhyCH information elements				
CPCH set info list	MP	1 to <maxCPCHsets>		
>CPCH set info	MP		CPCH set info 10.3.6.10	

10.2.52.6.10 System Information Block type 9

NOTE: Only for FDD.

The system information block type 9 contains CPCH information to be used in the cell.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
References to other system information blocks	OP		References to other system information blocks 10.3.8.10	Only system information blocks with area scope "Cell" and update mechanism "expiration timer" may be referenced.
PhyCH information elements				
CPCH set persistence levels list	MP	..1 to <maxCPCHsets>		
>CPCH set persistence levels	MP		CPCH persistence levels 10.3.6.9	

10.2.52.6.11 System Information Block type 10

NOTE: Only for FDD.

The system information block type 10 contains information to be used by UEs having their DCH controlled by a DRAC procedure.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
References to other system information blocks	OP		References to other system information blocks 10.3.8.10	Only system information blocks with area scope "Cell" and update mechanism "expiration timer" may be referenced.
UE information				
DRAC system information	MP		DRAC system information 10.3.3.9	DRAC information is sent for each class of terminal

10.2.52.6.12 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/Group name	Need	Multi	Type and reference	Semantics description
References to other system information blocks	OP		References to other system information blocks 10.3.8.11	Only system information blocks with area scope "Cell" and update mechanism "value tag" may be referenced.
Measurement information elements				
FACH measurement occasion info	OP		FACH measurement occasion info 10.3.7.8	
Measurement control system information	MP		Measurement control system information 10.3.7.72	

10.2.52.6.13 System Information Block type 12

The system information block type 12 contains measurement control information to be used in connected mode.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
References to other system information blocks	OP		References to other system information blocks 10.3.8.11	Only system information blocks with area scope "Cell" and update mechanism "value tag" may be referenced.
Measurement information elements				
FACH measurement occasion info	OP		FACH measurement occasion info 10.3.7.8	
Measurement control system information	MP		Measurement control system information 10.3.7.72	

10.2.52.6.14 System Information Block type 13

The system information block type 13 contains ANSI-41 system information.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Other information elements				
References to other system information blocks	OP		References to other system information blocks 10.3.8.11	Only system information blocks with area scope "Cell" and update mechanism "value tag" may be referenced.
CN Information Elements				
CN Domain system information list		1 to <maxCNdomains>		Send CN information for each CN domain.
>CN Domain system information			CN Domain system information 10.3.1.2	
UE Information				
UE timers and constants in idle mode	OP		UE timers and constants in idle mode 10.3.3.43	
Capability update requirement	OP		Capability update requirement 10.3.3.2	

10.2.52.6.14.1 System Information Block type 13.1

The system information block type 13.1 contains the ANSI-41 RAND information.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
ANSI-41 information elements				
ANSI-41 RAND information	MP		ANSI-41 RAND information 10.3.9.6	

10.2.52.6.14.2 System Information Block type 13.2

The system information block type 13.2 contains the ANSI-41 User Zone Identification information.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
ANSI-41 information elements				
ANSI-41 User Zone Identification information	MP		ANSI-41 User Zone Identification information 10.3.9.7	

10.2.52.6.14.3 System Information Block type 13.3

The system information block type 13.3 contains the ANSI-41 Private Neighbor List information.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
ANSI-41 information elements				
ANSI-41 Private Neighbor List information	MP		ANSI-41 Private Neighbor List information 10.3.9.5	

10.2.52.6.14.4 System Information Block type 13.4

The system information block type 13.4 contains the ANSI-41 Global Service Redirection information.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
ANSI-41 information elements				
ANSI-41 Global Service Redirection information	MP		ANSI-41 Global Service Redirection information 10.3.9.2	

10.2.52.6.15 System Information Block type 14

NOTE: Only for 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/Group name	Need	Multi	Type and reference	Semantics description
Other information elements				
References to other system information blocks	OP		References to other system information blocks 10.3.8.11	Only system information blocks with area scope "Cell" and update mechanism "value tag" may be referenced.
PhyCH information elements				
Primary CCPCH Tx Power	OP		Primary CCPCH Tx Power 10.3.6.50	For path loss calculation
Individual Timeslot interference list	MP	1 to <maxTS>		
>Individual Timeslot interference	MP		Individual Timeslot interference 10.3.6.32	
PRACH Constant Value	OP		Constant Value 10.3.6.8	Operator controlled PRACH Margin
DPCH Constant Value	OP		Constant Value 10.3.6.8	Operator controlled UL DPCH Margin
PUSCH Constant Value	OP		Constant Value 10.3.6.8	Operator controlled PUSCH Margin

10.2.52.6.16 System Information Block type 15

The system information block type 15 contains information useful for LCS. In particular it allows the UE based method to perform localisation without dedicated signalling. For the UE assisted methods the signalling is reduced.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
References to other system information blocks	OP		References to other system information blocks 10.3.8.11	Only system information blocks with area scope "Cell" and update mechanism "value tag" may be referenced.
LCS GPS assistance for SIB	OP		LCS GPS assistance for SIB 10.3.7.47	
LCS OTDOA assistance for SIB	OP		LCS OTDOA assistance for SIB 10.3.7.61	

10.2.52.6.16.1 System Information Block type 15.1

The system information block type 15.1 contains information useful for LCS DGPS Corrections. The DGPS Corrections message contents are based on a Type-1 message of version 2.2 of the RTCM-SC-104 recommendation for differential service. This format is a standard of the navigation industry and is supported by all DGPS receivers.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
UTRAN Time Flag	MP		Bitstring(1)	
Node B Clock Drift Flag	MP		Bitstring(1)	
Node B Clock Drift	OP		Real(-0.1..0.1 by a proper step)	This IE provides an estimate of the drift rate of the Node B clock relative to GPS time. It has units of µsec/sec (ppm) and a range of ±0.1. This IE aids the UE in maintaining the relation between GPS and cell timing over a period of time. A positive value for Node B Clock Drift indicates that the Node B clock is running at a greater frequency than desired.
Reference Location	MP		As defined in TS23.032	Provides a prior knowledge of the approximate location of the UE
SFN	OP		Integer(0..4095)	The SFN that occurs at the Reference GPS TOW time
Reference GPS TOW	MP		Integer(0..6.047*10^{11})	GPS Time of Week with scaling factor of 1 usec. This field time-stamps the start of the frame with SFN=0.
Status/Health	MP		Enumerated(UDRE scale 1.0, UDRE scale 0.75, UDRE scale 0.5, UDRE scale 0.3, UDRE scale 0.2, UDRE scale 0.1, no data, invalid data)	This field indicates the status of the differential corrections.
DPGS information	CV-Status	1..MAX_N_SAT		The following fields contain the DPGS corrections. If the Cipher information is included these fields are ciphered.
>SatID	MP		Integer(0..31)	The satellite ID number.
>IODE	MP		Integer(0..255)	This IE is the sequence number for the ephemeris for the particular satellite. The MS can use this IE to determine if new ephemeris is used for calculating the corrections that are provided in the broadcast message. This eight-bit IE is incremented for each new set of ephemeris for the satellite and may occupy the numerical range of [0, 239] during normal operations.

>UDRE	MP		Enumerated(UDRE ≤ 1.0 m, 1.0m < UDRE ≤ 4.0m, 4.0m < UDRE ≤ 8.0m, 8.0m < UDRE)	User Differential Range Error. This field provides an estimate of the uncertainty (1-σ) in the corrections for the particular satellite. The value in this field shall be multiplied by the UDRE Scale Factor in the Status field to determine the final UDRE estimate for the particular satellite.
>PRC	MP		Integer(-2047..2047)	Scaling factor 0.32 meters (different from [13])
>RRC	MP		Integer(-127..127)	Scaling factor 0.032 meters/sec (different from [13])
>Delta PRC2	MP		Integer(-127..127)	The difference in the pseudorange correction between the satellite's ephemeris identified by IODE and the previous ephemeris two issues ago IODE –2.
>Delta RRC2	MP		Integer(-7..7)	The difference in the pseudorange rate-of-change correction between the satellite's ephemeris identified by IODE and IODE-2.

NOTE: Each UDRE value shall be adjusted based on the operation of an Integrity Monitor (IM) function which exists at the network (SRNC, GPS server, or reference GPS receiver itself). Positioning errors derived at the IM which are excessive relative to DGPS expected accuracy levels shall be used to scale the UDRE values to produce consistency.

Multi Bound	Explanation
MAX_N_SAT	Maximum number of satellites included in the IE=16

Condition	Explanation
Status/Health	This IE is mandatory if "status" is not equal to "no data" or "invalid data", otherwise the IE is not needed

10.2.52.6.16.2 System Information Block type 15.2

The system information block type 15.2 contains information useful for ephemeris and clock corrections of a particular satellite. These IE fields are extracted from the subframes 1 to 3 of the GPS navigation message [12].

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Transmission TOW	MP		Enumerated(0. 19)	The approximate GPS time-of-week when the message is broadcast
SatID	MP		Enumerated(0..63)	Satellite ID
TLM Message	MP		Bit string(14)	
TLM Revd (C)	MP		Bit string(2)	
HOW	MP		Bit string(22)	
WN	MP		Bit string(10)	
C/A or P on L2	MP		Bit string(2)	
URA Index	MP		Bit string(4)	
SV Health	MP		Bit string(6)	
IODC	MP		Bit string(10$^{(1)}$)	
L2 P Data Flag	MP		Bit string(1)	
SF 1 Reserved	MP		Bit string(87)	
T_{GD}	MP		Bit string(8)	
t_{oc}	MP		Bit string(16$^{(1)}$)	
af_2	MP		Bit string(8)	
af_1	MP		Bit string(16)	
af_0	MP		Bit string(22)	
C_{rs}	MP		Bit string(16)	
Δn	MP		Bit string(16)	
M_0	MP		Bit string(32)	
C_{uc}	MP		Bit string(16)	
e	MP		Bit string(32$^{(1)}$)	
C_{us}	MP		Bit string(16)	
$(A)^{1/2}$	MP		Bit string(32$^{(1)}$)	
t_{oe}	MP		Bit string(16$^{(1)}$)	
Fit Interval Flag	MP		Bit string(1)	
AODO	MP		Bit string(5)	
C_{ic}	MP		Bit string(16)	
$OMEGA_0$	MP		Bit string(32)	
C_{is}	MP		Bit string(16)	
i_0	MP		Bit string(32)	
C_{rc}	MP		Bit string(16)	
ω	MP		Bit string(32)	
OMEGAdot	MP		Bit string(24)	
Idot	MP		Bit string(14)	
Spare/zero fill	MP		Bit string(20)	

10.2.52.6.16.3 System Information Block type 15.3

The system information block type 15.3 contains information useful for ionospheric delay, UTC offset, and Almanac. These IE fileds are extracted from the subframes 4 and 5 of the GPS navigation message, excluding the parity bits and other redundant bits [12].

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Transmission TOW	MP		Enumerated(0. 19)	The approximate GPS time-of-week when the message is broadcast
SatMask	MP		Enumerated(1..32)	indicates the satellites that contain the pages being broadcast in this data set
LSB TOW	MP		Bit string(8)	
GPS Info	MP	1 to <Max_Dat _rep>		
>SFIO 0	MP		Bit string(1)	Each repetition corresponds to a different page no. as described in the table below
>Data ID	MP		Bit string(2)	
>Page No.	MP		Bit string(6)	
>Word 3	MP		Bit string(16)	
>Word 4	MP		Bit string(24)	
>Word 5	MP		Bit string(24)	
>Word 6	MP		Bit string(24)	
>Word 7	MP		Bit string(24)	
>Word 8	MP		Bit string(24)	
>Word 9	MP		Bit string(24)	
>Word 10	MP		Bit string(22)	
Spare/zero fill	MP		Bit string(5)	

Mapping of Almanac, Health, Iono, and UTC Data to Subframe Number and Page Number

Data Type	Subframe	Page(s)
Almanac Data (SV1 – 24)	5	1 - 24
Almanac Data (SV25 – 32)	4	2, 3, 4, 5, 7, 8, 9, 10
SV Health (SV1 – 24)	5	25
SV Health (SV25 – 32)	4	25
Iono/UTC Corrections	4	18

Multi Bound	Explanation
Max_Dat_rep	Maximum number of repeats=3

10.2.52.6.17 System Information Block type 16

The system information block type 16 contains radio bearer, transport channel and physical channel parameters to be stored by UE in idle and connected mode for use during handover to UTRAN. The block may also contain scheduling information for other system information blocks.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Other information elements				
References to other system information blocks	OP		References to other system information blocks 10.3.8.11	Only system information blocks with area scope "Cell" and update mechanism "value tag" may be referenced.
UE information elements				
>Re-establishment timer	MP		Re-establishment timer 10.3.3.30	
RB information elements				
Predefined RB configuration	MP		Predefined RB configuration 10.3.4.7	
TrCH Information Elements				
Predefined TrCH configuration	MP		Predefined TrCH configuration 10.3.5.9	
PhyCH Information Elements				
Predefined PhyCH configuration	MP		Predefined PhyCH configuration 10.3.6.48	

10.2.53 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
Other information elements				
BCCH modification info	MP		BCCH modification info 10.3.8.1	

If the encoded message does not fill a transport block, the RRC layer shall insert padding according to subclause 12.x.

10.2.54 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE Information Elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Integrity protection mode info	OP		Integrity protection mode info 10.3.3.18	
Ciphering mode info	OP		Ciphering mode info 10.3.3.5	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
New U-RNTI	OP		U-RNTI 10.3.3.45	
New C-RNTI	OP		C-RNTI 10.3.3.8	
DRX Indicator	MP		DRX Indicator 10.3.3.10	
UTRAN DRX cycle length coefficient	MD		UTRAN DRX cycle length coefficient 10.3.3.47	Default value is the existing value of UTRAN DRX cycle length coefficient
CN Information Elements				
CN Information info	OP		CN Information info 10.3.1.3	
RB information elements				
RB with PDCP information list	OP	1 to <maxRBallRABs>		This IE is needed for each RB having PDCP in the case of lossless SRNS relocation
>RB with PDCP information	MP		RB with PDCP information 10.3.4.19	
TrCH Information Elements				
Uplink transport channels				
UL Transport channel information common for all transport channels	OP		UL Transport channel information common for all transport channels 10.3.5.24	
Added or Reconfigured TrCH information list	MP	1 to <maxTrCH>		

>Added or Reconfigured UL TrCH information	MP		Added or Reconfigured UL TrCH information 10.3.5.2	
CHOICE *mode*	OP			
>FDD				
>>CPCH set ID	OP		CPCH set ID 10.3.5.3	
>> Added or Reconfigured TrCH information for DRAC list	OP	1 to <maxTrCH>		
>>>DRAC static information	MP		DRAC static information 10.3.5.7	
>TDD				(no data)
Downlink transport channels				
DL Transport channel information common for all transport channels	OP		DL Transport channel information common for all transport channels 10.3.5.6	
Added or Reconfigured TrCH information list	MP	1 to <maxTrCH>		
>Added or Reconfigured DL TrCH information	MP		Added or Reconfigured DL TrCH information 10.3.5.1	
PhyCH information elements				
Frequency info	MD		Frequency info 10.3.6.30	Default value is the existing value of frequency information
Uplink radio resources				
Maximum allowed UL TX power	MD		Maximum allowed UL TX power 10.3.6.33	Default value is the existing maximum UL TX power
CHOICE *channel requirement*	OP			At least one spare choice (criticality = reject) required
>Uplink DPCH info			Uplink DPCH info 10.3.6.76	
>PRACH Info (for RACH)			PRACH Info (for RACH) 10.3.6.44	
Downlink radio resources				
CHOICE *mode*				
>FDD				
>>Downlink information common for all radio links	OP		Downlink information common for all radio links 10.3.6.20	
>>Downlink PDSCH information	OP		Downlink PDSCH information 10.3.6.26	
>>CPCH set Info	OP		CPCH set Info 10.3.6.10	
>TDD				(no data)
Downlink information per radio link list	OP	1 to <maxRL>		Send downlink information for each radio link

>Downlink information for each radio link	MP		Downlink information for each radio link 10.3.6.23	

10.2.55 TRANSPORT CHANNEL RECONFIGURATION COMPLETE

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

RLC-SAP: AM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Uplink integrity protection activation info	OP		Integrity protection activation info 10.3.3.16	
CHOICE mode	OP			
>FDD				(no data)
>TDD				
>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.82	This information element shall be present in case of handover procedure. Calculated timing advance value for the new cell after handover in a synchronous TDD network
RB Information elements				
Radio bearer uplink ciphering activation time info	OP		RB activation time info 10.3.4.10	
RB with PDCP information list	OP	1 to <maxRBallRABs>		This IE is needed for each RB having PDCP in the case of lossless SRNS relocation
>RB with PDCP information	MP		RB with PDCP information 10.3.4.19	

10.2.56 TRANSPORT CHANNEL RECONFIGURATION FAILURE

This message is sent by UE if the configuration given by UTRAN is unacceptable or if the UE failed to establish the physical channel(s).

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Failure cause	MP		Failure cause and error information 10.3.3.12	

10.2.57 TRANSPORT FORMAT COMBINATION CONTROL

This message is sent by UTRAN to control the uplink transport format combination within the allowed transport format combination set.

RLC-SAP: TM, AM or UM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	CV-notTM		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
TrCH information elements				
DPCH TFCS in uplink	MP		Transport Format Combination subset 10.3.5.22	
TFC Control duration	CV-notTMopt		TFC Control duration 10.3.6.69	

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.

If transparent mode signalling is used and the encoded message does not fill a transport block, the RRC layer shall insert padding according to subclause 12.x.

10.2.58 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Failure cause	MP		Failure cause and error information 10.3.3.12	

10.2.59 UE CAPABILITY ENQUIRY

The UE CAPABILITY ENQUIRY is used by the UTRAN to enquire inter-system classmarks from the UE.

RLC-SAP: TBD

Logical channel: DCCH

Direction: UTRAN → UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	Integrity check info is included if integrity protection is applied
Capability update requirement	MP		Capability update requirement 10.3.3.2	

10.2.60 UE CAPABILITY INFORMATION

This message is sent by UE to convey UE specific capability information to the UTRAN.

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UE → UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	Integrity check info is included if integrity protection is applied
UE radio access capability	OP		UE radio access capability 10.3.3.40	
Other information elements				
UE system specific capability	OP		Inter-system message 10.3.8.6	Includes inter-system classmark

10.2.61 UE CAPABILITY INFORMATION CONFIRM

This message is sent by UTRAN to confirm that UE capability information has been received.

RLC-SAP: AM orUM

Logical channel: DCCH

Direction: UTRAN → UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	Integrity check info is included if integrity protection is applied

10.2.62 UPLINK DIRECT TRANSFER

This message is used to transfer NAS messages for an on-going signalling flow. RLC-SAP: AM

Logical channel: DCCH

Direction: UE ->UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	Integrity check info is included if integrity protection is applied
CN information elements				
Flow Identifier	MP		Flow Identifier 10.3.1.4	Allocated by UE for a particular flow
NAS message	MP		NAS message 10.3.1.8	
Measurement information elements				
Measured results on RACH	OP		Measured results on RACH 10.3.7.70	

10.2.63 UPLINK PHYSICAL CHANNEL CONTROL

NOTE: Only for TDD.

In TDD this message is used to transfer uplink physical channel parameters to the UE.

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	OP		Integrity check info 10.3.3.15	
PhyCH information elements				
CCTrCH power control info	OP		CCTrCH power control info 10.3.6.6	Power control information for one CCTrCH
Timing Advance	OP		UL Timing Advance 10.3.6.82	
Timeslot List	OP	1 to <maxTS>		
>Individual UL Timeslot interference	MP		Individual Timeslot interference 10.3.6.32	

PRACH Constant Value	OP		Constant value 10.3.6.8	Operator controlled PRACH Margin
DPCH Constant Value	OP		Constant value 10.3.6.8	Operator controlled UL DPCH Margin
PUSCH Constant Value	OP		Constant value 10.3.6.8	Operator controlled PUSCH Margin

10.2.64 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
U-RNTI	MP		U-RNTI 10.3.3.45	
Integrity check info	CH		Integrity check info 10.3.3.15	
URA update cause	MP		URA update cause 10.3.3.44	
Protocol error indicator	MD		Protocol error indicator 10.3.3.28	Default value is FALSE
Other information elements				
Protocol error information	CV-*ProtErr*		Protocol error information 10.3.8.10	

Condition	Explanation
ProtErr	If the IE "Protocol error indicator" has the value "TRUE"

10.2.65 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/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
U-RNTI	CV-CCCH		U-RNTI 10.3.3.45	
Integrity check info	CH		Integrity check info 10.3.3.15	Integrity check info is included if integrity protection is applied
Integrity protection mode info	OP		Integrity protection mode info 10.3.3.18	
Ciphering mode info	OP		Ciphering mode info 10.3.3.5	
New U-RNTI	OP		U-RNTI 10.3.3.45	
New C-RNTI	OP		C-RNTI 10.3.3.8	
DRX Indicator	MP		DRX Indicator 10.3.3.10	
UTRAN DRX cycle length coefficient	MD		UTRAN DRX cycle length coefficient 10.3.3.47	Default value is the existing value of UTRAN DRX cycle length coefficient
CN Information Elements				
CN Information info	OP		CN Information info 10.3.1.3	
UTRAN mobility information elements				
URA identity	OP		URA identity 10.3.2.6	
RB information elements				
RB with PDCP information list	OP	1 to <maxRBallRABs>		This IE is needed for each RB having PDCP in the case of lossless SRNS relocation
>RB with PDCP information	MP		RB with PDCP information 10.3.4.19	

Condition	Explanation
CCCH	This IE is only sent when CCCH is used

10.3 Information element functional definitions

10.3.1 CN Information elements

10.3.1.1 CN domain identity

Identifies the type of core network domain.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CN domain identity	MP		Enumerated (CS domain, PS domain, Don't care)	At least 1 spare value needed Criticality: criticality reject is needed

10.3.1.2 CN Domain System Information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CN domain identity	MP		CN domain identity 10.3.1.1	
CHOICE CN Type	MP			
>GSM-MAP				
>>CN domain specific NAS system information	MP		NAS system information (GSM-MAP) 10.3.1.9	
>ANSI-41				
>>CN domain specific NAS system information	MP		ANSI-41 NAS system information, 10.3.9.4	
CN domain specific DRX cycle length coefficient	MP		CN domain specific DRX cycle length coefficient, 10.3.3.6	

10.3.1.3 CN Information info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
PLMN identity	OP		PLMN identity 10.3.1.11	
CN common GSM-MAP NAS system information	OP		NAS system information (GSM-MAP) 10.3.1.9	
CN domain related information	OP	1 to <maxCNdomains>		
>CN domain identity	MP		CN domain identity 10.3.1.1	
>CN domain specific GSM-MAP NAS system info	MP		NAS system information (GSM-MAP) 10.3.1.9	

NOTE 1: Necessity of PLMN is FFS and for CN domain identity and NAS system information, the confirmation in SA WG2 is needed.

10.3.1.4 Flow Identifier

This IE is allocated by the UE for a particular signalling flow on an indication from the upper layers.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Flow Identifier	MP		Integer (0…63)	

10.3.1.5 IMEI

This IE contains an International Mobile Equipment Identity. Setting specified in [TS 23.003]

Information Element/Group name	Need	Multi	Type and reference	Semantics description
IMEI	MP	15		
>IMEI digit	MP		INTEGER(0..15)	

10.3.1.6 IMSI (GSM-MAP)

This IE contains an International Mobile Subscriber Identity, used towards a GSM-MAP type of PLMN. Setting specified in [TS 23.003]

Information Element/Group name	Need	Multi	Type and reference	Semantics description
IMSI	MP	6 to 15		
>IMSI digit	MP		INTEGER(0..9)	

10.3.1.7 Location Area Identification

Identifies uniquely a location area for a GSM-MAP type of PLMN. Setting specified in [TS24.008].

Information Element/Group name	Need	Multi	Type and reference	Semantics description
PLMN identity	MP		PLMN identity 10.3.1.11	
LAC	MP		Bit string(16)	

10.3.1.8 NAS message

A non-access stratum message to be transferred transparently through UTRAN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
NAS message	MP		Octet string (1..4095)	

10.3.1.9 NAS system information (GSM-MAP)

This information element contains system information that belongs to the non-access stratum for a GSM-MAP type of PLMN. 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	Need	Multi	Type and reference	Semantics description
GSM-MAP NAS system information	MP		Octet string(1..8)	

10.3.1.10 Paging record Type identifier

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Paging Record Type Identifier	MP		Enumerated (IMSI (GSM-MAP), TMSI (GSM-MAP)/ P-TMSI, IMSI (DS-41), TMSI (DS-41))	

10.3.1.11 PLMN identity

This information element identifies a Public Land Mobile Network for a GSM-MAP type of PLMN. Setting of digits is defined in [TS 23.003].

Information Element/Group name	Need	Multi	Type and reference	Semantics description
MCC	MP	3		
>MCC digit	MP		INTEGER(0..9)	
MNC	MP	2 to 3		
>MNC digit	MP		INTEGER(0..9)	

10.3.1.12 PLMN Type

Identifies the type of Public Land Mobile Network (PLMN). This IE shall be used to control the interpretation of network dependent messages and information elements in the RRC protocol.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
PLMN Type	MP		Enumerated (GSM-MAP, ANSI-41, GSM-MAP and ANSI-41)	At least 1 spare value needed Criticality: reject is needed

10.3.1.13 P-TMSI (GSM-MAP)

This IE contains a Packet Temporary Mobile Subscriber Identity, used towards a GSM-MAP type of PLMN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
P-TMSI	MP		Bit string (32)	Setting specified in [TS 23.003]

10.3.1.14 RAB identity

This information element uniquely identifies a radio access bearer within a CN domain.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *RAB identity type*	MP			
>RAB identity (GSM-MAP)			Bit string (8)	Formatted according to [TS 24.008].
>RAB identity (ANSI-41)			Bit string (8)	

CHOICE *NAS binding info type*	Condition under which the given *RAB identity type* is chosen
RAB identity (GSM-MAP)	PLMN is of type GSM-MAP
RAB identity (ANSI-41)	PLMN is of type ANSI-41

10.3.1.15 Routing Area Code

Identifies a routing area within a location area for a GSM-MAP type of PLMN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Routing Area Code	MP		Bit string(8)	Setting specified in [TS 23.003]

10.3.1.16 Routing Area Identification

Identifies uniquely a routing area for a GSM-MAP type of PLMN. Setting specified in [TS 23.003].

Information Element/Group name	Need	Multi	Type and reference	Semantics description
LAI	MP		Location area identification 10.3.1.7	
RAC	MP		Routing area code 10.3.1.15	

10.3.1.17 Service Descriptor

Identifies a service and/or a protocol entity in the core network.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *Service descriptor type*	MP			
>Service Descriptor (GSM-MAP)			Bit string (4)	Protocol Discriminator [TS 24.007] The value of RR in the above reference is reserved for paging response.
>Service Descriptor (ANSI-41)			Bit string(4)	TIA/EIA IS-834

CHOICE *Service descriptor type*	Condition under which the given *Service descriptor type* is chosen
Service descriptor (GSM-MAP)	PLMN is of type GSM-MAP
Service descriptor (ANSI-41)	PLMN is of type ANSI-41

10.3.1.18 TMSI (GSM-MAP)

This IE contains a Temporary Mobile Subscriber Identity, used towards a GSM-MAP type of PLMN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
TMSI (GSM-MAP)	MP		Bit string (32)	Setting specified in [TS 23.003]

10.3.2 UTRAN mobility Information elements

10.3.2.1 Cell Access Restriction

Indicates the restrictions to cell access.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Cell Barred	MP		Enumerated(not barred, barred)	
Intra-frequency cell re-selection indicator	CV-Barred		Enumerated(not allowed, allowed)	
T_{barred}	CV-Barred		Integer (10,20,40,80,160,320,640,1280)	[4] (TS25.304)
Cell Reserved for operator use	MP		Enumerated(reserved, not reserved)	
Cell Reserved for SoLSA exclusive use	MP		Enumerated(reserved, not reserved)	
Access Class Barred list	MD	maxAC		Default is no access class barred is applied. The first instance of the parameter corresponds to Access Class 0, the second to Access Class 1 and so on up to Access Class 15. UE reads this IE of its access class stored in SIM.
>Access Class Barred	MP		Enumerated(not barred, barred)	

Condition	Explanation
Barred	Presence is mandatory if the IE "Cell Barred" has the value "Barred"; otherwise the element is not needed in the message.

10.3.2.2 Cell identity

This information element identifies a cell unambiguously within a PLMN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Cell identity	MP		bit string(28)	

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

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Mapping Info	MD		Mapping info 10.3.2.5	Contains mapping function for quality measurements. Default is an implicit mapping: Q_{map} = $Q_{meas,LEV}$, TS 25.304.
CHOICE *mode*	MP			
>FDD				
>>Cell_selection_and_reselection_quality_measure	MP		Enumerated (CPICH Ec/N0, CPICH RSCP)	Choice of measurement (CPICH Ec/N0 or CPICH RSCP) to use as quality measure Q.
>>$S_{intrasearch}$	OP		Integer (-32..20 by step of 2)	TS 25.304 [dB]
>>$S_{intersearch}$	OP		Integer (-32..20 by step of 2)	TS 25.304 [dB]
>>$S_{searchHCS}$	OP		Integer (-32..20 by step of 2)	TS 25.304 [dB]
>>RAT List	OP	1 to <maxOtherRAT>		
>>>RAT identifier	MP		Enumerated (GSM, cdma2000)	At least 2 spare values Criticality: reject are needed
>>>$S_{search,RAT}$	MP		Integer (-32..20 by step of 2)	TS 25.304 [dB]
>>>$S_{HCS,RAT}$	OP		Integer (-32..20 by step of 2)	TS 25.304 [dB]
>TDD				
>>$S_{intrasearch}$	OP		Integer (-105..91 by step of 2)	TS 25.304 [dB]

>>$S_{intersearch}$	OP		Integer (-105..91 by step of 2)	TS 25.304 [dB]
>>$S_{searchHCS}$	OP		Integer (-105..91 by step of 2)	TS 25.304 [dB]
>>RAT List	OP	1 to <maxOtherRAT>		
>>>RAT identifier	MP		Enumerated (GSM, cdma2000)	At least 2 spare values Criticality: reject are needed
>>>$S_{search,RAT}$	OP		Integer (-105..91 by step of 2)	TS 25.304 [dB]
>>>$S_{HCS,RAT}$	OP		Integer (-105..91 by step of 2)	TS 25.304 [dB]
$Qhyst_S$	MP		Integer (0..40 by step of 2)	
$Treselection_S$	MP		Integer (0..31)	[s]
HCS Serving cell Information	OP		HCS Serving cell information 10.3.7.12	
Maximum allowed UL TX power	MP		Maximum allowed UL TX power 10.3.6.33	[dBm] UE_TXPWR_MAX_RACH in 25.304.
CHOICE *mode*	MP			
>FDD				
>>Qqualmin	MD		Integer (-20..0)	Ec/N0, [dB] Default value is Qrxlevmin for the serving cell
>>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell
>TDD				
>>Qrxlevmin	MP		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell

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

Information Element/Group name	Need	Multi	Type and reference	Semantics description
$Qoffset_{s,n}$	MD		Real(-50.0..50.0 by step of 1)	Default value is 0.
Maximum allowed UL TX power	MD		Maximum allowed UL TX power 10.3.6.33	[dBm] UE_TXPWR_MAX_RACH in 25.304. Default is the Maximum allowed UL TX power for the serving cell
HCS neighbouring cell information	OP		HCS Neighbouring cell information 10.3.7.11	
CHOICE *mode*	MP			
>FDD				
>>Qqualmin	MD		Integer (-20..0)	Ec/N0, [dB] Default value is Qqualmin for the serving cell
>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell
>TDD				
>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell

10.3.2.5 Mapping Info

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Mapping List	MP	1 to <MaxRAT>		
>RAT	MP		Enumerated (UTRA FDD, UTRA TDD, GSM, cdma2000)	
>Mapping Function Parameter List	MP	1 to <maxMeas Intervals>		
>> Function type	MP		Enumerated (linear, function type 2, function type 3, function type 4)	Type of the function within the interval.
>>Map_parameter_1	MD		Integer (0..99)	Parameter describing the mapping function between the quality measurement and the representing quality value, see TS 25.304. Default value is zero for the first interval or otherwise the value of Map_parameter_2 of the interval before.
>>Map_parameter_2	MP		Integer (0..99)	Parameter describing the mapping function between the quality measurement and the representing quality value, see TS 25.304.
>>Upper_limit	CV - MaxInt		Integer (1..MaxMeas)	Upper limit of interval for which the Map_parameter_1 and Map_parameter_2 are valid. MaxMeas = 25 if RAT = UTRA FDD / CPICH Ec/N0, MaxMeas = 91 if RAT = UTRA TDD or if RAT = UTRA FDD/ CPICH RSCP, MaxMeas = 63 if RAT = GSM.

Condition	Explanation
MaxInt	This information is only sent if Mapping Function Parameter List has not reached maxMeasIntervals.

10.3.2.6 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	Need	Multi	Type and reference	Semantics description
URA identity	MP		bit string(16)	

10.3.3 UE Information elements

10.3.3.1 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	Need	Multi	Type and reference	Semantics description
Activation time	MP		Integer(0..255)	CFN [TS 25.402]

10.3.3.2 Capability Update Requirement

This IE indicates to the UE which specific capabilities to transfer to the network.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UE radio access capability update requirement	MP		Boolean	TRUE indicates update required
System specific capability update requirement list	OP	1 to <maxSystemCapability>		
>System specific capability update requirement	MP		Enumerated (GSM)	At least 15 spare values Criticality: reject are needed

Default value is:

"UE radio capability update requirement" = false

"System specific capability update requirement" not present.

10.3.3.3 Cell update cause

Indicates the cause for s cell update.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Cell update cause	MP		Enumerated (cell reselection, periodic cell update, UL data transmission, paging response, RB control response)	At least 3 spare values, Criticality: reject, are needed

10.3.3.4 Ciphering Algorithm

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Ciphering algorithm	MP		Bit string(4) ("0000_2":UEA0, no encryption; "0001_2":UEA1, Kasumi.)	

10.3.3.5 Ciphering mode info

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

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Ciphering mode command	MP		Enumerated (start/restart, stop)	
Ciphering algorithm	CV-*notStop*		Ciphering algorithm 10.3.3.4	
Activation time for DPCH	OP		Activation time 10.3.3.1	Used for radio bearers mapped on RLC-TM
Radio bearer downlink ciphering activation time info	OP		RB activation time info, 10.3.4.10	Used for radio bearers mapped on RLC-AM or RLC-UM

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

10.3.3.6 CN domain specific 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	Need	Multi	Type and reference	Semantics description
CN domain specific DRX cycle length coefficient	MP		Integer(6...12)	Refers to 'k' in the formula as specified in 25.304, Discontinuous reception

10.3.3.7 CPCH Parameters

NOTE: Only for 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	Need	Multi	Type and reference	Semantics description
Initial Priority Delay	OP	1 to maxASC		Initial delays for ASC priority.
>NS_{IP}	MP		Integer (0…28)	Number of slots for initial fixed delay for each ASC priority level
Backoff control parameters	MP			
>$N_{ap\_retrans\_max}$	MP		Integer (1…64)	Max number of AP transmissions without AP-AICH response, a PHY parameter.
>N_{access_fails}	MP		Integer (1…64)	Max number of preamble ramping cycles when NAK response received, a MAC parameter.
>$NF_{bo\_no\ aich}$	MP		Integer (0…31)	Number of frames for UE backoff after $N_{ap\_retrans\_max}$ unsuccessful AP access attempts, a MAC parameter.
>NS_{bo_busy}	MP		Integer (0…63)	Number of slots for UE fixed backoff after access attempt to busy CPCH, a MAC parameter.
>$NF_{bo\_all\_busy}$	MP		Integer (0…31)	Max number of frames for UE backoff after access attempt to last busy CPCH, a MAC parameter. UE randomly selects backoff value from range (0..NF_bo_all_busy)
>$NF_{bo\_\ mismatch}$	MP		Integer (0…127)	Max number of frames for the UE backoff after received mismatch on CD/CA-ICH, a MAC parameter. UE randomly selects backoff value from range (0..NF_bo_mismatch)
>T_{CPCH}	MP		Enumerated (0, 1)	CPCH channel timing used to determine Tau, a PHY parameter
Power Control Algorithm	MP		Enumerated (algorithm 1, algorithm 2)	Specifies algorithm to be used by UE to interpret TPC commands
TPC step size	CV algo		Integer (1, 2)	In dB

DL DPCCH BER	MP		Integer (0..63)	The BER quality value shall be set in the range 0 ≤ DPCCH BER ≤ 1 in the unit BER_dB where: BER_dB_0: DPCCH BER = 0 BER_dB_1: -∞ < Log10(DPCCH BER) < -4.03 BER_dB_2: -4.03 ≤ Log10(DPCCH BER) < -3.965 BER_dB_3: -3.965 ≤ Log10(DPCCH BER) < -3.9 ... BER_dB_61: -0.195 ≤ Log10(DPCCH BER) < -0.13 BER_dB_62: -0.13 ≤ Log10(DPCCH BER) < -0.065 BER_dB_63: -0.065 ≤ Log10(DPCCH BER) ≤ 0

Condition	Explanation
algo	The IE is mandatory if "Power Control Algorithm" is set to "algorithm 1", otherwise the IE is not needed

10.3.3.8 C-RNTI

The cell RNTI (C-RNTI) identifies an UE having a RRC connection within a cell.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
C-RNTI	MP		bit string(16)	

10.3.3.9 DRAC system information

Information element	Need	Multi	Type and reference	Semantics description
DRAC system information	MP	1 to <maxDRACclasses>		DRAC information is sent for each class of terminal
>Transmission probability	MP		Transmission probability 10.3.3.37	
>Maximum bit rate	MP		Maximum bit rate 10.3.3.20	

10.3.3.10 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	Need	Multi	Type and reference	Semantics description
DRX indicator	MP		Enumerated(no DRX, DRX with cell updating, DRX with URA updating)	At least 1 spare value, Criticality: reject, are needed

10.3.3.11 Establishment cause

Cause for an RRC connection establishment request.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Establishment cause	MP		Enumerated(Originating Conversational Call, Originating Streaming Call, Originating Interactive Call, Originating Background Call,Terminating Conversational Call, Terminating Streaming Call, Terminating Interactive Call, Terminating Background Call, Emergency Call, Inter-system cell re-selection, Registration, Detach, SMS, Call re-establishment)	At least 18 spare values, Criticality: reject, are needed

NOTE: These causes shall be aligned with causes received from higher layers.

10.3.3.12 Failure cause and error information

Cause for failure to perform the requested procedure.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Failure cause	MP		Enumerated (Configuration unacceptable, physical channel failure, incompatible simultaneous reconfiguration, protocol error)	At least 3 spare values, Criticality: reject, are needed
Protocol error information	CV-*ProtErr*		Protocol error information 10.3.8.10	

Condition	Explanation
ProtErr	Presence is mandatory if the IE "Failure cause" has the value "Protocol error"; otherwise the element is not needed in the message.

10.3.3.13 Hyper Frame Number

The hyper frame number (HFN) is used to initialise both COUNT-C and COUNT-I for the ciphering and integrity protection algorithms, respectively.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
HFN	MP		Bit string (20)	Start value for uplink and downlink COUNT-C and COUNT-I. For RBs using RLC transparent mode, zeros should be added, as LSB, to form a HFN of 24 bits. For RLC unacknowledged mode, zeros shall be added, as LSB, to form a HFN of 25 bits For integrity protection function, zeros shall be added, as LSB to form a HFN of 28 bits.

10.3.3.14 Initial UE identity

This information element identifies the UE at a request of an RRC connection.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE UE id type	MP			At least 8 spare choices, Criticality: reject, is needed
>IMSI (GSM-MAP)			IMSI (GSM-MAP) 10.3.1.6	
>TMSI and LAI (GSM-MAP)				
>>TMSI (GSM-MAP)	MP		TMSI (GSM-MAP) 10.3.1.18	
>>LAI (GSM-MAP)	MP		Location Area Identification 10.3.1.7	
>P-TMSI and RAI (GSM-MAP)				
>>P-TMSI (GSM-MAP)	MP		P-TMSI (GSM-MAP) 10.3.1.13	
>>RAI (GSM-MAP)	MP		Routing Area Identification 10.3.1.16	
>IMEI			IMEI 10.3.1.5	
>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	

10.3.3.15 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	Need	Multi	Type and reference	Semantics description
Message authentication code	MP		bit string(32)	MAC-I [TS 33.102]
RRC Message sequence number	MP		Integer (0..15)	The local RRC hyper frame number (HFN) is concatenated with the RRC message sequence number to form the input parameter COUNT-I for the integrity protection algorithm.

10.3.3.16 Integrity protection activation info

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

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RRC message sequence number list	MP	4 to 5		The RRC sequence number when a new integrity protection configuration shall be applied, for CCCH and signalling radio bearers in the order RB0, RB1, RB2, RB3, RB4.
>RRC message sequence number	MP		Integer (0.. 15)	

10.3.3.17 Integrity protection Algorithm

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Integrity protection algorithm	MP		Bit string(4) ("0001_2":UIA 1, Kasumi.)	

10.3.3.18 Integrity protection mode info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Integrity protection mode command	MP		Enumerated(start, modify)	At least 2 spare values, Criticality: reject, are needed
Downlink integrity protection activation info	CV-*modify*		Integrity protection activation info 10.3.3.16	
Integrity protection algorithm	OP		Integrity protection algorithm 10.3.3.17	
Integrity protection initialisation number	CV-*start*		Bitstring(32)	FRESH [TS 33.102]

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

10.3.3.19 LCS capability

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Standalone location method(s) supported	MP		Boolean	Defines if a UE can measure its location by some means unrelated to UTRAN TRUE means supported
UE based OTDOA supported	MP		Boolean	TRUE means supported
Network Assisted GPS support	MP		Enumerated ('Network based', 'UE based', 'Both', 'None')	Defines if the UE supports network based or UE based GPS methods.
GPS reference time capable	MP		Boolean	Defines if a UE has the capability to measure GPS reference time as defined in 25.215. TRUE means capable
Support for IPDL	MP		Boolean	Defines if a UE has the capability to use IPDL to enhance its 'SFN-SFN observed time difference –type 2' measurement. TRUE means supported

10.3.3.20 Maximum bit rate

NOTE: Only for FDD.

Indicates the maximum user bit rate allowed on a DCH controlled by DRAC procedure for the transmission period (Transmission time validity).

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Maximum bit rate	MP		integer(0..512 by step of 16)	=kbit/s

10.3.3.21 Measurement capability

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Need for downlink compressed mode				
FDD measurements DL	MP		Boolean	TRUE means that the UE requires DL compressed mode in order to perform measurements on FDD
TDD measurements DL	CV *tdd_sup*		Boolean	TRUE means that the UE requires DL compressed mode in order to perform measurements on TDD
GSM measurements DL	CV *gsm_sup*			
> GSM 900 DL	MP		Boolean	TRUE means that the UE requires DL compressed mode in order to perform measurements on GSM 900
> DCS 1800 DL	MP		Boolean	TRUE means that the UE requires DL compressed mode in order to perform measurements on DCS 1800
> GSM 1900 DL	MP		Boolean	TRUE means that the UE requires DL compressed mode in order to perform measurements on GSM 1900
Multi-carrier measurement DL	CV *mc_sup*		Boolean	TRUE means that the UE requires DL compressed mode in order to perform measurements on multi-carrier
Need for uplink compressed mode				
FDD measurements UL	MP		Boolean	TRUE means that the UE requires UL compressed mode in order to perform measurements on FDD
TDD measurements UL	CV *tdd_sup*		Boolean	TRUE means that the UE requires UL compressed mode in order to perform measurements on TDD
GSM measurements UL	CV *gsm_sup*			
> GSM 900 UL	MP		Boolean	TRUE means that the UE requires UL compressed mode in order to perform measurements on GSM 900
> DCS 1800 UL	MP		Boolean	TRUE means that the UE requires UL compressed mode in order to perform measurements on DCS 1800
> GSM 1900 UL	MP		Boolean	TRUE means that the UE requires UL compressed mode in order to perform measurements on GSM 1900
Multi-carrier measurement UL	CV *mc_sup*		Boolean	TRUE means that the UE requires UL compressed mode in order to perform measurements on multi-carrier

Condition	Explanation
tdd_sup	Presence is mandatory if IE Multi-mode capability = TDD. Otherwise this field is not needed in the message.
gsm_sup	Presence is mandatory if IE Multi-RAT capability = GSM. Otherwise this field is not needed in the message.
mc_sup	Presence is mandatory if IE Multi-RAT capability = multi-carrier. Otherwise this field is not needed in the message.

10.3.3.22 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	Need	Multi	Type and reference	Semantics description
Number of RRC Message Transmissions	MP		Integer(1..8)	

10.3.3.23 Paging cause

Cause for a CN originated page.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Paging cause	MP		Enumerated(Terminating Conversational Call, Terminating Streaming Call, Terminating Interactive Call, Terminating Background Call, SMS)	At least 4 spare values, Criticality: reject, are needed

NOTE: These causes shall be aligned with causes received from higher layers.

10.3.3.24 Paging record

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE Paging originator	MP			
> CN originator				
>> Paging cause	MP		Paging cause 10.3.3.23	
>> CN domain identity	MP		CN domain identity 10.3.1.1	
>>CHOICE UE Identity	MP			At least 3 spare choice, Criticality: reject, are needed
>>>IMSI (GSM-MAP)			IMSI (GSM-MAP) 10.3.1.6	
>>>TMSI (GSM-MAP)			TMSI (GSM-MAP) 10.3.1.18	
>>>P-TMSI (GSM-MAP)			P-TMSI (GSM-MAP) 10.3.1.13	
>>>IMSI (DS-41)			TIA/EIA/IS-2000-4	
>>>TMSI (DS-41)			TIA/EIA/IS-2000-4	
> UTRAN originator				
>>U-RNTI	MP		U-RNTI 10.3.3.45	

Condition	Explanation
CHOICE *Paging originator*	**Condition under which the given *paging originator* is chosen**
CN Originating	For CN originating pages (idle mode)
UTRAN Originating	For UTRAN originating pages (connected mode)

10.3.3.25 PDCP capability

Indicates which algorithms and which value range of their parameters are supported by the UE.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Support for lossless SRNS relocation	MP		Boolean	TRUE means supported
Support for RFC2507	MP		Boolean	TRUE means supported
Max HC context space	CV-*hc_sup*		Integer(512, 1024, 2048, 4096, 8192)	Maximum header compression context space in bytes supported by the UE At least 3 spare values needed, criticality: reject

Condition	Explanation
hc_sup	Presence is mandatory if IE Support for RFC 2507 = TRUE. Otherwise this field is not needed in the message

10.3.3.26 Physical channel capability

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Downlink physical channel capability information elements				
CHOICE *mode*	MP			
>FDD				
>>Maximum number of simultaneous CCTrCH	MP		Integer (1..8)	
>> Max no DPCH/PDSCH codes	MP		Integer (1..8)	Maximum number of DPCH/PDSCH codes to be simultaneously received
>> Max no physical channel bits received	MP		Integer (600, 1200, 2400, 3600, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 48000, 57600, 67200, 76800)	Maximum number of physical channel bits received in any 10 ms interval (DPCH, PDSCH, S-CCPCH) At least 1 spare values needed
>>Support for SF 512	MP		Boolean	TRUE means supported
>>Support of PDSCH	MP		Boolean	TRUE means supported
>>Simultaneous reception of SCCPCH and DPCH	MP		Boolean	TRUE means supported
>>Simultaneous reception of SCCPCH, DPCH and PDSCH	CV-*if_sim_rec_pdsch_sup*		Boolean	TRUE means supported
>>Max no of S-CCPCH RL	CV-*if_sim_rec*		Integer(1)	Maximum number of simultaneous S-CCPCH radio links At least 7 spare values needed.
>TDD				
>>Maximum number of simultaneous CCTrCH	MP		Integer (1..8)	
>>Maximum number of timeslots per frame	MP		Integer (1..14)	At least 2 spare values needed.
>>Maximum number of physical channels per frame	MP		Integer (1..224)	At least 32 spare values needed
>>Minimum SF	MP		Integer (1, 16)	
>>Support of PDSCH	MP		Boolean	TRUE means supported
Uplink physical channel capability information elements				
CHOICE *mode*	MP			
>FDD				
>>Maximum number of DPDCH bits transmitted per 10 ms	MP		Integer (600, 1200, 2400, 4800. 9600, 19200. 28800, 38400, 48000, 57600)	At least 6 spare values needed
>>Support of PCPCH	MP		Boolean	TRUE means supported
>TDD				
>>Maximum number of simultaneous CCTrCH	MP		Integer (1..8)	

>>Maximum Number of timeslots per frame	MP		Integer (1..14)	At least 2 spare values needed
>>Maximum number of physical channels per timeslot	MP		Integer (1, 2)	
>>Minimum SF	MP		Integer (1, 2, 4, 8, 16)	At least 3 spare values needed
>>Support of PUSCH	MP		Boolean	TRUE means supported

Condition	Explanation
if_sim_rec_pdsch_sup	Presence is mandatory if IE Simultaneous reception of SCCPCH and DPCH = True and IE Support of PDSCH = True. Otherwise this field is not needed in the message.
if_sim_rec	Presence is mandatory if IE capability Simultaneous reception of SCCPCH and DPCH = True. Otherwise this field is not needed in the message.

10.3.3.27 Protocol error cause

This IE indicates the cause for a message or information which was not comprehended.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Protocol error cause	MP		Enumerated (ASN.1 violation or encoding error, Message type non-existent or not implemented, Message not compatible with receiver state, Information element value not comprehended, Conditional information element error, Message extension not comprehended)	At least 2 spare values are needed.

10.3.3.28 Protocol error indicator

This IE indicates whether a message was transmitted due to a protocol error or not.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Protocol error indicator	MP		Boolean	TRUE means a protocol error occurred. FALSE means a protocol error did not occur.

10.3.3.29 Redirection info

This IE is used to redirect the UE to another frequency or other system.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE Redirection Information	MP			At least one spare choice, Criticality: reject, is needed.
>Frequency info			Frequency info 10.3.6.30	
>Inter-system info			Inter-system info 10.3.7.25	

10.3.3.30 Re-establishment timer

This information element indicates which timer to associate with RAB. SRBs are associated with T314. IE "T314 value" and IE "T315 value" are used to update timer value stored in the UE. The value of timers shall not be updated in UE locally by decoding SYSTEM INFORMATION during connected mode.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE Timer value	MP			
>T314				
>>T314 value	OP		Integer(0, 2, 4, 6, 8, 12, 16, 20)	
>T315				
>>T315 value	OP		Integer(0,10, 30, 60, 180, 600, 1200, 1800)	

10.3.3.31 Rejection cause

Cause for rejection of RRC connection establishment request.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Rejection cause	MP		Enumerated(congestion, unspecified)	At least 2 spare values, Criticality: reject, are needed

10.3.3.32 Release cause

Cause for release of RRC connection.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Release cause	MP		Enumerated (normal event, unspecified, pre-emptive release, congestion, re-establishment reject)	At least 3 spare values, Criticality: reject, are needed

10.3.3.33 RF capability

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
CHOICE *mode*	MP			
>FDD				
>>UE power class	MP		Enumerated(1..4)	as defined in 25.101 subclause 6.2.1
>>Tx/Rx frequency separation	MP		Enumerated(190, 174.8-205.2, 134.8-245.2)	In MHz as defined in 25.101 subclause 5.3. NOTE: Not applicable if UE is not operating in frequency band a (as defined in 25.101). At least 1 spare value needed
>TDD				
>>UE power class	MP		Enumerated (1..4)	as defined in 25.102 subclause 6.2.1
>>Radio frequency bands	MP	1 to <maxFrequencybands>	Enumerated(a, b, c)	as defined in 25.102 subclause 5.2 At least 1 spare value needed
>>Chip rate capability	MP		Enumerated(3.84Mcps,1.28Mcps)	as defined in 25.102

10.3.3.34 RLC capability

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Total RLC AM buffer size	MP		Integer (2,10,50,100,150,500,1000)	Total receiving and transmitting RLC AM buffer capability in kBytes At least 1 spare value needed
Maximum number of AM entities	MP		Integer (3,4,5,6,8,16,32)	At least 1 spare value needed

10.3.3.35 RLC reset indicator

This IE is used to re-configure AM RLC on c-plane and u-plane.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RLC reset indicator	MP		Boolean	TRUE means reset required FALSE means reset not required

10.3.3.36 Security capability

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Ciphering algorithm capability	MP		Bit string(16)	"0000000000000000_2": UEA0, no encryption supported; "0000000000000001_2": UEA1, Kasumi supported
Integrity protection algorithm capability	MP		Bit string(16)	"0000000000000001_2": UEA1, Kasumi supported

10.3.3.37 Transmission probability

NOTE: Only for FDD.

Indicates the probability for a mobile to be allowed to transmit on a DCH controlled by DRAC procedure.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Transmission probability	MP		Real(0.125.. 1.0 by step of 0.125)	probability

10.3.3.38 Transport channel capability

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Downlink transport channel capability information elements				
Max no of bits received	MP		Integer(640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840)	Maximum sum of number of bits of all transport blocks received in TTIs that end within the same arbitrary interval of length T<10 ms At least 3 spare values are needed.
Max convolutionally coded bits received	MP		Integer(640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840)	Maximum sum of number of bits of all convolutionally coded transport blocks received in TTIs that end within the same arbitrary interval of length T<10 ms At least 3 spare values are needed
Max turbo coded bits received	CV *turbo_dec_sup*		Integer(640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840)	Maximum sum of number of bits of all turbo coded transport blocks received in TTIs that end within the same arbitrary interval of length T<10 ms At least 3 spare values are needed
Maximum number of simultaneous transport channels	MP		Integer(4, 8, 16, 32)	
Max no of received transport blocks	MP		Integer(4, 8, 16, 32, 48, 64, 96, 128, 256, 512)	Maximum total number of transport blocks received within TTIs that end at within the same 10ms interval At least 6 spare values needed
Maximum number of TFC in the TFCS	MP		Integer(16, 32, 48, 64, 96, 128, 256, 512, 1024)	At least 7 spare values needed
Maximum number of TF	MP		Integer(32, 64, 128, 256, 512, 1024)	At least 2 spare values needed
Support for turbo decoding	MP		Boolean	TRUE means supported
Uplink transport channel capability information elements				
Max no of bits transmitted	MP		Integer(640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840)	Maximum sum of number of bits of all transport blocks transmitted in TTIs that start at the same time At least 3 spare values needed

Max convolutionally coded bits transmitted	MP		Integer(640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840)	Maximum sum of number of bits of all convolutionally coded transport blocks transmitted in TTIs that start at the same time At least 3 spare values needed
Max turbo coded bits transmitted	CV *turbo_enc_sup*		Integer(640, 1280, 2560, 3840, 5120, 6400, 7680, 8960, 10240, 20480, 40960, 81920, 163840)	Maximum sum of number of bits of all turbo coded transport blocks transmitted in TTIs that start at the same time At least 3 spare values needed
Maximum number of simultaneous transport channels	MP		Integer(2, 4, 8, 16, 32)	At least 3 spare values needed
Max no of transmitted transport blocks	MP		Integer(2, 4, 8, 16, 32, 48, 64, 96, 128, 256, 512)	Maximum total number of transport blocks transmitted within TTIs that start at the same time At least 5 spare values needed
Maximum number of TFC in the TFCS	MP		Integer(4, 8, 16, 32, 48, 64, 96, 128, 256, 512, 1024)	At least 5 spare values needed
Maximum number of TF	MP		Integer(32, 64, 128, 256, 512, 1024)	At least 2 spare values needed
Support for turbo encoding	MP		Boolean	TRUE means supported

Condition	Explanation
turbo_dec_sup	Presence is mandatory if IE Support of turbo decoding = True. Otherwise this field is not needed in the message.
turbo_enc_sup	Presence is mandatory if IE Support of turbo encoding = True. Otherwise this field is not needed in the message.

10.3.3.39 UE multi-mode/multi-RAT capability

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Multi-RAT capability				
Support of GSM	MP		Boolean	
Support of multi-carrier	MP		Boolean	
Multi-mode capability	MP		Enumerated (TDD, FDD, FDD/TDD)	

10.3.3.40 UE radio access capability

Information Element/Group name	Need	Multi	Type and reference	Semantics description
ICS version	MP		Enumerated(R99)	Indicates the release version of TS 34.123-2 (Implementation Conformance Statement (ICS) proforma specification) that is applicable for the UE.. At least 7 spare values needed
PDCP capability	MP		PDCP capability 10.3.3.25	
RLC capability	MP		RLC capability 10.3.3.34	
Transport channel capability	MP		Transport channel capability 10.3.3.38	
RF capability	MP		RF capability 10.3.3.33	
Physical channel capability	MP		Physical channel capability 10.3.3.26	
UE multi-mode/multi-RAT capability	MP		UE multi-mode/multi-RAT capability 10.3.3.39	
Security capability	MP		Security capability 10.3.3.36	
LCS capability	MP		LCS capability 10.3.3.19	
CHOICE *mode*	MP			
>FDD				
>>Measurement capability	MP		Measurement capability 10.3.3.21	
>TDD				(no data)

10.3.3.41 UE Timers and Constants in CELL_DCH

This information element specifies timer- and constant values used by the UE in state CELL_DCH.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
T304	MD		Integer(100, 200, 400, 1000, 2000)	Value in milliseconds. Default value is 2000. At least 3 spare values are needed Criticality: reject is needed
N304	MD		Integer(1..8)	Default value is 2.
T308	MD		Integer(40, 80, 160, 320)	Value in milliseconds. Default value is 320.
T309	MD		Integer(1…8)	Value in seconds. Default value is 5.
T310	OP		Integer(40 .. 320 by step of 40)	Value in milliseconds.
N310	OP		Integer(1 .. 8)	
T311	OP		Integer(250 .. 2000 by step of 250)	Value in milliseconds.
T313	MD		Integer (0..15)	Value in seconds. Default value is 3.
N313	MD		Integer (1, 50, 100, 200, 400, 600, 800, 1000)	Default value is 50.
T314	MD		Integer (2,4,6,8,12, 16,20)	Value in seconds. Default value is 12.
T315	MD		Integer (0,10, 30, 60, 180, 600, 1200, 1800)	Value in seconds. Default value is 180.
N315	MD		Integer (1, 50, 100, 200, 400, 600, 800, 1000)	Default value is 1.

10.3.3.42 UE Timers and Constants in connected mode

This information element specifies timer- and constants values used by the UE in connected mode.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
T301	MD		Integer(1... 8)	Value in seconds. Default value is 1.
T302	MD		Integer(1... 8)	Value in seconds. Default value is 5.
N302	MD		Integer(1.. 8)	Default value is 3.
T303	MD		Integer(1... 8)	Value in seconds. Default value is 8.
N303	MD		Integer(1.. 8)	Default value is 3.
T304	MD		Integer(100, 200, 400, 1000, 2000)	Value in milliseconds. Default value is 2000. At least 3 spare values are needed Criticality: reject is needed
N304	MD		Integer(1.. 8)	Default value is 60.
T305	MD		Integer(5, 10, 30, 60, 120, 360, 720, infinity)	Value in minutes. Default value is 60. Infinity means no update
T306	MD		Integer(5, 10, 30, 60, 120, 360, 720, infinity)	Value in minutes. Default value is 60. Infinity means no update
T307	MD		Integer(5, 10, 15, 20, 30, 40, 50)	Value in seconds. Default value is 30. At least 1 spare value needed Criticality: reject is needed
T308	MD		Integer(40, 80, 160, 320)	Value in milliseconds. Default value is 320.
T309	MD		Integer(1… 8)	Value in seconds. Default value is 5.
T310	OP		Integer(40 .. 320 by step of 40)	Value in milliseconds
N310	OP		Integer(1 .. 8)	
T311	OP		Integer(250 .. 2000 by step of 250)	Value in milliseconds
T312	MD		Integer (0..15)	Value in seconds. Default value is 1.
N312	MD		Integer (1, 50, 100, 200, 400, 600, 800, 1000)	Default value is 1.
T313	MD		Integer (0..15)	Value in seconds. Default value is 3.
N313	MD		Integer (1, 50, 100, 200, 400, 600, 800, 1000)	Default value is 50.
T314	OP		Integer(0, 2, 4, 6, 8, 12, 16, 20)	Value in seconds. Default value is 12.

T315	MD		Integer (0,10, 30, 60, 180, 600, 1200, 1800)	Value in seconds. Default value is 180.
N315	MD		Integer (1, 50, 100, 200, 400, 600, 800, 1000)	Default value is 1.

10.3.3.43 UE Timers and Constants in idle mode

This information element specifies timer- and constant values used by the UE in idle mode.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
T300	MP		Integer(1... 8)	Value in seconds
N300	MP		Integer(1.. 8)	
T312	MP		Integer(0 .. 15)	Value in seconds
N312	MP		Integer (1, 50, 100, 200, 400, 600, 800, 1000)	

10.3.3.44 URA update cause

Indicates the cause for s URA update.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
URA update cause	MP		Enumerated(change of URA, periodic URA update, re-entered service area)	At least 5 spare values Criticality: reject, are needed

10.3.3.45 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	Need	Multi	Type and reference	Semantics description
SRNC identity	MP		bit string(12)	
S-RNTI	MP		bit string(20)	

10.3.3.46 U-RNTI Short

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	Need	Multi	Type and reference	Semantics description
SRNC identity	MP		bit string(12)	
S-RNTI 2	MP		bit string(10)	

10.3.3.47 UTRAN 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	Need	Multi	Type and reference	Semantics description
DRX cycle length coefficient	MP		Integer(2...12)	Refers to 'k' in the formula as specified in 25.304, Discontinuous reception

10.3.3.48 Wait time

Wait time defines the time period the UE has to wait before repeating the rejected procedure.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Wait time	MP		Integer(0.. 15)	Wait time in seconds The value 0 indicates that repetition is not allowed.

10.3.4 Radio Bearer Information elements

10.3.4.1 Downlink RLC STATUS info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Timer_Status_Prohibit	OP		Integer(10..550 by step of 10)	Minimum time in ms between STATUS reports At least 16 spare values with criticality reject is needed
Timer_EPC	OP		Integer(50, 60, 70, 80, 90, 100, 120, 140, 160, 180, 200, 300, 400, 500, 700, 900)	Time in ms At least 16 spare values with criticality reject is needed
Missing PU Indicator	MP		Boolean	Value true indicates that UE should send a STATUS report for each missing PU that is detected
Timer_STATUS_periodic	OP		Integer(100, 200, 300, 400, 500, 750, 1000, 2000)	Time in milliseconds

10.3.4.2 PDCP info

The purpose of the PDCP info IE is to indicate which algorithms shall be established and to configure the parameters of each of the algorithms.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Support for lossless SRNS relocation	CV-*LosslessCriteria*		Boolean	TRUE means support
Max PDCP SN	CV *Lossless*		Integer (255, 65535)	Maximum PDCP sequence number. Default value is 65535.
PDCP PDU header	MD		Enumerated (present, absent)	Whether a PDCP PDU header is existent or not. Default value is "present"
Header compression information	OP	1 to <maxPDCPAlgoType>		
>CHOICE *algorithm type*	MP			7 spare values needed, criticality: reject
>>RFC2507				Header compression according to IETF standard RFC2507
>>>F_MAX_PERIOD	MD		Integer (1..65535)	Largest number of compressed non-TCP headers that may be sent without sending a full header. Default value is 256.
>>>F_MAX_TIME	MD		Integer (1..255)	Compressed headers may not be sent more than F_MAX_TIME seconds after sending last full header. Default value is 5.
>>>MAX_HEADER	MD		Integer (60..65535)	The largest header size in octets that may be compressed. Default value is 168.
>>>TCP_SPACE	MD		Integer (3..255)	Maximum CID value for TCP connections. Default value is 15.
>>>NON_TCP_SPACE	MD		Integer (3..65535)	Maximum CID value for non-TCP connections. Default value is 15.
>>>EXPECT_REORDERING	MD		Enumerated (reordering not expected, reordering expected)	Whether the algorithm shall reorder PDCP SDUs or not. Default value is "reordering not expected".

Condition	Explanation
LosslessCriteria	This IE is present only if the IE "RLC mode" is "Acknowledged" and the IE "In-sequence delivery " is "True".
Lossless	This IE shall be present if the IE "Support for lossless SRNS relocation" Is TRUE, otherwise it shall be absent.

10.3.4.3 PDCP SN info

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Receive PDCP sequence number	MP		Integer(0..65535)	The PDCP sequence number which the sender of the message is expecting next to be received.

10.3.4.4 Polling info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Timer_poll_prohibit	OP		Integer(50, 60, 70, 80, 90, 100, 120, 140, 160, 180, 200, 300, 400, 500, 700, 900)	Minimum time between polls in ms 16 spare values needed, criticality: reject
Timer_poll	OP		Integer(10..550 by step of 10, 600..1000 by step of 50)	Time in ms. 16 spare values needed, criticality: reject
Poll_PU	OP		Integer(1,2,4,8,16,32,64,128)	Number of PUs, interval between pollings 8 spare values needed, criticality: reject
Poll_SDU	OP		Integer(1,4,16,64)	Number of SDUs, interval between pollings 4 spare values needed, criticality: reject
Last transmission PU poll	MP		Boolean	TRUE indicates that poll is made at last PU in transmission buffer
Last retransmission PU poll	MP		Boolean	TRUE indicates that poll is made at last PU in retransmission buffer
Poll_Window	OP		Integer(50,60,70,80,85,90,95,99)	Percentage of transmission window, threshold for polling 8 spare values needed, criticality: reject
Timer_poll_periodic	OP		Integer(100, 200, 300, 400, 500, 750, 1000, 2000)	Time in milliseconds Timer for periodic polling. 8 spare values needed, criticality: reject

10.3.4.5 Predefined configuration identity

This information element identifies a pre- defined radio parameter configuration.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Predefined radio configuration identity	MP		Integer (0..15)	

10.3.4.6 Predefined configuration value tag

This information element is used to identify different versions of a radio bearer configuration as may be used within one PLMN e.g. to support different UTRAN implementations.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Predefined configuration value tag	MP		Integer(0..15)	

10.3.4.7 Predefined RB configuration

This information element concerns a pre- defined configuration of radio bearer parameters

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Signalling radio bearer information				
Signalling RB information to setup List	MP	1 to <maxSRBsetup>		For each signalling radio bearer
>Signalling RB information to setup	MP		Signalling RB information to setup 10.3.4.21	
RB information				Only one RAB supported
>RB information to setup list	MP	1 to <maxRBcount>	RB information to setup 10.3.4.17	
>RB information to setup	MP		RB information to setup 10.3.4.17	

10.3.4.8 RAB info

This IE contains information used to uniquely identify a radio access bearer.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RAB identity	MP		RAB identity 10.3.1.14	
CN domain identity	MP		CN domain identity 10.3.1.1	
Re-establishment timer	MP		Re-establishment timer 10.3.3.30	

10.3.4.9 RAB information for setup

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RAB info	MP		RAB info 10.3.4.8	
RB information to setup list	MP	1 to <maxRBperRAB>		
>RB information to setup	MP		RB information to setup 10.3.4.17	

10.3.4.10 RB activation time info

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

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Radio bearer activation time	OP	1 to <maxRB>		
>RB identity	MP		RB identity 10.3.4.13	
>RLC sequence number	MP		Integer (0.. 4095)	RLC SN [TS 25.322]

10.3.4.11 RB COUNT-C MSB information

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

Information Element/Group name	Needed	Multi	Type and reference	Semantics description
RB identity	MP		RB identity 10.3.4.13	
COUNT-C-MSB-uplink	MP		Integer (0.. 2^25-1)	25 MSBs from COUNT-C associated to this RB
COUNT-C-MSB-downlink	MP		Integer (0.. 2^25-1)	25 MSBs from COUNT-C associated to this RB

10.3.4.12. RB COUNT-C information

The COUNT-C values of the radio bearer.

Information Element/Group name	Needed	Multi	Type and reference	Semantics description
RB identity	MP		RB identity 10.3.4.13	
COUNT-C-uplink	MP		Integer (0.. 2^32-1)	
COUNT-C-downlink	MP		Integer (0.. 2^32-1)	

10.3.4.13 RB identity

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

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RB identity	MP		Integer(0..31)	Values 0-4 shall only be used for signalling radio bearers

10.3.4.14 RB information to be affected

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RB identity	MP		RB identity 10.3.4.13	
RB mapping info	MP		RB mapping info 10.3.4.18	

10.3.4.15 RB information to reconfigure

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RB identity	MP		RB identity 10.3.4.13	
PDCP info	OP		PDCP info 10.3.4.2	
PDCP SN info	C PDCP		PDCP SN info 10.3.4.3	PDCP sequence number info from the network. Present only in case of lossless SRNS relocation.
CHOICE *RLC info type*	OP			
>RLC info			RLC info 10.3.4.20	
RB mapping info	OP		RB mapping info 10.3.4.18	
RB suspend/resume	OP		Enumerated(suspend, resume)	

Condition	Explanation
PDCP	This IE is optional only if "PDCP info" is present. Otherwise it is absent.

10.3.4.16 RB information to release

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RB identity	MP		RB identity 10.3.4.13	

10.3.4.17 RB information to setup

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RB identity	MP		RB identity 10.3.4.13	
PDCP info	OP		PDCP info 10.3.4.2	
RLC info	MP		RLC info 10.3.4.20	
RB mapping info	MP		RB mapping info 10.3.4.18	

Multi Bound	Explanation
MaxSetupRBcount	The maximum number of RBs to setup.

NOTE This information element is included within IE "Predefined RB configuration"

10.3.4.18 RB mapping info

A multiplexing option for each possible transport channel this RB can be multiplexed on.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Information for each multiplexing option	MP	1 to <maxRBMuxOptions>		
>Number of RLC logical channels	CV-*UL-RLC info*	1 to MaxLoCHperRLC		1 or 2 logical channels per RLC entity or radio bearer RLC [TS 25.322]
>>RLC logical channel mapping indicator	CV-UL-RLCLogicalChannels		Boolean	TRUE indicates that the first logical channel shall be used for data PDUs and the second logical channel shall be used for control PDUs. FALSE indicates that control and data PDUs can be sent on either of the two logical channels.
>>Uplink transport channel type	MP		Enumerated(DCH,RACH,CPCH,USCH)	CPCH is FDD only USCH is TDD only
>>ULTransport channel identity	CV-*UL-DCH*		Transport channel identity 10.3.5.18	This is the ID of a DCH that this RB could be mapped onto.
>>Logical channel identity	OP		Integer(1..15)	This parameter is used to distinguish logical channels multiplexed by MAC on a transport channel.
>>MAC logical channel priority	MP		Integer(1..8)	This is priority between a user's different RBs (or logical channels). [25.321]
>>Logical channel max loss	MD		Integer(0,5,10,15,20,25,30,35,40,45,50,55,60,65,70,75,80,85,90,95,100)	The maximum fraction of transport blocks (in percent) that may be blocked for transmission in favour of lower priority data [25.321]. Default value is 0.
>Number of RLC logical channels	CV-*DL-RLC info*	1 to 2		1 or 2 logical channels per RLC entity or radio bearer RLC [TS 25.322]
>>Downlink transport channel type	MP		Enumerated(DCH,FACH,DSCH)	
>>DL Transport channel identity	CV-*DL-DCH/DSCH*		Transport channel identity 10.3.5.18	
>>Logical channel identity	OP		Integer(1..15)	16 is reserved

Condition	Explanation
UL-RLC info	If "CHOICE Uplink RLC mode" in IE "RLC info" is present this IE is MP. Otherwise the IE is not needed.
DL-RLC info	If "CHOICE Downlink RLC mode" in IE "RLC info" is present this IE is MP. Otherwise the IE is not needed.
UL-RLCLogicalChannels	If "Number of RLC logical channels" in IE "RB mapping info" is 2, in the uplink, then this is present. Otherwise this IE is not needed.
UL-DCH	If IE "Uplink transport channel type" is equal to "DCH" this IE is MP. Otherwise the IE is not needed.
DL-DCH/DSCH	If IE "Downlink transport channel type" is equal to "DCH" or "DSCH" this IE is MP. Otherwise the IE is not needed.

10.3.4.19 RB with PDCP information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RB identity	MP		RB identity 10.3.4.13	
PDCP SN info	MP		PDCP SN info 10.3.4.3	PDCP sequence number info from the UE for lossless SRNS relocation.

10.3.4.20 RLC info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *Uplink RLC mode*	OP			Indicates if Acknowledged, Unacknowledged or Transparent mode RLC shall be used. One spare value needed, criticality: reject.
>AM RLC				
>>Transmission RLC discard	MP		Transmission RLC discard 10.3.4.22	
>>Transmission window size	MP		Integer(1,8,16,32,128,256,512,768,1024,1536,2047,2560,3072,3584,4095)	Maximum number of RLC PUs sent without getting them acknowledged. This parameter is needed if acknowledged mode is used. At least one spare value needed, criticality: reject
>>Receiving window size	MP		Integer(1,8,16,32,128,256,512,768,1024,1536,2047,2560,3072,3584,4095)	Maximum number of RLC PUs allowed to be received. This parameter is needed if acknowledged mode is used. This is to provide information of the UTRAN Receiving window size to the UE, for the RLC AM entity. At least one spare value with criticality reject needed
>>Timer_RST	MP		Integer(50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 700, 800, 900, 1000)	It is used to detect the loss of RESET ACK PDU. 16 spare values needed, criticality: reject
>>Max_RST	MP		Integer(1, 4, 6, 8, 12 16, 24, 32)	The maximum number of retransmission of RESET PDU. 8 spare values needed, criticality: reject
>> Polling info	OP		Polling info 10.3.4.4	
>UM RLC				
>> Transmission RLC discard	OP		Transmission RLC discard10.3.4.22	
>TM RLC				
>>Transmission RLC discard	OP		Transmission RLC discard 10.3.4.22	
CHOICE *Downlink RLC mode*	OP			Indicates if Acknowledged, Unacknowledged or Transparent mode RLC shall be used. One spare value needed, criticality: reject.
>AM RLC				
>>In-sequence delivery	MP		Boolean	TRUE indicates that RLC shall preserve the order of higher layer PDUs when these are delivered.

>>Receiving window size	MP		Integer(1,8,16,32,128,256,512,768,1024,1536,2047,2560,3072,3584,4095)	Maximum number of RLC PUs allowed to be received. This parameter is needed if acknowledged mode is used. At least one spare value with criticality reject needed
>>Downlink RLC status Info	MP		Downlink RLC status info 10.3.4.1	
>UM RLC				(No data)
>TM RLC				(No data)
>>Segmentation indication	MP		Boolean	TRUE indicates that segmentation is performed.

NOTE This information element is included within IE "Predefined RB configuration"

10.3.4.21 Signalling RB information to setup

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RB identity	MD		RB identity 10.3.4.13	Default value is the smallest value not yet used as default in the message (e.g., 0, then 1, and so on)
CHOICE *RLC info type*	MP			
>RLC info			RLC info 10.3.4.20	
RB mapping info	MP		RB mapping info 10.3.4.18	

NOTE This information element is included within IE "Predefined RB configuration"

10.3.4.22 Transmission RLC Discard

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE SDU Discard Mode	MP			Different modes for discharge the RLC buffer on the transmitter side; "Timer based with explicit signalling", "Timer based without explicit signalling", "Discard after Max_DAT retransmissions" or "No_discard". For unacknowledged mode and transparent mode only Timer based without explicit signalling is applicable. If "No_discard" is used, reset procedure shall be done after Max_DAT retransmissions
>Timer based explicit				
>>Timer_MRW	MP		Integer(50,60, 70, 80, 90, 100, 120, 140, 160, 180, 200, 300, 400, 500, 700, 900)	It is used to trigger the retransmission of a STATUS PDU containing an MRW SUFI field. 16 spare values needed, criticality: reject
>>Timer_discard	MP		Integer(100, 250, 500, 750, 1000, 1250, 1500, 1750, 2000, 2500, 3000, 3500, 4000, 4500, 5000, 7500)	Elapsed time in miliseconds before a SDU is discarded.
>>MaxMRW	MP		Integer(1, 4, 6, 8, 12 16, 24, 32)	It is the maximum value for the number of retransmissions of a MRW command 8 spare values needed, criticality: ffs
>Timer based no explicit				
>>Timer_discard	MP		Integer(10,20,30,40,50,60,70,80,90,100)	Elapsed time in miliseconds before a SDU is discarded.
>Max DAT retransmissions				
>> Max_DAT	MP		Integer(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.
>>Timer_MRW	MP		Integer(50, 60, 70, 80, 90, 100, 120, 140, 160, 180, 200, 300, 400, 500, 700, 900)	It is used to trigger the retransmission of a STATUS PDU containing an MRW SUFI field. 16 spare values needed, criticality: reject
>>MaxMRW	MP		Integer(1, 4, 6, 8, 12 16, 24, 32)	It is the maximum value for the number of retransmissions of a MRW command 8 spare values needed, criticality: ffs

>No discard				
>> Max_DAT	MP		Integer(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.

CHOICE *SDU Discard Mode*	**Condition under which the given *SDU Discard Mode* is chosen**
Timer based explicit	If the modes for discharge of the RLC buffer on the transmitter side is "Timer based with explicit signalling"
Timer based no explicit	If the modes for discharge of the RLC buffer on the transmitter side is "Timer based without explicit signalling" For unacknowledged mode, only Timer based without explicit signalling is applicable.
Max DAT retransmissions	If the modes for discharge of the RLC buffer on the transmitter side is "Discard after Max_DAT retransmissions"
No discard	If the modes for discharge the of RLC buffer on the transmitter side is "Reset procedure shall be done after Max_DAT retransmissions"

10.3.5 Transport CH Information elements

10.3.5.1 Added or Reconfigured DL TrCH information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
DL Transport channel identity	MP		Transport channel identity 10.3.5.18	
CHOICE DL parameters				
>Independent				
>>TFS	MP		Transport Format Set 10.3.5.23	
>SameAsUL				
>>UL TrCH identity	MP		Transport channel identity 10.3.5.18	Same TFS applies as specified for indicated UL TrCH
DCH quality target	OP		Quality target 10.3.5.10	
Transparent mode signalling info	OP		Transparent mode signalling info 10.3.5.17	This IE is not used in RB RELEASE message nor RB RECONFIGURATION message

10.3.5.2 Added or Reconfigured UL TrCH information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UL Transport channel identity	MP		Transport channel identity 10.3.5.18	
TFS	MP		Transport Format Set 10.3.5.23	

NOTE This information element is included within IE "Predefined RB configuration""

10.3.5.3 CPCH set ID

NOTE: Only for FDD.

This information element indicates that this transport channel may use any of the Physical CPCH channels defined in the CPCH set info which contains the same CPCH set ID. The CPCH set ID associates the transport channel with a set of PCPCH channels defined in a CPCH set info IE and a set of CPCH persistency values. The CPCH set info IE(s) and the CPCH persistency values IE(s) each include the CPCH set ID and are part of the SYSTEM INFORMATION message

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CPCH set ID	MP		Integer(1...<maxCPCHsets>)	Identifier for CPCH set info and CPCH persistency value messages

Multi Bound	Explanation
MaxCPCHsets	Maximum number of CPCH sets per Node B

10.3.5.4 Deleted DL TrCH information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
DL Transport channel identity	MP		Transport channel identity 10.3.5.18	

10.3.5.5 Deleted UL TrCH information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UL Transport channel identity	MP		Transport channel identity 10.3.5.18	

10.3.5.6 DL Transport channel information common for all transport channels

Information Element/Group name	Need	Multi	Type and reference	Semantics description
SCCPCH TFCS	OP		Transport Format Combination Set 10.3.5.20	This IE should be absent within IE "Predefined RB configuration"
CHOICE *mode*	OP			
>FDD				
>>CHOICE DL parameters	MP			
>>>Independent				
>>>>DL DCH TFCS	OP		Transport Format Combination Set 10.3.5.20	
>>>SameAsUL				(no data)
>TDD				
>>Individual DL CCTrCH information	OP	1 to >maxCCTrCH>		
>>>DL TFCS Identity	MP		Transport format combination set identity 10.3.5.21	Identifies a special CCTrCH for shared or dedicated channels.
>>>CHOICE DL parameters	MP			
>>>>Independent				
>>>>>DL TFCS	MP		Transport format combination set 10.3.5.20	
>>>>SameAsUL				
>>>>>UL DCH TFCS Identity	MP		Transport format combination set identity 10.3.5.21	Same TFCS applies as specified for the indicated UL DCH TFCS identity except for information applicable for UL only

NOTE This information element is included within IE "Predefined TrCh configuration"

10.3.5.7 DRAC Static Information

NOTE: Only for FDD.

Contains static parameters used by the DRAC procedure. Meaning and use is described in subclause 14.6.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Transmission Time Validity	MP		Integer(1..256)	number of frames
Time duration before retry	MP		Integer(1..256)	number of frames
DRAC Class Identity	MP		Integer(1..8)	Indicates the class of DRAC parameters to use in SIB10 message

10.3.5.8 Power Offset Information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *Gain Factors*	MP			
>Signalled Gain Factors				
>>Gain Factor β_c	MP		Integer (0.. 15)	For UL DPCCH or control part of PRACH or PCPCH
>>Gain Factor β_d	MP		Integer (0..15)	For UL DPDCH or data part of PRACH or PCPCH
>>Reference TFC ID	OP		Integer (0..3)	If this TFC is a reference TFC, indicates the reference ID.
>Computed Gain Factors				
>>Reference TFC ID	MP		Integer (0.. 3)	Indicates the reference TFC Id of the TFC to be used to calculate the gain factors for this TFC. In case of using computed gain factors, at least one signalled gain factor is necessary for reference.
Power offset P p-m	OP		Integer(-5..10)	In dB. Power offset between the last transmitted preamble and the control part of the message (added to the preamble power to receive the power of the message control part) Needed only for PRACH

CHOICE *Gain Factors*	Condition under which the way to signal the *Gain Factors* is chosen
Signalled Gain Factors	The values for gain factors β_c and β_d are signalled directly for a TFC.
Computed Gain Factors	The gain factors β_c and β_d are computed for a TFC, based on the signalled settings for the associated reference TFC.

10.3.5.9 Predefined TrCH configuration

This information element concerns a pre- defined configuration of transport channel parameters.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
UL Transport channel information common for all transport channels	MP		UL Transport channel information common for all transport channels 10.3.5.24	
Added or Reconfigured TrCH information				
Added or Reconfigured UL TrCH information	MP	1 to <maxTrCH preconf>		
>Added or Reconfigured UL TrCH information	MP		Added or Reconfigured UL TrCH information 10.3.5.2	
DL Transport channel information common for all transport channels	MP		DL Transport channel information common for all transport channels 10.3.5.6	
Downlink transport channels				
Added or Reconfigured DL TrCH information	MP	1 to <maxTrCH preconf>		
>Added or Reconfigured DL TrCH information	MP		Added or Reconfigured DL TrCH information 10.3.5.1	

10.3.5.10 Quality Target

Information Element/Group name	Need	Multi	Type and reference	Semantics description
BLER Quality value	MP		Real(0.00 ..1.00, by step of 0.02)	In dB= -Log10(Transport channel BLER)

10.3.5.11 Semi-static Transport Format Information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Transmission time interval	MP		Integer(10, 20, 40, 80, dynamic)	In ms. The value dynamic is only used in TDD mode 3 spare values are needed Criticality reject
Type of channel coding	MP		Enumerated(No coding, Convolutional, Turbo)	
Coding Rate	CV-Coding		Enumerated(1/2, 1/3)	
Rate matching attribute	MP		Integer(1..hiRM)	
CRC size	MP		Integer(0, 8, 12, 16, 24)	in bits

Condition	Explanation
Coding	This IE is only present if IE "Type of channel coding" is "Convolutional"

10.3.5.12 TFCI Field 2 Information

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(field2)). The CTFC(field2) value specified in the first group applies for all values of TFCI(field 2) between 0 and the specified 'Max TFCI(field2) value'. The CTFC(field2) 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. A range of TFCI values on the transport channel level can be configured to correspond to a range of codes in PDSCH mapping table.

Method #2 - Explicit

The mapping between TFCI(field 2) value and CTFC(field2) is spelt out explicitly for each value of TFCI (field2).

Information Element/Group name	Need	Multi	IE type and reference	Semantics description
CHOICE *Signalling method*	MP			
> TFCI range				
>> TFCI(field 2) range	MP	1 to <maxPDSCH-TFCIgroups>		
>>>Max TFCI(field2) value	MP		Integer(1..1023)	This is the Maximum value in the range of TFCI(field2) values for which the specified CTFC(field2) applies
>>>TFCS Information for DSCH (TFCI range method)	MP		TFCS Information for DSCH (TFCI range method) 10.3.5.14	
> Explicit				
>>TFCS explicit configuration	MP		TFCS explicit configuration 10.3.5.13	

CHOICE *Signalling method*	Condition under which *Split type* is chosen
TFCI range	
Explicit	

10.3.5.13 TFCS Explicit Configuration

Information Element/Group name	Need	Multi	IE type and reference	Semantics description
CHOICE TFCS representation	MP			
>Complete reconfiguration				
>>TFCS complete reconfiguration information	MP		TFCS Recofiguration/Addition information 10.3.5.15	
>Addition				
>> TFCS addition information	MP		TFCS Reconfiguration/Addition information 10.3.5.15	
>Removal				

>> TFCS removal information	MP		TFCS Removal Information 10.3.5.16	
>Replace				
>> TFCS removal information	MP		TFCS Removal Information 10.3.5.16	
>> TFCS addition information	MP		TFCS Reconfiguration/Addition information 10.3.5.15	

10.3.5.14 TFCS Information for DSCH (TFCI range method)

The CTFC size should be chosen based on the maximum CTFC size for the UE. Integer number calculated according to clause 14. The calculation of CTFC ignores any DCH transport channels which may be assigned.

Information Element/Group name	Need	Multi	IE type and reference	Semantics description
CHOICE CTFC Size	MP			At least one, criticality: reject, spare value needed for future extension
>2 bit CTFC				
>>2bit CTFC	MP		Integer(0..3)	
>4 bit CTFC				
>>4bit CTFC	MP		Integer(0..15)	
>6 bit CTFC				
>>6 bit CTFC	MP		Integer(0..63)	
>8 bit CTFC				
>>8 bit CTFC	MP		Integer(0..255)	
>12 bit CTFC				
>>12 bit CTFC	MP		Integer(0..4095)	
>16 bit CTFC				
>>16 bit CTFC	MP		Integer(0..65535)	
>24 bit CTFC				
>>24 bit CTFC	MP		Integer(0..16777215)	

10.3.5.15 TFCS Reconfiguration/Addition Information

When it is used in TFCI field 1, the calculation of CTFC ignores any DSCH transport channels which may be assigned.When it is used in TFCI field 2, the calculation of CTFC ignores any DCH transport channels.

The CTFC size should be chosen based on the maximum CTFC size for the UE. The first instance of the parameter "CTFC information" corresponds to Transport format combination 0, the second to transport format combination 1 and so on when it is used besides the case of TFCS *Addition*. Integer number of CTFC calculated according to clause 14.

In case of TFCS *Addition*, the integer number(s) is the CTFC that is added. The new additional TFC(s) is inserted into the first available position(s) in the TFCI. CTFC size should be same as the size used in *Complete reconfiguration*.

Information Element/Group name	Need	Multi	IE type and reference	Semantics description
CHOICE CTFC Size	MP			At least one, criticality: reject, spare value needed for future extension
>2 bit CTFC				
>>CTFC information	MP	1 to <maxTFC>		
>>>2bit CTFC	MP		Integer(0..3)	
>>>Power offset Information	OP		Power Offset Information 10.3.5.8	Needed only for uplink DPCCH/DPDCH or PRACH.
>4 bit CTFC				
>>CTFC information	MP	1 to <maxTFC>		
>>>4bit CTFC	MP		Integer(0..15)	
>>>Power offset Information	OP		Power Offset Information 10.3.5.8	Needed only for uplink DPCCH/DPDCH or PRACH.
>6 bit CTFC				
>>CTFC information	MP	1 to <maxTFC>		
>>>6 bit CTFC	MP		Integer(0..63)	
>>>Power offset Information	OP		Power Offset Information 10.3.5.8	Needed only for uplink DPCCH/DPDCH or PRACH.
>8 bit CTFC				
>>CTFC information	MP	1 to <MaxTFC>		
>>>8 bit CTFC	MP		Integer(0..255)	
>>>Power offset Information	OP		Power Offset Information 10.3.5.8	Needed only for uplink DPCCH/DPDCH or PRACH.
>12 bit CTFC				
>>CTFC information	MP	1 to <maxTFC>		
>>>12 bit CTFC	MP		Integer(0..4095)	
>>>Power offset Information	OP		Power Offset Information 10.3.5.8	Needed only for uplink DPCCH/DPDCH or PRACH.
>16 bit CTFC				
>>CTFC information	MP	1 to <maxTFC>		
>>>16 bit CTFC	MP		Integer(0..65535)	
>>>Power offset Information	OP		Power Offset Information 10.3.5.8	Needed only for uplink DPCCH/DPDCH or PRACH.
>24 bit CTFC				
>>CTFC information	MP	1 to <MaxTFC>		
>>>24 bit CTFC	MP		Integer(0..16777215)	
>>>Power offset Information	OP		Power Offset Information 10.3.5.8	Needed only for uplink DPCCH/DPDCH or PRACH.

10.3.5.16 TFCS Removal Information

The integer number(s) is a reference to the transport format combinations to be removed.

Information Element/Group name	Need	Multi	IE type and reference	Semantics description
Removal TFCI information	MP	1 to <maxTFC>		
>TFCI	MP		Integer(0..1023)	

Range Bound	Explanation
MaxDelTFCcount	Maximum number of Transport Format Combinations to be removed.

10.3.5.17 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	Need	Multi	Type and reference	Semantics description
Type of message	MP		Enumerated (TRANSPORT FORMAT COMBINATION CONTROL)	Indicates which type of message sent on the transparent mode signalling DCCH At least 1 spare value needed Criticality: criticality reject is needed
CHOICE *Transparent signalling mode*	MP			
>Mode 1				(no data)
>Mode 2				
>>Controlled transport channels list	MP	1 to <maxTrCH>		The transport channels that are effected by the rate control commands sent on this transparent mode DCCH
>>>UL Controlled transport channels	MP		Transport channel identity, 10.3.5.18	

10.3.5.18 Transport channel identity

This information element is used to distinguish transport channels. Transport channels of different type (RACH, CPCH, USCH, FACH/PCH, DSCH or DCH) have separate series of identities. This also holds for uplink and downlink transport channel identities (i.e. for DCH). Depending on in which context a transport channel identity *n* that is sent, it will have different meaning

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Transport channel identity	MP		Integer(1..32)	

10.3.5.19 Transport Format Combination (TFC)

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Transport format combination	MP		Integer (0.. 1023)	

10.3.5.20 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 TDD, different coded composite transport channels have independent transport format combination sets and thus independent TFCI values.

For FDD, Where the UE is assigned access to one or more DSCH transport channels, a TFCI(field2) is used to signal the transport format combination for the DSCH. The following two cases exist:

- Case 1:
  Using one TFCI-word on the physical layer. A logical split determines the available number of transport format combinations for DCH and DSCH.
- Case 2:
  Using split TFCI on the physical layer. Two TFCI-words, each having a static length of five bits, are used.

Information Element/Group name	Need	Multi	IE type and reference	Semantics description
CHOICE *TFCI signalling*	MP			'Normal' : meaning no split in the TFCI field (either 'Logical' or 'Hard') 'Split' : meaning there is a split in the TFCI field (either 'Logical' or 'Hard'). This value is only valid for FDD downlink when using DSCH.
> Normal				
>> TFCI Field 1 Information	MP		TFCS explicit Configuration 10.3.5.13	
> Split				
>> Split type	OP		Enumerated ('Hard', 'Logical')	'Hard' : meaning that TFCI (field 1) and TFCI (field 2) are each 5 bits long and each field is block coded separately. 'Logical' : meaning that on the physical layer TFCI (field 1) and TFCI (field 2) are concatenated, field 1 taking the most significant bits and field 2 taking the least significant bits). The whole is then encoded with a single block code.
>> Length of TFCI(field2)	OP		Integer (1..10)	This IE indicates the length measured in number of bits of TFCI(field2)
>> TFCI Field 1 Information	OP		TFCS explicit Configuration 10.3.5.13	
>> TFCI Field 2 Information	OP		TFCI field 2 information 10.3.5.12	

CHOICE *TFCI signalling*	**Condition under which *TFCI signalling type* is chosen**
Normal	It is chosen when no split in the TFCI field.
Split	It is chosen when split in the TFCI field. This value is only valid for FDD downlink when using DSCH.

10.3.5.21 Transport Format Combination Set Identity

NOTE: Only for TDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
TFCS ID	MD		Integer (1...8)	Indicates the identity of every TFCS within a UE. Default value is 1.
Shared Channel Indicator	MP		Boolean	TRUE indicates the use of shared channels. Default is false.

10.3.5.22 Transport Format Combination Subset

Indicates which Transport format combinations in the already defined Transport format combination set are allowed.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE Subset representation	MP			
>Minimum allowed Transport format combination index	MP		Transport format combination 10.3.5.19	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 list	MP	1 to <maxTFC>		
>>Allowed transport format combination	MP		Transport format combination 10.3.5.19	The integer number is a reference to the *Transport format combination,* which arrived at that position in the *Transport Format Combination Set.*
>Non-allowed transport format combination list	MP	1 to <maxTFC>		
>>Non-allowed transport format combination	MP		Transport format combination 10.3.5.19	The integer number is a reference to the *Transport format combination,* which arrived at that position in the *Transport Format Combination Set.*
>Restricted TrCH information	MP	1 to <maxTrCH>		
>>Restricted UL TrCH identity	MP		Transport channel identity 10.3.5.18	The integer number(s) is a reference to the transport channel that is restricted.
>>Allowed TFIs	OP	1 to <maxTF>		
>>>Allowed TFI	MP		Integer(0..31)	The integer number 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.

10.3.5.23 Transport Format Set

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *Transport channel type*	MP			
>Dedicated transport channels				The transport channel that is configured with this TFS is of type DCH
>>Dynamic Transport Format Information	MP	1 to <maxTF>		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.
>>>Transmission Time Interval	CV-dynamicTTI		Integer(10,20,40,80)	ms 4 spare values are needed Criticality reject
>>>Number of Transport blocks	MP		Integer(0..512)	Note
>>>RLC Size	MP		Integer(0..4992)	Unit is bits
>>Semi-static Transport Format Information	MP		Semi-static Transport Format Information 10.3.5.11	
>Common transport channels				The transport channel that is configured with this TFS is of a type not equal to DCH
>>Dynamic Transport Format Information	MP	1 to <maxTF>		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	MP		Integer(0..512)	Note
>>>RLC Size	MP		Integer(0..4992)	Unit is bits
>>>CHOICE mode	MP			
>>>>FDD				(no data)
>>>>TDD				
>>>>> Transmission Time Interval	CV-dynamicTTI		Integer(10,20,40,80)	ms 4 spare values needed. Criticality reject
>>Semi-static Transport Format Information	MP		Semi-static Transport Format Information 10.3.5.11	

Condition	Explanation
dynamicTTI	This IE is included if dynamic TTI usage is indicated in IE Transmission Time Interval in Semi-static Transport Format Information. Otherwise it is not needed.

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.

NOTE: For dedicated channels, 'RLC size' reflects RLC PDU size. In FDD for common channels 'RLC size' reflects actual TB size. In TDD for common channels since MAC headers are not octet aligned, to calculate TB size the MAC header bit offset is added to the specified size (similar to the dedicated case). Therefore for TDD DCH TrCHs the 4 bit C/T is added if MAC multiplexing is applied, for FACH the 3 bit TCTF offset is added and for RACH the 2 bit TCTF offset is added.

NOTE: If the number of transport blocks <> 0, and Optional IE "CHOICE RLC mode" or "CHOICE Transport block size is absent, it implies that no RLC PDU data exists but only parity bits exist. If the number of transport blocks = 0, it implies that neither RLC PDU data nor parity bits exist.

10.3.5.24 UL Transport channel information common for all transport channels

Information Element/Group name	Need	Multi	Type and reference	Semantics description
TFC subset	MD		Transport Format Combination Subset 10.3.5.22	Default value is the complete existing set of transport format combinations
CHOICE *mode*	OP			
>FDD				
>>UL DCH TFCS	MP		Transport formation combination set 10.3.5.20	
>TDD				
>>Individual UL CCTrCH information	OP	1 to <maxCCTrCH>		
>>>UL TFCS Identity	MP		Transport format combination set identity 10.3.5.21	Identifies a special CCTrCH for shared or dedicated channels.
>>>UL TFCS	MP		Transport format combination set 10.3.5.20	

NOTE This information element is included within IE "Predefined TrCh configuration"

10.3.6 Physical CH Information elements

10.3.6.1 AC-to-ASC mapping

Information Element/Group name	Need	Multi	Type and reference	Semantics description
AC-to-ASC mapping table	MP	maxASCmap		
> AC-to-ASC mapping	MP		Integer(0…7)	Mapping of Access Classes to Access Service Classes (cf. Sec. 8.5.15.)

10.3.6.2 AICH Info

NOTE: Only for FDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Secondary scrambling code	MD		Secondary scrambling code 10.3.6.64	Default is the same scrambling code as for the Primary CPICH
Channelisation code	MP		Integer(0..255)	SF is fixed and equal to 256
STTD indicator	MP		STTD Indicator 10.3.6.68	
AICH transmission timing	MP		Enumerated (0, 1)	See parameter AICH_Transmission_Timing in TS 25.211

10.3.6.3 AICH Power offset

NOTE: Only for FDD.

This is the power per transmitted Acquisition Indicator minus power of the Primary CPICH.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
AICH Power offset	MP		Integer(-10..+5)	Offset in dB

10.3.6.4 Allocation period info

NOTE: Only for TDD.

Parameters used by UE to determine period of shared channel allocation.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Allocation Activation Time	MP		Integer (1..256)	Frame number start of the allocation period.
Allocation Duration	MP		Integer (1..256)	Total number of frames for the allocation period.

10.3.6.5 Block STTD indicator

NOTE: Only for TDD

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Block STTD indicator	MP		Boolean	TRUE indicates that block STTD is used

10.3.6.6 CCTrCH power control info

Parameters used by UE to set the SIR target value for uplink open loop power control in TDD.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
TFCS Identity	OP		Transport Format Combination Set Identity 10.3.5.21	TFCS Identity of this CCTrCH. Default value is 1.
Uplink DPCH power control info	MP		Uplink DPCH power control info 10.3.6.79	

10.3.6.7 Common timeslot info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
2nd interleaving mode	MD		Enumerated(Frame, Timeslot)	Frame timeslot related interleaving. Default value is "Frame"
TFCI coding	MD		Integer(4,8,16,32)	Describes the way the TFCI bits are coded in bits. Defaults is no TFCI bit: 4 means 1 TFCI bit is coded with 4 bits. 8 means 2 TFCI bits are coded with 8 bits. 16 means 3 – 5 TFCI bits are coded with 16 bits. 32 means 6 – 10 TFCI bits coded with 32 bits.
Puncturing limit	MP		Real(0.40..1.0 by step of 0.04)	
Repetition period	MD		Integer(1, 2,4,8,16,32,64)	Default is continuous allocation. Value 1 indicate continuous
Repetition length	MP		Integer(1.. Repetition period –1)	Note that this is empty if repetition period is set to 1

10.3.6.8 Constant value

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	Need	Multi	Type and reference	Semantics description
Constant value	MP		Integer (-10..10)	At least 11 spare values needed Criticality: reject is needed

10.3.6.9 CPCH persistence levels

NOTE: Only for FDD.

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	Need	Multi	Type and reference	Semantics description
CPCH set ID	MP		Integer (1 .. <maxCPCHsets>)	Identifier for CPCH set info.
Dynamic persistence level	MP	1 to <maxTF-CPCH>	Dynamic persistence level 10.3.6.29	Persistence level for transport format.

10.3.6.10 CPCH set info

NOTE: Only for FDD.

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	Need	Multi	Type and reference	Semantics description
CPCH set ID	MP		CPCH set ID 10.3.5.3	Indicates the ID number for a particular CPCH set allocated to a cell.
TFS	MP		Transport Format Set 10.3.5.23	Transport Format Set Information allocated to this CPCH set.
TFCS	MP		Transport Format Combination Set 10.3.5.20	Transport Format Set Information allocated to this CPCH set
AP preamble scrambling code	MP		Integer (0..79)	Preamble scrambling code for AP in UL
AP-AICH scrambling code	MP		Secondary Scrambling Code 10.3.6.64	Default is the same scrambling code as for the primary CPICH.
AP-AICH channelisation code	MP		Integer(0..255)	Channelisation code for AP-AICH in DL
CD preamble scrambling code	MP		Integer (0..79)	Preamble scrambling code for CD in UL
CD/CA-ICH scrambling code	MD		Secondary Scrambling Code 10.3.6.64	Default is the same scrambling code as for the primary CPICH.
CD/CA-ICH channelisation code	MP		Integer (0..255)	Channelisation code for CD/CA-ICH in DL
Available CD access slot subchannel	CV-CDSigPresent	1 to <maxPCPCH-CDsubCh>		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 access slot subchannel	MP		Integer (0..11)	
Available CD signatures	OP	1 to <maxPCPCH-CDsig>		Signatures for CD preamble in UL. Note: if not present, all signatures are available for use.
>CD signatures	MP		Integer (0..15)	
DeltaPp-m	MP		Integer (-10..10)	In dB. Power offset between the transmitted CD preamble and UL DPCCH of the power control preamble or message part (added to the preamble power to calculate the power of the UL DPCCH)
UL DPCCH Slot Format	MP		Enumerated (0,1,2)	Slot format for UL DPCCH in power control preamble and in message part
N_start_message	MP		Integer (1..8)	Number of Frames for start of message indication

N_EOT	MP		Integer(0...7)	Actual number of appended EOT indicators is T_EOT = N_TTI * ceil(N_EOT/N_TTI), where N_TTI is the number of frames per TTI and "ceil" refers to rounding up to nearest integer.
Channel Assignment Active	OP		Boolean	When present, indicates that Node B send a CA message and VCAM mapping rule (14.11) shall be used.
CPCH status indication mode	MP		Enumerated (PCPCH availability, PCPCH availability and minimum available Spreading Factor)	Defines the status information type broadcast on the CPCH Status Indication Channel (CSICH)
PCPCH Channel Info.	MP	1 to <maxPCPCHs>		
> UL scrambling code	MP		Integer (0..79)	For PCPCH message part
> DL channelisation code	MP		Integer (0…511)	For DL DPCCH for PCPCH message part
> DL scrambling code	MD		Secondary Scrambling Code 10.3.6.64	Default is the same scrambling code as for the primary CPICH.
> PCP length	MP		Enumerated (0, 8)	Indicates length of power control preamble, 0slots (no preamble used) or 8 slots
> UCSM Info	CV-NCAA			
>>Minimum Spreading Factor	MP		Integer (4,8,16,32,64,128,256)	The UE may use this PCPCH at any Spreading Factor equal to or greater than the indicated minimum Spreading Factor. The Spreading Factor for initial access is the minimum Spreading Factor.
>> NF_max	MP		Integer (1…64)	Maximum number of frames for PCPCH message part
>> Channel request parameters for UCSM	MP	1 to <maxSig>		Required in UE channel selection mode.
>>>Available AP signature	MP	1 to <maxPCPCH-APsig>		AP preamble signature codes for selection of this PCPCH channel.
>>>> AP signature	MP		Integer (0..15)	
>>>Available AP access slot subchannel	OP	1 to <maxPCPCH-APsubCh>		Lists the set of subchannels to be used for AP access preambles in combination with the above AP signature(s). Note: if not present, all subchannels are to be used without access delays.
>>>> AP access slot subchannel	MP		Integer (0..11)	
VCAM info	CV-CAA			
> Available Minimum Spreading Factor	MP	1 to <maxPCPCH-SF>		

>> Minimum Spreading Factor	MP		Enumerated (4,8,16,32,64,128,256)	
>>NF_max	MP		Integer (1..64)	Maximum number of frames for PCPCH message part
>> Maximum available number of PCPCH	MP		Integer (1..64)	Maximum available number of PCPCH for the indicated Spreading Factor.
>> Available AP signatures	MP	1 to <maxPCPCH-APsig>		Signatures for AP preamble in UL.
>>> AP signature			Integer (0..15)	
>> Available AP sub-channel	OP	1 to <maxPCPCH-APsubCh>		AP sub-channels for the given AP signature in UL. Note: if not present, all subchannels are to be used without access delays.
>>> AP sub-channel	MP		Integer (0..11)	

Condition	Explanation
CDSigPresent	This IE may be included if IE "Available CD signatures" is present.
NCAA	This IE is included if IE "Channel Assignment Active" is not present
CAA	This IE is included if IE ""Channel Assignment Active" is present.

10.3.6.11 CPCH Status Indication mode

CPCH Status Indication mode can take 2 values: PCPCH Availability (PA) mode and PCPCH Availability with Minimum Available Spreading Factor (PAMASF) mode. PAMASF mode is used when Channel Assignment is active. PA mode is used when Channel Assignment is not active (UE Channel Selection is active). These two separate modes are described independently in the subclause that follows. TS25.211 defines the Status Indicators (SIs) of the CSICH channel which convey the CPCH status information described here. A CSICH may contain from 3 upto a maximum of 60 Status Indicators.

10.3.6.11.1 PCPCH Availability (PA) mode

In PA mode, CPCH Status Indication conveys the PCPCH Channel Availability value which is a 1 to 16 bit value which indicates the availability of each of the 1 to 16 defined PCPCHs in the CPCH set. PCPCHs are numbered from PCPCH0 through PCPCH15. There is one bit of the PCPCH Channel Availability (PCA) value for each defined PCPCH channel. If there are 2 PCPCHs defined in the CPCH set, then there are 2 bits in the PCA value. And likewise for other numbers of defined PCPCH channels up to 16 maximum CPCH channels per set when UE Channel Selection is active.

The number of SIs (Status Indicators) per frame is a function of the number of defined PCPCH channels.

Number of defined PCPCHs(=K)	Number of SIs per frame(=N)
1, 2, 3	*3*
4,5	*5*
6,7,8,9,10,11,12,13,14,15	*15*
16	*30*

The value of the SI shall indicate the PCA value for one of the defined PCPCHs, where PCA(n)=1 indicates that the PCPCH is available, and PCA(n)=0 indicates that the PCPCHn is not available. SI(0) shall indicate PCA(0) for PCPCH0, SI(1) shall indicate PCA(1) for PCPCH1, etc., for each defined PCPCH. When the number of SIs per frame exceeds the number of defined PCPCHs (K), the SIs which exceed K shall be set to repeat the PCA values for the defined PCPCHs. In general , SI(n) = PCA(n mod (K)),

where PCA(i) is availability of PCPCHi,

and n ranges from 0 to N-1.

10.3.6.11.2 PCPCH Availability with Minimum Available Spreading Factor (PAMASF) mode

In PAMASF mode, CPCH Status Indication conveys two informations. One is the Minimum Available Spreading Factor (MASF) value and the other is the PCPCH Channel Availability (PCA) value.

- MASF is a 3 bit number with bits MASF0 through MASF2 where MASF0 is the MSB of the MASF value and MASF2 is the LSB of the MASF value.

The following table defines MASF(0), MASF(1) and MASF(2) values to convey the MASF. All spreading factors greater than MASF are available

Minimum Available Spreading Factor (MASF)	**MASF(0)**	**MASF(1)**	**MASF(2)**	
N/A (No available CPCH resources)	0	0	0	
256	0	0	1	
128	0	1	0	
64	0	1	1	
32	1	0	0	
16	1	0	1	
08	1	1	0	
04	1	1	1	

The number of SIs (Status Indicators) per frame, N is a function of the number of defined PCPCH channels, K.

Number of defined PCPCHs(K)	**Number of SIs per frame(N)**
1, 2,	*5*
3,4,5,6,7,8,9,10,11,12	*15*
13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	*30*
28….57	*60*

PCA(n)=1 indicates that the PCPCHn is available, and PCA(n)=0 indicates that the PCPCHn is not available. PCA value for each PCPCH channel defined in a CPCH set shall be assigned to one SI (Status Indicator), and 3-bit MASF value shall be assigned to SIs as shown in Figure 56.

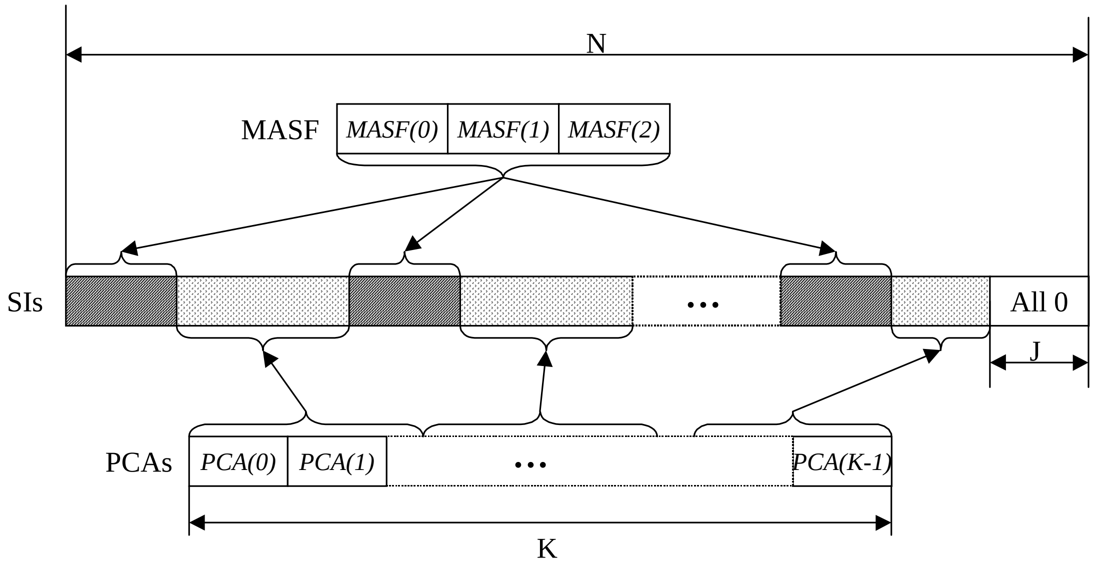


Figure 56: Mapping of MASF and PCAs to SIs in CSICH

The number of repetition that 3-bit MASF values shall be repeated is

$$T = \lfloor (N-K)/3 \rfloor$$

where $\lfloor x \rfloor$ is largest integer less than or equal to x. Each MASF value it, MASF(n), shall be mapped to SI as follows.

$$SI_{l(t+4)+i} = MASF(i), \quad 0 \le i \le 2 \quad l = 0,1,\cdots,s-1$$
$$SI_{s+l(t+3)+i} = MASF(i), \quad 0 \le i \le 2 \quad l = s,s+1,\cdots,T-1,$$

where

$$t = \lfloor K/T \rfloor$$

and

$$s = K - t \cdot T$$

Each PCA value bit, PCA(n), shall be mapped to SI as follows.

$$SI_{l(t+4)+j+3} = PCA(l + l \cdot t + j), \quad 0 \le j \le t \qquad l = 0,1,\cdots,s-1$$
$$SI_{s+l(t+3)+j+3} = PCA(s + l \cdot t + j), \quad 0 \le j \le t-1 \quad l = s,s+1,\cdots,T-1$$

The remaining

$$J = N - (3T + K)$$

SIs shall be set to 0.

10.3.6.12 CSICH Power offset

NOTE: Only for FDD.

This is the power per transmitted CSICH Indicator minus power of the Primary CPICH.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CSICH Power offset	MP		Integer(-10..+5)	Offset in dB, granularity of 1 dB

10.3.6.13 Default DPCH Offset Value

NOTE: Only for FDD.

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	Need	Multi	Type and reference	Semantics description
Default DPCH Offset Value (DOFF)	MP		Integer (0..306688 by step of 512)	Number of chips=. 0 to 599 time 512 chips, see TS 25.402. At least 424 spare values needed Criticality: reject is needed

10.3.6.14 Downlink DPCH info common for all RL

NOTE: Only for FDD

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Downlink DPCH power control information	OP		Downlink DPCH power control information 10.3.6.19	
Spreading factor	MP		Integer(4, 8, 16, 32, 64, 128, 256, 512)	
Fixed or Flexible Position	MP		Enumerated (Fixed, Flexible)	
TFCI existence	MP		Boolean	TRUE indicates that TFCI exists
CHOICE *SF*	MP			
> SF = 256				
>> Number of bits for Pilot bits	MP		Integer (2,4,8)	In bits
> SF = 128				
>>Number of bits for Pilot bits	MP		Integer(4,8)	In bits
> Otherwise				(no data)

CHOICE *SF*	Condition under which the given *SF* is chosen
SF=128	"Spreading factor" is set to 128
SF=256	"Spreading factor" is set to 256
Otherwise	"Spreading factor" is set to a value distinct from 128 and 256

10.3.6.15 Downlink DPCH info common for all RL Post

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Downlink DPCH power control information	OP		Downlink DPCH power control information 10.3.6.19	

10.3.6.16 Downlink DPCH info common for all RL Pre

NOTE: Only for FDD

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Spreading factor	MP		Integer(4, 8, 16, 32, 64, 128, 256, 512)	Defined in CHOICE SF512-Andpilot with "number of its for pilot bits" in ASN.1
Fixed or Flexible Position	MP		Enumerated (Fixed, Flexible)	
TFCI existence	MP		Boolean	TRUE indicates that TFCI exists
CHOICE *SF*	MP			
> SF = 256				
>> Number of bits for Pilot bits	MP		Integer (2,4,8)	In bits
> SF = 128				
>>Number of bits for Pilot bits	MP		Integer(4,8)	In bits
> Otherwise				(no data)

CHOICE *SF*	Condition under which the given *SF* is chosen
SF=128	"Spreading factor" is set to 128
SF=256	"Spreading factor" is set to 256
Otherwise	"Spreading factor" is set to a value distinct from 128 and 256

10.3.6.17 Downlink DPCH info for each RL

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *mode*	MP			
>FDD				
>>Primary CPICH usage for channel estimation	MP		Primary CPICH usage for channel estimation 10.3.6.53	
>>DPCH frame offset	MP		Integer(0..38144 by step of 256)	Offset (in number of chips) between the beginning of the P-CCPCH frame and the beginning of the DPCH frame This is called $\tau_{DPCH,n}$ in TS 25.211
>>Secondary CPICH info	OP		Secondary CPICH info 10.3.6.63	
>>DL channelisation code	MP	1 to <maxDPCH-DLchan>		SF of the channelisation code of the data part for each DPCH
>>>Secondary scrambling code	MD		Secondary scrambling code 10.3.6.64	Default is the same scrambling code as for the Primary CPICH
>>> CHOICE *Spreading factor*	MP		Integer(4, 8, 16, 32, 64, 128, 256, 512)	Defined in CHOICE SF512-AndCodenumber with "code number" in ASN.1
>>>Code number	MP		Integer(0..Spreading factor - 1)	
>>> Scrambling code change	CH SF/2		Enumerated (code change, no code change)	Indicates whether the alternative scrambling code is used for compressed mode method 'SF/2'.
>>TPC combination index	MP		TPC combination index 10.3.6.73	
>>SSDT Cell Identity	OP		SSDT Cell Identity 10.3.6.66	
>>Closed loop timing adjustment mode	CH TxDiversity Mode		Integer(1, 2)	It is present if current TX Diversity Mode in UE is "closed loop mode 1" or "closed loop mode 2". Value in slots
>TDD				
>>DL CCTrCh List	MP	1..<maxCCTrCH>		
>>>TFCS Identity	MD		Transport Format Combination Set Identity 10.3.5.21	Identity of this CCTrCh. Default is specified in 10.3.5.21
>>>Time info	MP		Time Info 10.3.6.71	
>>>Common timeslot info	MD		Common Timeslot Info 10.3.6.7	Default is the current Common timeslot info
>>>Individual Timeslot info list	MD	1 to < maxTS>		Default is the current Timeslot info list

>>>>Individual timeslot info	MP		Individual timeslot info 10.3.6.31	
>>>>Channelisation code list	MP	1 to <maxDPCHcodesPerTS>		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.
>>>>>Channelisation code	MP		Enumerated ((16/1)...(16/16))	

Condition	Explanation
HO list length	maxCCTrCH is 8 in case of handover, otherwise it is equal to one.
HO presence	The element is only present in case of handover
SF/2	The information element is mandatory if the UE has an active compressed mode pattern sequence, which is using compressed mode method "SF/2". Otherwise the IE is not needed.

10.3.6.18 Downlink DPCH info for each RL Post

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *mode*	MP			
>FDD				
>>Primary CPICH usage for channel estimation	MP		Primary CPICH usage for channel estimation 10.3.6.53	
>>Secondary scrambling code	MD		Secondary scrambling code 10.3.6.64	Default is the same scrambling code as for the Primary CPICH
>>Code number	MP		Integer(0..maxCodeNum)	
>>TPC combination index	MP		TPC combination index 10.3.6.73	
>TDD				
>>Time info	MP		Time Info 10.3.6.71	
>>Common timeslot info	MP		Common Timeslot Info 10.3.6.7	
>>Individual Timeslot info list	MP	1 to < Max TS>		
>>>Individual timeslot info	MP		Individual timeslot info 10.3.6.31	
>>>Channelisation code list	MP	1 to <MaxDPCHcodesPerTS>		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.
>>>>Channelisation code	MP		Enumerated ((16/1)...(16/16))	

10.3.6.19 Downlink DPCH power control information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE mode	MP			
>FDD				
>>DPC Mode	MP		Enumerated (Single TPC, TPC triplet in soft)	"Single TPC" is DPC_Mode=0 and "TPC triplet in soft" is DPC_mode=1 in [TS 25.214]
> TDD				(no data)

10.3.6.20 Downlink information common for all radio links

NOTE: Only for FDD

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Downlink DPCH info common for all RL	OP		Downlink DPCH info common for all RL 10.3.6.14	
Default DPCH Offset Value	MD		Default DPCH Offset Value, 10.3.6.13	Default value is 0
DPCH compressed mode info	MD		DPCH compressed mode info 10.3.6.27	Default value is the existing value of DPCH compressed mode information
TX Diversity Mode	MD		TX Diversity Mode 10.3.6.74	Default value is the existing value of TX Diversity mode
SSDT information	OP		SSDT information 10.3.6.67	

10.3.6.21 Downlink information common for all radio links Post

NOTE: Only for FDD

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Downlink DPCH info common for all RL	MP		Downlink DPCH info common for all RL Post 10.3.6.9.18	

10.3.6.22 Downlink information common for all radio links Pre

NOTE: Only for FDD

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Downlink DPCH info common for all RL	MP		Downlink DPCH info common for all RL Pre 10.3.6.16	
Default DPCH Offset Value	MD		Default DPCH Offset Value, 10.3.6.13	Default value is 0

10.3.6.23 Downlink information for each radio link

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Choice mode	MP			
>FDD				
>>Primary CPICH info	MP		Primary CPICH info 10.3.6.51	
>>PDSCH with SHO DCH Info	OP		PDSCH with SHO DCH Info 10.3.6.39	
>>PDSCH code mapping	OP		PDSCH code mapping 10.3.6.36	
>TDD				
>>Primary CCPCH info			Primary CCPCH info 10.3.6.49	
Downlink DPCH info for each RL	OP		Downlink DPCH info for each RL 10.3.6.17	Note 1
Secondary CCPCH info	OP		Secondary CCPCH info 10.3.6.61	
References to system information blocks	OP	1 to <maxSIB-FACH>		Note 1
>Scheduling information	MP		Scheduling information 10.3.8.12	Note 1

NOTE 1: This IE shall not be set in case of CELL UPDATE CONFIRM message.

10.3.6.24 Downlink information for each radio link Post

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Choice mode	MP			
>FDD				
>>Primary CPICH info	MP		Primary CPICH info 10.3.6.51	
>TDD				
>>Primary CCPCH info	OP		Primary CCPCH info	
Downlink DPCH info for each RL	MP		Downlink DPCH info for each RL Post 10.3.6.17	

10.3.6.25 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	Need	Multi	Type and reference	Semantics description
DL Outer loop control	MP		Enumerated(Increase allowed, Increase not allowed)	

10.3.6.26 Downlink PDSCH information

NOTE: Only for FDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>PDSCH with SHO DCH Info	OP		PDSCH with SHO DCH Info 10.3.6.39	
>>PDSCH code mapping	OP		PDSCH code mapping 10.3.6.36	

10.3.6.27 DPCH compressed mode info

NOTE: Only for FDD.

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	Need	Multi	Type and reference	Semantics description
Transmission gap pattern sequence		1 to <MaxTGPS>		
> TGPSI	MP		Integer(1..< MaxTGPS>)	Transmission Gap Pattern Sequence Identifier Establish a reference to the compressed mode pattern sequence. Up to <MaxTGPS> simultaneous compressed mode pattern sequences can be used.
>TGPS Status Flag	MP		Enumerated(active, inactive)	This flag indicates the current status of the Transmission Gap Pattern Sequence, whether it shall be activated or deactivated.
>Transmission gap pattern sequence configuration parameters	OP			
>> TGMP	MP		Enumerated(TDD measurement, FDD measurement, GSM measurement, Other)	Transmission Gap pattern sequence Measurement Purpose.
>> TGPRC	MP		Integer (1..63, Infinity)	The number of transmission gap patterns within the Transmission Gap Pattern Sequence.

>> TGCFN	MP		Integer (0..255)	Connection Frame Number of the first frame of the first pattern within the Transmission Gap Pattern Sequence.
>> TGSN	MP		Integer (0..14)	Transmission Gap Starting Slot Number The slot number of the first transmission gap slot within the TGCFN.

>>TGL1	MP		Integer(1..14)	The length of the first Transmission Gap within the transmission gap pattern expressed in number of slots
>> TGL2	MD		Integer (1..14)	The length of the second Transmission Gap within the transmission gap pattern. If omitted, then TGL2=TGL1.
>>TGD	MP		Integer(15..269, undefined)	Transmission gap distance indicates the number of slots between starting slots of two consecutive transmission gaps within a transmission gap pattern. If there is only one transmission gap in the transmission gap pattern, this parameter shall be set to zero.
>> TGPL1	MP		Integer (1..144)	The duration of transmission gap pattern 1.
>> TGPL2	MD		Integer (1..144)	The duration of transmission gap pattern 2. If omitted, then TGPL2=TGPL1.
>>RPP	MP		Enumerated (mode 0, mode 1).	Recovery Period Power control mode during the frame after the transmission gap within the compressed frame. Indicates whether normal PC mode or compressed PC mode is applied
>>ITP	MP		Enumerated (mode 0, mode 1).	Initial Transmit Power is the uplink power control method to be used to compute the initial transmit power after the compressed mode gap.
>>UL/DL mode	MP		Enumerated (UL only, DL only, UL/DL)	Defines whether only DL, only UL, or combined UL/DL compressed mode is used.
>> Downlink compressed mode method	CV DL		Enumerated (puncturing, SF/2, higher layer scheduling)	Method for generating downlink compressed mode gap
>> Uplink compressed mode method	CV UL		Enumerated (SF/2, none, higher layer scheduling)	Method for generating uplink compressed mode gap
>>Downlink frame type	MP		Enumerated (A, B)	
>>DeltaSIR1	MP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE during the compressed frames corresponding to the first transmission gap in the transmission gap pattern (without including the effect of the bit-rate increase)
>>DeltaSIRafter1	MP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE one frame after the compressed frames corresponding to the first transmission gap in the transmission gap pattern.

>>DeltaSIR2	OP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE during the compressed frames corresponding to the second transmission gap in the transmission gap pattern (without including the effect of the bit-rate increase) When omitted, DeltaSIR2 = DeltaSIR1.

Range Bound	Explanation
MaxTGPS	Maximum number of transmission gap pattern sequences. Value 6.

Condition	Explanation
UL	This information element is only sent when the value of the "UL/DL mode" IE is "UL only" or "UL/DL".
DL	This information element is only sent when the value of the "UL/DL mode" IE is "DL only" or "UL/DL".

10.3.6.28 DPCH Compressed Mode Status Info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Transmission gap pattern sequence		1 to <MaxTGPS>		
> TGPSI	MP		Integer(1..<MaxTGPS>)	Transmission Gap Pattern Sequence Identifier
> TGPS Status Flag	MP		Enumerated(active, inactive)	This flag indicates the current status of the Transmission Gap Pattern Sequence, whether it shall be active or inactive.

10.3.6.29 Dynamic persistence level

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Dynamic persistence level	MP		Integer(1..8)	Level shall be mapped to a dynamic persistence value in the range 0 .. 1.

10.3.6.30 Frequency info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE mode	MP			
>FDD				
>>UARFCN uplink (Nu)	MP		Integer(0.. 16383)	[25.101]
>>UARFCN downlink (Nd)	OP		Integer(0 .. 16383)	[25.101] If IE not present, default duplex distance of 190 MHz shall be used.
>TDD				
>>UARFCN (Nt)	MP		Integer(0 .. 16383)	[25.102]

10.3.6.31 Individual timeslot info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Timeslot number	MP		Timeslot number 10.3.6.72	Timeslot within a frame
TFCI existence	CH		Boolean	TRUE indicates that the TFCI exists. It shall be coded in the first physical channel of this timeslot.
Midamble Shift and burst type	MP		Midamble shift and burst type10.3.6.35	

10.3.6.32 Individual Timeslot interference

Parameters used by the UE for uplink open loop power control in TDD.

Information element	Need	Multi	Type and reference	Semantics description
Timeslot number	MP		Timeslot number 10.3.6.72	
UL Timeslot Interference	MP		ULInterference 10.3.6.75	

10.3.6.33 Maximum allowed UL TX power

This information element indicates the maximum allowed uplink transmit power.

Information Element	Need	Multi	Type and reference	Semantics description
Maximum allowed UL TX power	MP		Integer(-50..33)	In dBm At least 44 spare values are needed Criticality: reject is needed

10.3.6.34 Midamble configuration

NOTE: Only for TDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Midamble burst type 1	MD		Integer(4, 8,16)	Maximum number of midamble shifts for bursttype 1. Default value is 8.
Midamble burst type 2	MD		Integer(3, 6)	Maximum number of midamble shifts for bursttype 2. Default value is 3.

Default value is all the subfields set to their default value.

10.3.6.35 Midamble shift and burst type

NOTE: Only for TDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE Burst Type	MP			
>Type 1				
>>Midamble Shift	MD		Integer(0..15)	Default value is the midamble shift selected by layer 1.
>Type 2				
>>Midamble Shift	MD		Integer(0..5)	Default value is the midamble shift selected by layer 1.

10.3.6.36 PDSCH code mapping

NOTE: Only for FDD.

This IE indicates the association between each possible value of TFCI(field 2) and the corresponding PDSCH channelisation code(s). There are three fundamentally different 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. A fourth option is also provided which allows the UTRAN to replace individual entries in the TFCI(field 2) to PDSCH code mapping table with new PDSCH code values.

There are four different signalling methods defined. The signalling method shall be selected by the UTRAN.

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) = 0, is given by the SF and code number = 'PDSCH code start' of Group = 1. The PDSCH code used for TFCI(field 2) = 1, is given by the SF and code number = 'PDSCH code start' + 1. This continues, with unit increments in the value of TFCI(field 2) 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).

Note that each value of TFCI (field 2) is associated with a given 'code number' and when the 'multi-code info' parameter is greater than 1, then each value of TFCI (field 2) actually maps to a set of PDSCH codes. In this case contiguous codes are assigned, starting at the channelisation code denoted by the 'code number' parameter and including all codes with code numbers up to and including 'code number' - 1 + the value given in the parameter 'multi-code info'.

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 0 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	Need	Multi	Type and reference	Semantics description
DL Scrambling Code	MD		Secondary scrambling code 10.3.6.64	Scrambling code on which PDSCH is transmitted. Default is the same scrambling code as for the Primary CPICH
Choice *signalling method*	MP			
>code range				
>>PDSCH code mapping	MP	1 to < maxPDSCH-TFCIgroups >		
>>>Spreading factor	MP		Integer(4, 8, 16, 32, 64, 128, 256)	At least 1 spare value needed Criticality: reject is needed
>>>multi-code info	MP		Integer(1..16)	This parameter indicates the number of PDSCH transmitted to the UE. The PDSCH codes all have the same SF as denoted by the 'Spreading factor' parameter. Contiguous codes are assigned, starting at the channelisation code denoted by the spreading factor and code number parameter and including all codes, with code numbers up to and including 'code number' - 1 + 'multi-code info'. Note that 'code number'-1+'multi-code info' will not be allowed to exceed 'Spreading factor - 1'
>>Code number (for PDSCH code start)	MP		Integer(0..Spreading factor-1)	
>>Code number (for PDSCH code stop)	MP		Integer(0..Spreading factor-1)	
>TFCI range				
>>DSCH mapping	MP	1 to < maxPDSCH-TFCIgroups >		
>>>Max TFCI(field2) value	MP		Integer(1..1023)	This is the maximum value in the range of TFCI(field 2) values for which the specified PDSCH code applies
>>>Spreading factor (for PDSCH code)	MP		Integer(4, 8, 16, 32, 64, 128, 256)	At least 1 spare value needed Criticality: reject is needed
>>>Code number (for PDSCH code)	MP		Integer(0..Spreading factor-1)	
>>>multi-code info	MP		Integer(1..16)	Semantics as described for this parameter above
>Explicit				

>>PDSCH code info	MP	1 to < maxTFCI-2-Combs >		The first instance of the parameter *PDSCH code* corresponds to TFCI (field2) = 0, the second to TFCI(field 2) = 1and so on.
>>>Spreading factor (for PDSCH code)	MP		Integer(4, 8, 16, 32, 64, 128, 256)	At least 1 spare value needed Criticality: reject is needed
>>>Code number (for PDSCH code)	MP		Integer(0..Spreading factor-1)	
>>>multi-code info	MP		Integer(1..16)	Semantics as described for this parameter above
>Replace				This choice is made if the PDSCH code(s) associated with a given value of TFCI(field 2) is to be replaced.
>>Replaced PDSCH code	MP	1 to < maxTFCI-2-Combs >		Identity of the PDSCH code(s) to be used for the specified value of TFCI(field 2). These code identity(s) replace any that had been specified before
>>>TFCI (field 2)	MP		Integer (0..1023)	Value of TFCI(field 2) for which PDSCH code mapping will be changed
>>>Spreading factor (for PDSCH code)	MP		Integer(4, 8, 16, 32, 64, 128, 256)	
>>>Code number (for PDSCH code)	MP		Integer(0..Spreading factor-1)	
>>>multi-code info	MP		Integer(1..16)	Semantics as described for this parameter above

10.3.6.37 PDSCH info

NOTE: Only for TDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
TFCS Identity	MD		Transport format combination set Identity 10.3.5.21	TFCS to be used. Default is as specified in 10.3.5.21.
SFN Time info	OP		SFN Time info 10.3.6.65	
Common timeslot info	MD		Common timeslot info 10.3.6.7	Common timeslot info is needed if Common timeslot info needs to be updated.
Timeslot List	MD	1 to <maxTS>		Timeslot List is needed if Timeslot List needs to be updated.
>Individual timeslot info	MP		Individual timeslot info 10.3.6.31	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 List	MP	1 to 16		
>>Channelisation Code	MP		Enumerated((16/1)..(16/16))	

10.3.6.38 PDSCH system information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
PDSCH information	MP	1 to <maxPDSCH>		
>PDSCH info	MP		PDSCH info 10.3.6.37	
>DSCH TFS	MP		Transport format set 10.3.5.23	
>DSCH TFCS	MP		Transport Format Combination Set 10.3.5.20	

10.3.6.39 PDSCH with SHO DCH Info

NOTE: Only for FDD

Information Element/Group name	Need	Multi	Type and reference	Semantics description
DSCH radio link identifier	MP		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	OP			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. This parameter may only be sent if there is a 'hard' split of the TFCI field and in this case the sending of the parameter is optional.
Radio link identifier	OP	1 to <maxRL>		
>Primary CPICH info	MP		Primary CPICH info 10.3.6.51	The CPICH scrambling code is used for this purpose

10.3.6.40 Persistence scaling factors

This IE defines scaling factors associated with ASC 2 – ASC 7 (multiplicity corresponds to the number of PRACH partitions minus 2) to be applied to the dynamic persistence value. This IE shall not be present in system information if only ASC 0 and ASC 1 are defined. If it is not present for ASC >1, default persistence scaling factor 1 shall be used (see Sec. 8.5.14).

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Access Service Class		1 to maxASCpersist		
> Persistence scaling factor	MP		Real(0.9..0.2, by step of 0.1)	Scaling factors in the range 0,…,1

10.3.6.41 PICH Info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *mode*	MP			
>FDD				
>>Secondary scrambling code	MD		Secondary scrambling code 10.3.6.64	Default is the same scrambling code as for the Primary CPICH
>>Channelisation code	MP		Integer(0..255)	SF is fixed and equal to 256
>>Number of PI per frame	MP		Integer (18, 36 72 144)	
>>STTD indicator	MP		STTD Indicator 10.3.6.68	
>TDD				
>>Channelisation code	MD		Enumerated ((16/1)...(16/16))	Default value is the channelisation code used by the SCCPCH carrying the associated PCH.
>>Timeslot	MD		Timeslot number 10.3.6.72	Default value is the timeslot used by the SCCPCH carrying the associated PCH.
>>Burst type	MP		Enumerated (Typ1,Typ2)	
>>Midamble shift	MD		Midamble shift 10.3.6.35	Default value is the midamble shift used by the SCCPCH carrying the associated PCH.
>>Repetition period/length	MD		Enumerated((4/2),(8/2), (8/4),(16/2), (16/4), (32/2),(32/4), (64/2),(64/4))	Default value is "(64/2)".
>>Offset	MP		Integer (0...Repetition period -1)	SFN mod Repetitionperiod = Offset.
>>Paging indicator length	MD		Integer (2, 4, 8)	Indicates the length of one paging indicator in symbols.. Default value is 2.
>>N_{GAP}	MD		Integer(2, 4, 8)	Number of frames between the last frame carrying PICH for this Paging Occasion and the first frame carrying paging messages for this Paging Occasion. Default value is 4.
>>N_{PCH}	MD		Integer(1 .. 8)	Number of paging groups. Default value is 2.

10.3.6.42 PICH Power offset

NOTE: Only for FDD.

This is the power transmitted on the PICH minus power of the Primary CPICH.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
PICH Power offset	MP		Integer(-10 .. +5)	Offset in dB

10.3.6.43 PRACH Channelisation Code

NOTE: Only for TDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE SF	MP			
>SF16				
>>Channelisation Code List	MP	1 to 8		
>>>Channelisation code	MP		Enumerated ((16/1)...(16/16))	1:1 mapping between spreading code and midamble shift
>SF8				
>>Channelisation Code List	MP	1 to 8		
>>>Channelisation Code	MP		Enumerated((8/1)..(8/8))	

10.3.6.44 PRACH info (for RACH)

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *mode*	MP			
>FDD				
>>Available Signature	MP	1 to <maxSig>		
>>>Signature	MP		Integer (0..15)	
>>Available SF	MP		Integer (32,64,128,256)	In chips per symbol Defines the smallest permitted SF (i.e. the maximum rate)
>>Scrambling code number	MP		Integer (0 .. 15)	Identification of scrambling code see TS 25.213
>>Puncturing Limit	MP		Real(0.40..1.00 by step of 0.04)	
>>Available Sub Channel number	MP	1 to < maxSubCh >		
>>>Sub Channel number	MP		Integer (0..11)	
>TDD				
>>Timeslot	MP		Timeslot number 10.3.6.72	
>>PRACH Channelisation Code	MP		PRACH Channelisation Code 10.3.6.43	
>>PRACH Midamble	OP		Enumerated (Direct, Direct/Inverted)	Direct or direct and inverted midamble are used for PRACH

Multi Bound	Explanation
MaxSubCh	Maximum number of available sub channels = 12
MaxSig	Maximum number of available signatures = 16

10.3.6.45 PRACH partitioning

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE mode				
>FDD				
>>Access Service class	MP	1 to maxASC		
>>>Available signature Start Index	MP		Integer(0..15)	
>>>Available signature End Index	MP		Integer(0..15)	
>>>Available sub-channel Start Index	MP		Integer(0..11)	
>>>Available sub-channel End Index	MP		Integer(0..11)	
>>TDD				
>>>Access Service class List	MP	1 to maxASC		List of Access Service classes
>>>>Access service class Index	MP		Integer(1..8)	
>>>>Repetition Period	MD		Integer(1, 2, 4, 8)	Default value is continuous. Value 1 indicates continuous allocation
>>>>Offset	MP		Integer(0..Repetition Period - 1)	Note that this is empty if repetition period is set to 1

The following description applies to FDD only.

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.

10.3.6.46 PRACH power offset

NOTE: Only for FDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Power offset P0	MP		Integer (1..8)	Power step when no acquisition indicator is received in dB
Preamble Retrans Max	MP		Integer (1..64)	Maximum number of preambles in one preamble ramping cycle

10.3.6.47 PRACH system information list

Information element	Need	Multi	Type and reference	Semantics description
PRACH system information	MP	1 .. <maxPRACH>		
>PRACH info	MP		PRACH info (for RACH) 10.3.6.44	
>Transport channel identity	MP		Transport channel identity 10.3.5.18	
>RACH TFS	MD		Transport format set 10.3.5.23	Default value is the value of "RACH TFS" for the previous PRACH in the list (note : the first occurrence is then MP)
>RACH TFCS	MD		Transport Format Combination Set 10.3.5.20	Default value is the value of "RACH TFCS" for the previous PRACH in the list (note : the first occurrence is then MP)
>PRACH partitioning	MD		PRACH partitioning 10.3.3.45	Default value is the value of "PRACH partitioning" for the previous PRACH in the list (note : the first occurrence is then MP)
>Persistence scaling factors	OP		Persistence scaling factors 10.3.6.40	If this IE is absent, value is the value of "Persistence scaling factors" for the previous PRACH in the list if value exists
>AC-to-ASC mapping	OP		AC-to-ASC mapping 10.3.6.1	Only present in SIB 5 If this IE is absent, value is the value of "Persistence scaling factors" for the previous PRACH in the list if value exists
>CHOICE *mode*	MP			
>>FDD				
>>>Primary CPICH TX power	MD		Primary CPICH TX power 10.3.6.52	Default value is the value of "Primary CPICH TX power" for the previous PRACH in the list (note : the first occurrence is then MP)
>>>Constant value	MD		Constant value 10.3.6.8	Default value is the value of "Constant value" for the previous PRACH in the list (note : the first occurrence is then MP)
>>>PRACH power offset	MD		PRACH power offset 10.3.6.46	Default value is the value of "PRACH power offset" for the previous PRACH in the list (note : the first occurrence is then MP)
>>>RACH transmission parameters	MD		RACH transmission parameters 10.3.6.58	Default value is the value of "RACH transmission parameters" for the previous PRACH in the list (note : the first occurrence is then MP)
>>>AICH info	MD		AICH info 10.3.6.2	Default value is the value of "AICH info" for the previous PRACH in the list (note : the first occurrence is then MP)
>>TDD				(no data)

10.3.6.48 Predefined PhyCH configuration

This information element concerns a pre- defined configuration of physical channel parameters.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Uplink radio resources				
Uplink DPCH info	MP		Uplink DPCH info Pre 10.3.6.78	
Downlink radio resources				
CHOICE *mode*				
>FDD				
>>Downlink information common for all radio links			Downlink information common for all radio links Pre 10.3.6.22	
>TDD				(no data)

10.3.6.49 Primary CCPCH info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *mode*	MP			
>FDD				
>>TX Diversity indicator	MD		Boolean	Default value is "TRUE"
>TDD				
>>CHOICE SyncCase	OP			
>>>Sync Case 1				
>>>>Timeslot	MP		Integer (0...14)	PCCPCH timeslot
>>>Sync Case 2				
>>>>Timeslot	MP		Integer(0..6)	
>>Cell parameters ID	OP		Integer (0...127)	The Cell parameters ID is described in 25.223.
>>Block STTD indicator	MD		Block STTD indicator 10.3.6.5	Default value is "TRUE"

10.3.6.50 Primary CCPCH TX Power

NOTE: Only for TDD.

Information Element/group name	Need	Multi	Type and reference	Semantics description
Primary CCPCH Tx Power	MP		Integer(6..43)	In dBm

10.3.6.51 Primary CPICH info

NOTE: Only for FDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Primary scrambling code	MP		Integer(0..511)	

10.3.6.52 Primary CPICH Tx power

NOTE: Only for FDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Primary CPICH Tx Power	MP		Integer(-10..50)	At least 3 spare values are needed for future extensions with criticality reject

10.3.6.53 Primary CPICH usage for channel estimation

NOTE: Only for FDD.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Primary CPICH usage for channel estimation	MP		Enumerated(Primary CPICH may be used, Primary CPICH shall not be used)	

10.3.6.54 PUSCH info

NOTE: Only for TDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
TFCS Identity	MD		Transport format combination set Identity 10.3.5.21	Default is as specified in 10.3.5.21.
SFN Time info	OP		SFN Time info 10.3.6.65	
Common timeslot info	MD		Common timeslot info 10.3.6.7	Default is the old Common timeslot info.
Timeslot List	MD	1 to <maxTS>		Default is the old Timeslot List.
>Individual timeslot info	MP		Individual timeslot info 10.3.6.31	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 List	MP	1..2		
>>Channelisation Code	MP		Enumerated((1/1),)(2/1),(2/2),(4/1)..(4/4),(8/1)..(8/8),(16/1)..(16/16))	

10.3.6.55 PUSCH Capacity Allocation info

NOTE: Only for TDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE PUSCH allocation	MP			
>PUSCH allocation pending				(no data)
>PUSCH allocation assignment				
>>PUSCH power control info	OP		PUSCH power control info 10.3.6.56	
>>PUSCH info	MP		PUSCH info 10.3.6.54	

10.3.6.56 PUSCH power control info

NOTE: Only for TDD.

Interference level measured for a frequency at the UTRAN access point used by UE to set PUSCH output power.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UL target SIR	MP		Real (-11 .. 20 by step of 0.5)	in dB

10.3.6.57 PUSCH system information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
PUSCH information	MP	1 to <maxPUSCH>		
>PUSCH info	MP		PUSCH info 10.3.6.54	
>USCH TFS	MP		Transport format set 10.3.5.23	
>USCH TFCS	MP		Transport Format Combination Set 10.3.5.20	

10.3.6.58 RACH transmission parameters

NOTE: Only for FDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Mmax	MP		Integer(1..32)	Maximum number of preamble cycles
NB01min	MP		Integer(0..50)	Sets lower bound for random back-off
NB01max	MP		Integer(0..50)	Sets upper bound for random back-off

10.3.6.59 Radio link addition information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Primary CPICH info	MP		Primary CPICH info 10.3.6.51	
Downlink DPCH info for each RL	MP		Downlink DPCH info for each RL 10.3.6.17	
TFCI combining indicator	OP		TFCI combining indicator 10.3.6.70	
Secondary CCPCH info	OP		Secondary CCPCH info 10.3.6.61	Note 1
TFCS	OP		Transport format set 10.3.5.23	For FACHs and PCH Note 1
FACH/PCH information	OP	1 to <maxFACHcount>		Note 1
>TFS	OP		Transport format set 10.3.5.23	For each FACHs and PCH Note 1
References to system information blocks	OP	1 to <maxSIB-FACH>		Note 1
>Scheduling information	MP		Scheduling information 10.3.8.12	Note 1

NOTE 1: These IEs are present when the UE needs to listen to system information on FACH in CELL_DCH state.

10.3.6.60 Radio link removal information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Primary CPICH info	MP		Primary CPICH info 10.3.6.51	

10.3.6.61 Secondary CCPCH info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Selection Indicator	CV-BCH		Enumerated (On, Off)	Needed if send on BCH.
CHOICE *mode*	MP			
>FDD				
>>Primary CPICH usage for channel estimation	MP		Primary CPICH usage for channel estimation 10.3.6.53	
>>Secondary CPICH info	OP		Secondary CPICH info 10.3.6.63	
>>Secondary scrambling code	MD		Secondary scrambling code 10.3.6.64	Default is the same scrambling code as for the Primary CPICH
>>STTD indicator	MD		STTD Indicator 10.3.6.68	Default value is "TRUE"
>>Spreading factor	MP		Integer(4, 8, 16, 32, 64, 128, 256)	
>>Code number	MP		Integer(0..Spreading factor - 1)	
>>Pilot symbol existence	MD		Boolean	TRUE means the existence. Default value is "TRUE"
>>TFCI existence	MD		Boolean	TRUE means the existence. Default value is "TRUE"
>>Fixed or Flexible Position	MD		Enumerated (Fixed, Flexible)	Default value is "Flexible"
>>Timing Offset	MD		Integer(0..38144 by step of 256)	Chip Delay of the Secondary CCPCH relative to the Primary CCPCH. Default value is 0.
>TDD				
>>Offset	MD		Integer (0...Repetition Period -1)	SFN modulo Repetition period = offset. Repetition period is the one indicated in the accompanying Common timeslot info IE
>>Common timeslot info	MP		Common timeslot info 10.3.6.7	
>>Individual timeslot info	MP		Individual timeslot info 10.3.6.31	
>>Code List	MP	1..<maxCodesCount>		
>>>Channelisation Code	MP		Enumerated((16/1)..(16/16))	

10.3.6.62 Secondary CCPCH system information

Information element	Need	Multi	Type and reference	Semantics description
Secondary CCPCH system information	MP	1 to <maxSCCPCH>		
>Secondary CCPCH info	MP		Secondary CCPCH info 10.3.6.61	Note 1
>TFCS	MD		Transport format set 10.3.5.23	For FACHs and PCH Default value is the value of "TFCS" for the previous SCCPCH in the list (note : the first occurrence is then MP)
>FACH/PCH information	MD	1 to <maxFACHPCH>		Default value is the value of "FACH/PCH" for the previous SCCPCH in the list (note : the first occurrence is then MP)
>>Transport channel identity	MP		Transport channel identity 10.3.5.18	
>>TFS	MP		Transport format set 10.3.5.23	For each FACHs and PCH Note 2
>>CTCH indicator	MP		Boolean	The value "TRUE" indicates that a CTCH is mapped on the FACH, and "FALSE" that no CTCH is mapped.
>PICH info	OP		PICH info 10.3.6.41	PICH info is present only when PCH is multiplexed on Secondary CCPCH

NOTE 1: The secondary CCPCH carrying the PCH shall be the first Secondary CCPCH information in the list.

NOTE 2: TFS for PCH shall be the first FACH/PCH information in the list if PCH exists.

10.3.6.63 Secondary CPICH info

NOTE: Only for FDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Secondary scrambling code	MD		Secondary scrambling code 10.3.6.64	Default is the same scrambling code as for the Primary CPICH
Channelisation code	MP		Integer(0..255)	SF=256

10.3.6.64 Secondary scrambling code

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Secondary scrambling code	MP		Integer(1..15)	At least 1 spare value needed Criticality: reject is needed

10.3.6.65 SFN Time info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Activation time	MD		Integer (0..4094)	System frame number start of the physical channel existence. Default value is "Now"
Duration	MD		Integer(1..4096)	Total number of frames the physical channel will exist. Default value is "infinite".

10.3.6.66 SSDT cell identity

NOTE: Only for FDD.

This IE is used to associate a cell identity with a given radio link.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
SSDT cell id	MP		Enumerated (a, b, c, d, e, f, g, h)	

10.3.6.67 SSDT information

NOTE: Only for FDD.

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	Need	Multi	Type and reference	Semantics description
S field	MP		Integer (1, 2)	in bits
Code Word Set	MP		Enumerated (long, medium, short, SSDT off)	

NOTE: These parameters shall be set optionally associated with DL DPCH info but not for each RL.

10.3.6.68 STTD indicator

Indicates whether STTD is used or not.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
STTD Indicator	MP		Boolean	TRUE means that STTD is used

10.3.6.69 TFC Control duration

Information Element/Group name	Need	Multi	Type and reference	Semantics description
TFC Control duration	MP		Integer (1, 16, 24, 32, 48, 64, 128, 192, 256, 512)	Defines the period in multiples of 10 ms frames for which the defined TFC sub-set is to be applied. At least 8 spare values for future extensions with criticality reject are needed.

10.3.6.70 TFCI Combining Indicator

NOTE: Only for FDD.

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 can only be sent when the UE is in CELL_DCH state with a DSCH transport channel assigned and when there is a 'hard' split in the TFCI field (such that TFCI1 and TFCI2 have their own separate block coding).

Information Element/Group name	Need	Multi	Type and reference	Semantics description
TFCI combining indicator	MP		Boolean	TRUE means that TFCI is combined

10.3.6.71 Time info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Activation time	MD		Activation time 10.3.3.1	Frame number start of the physical channel existence. Default value is "Now"
Duration	MD		Integer(1..4096)	Total number of frames the physical channel will exist. Default value is "infinite".

10.3.6.72 Timeslot number

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Timeslot number	MP		Integer(0..14)	Timeslot within a frame

10.3.6.73 TPC combination index

NOTE: Only for FDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
TPC combination index	MP		Integer(0..5)	Radio links with the same index have TPC bits, which for the UE are known to be the same.

10.3.6.74 TX Diversity Mode

NOTE: Only for FDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Tx diversity Mode	MP		Enumerated (none, STTD, closed loop mode1, closed loop mode2)	

10.3.6.75 UL interference

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UL interference	MP		Integer (-110..-70)	In dBm At least 23 spare values with criticality reject are needed

NOTE: In TDD, this IE is a timeslot specific value.

10.3.6.76 Uplink DPCH info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Uplink DPCH power control info	OP		Uplink DPCH power control info 10.3.6.79	
CHOICE *mode*	MP			
>FDD				
>>Scrambling code type	MP		Enumerated(short, long)	
>>Scrambling code number	MP		Integer(0..16 777215)	
>>Number of DPDCH	MD		Integer(2..m axDPDCH)	Default value is 1. Number of DPDCH is 1 in HANDOVER TO UTRAN COMMAND
>>Spreading factor	MP		Integer(4, 8, 16, 32, 64, 128, 256)	SF of the channelisation code for data part
>>TFCI existence	MD		Boolean	TRUE means existence. Default value is "TRUE"
>>Number of FBI bits	CH		Integer (1, 2)	In bits. Number of FBI bits is needed if SSDT or FB Mode Transmit Signalling is supported.
>>Puncturing Limit	MP		Real(0.40 ..1 by step of 0.04)	
>TDD				
>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.82	
>>UL CCTrCH List	MP	1 to <maxCCTr CH>		
>>>TFCS Identity	MD		Transport Format Combination Set Identity 10.3.5.21	Default value is 1.
>>>Time info	MP		Time info 10.3.6.71	
>>>Common timeslot info	MD		Common timeslot info 10.3.6.7	Default is the current Common timeslot info
>>>Timeslot List	MD	1 to <maxTS>		Default is the current Timeslot List
>>>>Individual timeslot info	MP		Individual timeslot info 10.3.6.31	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.
>>>>Code List	MP	1..2		
>>>>>Channelisation Code	MP		Enumerated((1/1),)(2/1),(2/2),(4/1)..(4/ 4),(8/1)..(8/8) ,(16/1)..(16/1 6))	

Condition	Explanation
Single	This IE is included if IE "Number of DPDCH" is "1"

10.3.6.77 Uplink DPCH info Post

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Uplink DPCH power control info	MP		Uplink DPCH power control info Post 10.3.6.80	
CHOICE *mode*	MP			
>FDD				
>>Scrambling code type	MP		Enumerated(short, long)	
>>Reduced scrambling code number	MP		Integer(0..8191)	Sub-range of values for initial use upon handover to UTRAN.
>>Spreading factor	MP		Integer(4, 8, 16, 32, 64, 128, 256)	SF of the channelisation code for data part There is only one DPDCH for this case
>TDD				(no data)
>>Uplink Timing Advance	OP		Uplink Timing Advance 10.3.6.82	
>>Time info	MP		Time Info 10.3.6.71	
>>Common timeslot info	MP		Common Timeslot Info 10.3.6.7	
>>Timeslot List	MP	1 to < MaxTS>		
>>>Individual timeslot info	MP		Individual timeslot info 10.3.6.31	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.
>>>Code List	MP	1..2		
>>>>Channelisation Code	MP		Enumerated((1/1),)(2/1),(2/2),(4/1)..(4/4),(8/1)..(8/8),(16/1)..(16/16))	

10.3.6.78 Uplink DPCH info Pre

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Uplink DPCH power control info	OP		Uplink DPCH power control info Pre 10.3.6.81	
CHOICE *mode*	MP			
>FDD				
>>TFCI existence	MP		Boolean	TRUE means existence. Default value is "TRUE"
>>Puncturing Limit	MP		Real(0.40 ..1 by step of 0.04)	
>TDD				(no data)

Condition	Explanation
Single	This IE is included if IE "Number of DPDCH" is "1"

10.3.6.79 Uplink DPCH power control info

Parameters used by UE to set DPCH initial output power and to use for closed-loop power control in FDD and parameters for uplink open loop power control in TDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *mode*	MP			
>FDD				
>>DPCCH Power offset	MP		Integer(-164,..-6 by step of 2)	In dB
>>PC Preamble	MP		Integer (0, 15)	
>>Power Control Algorithm	MP		Enumerated (algorithm 1, algorithm 2)	Specifies algorithm to be used by UE to interpret TPC commands
>>TPC step size	CV algo		Integer (1, 2)	In dB
>TDD				
>>UL target SIR	MP		Real (-11 .. 20 by step of 0.5dB)	In dB
>>Individual timeslot interference info	OP	1 to <maxTS>		
>>> Individual timeslot interference	MP		Individual timeslot interference 10.3.6.32	
>>DPCH Constant Value	OP		Constant Value 10.3.6.8	Quality Margin

Condition	Explanation
algo	The IE is mandatory if "Power Control Algorithm" is set to "algorithm 1", otherwise the IE is not needed

10.3.6.80 Uplink DPCH power control info Post

Parameters used by UE to set DPCH initial output power and to use for closed-loop power control.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *mode*	MP			
>FDD				(no data)
>>Power Control Algorithm	MP		Enumerated (algorithm 1, algorithm 2)	Specifies algorithm to be used by UE to interpret TPC commands
>>TPC step size	CV algo		Integer (1, 2)	In dB
>TDD				(no data)
>>UL target SIR	MP		Real (-11 .. 20 by step of 0.5dB)	In dB
>>UL Timeslot Interference	MP		UL Interference 10.3.6.75	

Condition	Explanation
algo	The IE is mandatory if "Power Control Algorithm" is set to "algorithm 1", otherwise the IE is not needed

10.3.6.81 Uplink DPCH power control info Pre

Parameters used by UE to set DPCH initial output power and to use for closed-loop power control in FDD and parameters for uplink open loop power control in TDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *mode*	MP			
>FDD				
>>DPCCH Power offset	MP		Integer(-164..-6 by step of 2)	In dB
>>PC Preamble	MP		Integer (0, 15)	
>TDD				(No data)
>>DPCH Constant Value	MP		Constant Value 10.3.6.8	Quality Margin

Condition	Explanation
Algo	The IE is mandatory if "Power Control Algorithm" is set to "algorithm 1", otherwise the IE is not needed

10.3.6.82 Uplink Timing Advance

NOTE: Only for TDD.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UL Timing Advance	MP		Integer (0..63)	Absolute timing advance value to be used to avoid large delay spread at the NodeB

10.3.7 Measurement Information elements

10.3.7.1 Additional measurements list

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Additional measurements	MP	1 to <MaxAdditionalMeas>		
>Additional measurement identity	MP		Measurement identity number 10.3.73	

10.3.7.2 Cell info

Includes non-frequency related cell info used in the IE "inter-frequency cell info list" and "intra frequency cell info list".

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Cell individual offset	MD		Real(-10..10 by step of 0.5)	In dB Default value is 0 dB Used to offset measured quantity value
Reference time difference to cell	OP		Reference time difference to cell 10.3.7.85	In chips. This IE is absent for serving cell.
CHOICE *mode*	MP			
>FDD				
>>Primary CPICH info	OP		Primary CPICH info 10.3.6.51	This IE is absent only if measuring RSSI only (broadband measurement.)
>>Primary CPICH Tx power	OP		Primary CPICH Tx power 10.3.6.52	Required if calculating pathloss.
>>Read SFN indicator	MP		Boolean	TRUE indicates that read of SFN is requested for the target cell
>>TX Diversity Indicator	MP		Boolean	
>TDD				
>>Primary CCPCH info	MP		Primary CCPCH info 10.3.6.49	
>>Primary CCPCH TX power	OP		Primary CCPCH TX power 10.3.6.50	
>> Timeslot list	OP	1 to <maxTS>		The UE shall report Timeslot ISCP values according the order of the listed Timeslot numbers
>>>Timeslot number	MP		Integer (0...14)	Timeslot numbers, for which the UE shall report Timeslot ISCP
>>>Burst Type	MD		Enumerated (Type1, Type2)	Use for Timeslot ISCP measurements only. Default value is "Type1"
Cell Selection and Re-selection Info	CV-BCHopt		Cell Selection and Re-selection for SIB11/12Info 10.3.2.4	Only when sent in system information. This IE is absent for serving cell. For neghbouring cell, if HCS is not used and all the parameters in cell selection and re-selection info are default value, this IE is absent.

10.3.7.3 Cell measured results

Includes non frequency related measured results for a cell.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Cell Identity	OP		Cell Identity 10.3.2.2	
SFN-SFN observed time difference	OP		SFN-SFN observed time difference 10.3.7.88	
CFN-SFN observed time difference	OP		CFN-SFN observed time difference 10.3.7.6	Note 2
CHOICE *mode*	MP			
>FDD				
>>Primary CPICH info	MP		Primary CPICH info 10.3.6.51	
>>CPICH Ec/N0	OP		Integer(-20..0)	In dB
>>CPICH RSCP	OP		Integer(-115..-40)	In dBm
>>Pathloss	OP		Integer(46..158)	In dB
>TDD				
>>Primary CCPCH info	MP		Primary CCPCH info 10.3.6.49	
>>Primary CCPCH RSCP	OP		Primary CCPCH RSCP 10.3.7.79	
>>Pathloss	OP		Integer(46..158)	
>> Timeslot list	OP	1 to < maxTS>		
>>>Timeslot ISCP	MP		Timeslot ISCP Info 10.3.7.90	The UE shall report the Timeslot ISCP in the same order as indicated in the cell info

NOTE 1: Feasibility of performing these measurements with compressed mode is unclear.

10.3.7.4 Cell measurement event results

Includes non frequency related cell reporting quantities.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *mode*	MP			
>FDD				
>>Primary CPICH info	MP	1 to <maxCellMeas>	Primary CPICH info 10.3.6.51	
>TDD				
>>Primary CCPCH info	MP	1 to <maxCellMeas>	Primary CCPCH info 10.3.6.49	

10.3.7.5 Cell reporting quantities

Includes non frequency related cell reporting quantities.

For all boolean types TRUE means inclusion in the report is requested.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
SFN-SFN observed time difference	MP		Enumerated(No report, type 1, type 2)	
CFN-SFN observed time difference	MP		Boolean	
Cell Identity	MP		Boolean	
CHOICE *mode*	MP			
>FDD				
>>CPICH Ec/N0	MP		Boolean	
>>CPICH RSCP	MP		Boolean	
>>Pathloss	MP		Boolean	
>TDD				
>>Timeslot ISCP	MP		Boolean	
>>Primary CCPCH RSCP	MP		Boolean	
>>Pathloss	MP		Boolean	

10.3.7.6 CFN-SFN observed time difference

The measured time difference to cell indicates the time difference that is measured by UE between RLC Transparent Mode COUNT-C 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

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE mode	MP			
>FDD				
>>CFN-SFN observed time difference	MP		Integer(0.. 157286399)	Number of chips
>TDD				
>> CFN-SFN observed time difference	MP		Integer(0..4095)	Number of frames

NOTE: This measurement is only used in TDD when cells are not SFN synchronized

10.3.7.7 Event results

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE event result	MP			
>Intra-frequency measurement event results			Intra-frequency measurement event results 10.3.7.37	
>Inter-frequency measurement event results			Inter-frequency measurement event results 10.3.7.17	
>Inter-system measurement event results			Inter-system measurement event results 10.3.7.28	For IS-2000 results, include fields of the *Pilot Strength Measurement Message* from subclause 2.7.2.3.2.5 of TIA/EIA/IS-2000.5
>Traffic volume measurement event results			Traffic volume measurement event results 10.3.7.94	
>Quality measurement event results			Quality measurement event results 10.3.7.82	
>UE internal measurement event results			UE internal measurement event results 10.3.7.103	
>LCS measurement event results			LCS measurement event results 10.3.7.58	

CHOICE *event result*	Condition under which the given *event result* is chosen
Intra-frequency measurement event results	If measurement type = intra-frequency measurement
Inter-frequency measurement event results	If measurement type = inter-frequency measurement
Inter-system measurement event results	If measurement type = inter-system measurement
Traffic volume measurement event results	If measurement type = traffic volume measurement
Quality measurement event results	If measurement type = Quality measurement
UE internal measurement event results	If measurement type = UE internal measurement
LCS measurement event results	If measurement type = LCS measurement

10.3.7.8 FACH measurement occasion info

This IE is for FDD only.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
k_UTRA	MP		UTRAN DRX cycle length coefficient 10.3.3.47	Default value is the existing value of UTRAN DRX cycle length coefficient
Other RAT present in inter-system cell info	OP	1 to <maxOtherRAT>		
>RAT type	MP		Enumerated(GSM, IS2000)	At least 14 spare values, Criticality: Reject, are needed
>k_Inter_Rat	MP		Integer(0..12)	

10.3.7.9 Filter coefficient

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Filter coefficient	MD		Integer(0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 15, 17, 19)	Default value is 0 At least one, criticality: reject, spare value needed for future extension

10.3.7.10 HCS Cell re-selection information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Penalty_time	MD		Integer(0, 10, 20, 30, 40, 50, 60)	Default value is 0 which means = not used In seconds
Temporary_offset	CV-*Penalty used*		Integer(10, 20, 30, 40, 50, 60, 70, infinity)	In seconds

Condition	Explanation
Penalty used	Not allowed if IE Penalty time equals 'not used' else MP

10.3.7.11 HCS neighbouring cell information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
HCS_PRIO	MD		Integer (0..7)	Default value = 0
Q_{HCS}	MD		Integer (-0..99)	Default value = 0
HCS Cell Re-selection Information	OP		HCS Cell Re-selection Information 10.3.7.10	

10.3.7.12 HCS Serving cell information

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
HCS_PRIO	MD		Integer (0..7)	Default value = 0
Q_{HCS}	MD		Integer(0..99)	Default value = 0
T_{CRmax}	MD		Integer(0, 30, 60, 120, 180, 240)	[s] Default value is 0 which means = not used
N_{CR}	CV-*UE speed detector*		Integer(1..16)	Default value = 8
$T_{CrmaxHyst}$	CV-*UE speed detector*		Integer(0, 10..70 by step of 10)	[s] Default value is 0 which means = not used

Condition	Explanation
UE Speed detector	Not allowed if T_{Crmax} equals 'not used' else MP

10.3.7.13 Inter-frequency cell info list

Contains the measurement object information for an inter-frequency measurement.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Removed inter-frequency cells	OP	1 .. <maxCellMeas>		
>Inter-frequency cell id	MP		Integer(0 .. <MaxInterCells>)	
New inter-frequency cells	OP	1 to <maxCellMeas>		
>Inter-frequency cell id	MD		Integer(0 .. <MaxInterCells>)	The first inter-frequency cell in the list corresponds to inter-frequency cell id 0, the second corresponds to inter-frequency cell id 1 etc
>Frequency info	MD		Frequency info 10.3.6.30	Default value is the value of the previous "frequency info" in the list (note : the first occurrence is then MP)
>Cell info	MP		Cell info 10.3.7.2	

10.3.7.14 Inter-frequency event identity

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Inter-frequency event identity	MP		Enumerated(2a, 2b, 2c, 2d, 2e, 2f)	

10.3.7.15 Inter-frequency measured results list

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Inter-frequency measurement results	OP	1 to <maxFreq>		
>Frequency info	MD		Frequency info 10.3.6.30	Default value is the value of the previous "frequency info" in the list (note : the first occurrence is then MP)
>UTRA carrier RSSI	OP		Integer(-95..-30)	In dBm
>Inter-frequency cell measurement results	OP	1 to <maxCellMeas>		
>>Cell measured results	MP		Cell measured results 10.3.7.3	

10.3.7.16 Inter-frequency measurement

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Inter-frequency cell info list	MP		Inter-frequency cell info list 10.3.7.13	Measurement object
Inter-frequency measurement quantity	OP		Inter-frequency measurement quantity 10.3.7.18	
Inter-frequency reporting quantity	OP		Inter-frequency reporting quantity 10.3.7.21	
Reporting cell status	CV-*reporting*		Reporting cell status 10.3.7.86	
Measurement validity	OP		Measurement validity 10.3.7.76	
Inter-frequency set update	OP		Inter-frequency set update 10.3.7.22	
CHOICE report criteria	MP			
>Intra-frequency measurement reporting criteria			Intra-frequency measurement reporting criteria 10.3.7.39	
>Inter-frequency measurement reporting criteria			Inter-frequency measurement reporting criteria 10.3.7.19	
>Periodical reporting criteria			Periodical reporting criteria 10.3.7.78	
>No reporting				(no data) Chosen when this measurement only is used as additional measurement to another measurement

Condition	Explanation
reporting	This IE is optional if the CHOICE "report criteria" is equal to "periodical reporting criteria" or "No reporting", otherwise the IE is not needed

10.3.7.17 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	Need	Multi	Type and reference	Semantics description
Inter-frequency event identity	MP		Inter-frequency event identity 10.3.7.34	
Inter-frequency cells	OP	1 to <maxFreq>		
>Frequency info	MP		Frequency info 10.3.6.30	
>Non frequency related measurement event results	MP		Cell measurement event results 10.3.7.4	

10.3.7.18 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	Need	Multi	Type and reference	Semantics description
CHOICE *reporting criteria*	MP			
>Intra-frequency reporting criteria				
>>Intra-frequency measurement quantity	MP		Intra-frequency measurement quantity 10.3.7.38	
>Inter-frequency reporting criteria				
>>Filter coefficient	MP		Filter coefficient 10.3.7.9	
>>CHOICE *mode*	MP			
>>>FDD				
>>>>Measurement quantity for frequency quality estimate	MP		Enumerated(CPICH Ec/N0, CPICH RSCP)	
>>>TDD				
>>>>Measurement quantity for frequency quality estimate	MP		Enumerated(Primary CCPCH RSCP)	

10.3.7.19 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	Need	Multi	Type and reference	Semantics description
Parameters required for each event	OP	1 to <maxMeasEvent>		
>Inter-frequency event identity	MP		Inter-frequency event identity 10.3.7.14	
>Threshold used frequency	CV – clause 0		Integer(-115..0)	Ranges used depend on measurement quantity. CPICH Ec/No -24..0dB CPICH/Primary CCPCH RSCP -115..-25dBm
>W used frequency	CV – clause 0		Real(0, 0.1..2.0 by step of 0.1)	
>Hysteresis	MP		Real(0, 0.5..14.5 by step of 0.5)	In event 2a, 2b, 2c, 2d, 2e, 2f
>Time to trigger	MP		Time to trigger 10.3.7.89	Indicates the period of time between the timing of event detection and the timing of sending Measurement Report. Time in ms.
>Amount of reporting	MP		Integer(1, 2, 4, 8, 16, 32, 64, infinity)	
>Reporting interval	MP		Integer(0, 250, 500, 1000, 2000, 4000, 8000, 16000)	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 miliseconds
>Reporting cell status	OP		Reporting cell status 10.3.7.86	
>Parameters required for each non-used frequency	OP	1 to <maxFreq>		
>>Threshold non used frequency	CV – clause 1		Integer(-115..0)	Ranges used depend on measurement quantity. CPICH Ec/No -24..0dB CPICH/Primary CCPCH RSCP -115..-25dBm

>>W non-used frequency	CV-clause 1		Real(0, 0.1..2.0 by step of 0.1)	

Condition	Explanation
Clause 0	2a,2b, 2d, or 2f, otherwise the IE is not needed
Clause 1	The IE is mandatory in if "inter frequency event identity" is set to 2a, 2b, 2c or 2^{e}, otherwise the IE is not needed

10.3.7.20 Inter-frequency measurement system information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Inter-frequency measurement identity number	MD		Measurement identity number 10.3.7.73	The inter-frequency measurement identity number has default value 2.
Inter-frequency cell info list	OP		Inter-frequency cell info list 10.3.7.13	
Inter-frequency measurement quantity	OP		Inter-frequency measurement quantity 10.3.7.18	
Inter-frequency measurement reporting criteria	OP		Inter-frequency measurement reporting criteria 10.3.7.19	

10.3.7.21 Inter-frequency reporting quantity

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UTRA Carrier RSSI	MP		Boolean	TRUE means report is requested
Frequency quality estimate	MP		Boolean	TRUE means that report is requested
Non frequency related cell reporting quantities	MP		Cell reporting quantities 10.3.7.5	

10.3.7.22 Inter-frequency SET UPDATE

NOTE: Only for FDD.

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	Need	Multi	Type and reference	Semantics description
UE autonomous update mode	MP		Enumerated (On, On with no reporting, Off)	
Non autonomous update mode	CV-Update			
>Radio link addition information	OP	1 to <maxRL>		Radio link addition information required for each RL to add
>>Primary CPICH info	MP		Primary CPICH info 10.3.6.51	Note 1
>Radio link removal information	OP	1 to <MaxRL>		Radio link removal information required for each RL to remove
>>Primary CPICH info	MP		Primary CPICH info 10.3.6.51	Note 1

Condition	Explanation
Update	The IE is mandatory if IE"UE autonomous update mode" is set to "Off", otherwise the IE is not needed.

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.

10.3.7.23 Inter-system cell info list

Contains the measurement object information for an inter-system measurement.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Removed inter-system cells	OP	1 to <maxCellMeas>		
>Inter-system cell id	MP		Integer(0 .. <maxCellMeas> - 1)	
New inter-system cells	OP	1 to <maxCellMeas>		
>Inter-system cell id	MD		Integer(0 .. <maxCellMeas> - 1)	The first inter-system cell in the list corresponds to inter-system cell id 0, the second corresponds to inter-system cell id 1 etc.
>CHOICE *Radio Access Technology*	MP			At least one spare choice, Criticality: Reject, is needed.
>>GSM				
>>>Qoffset$_{s,n}$	MD		Integer (-50..50)	Default value if the value of the previous Qoffset$_{s,n}$ in the list (NOTE: the first occurrence is then MP)
>>>HCS Neighbouring cell information	OP		HCS Neighbouring cell information 10.3.7.11	
>>>Qrxlevmin	MP			
>>>Maximum allowed UL TX power	MP		Maximum allowed UL TX power 10.3.6.33	
>>> BSIC	MP		BSIC 10.3.8.2	
>>>BCCH ARFCN	MP		Integer (0..1023)	GSM TS 04.18
>>>Output power	OP			
>>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*

10.3.7.24 Inter-system event identity

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Inter-system event identity	MP		Enumerated (3a, 3b, 3c, 3d)	

10.3.7.25 Inter-system info

Inter-system info defines the target system for redirected cell selection.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Inter-system info	MP		Enumerated (GSM)	At least 1 spare value, criticality = reject, required

10.3.7.26 Inter-system measured results list

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Inter-system measurement results	OP	1 to <maxOtherRAT>		
>CHOICE system				At least one spare value, criticality = reject, required
>>GSM				
>>>Frequency	MP			
>>>GSM carrier RSSI	OP		bit string(6)	RXLEV GSM TS 05.08
>>>Pathloss	OP		Integer(46..158)	In dB
>>>BSIC	OP		BSIC 10.3.8.2	
>>>Observed time difference to GSM cell	OP		Observed time difference to GSM cell 10.3.7.77	

10.3.7.27 Inter-system measurement

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Inter-system cell info list	OP		Inter-system cell info list 10.3.7.23	Measurement object
Inter-system measurement quantity	OP		Inter-system measurement quantity 10.3.7.29	
Inter-system reporting quantity	OP		Inter-system reporting quantity 10.3.7.32	
Reporting cell status	CV-*reporting*		Reporting cell status 10.3.7.86	
CHOICE report criteria	MP			
>Inter-system measurement reporting criteria			Inter-system measurement reporting criteria 10.3.7.30	
>Periodical reporting criteria			Periodical reporting criteria 10.3.7.78	
>No reporting				(no data) Chosen when this measurement only is used as additional measurement to another measurement

Condition	Explanation
reporting	This IE is optional if the CHOICE "report criteria" is equal to "periodical reporting criteria" or "No reporting", otherwise the IE is not needed

10.3.7.28 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	Need	Multi	Type and reference	Semantics description
Inter-system event identity	MP		Inter-system event identity 10.3.7.24	
Cells to report	MP	1 to <maxCellMeas>		
>Frequency	MP			
>BSIC	MP		BSIC 10.3.8.2	

10.3.7.29 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	Need	Multi	Type and reference	Semantics description
Measurement quantity for UTRAN quality estimate	MP		Intra-frequency measurement quantity 10.3.7.38	
CHOICE *system*	MP			
>GSM				
>>Measurement quantity	MP		Enumerated(GSM Carrier RSSI, Pathloss)	
>>Filter coefficient	MP		Filter coefficient 10.3.7.9	
>>BSIC verification required	MP		Enumerated(required, not required)	Note 1
>IS2000				
>>TADD E_C/I_0	MP		Integer(0..63)	Admission criteria for neighbours, see subclause 2.6.6.2.6 of TIA/EIA/IS-2000.5
>>TCOMP E_C/I_0	MP		Integer(0..15)	Admission criteria for neighbours, see subclause 2.6.6.2.5.2 of TIA/EIA/IS-2000.5
>>SOFT SLOPE	OP		Integer(0..63)	Admission criteria for neighbours, see subclause 2.6.6.2.3 and 2.6.6.2.5.2 of TIA/EIA/IS-2000.5
>>ADD_INTERCEPT	OP		Integer(0..63)	Admission criteria for neighbours, see subclause 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 "required" if IE "Observed time difference to GSM cell" in IE "Inter-system reporting quantity "is set to "true".

10.3.7.30 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	Need	Multi	Type and reference	Semantics description
Parameters required for each event	OP	1 to <maxMeasEvent>		
>Inter-system event identity	MP		Inter-system event identity 10.3.7.24	
>Threshold own system	CV – clause 0			
>W	CV – clause 0			In event 3a
>Threshold other system	CV – clause 1			In event 3a, 3b, 3c
>Hysteresis	MP			
>Time to trigger	MP		Time to trigger 10.3.7.89	Indicates the period of time between the timing of event detection and the timing of sending Measurement Report.
>Amount of reporting	MP			
>Reporting interval	MP			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.
>Reporting cell status	OP		Reporting cell status 10.3.7.86	

Condition	Explanation
Clause 0	The IE is mandatory if " Inter-system event identity" is set to "3a", otherwise the IE is not needed
Clause 1	The IE is mandatory if " Inter-system event identity" is set to 3a, 3b or 3c, otherwise the IE is not needed

10.3.7.31 Inter-system measurement system information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Inter-system measurement identity number	MD		Measurement identity number 10.3.7.73	The inter-system measurement identity number has default value 3.
Inter-system cell info list	OP		Inter-system cell info list 10.3.7.23	
Inter-system measurement quantity	OP		Inter-system measurement quantity 10.3.7.29	

10.3.7.32 Inter-system reporting quantity

For all boolean types TRUE means inclusion in the report is requested.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UTRAN estimated quality	MP		Boolean	
CHOICE *system*	MP			At least one spare choice, criticality = reject, required
>GSM				
>>Pathloss	MP		Boolean	
>>Observed time difference to GSM cell	MP		Boolean	
>>GSM Carrier RSSI	MP		Boolean	
>>BSIC	MP		Boolean	

10.3.7.33 Intra-frequency cell info list

Contains the measurement object information for an intra-frequency measurement.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Removed intra-frequency cells	OP	1 to <maxCellMeas>		
>Intra-frequency cell id	MP		Integer(0 .. <maxCellMeas> - 1)	
New intra-frequency cell	OP	1 to <maxCellMeas>		This information element must be present when "Intra-frequency cell info list" is included in the system information
>Intra-frequency cell id	MD		Integer(0 .. <maxCellMeas> - 1)	The first intra-frequency cell in the list corresponds to intra-frequency cell id 0, the second corresponds to intra-frequency cell id 1 etc.
>Cell info	MP		Cell info 10.3.7.2	

10.3.7.34 Intra-frequency event identity

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Intra-frequency event identity	MP		Enumerated (1a,1b,1c,1d, 1e,1f,1g,1h,1I)	

10.3.7.35 Intra-frequency measured results list

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Intra-frequency measured results	OP	1 to <maxCellMeas>		
>Cell measured results	MP		Cell measured results 10.3.7.3	

10.3.7.36 Intra-frequency measurement

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Intra-frequency cell info list	OP		Intra-frequency cell info list 10.3.7.33	Measurement object Not included for measurement of detected set.
Intra-frequency measurement quantity	OP		Intra-frequency measurement quantity 10.3.7.38	
Intra-frequency reporting quantity	OP		Intra-frequency reporting quantity 10.3.7.41	
Reporting cell status	CV-*reporting*		Reporting cell status 10.3.7.86	
Measurement validity	OP		Measurement validity 10.3.7.76	
CHOICE report criteria	MP			
>Intra-frequency measurement reporting criteria			Intra-frequency measurement reporting criteria 10.3.7.39	
>Periodical reporting criteria			Periodical reporting criteria 10.3.7.78	
>No reporting				(no data) Chosen when this measurement only is used as additional measurement to another measurement

Condition	Explanation
reporting	This IE is optional if the CHOICE "report criteria" is equal to "periodical reporting criteria" or "No reporting", otherwise the IE is not needed

10.3.7.37 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	Need	Multi	Type and reference	Semantics description
Intra-frequency event identity	MP		Intra-frequency event identity 10.3.7.34	
Cell measured event results	MP		Cell measured event results 10.3.7.4	

10.3.7.38 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	Need	Multi	Type and reference	Semantics description
Filter coefficient	MP		Filter coefficient 10.3.7.9	
CHOICE *mode*	MP			
>FDD				
>>Measurement quantity	MP		Enumerated(CPICH Ec/N0, CPICH RSCP, Pathloss, UTRA Carrier RSSI)	Pathloss=Primary CPICH Tx power-CPICH RSCP If used in Inter system measurement quantity only Ec/N0 an RSCP is allowed. If used in inter-frequency measurement quantity RSSI is not allowed.
>TDD				
>>Measurement quantity list	MP	1 to 4		
>>>Measurement quantity	MP		Enumerated(Primary CCPCH RSCP, Pathloss, Timeslot ISCP, UTRA Carrier RSSI)	Pathloss=Primary CCPCH Tx power-Primary CCPCH RSCP If used in inter-frequency measurement quantity RSSI is not allowed.

10.3.7.39 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: Timeslot ISCP below a certain threshold (TDD only).

Event 1i: Timeslot ISCP above a certain threshold (TDD only).

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Parameters required for each event	OP	1 to <maxMeasEvent>		
> Intra-frequency event identity	MP		Intra-frequency event identity 10.3.7.34	
>Triggering condition	CV – 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	CV – clause 2		Real(0..14.5 by step of 0.5)	In dB. In event 1a,1b.
>Cells forbidden to affect Reporting range	CV – clause 1	1 to <maxCellMeas>		In event 1a,1b
>>CHOICE *mode*	MP			
>>>FDD				
>>>>Primary CPICH info	MP		Primary CPICH info 10.3.6.51	
>>>TDD				
>>>>Primary CCPCH info	MP		Primary CCPCH info 10.3.6.49	
>W	CV – clause 2		Real(0.0..2.0 by step of 0.1)	
>Hysteresis	MP		Real(0..7.5 by step of 0.5)	In dB.

> Threshold used frequency	CV-clause 3		Integer (-125..165)	Range used depend on measurement quantity. CPICH RSCP -115 .. -40 dBm CPICH Ec/No -24..0 dB Pathloss 30..165dB ISCP -125..-30 dBm
>Reporting deactivation threshold	CV – clause 4		Integer(0, 1, 2, 3, 4, 5, 6, 7)	In event 1a Indicates the maximum number of cells allowed in the active set in order for event 1a to occur. 0 means not applicable .
>Replacement activation threshold	CV - clause 5		Integer(0, 1, 2, 3, 4, 5, 6, 7)	In event 1c Indicates the minimum number of cells allowed in the active set in order for event 1c to occur. 0 means not applicable
>Time to trigger	MP		Time to trigger 10.3.7.89	Indicates the period of time between the timing of event detection and the timing of sending Measurement Report. Time in ms
>Amount of reporting	MP		Integer(1, 2, 4, 8, 16, 32, 64, Infinity)	Measurement is "released" after the indicated amount of reporting from the UE itself.
>Reporting interval	MP		Integer(0, 250, 500, 1000, 2000, 4000, 8000, 16000)	Indicates the interval of periodical reporting when such reporting is triggered by an event. Interval in miliseconds. 0 means no periodical reporting
>Reporting cell status	OP		Reporting cell status 10.3.7.86	

Condition	Explanation
Clause 0	The IE is mandatory if "Intra-frequency event identity" is set to "1a","1b", "1e" or "1f", otherwise the IE is not needed
Clause 1	The IE is optional if "Intra-frequency event identity" is set to "1a" or "1b", otherwise the IE is not needed
Clause 2	The IE is mandatory if "Intra-frequency event identity" is set to "1a" or "1b", otherwise the IE is not needed
Clause 3	The IE is mandatory if "Intra-frequency event identity" is set to , "1e", "1f", "1h", "1i" or "1j", otherwise the IE is not needed
Clause 4	The IE is mandatory if "Intra-frequency event identity" is set to "1a", otherwise the IE is not needed
Clause 5	The IE is mandatory if "Intra-frequency event identity" is set to "1c", otherwise the IE is not needed
Clause 6	The IE is mandatory if "Intra-frequency event identity" is set to "1e" or "1f".

NOTE 1: When best PCCPCH in active set changes, all active cells are reported.

10.3.7.40 Intra-frequency measurement system information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Intra-frequency measurement identity number	MD		Measurement identity number 10.3.7.73	The intra-frequency measurement identity number has default value 1.
Intra-frequency cell info list	OP		Intra-frequency cell info list 10.3.7.33	
Intra-frequency measurement quantity	OP		Intra-frequency measurement quantity 10.3.7.38	
Intra-frequency reporting quantity for RACH Reporting	OP		Intra-frequency reporting quantity for RACH Reporting 10.3.7.42	
Maximum number of reported cells on RACH	OP		Maximum number of reported cells on RACH 10.3.7.68	
Reporting information for state CELL_DCH	OP		Reporting information for state CELL_DCH 10.3.7.87	Note 1

NOTE 1: The reporting of intra-frequency measurements is activated when state CELL_DCH is entered.

10.3.7.41 Intra-frequency reporting quantity

Contains the reporting quantity information for an intra-frequency measurement.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Reporting quantities for active set cells	MP		Cell reporting quantities 10.3.7.5	
Reporting quantities for monitored set cells	MP		Cell reporting quantities 10.3.7.5	
Reporting quantities for detected set cells	OP		Cell reporting quantities 10.3.7.5	

10.3.7.42 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	Need	Multi	Type and reference	Semantics description
SFN-SFN observed time difference	MP		Enumerated(No report, type 1, type 2)	
CHOICE *mode*	MP			
>FDD				
>>Reporting quantity	MP		Enumerated(CPICH Ec/N0, CPICH RSCP, Pathloss, No report)	
>TDD				
>>Reporting quantity list	MP	1 to 2		
>>>Reporting quantity	MP		Enumerated(Timeslot ISCP, Primary CCPCH RSCP, No report)	

10.3.7.43 LCS Error

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Error reason	MP		Enumerated(There were not enough cells to be received when performing mobile based OTDOA-IPDL. There were not enough GPS satellites to be received, when performing UE-based GPS location. Location calculation assistance data missing. Requested method not supported. Undefined error. Location request denied by the user. Location request not processed by the user and timeout.	
Additional Assistance Data	OP		structure and encoding as for the GPS Assistance Data IE in GSM 09.31 excluding the IEI and length octets	This field is optional. Its presence indicates that the target UE will retain assistance data already sent by the SRNC. The SRNC may send further assistance data for any new location attempt but need not resend previous assistance data. The field may contain the following: GPS Assistance Data necessary additional GPS assistance data

10.3.7.44 LCS GPS acquisition assistance

The Acquisition Assistance field of the GPS Assistance Data Information Element contains parameters that enable fast acquisition of the GPS signals in network-based GPS positioning. Essentially, these parameters describe the range and derivatives from respective satellites to the Reference Location at the Reference Time.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
CHOICE Reference Time				
>UTRAN reference time				GPS Time of Week counted in microseconds, given as GPS TOW in milliseconds and GPS TOW remainder in microseconds, UTRAN reference time = 1000 * GPS TOW msec + GPS TOW rem usec
>>GPS TOW msec	MP		Integer(0..6.048*10^8-1)	GPS Time of Week in miliseconds (rounded down to the nearest milisecond unit)
>>GPS TOW rem usec	MP		Integer(0..999)	GPS Time of Week in microseconds MOD 1000.
>>SFN	MP		Integer(0..4095)	
>GPS reference time only				
>>GPS TOW	MP		Integer(0..6.048*10^8-1)	GPS Time of Week in milliseconds (rounded down to the nearest millisecond unit).
Satellite information	MP	1 to <maxSat>		
>SatID	MP		Enumerated(0..63)	Identifies the satellites
>Doppler (0^{th} order term)	MP		Integer(-2048..2047)	Hz, scaling factor 2.5
>Extra Doppler	OP			
>>Doppler (1^{st} order term)	MP		Integer(-42..21)	Scaling factor 1/42
>>Doppler Uncertainty	MP		Real(12.5,25,50,100,200)	Hz
>Code Phase	MP		Integer(0..1022)	Chips, specifies the centre of the search window
>Integer Code Phase	MP		Integer(0..19)	1023 chip segments
>GPS Bit number	MP		Integer(0..3)	Specifies GPS bit number (20 1023 chip segments)
>Code Phase Search Window	MP		Integer(1023,1,2,3,4,6,8,12,16,24,32,48,64,96,128,192)	Specifies the width of the search window.
>Azimuth and Elevation	OP			
>>Azimuth	MP		Integer(0..31)	Degrees, scale factor 11.25
>>Elevation	MP		Integer(0..7)	Degrees, scale factor 11.25

CHOICE *Reference time*	**Condition under which the given *reference time* is chosen**
UTRAN reference time	The reference time is relating GPS time to UTRAN time (SFN)
GPS reference time only	The time gives the time for which the location estimate is valid

10.3.7.45 LCS GPS almanac

These fields specify the coarse, long-term model of the satellite positions and clocks. With one exception (δi), these parameters are a subset of the ephemeris and clock correction parameters in the Navigation Model, although with reduced resolution and accuracy. The almanac model is useful for receiver tasks that require coarse accuracy, such as determining satellite visibility. The model is valid for up to one year, typically. Since it is a long-term model, the field should be provided for all satellites in the GPS constellation.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
WN_a	MP		Bit string(8)	
Satellite information	MP	1 to <maxSat>		
>SatID	MP		Enumerated(0..63)	Satellite ID
>e	MP		Bit string(16)	
>t_{oa}	MP		Bit string(8)	
>δi	MP		Bit string(16)	
>OMEGADOT	MP		Bit string(16)	
>SV Health	MP		Bit string(8)	
>$A^{1/2}$	MP		Bit string(24)	
>$OMEGA_0$	MP		Bit string(24)	
>M_0	MP		Bit string(24)	
>ω	MP		Bit string(24)	
>af_0	MP		Bit string(11)	
>af_1	MP		Bit string(11)	

10.3.7.46 LCS GPS assistance data

The GPS Assistance Data element contains a single GPS assistance message that supports both UE-assisted and UE-based GPS methods. An Integrity Monitor (IM) shall detect unhealthy (e.g., failed/failing) satellites and also shall inform users of measurement quality in DGPS modes when satellites are healthy. Excessively large pseudo range errors, as evidenced by the magnitude of the corresponding DGPS correction, shall be used to detect failed satellites. Unhealthy satellites should be detected within 10 seconds of the occurrence of the satellite failure. When unhealthy (e.g., failed/failing) satellites are detected, the assistance and/or DGPS correction data shall not be supplied for these satellites. When the error in the IM computed position is excessive for solutions based upon healthy satellites only, DGPS users shall be informed of measurement quality through the supplied UDRE values.

NOTE: Certain types of GPS Assistance data may be derived, wholly or partially, from other types of GPS Assistance data.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
LCS GPS reference time	OP		LCS GPS reference time 10.3.7.53	
LCS GPS reference location	OP		Ellipsoid point with altitude defined in 23.032	The Reference Location field contains a 3-D location without uncertainty specified as per 23.032. The purpose of this field is to provide the UE with a priori knowledge of its location in order to improve GPS receiver performance.
LCS GPS DGPS corrections	OP		LCS GPS DGPS corrections 10.3.7.48	
LCS GPS navigation model	OP		LCS GPS navigation model 10.3.7.51	
LCS GPS ionospheric model	OP		LCS GPS ionospheric model 10.3.7.49	
LCS GPS UTC model	OP		LCS GPS UTC model 10.3.7.54	
LCS GPS almanac	OP		LCS GPS almanac 10.3.7.45	
LCS GPS acquisition assistance	OP		LCS GPS acquisition assistance 10.3.7.44	
LCS GPS real-time integrity	OP		LCS GPS real-time integrity 10.3.7.52	

10.3.7.47 LCS GPS assistance for SIB

The LCS GPS Assistance ciphering for SIB IE contains information for GPS differential corrections, ephemeris and clock corrections, as well as Almanac and other data..

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Cipher On/Off	OP			
>Ciphering Key Flag	MP		Bitstring(1)	See note 1
>Ciphering Serial Number	OP		Integer(0..65535)	The serial number used in the DES ciphering algorithm

NOTE 1: The UE always receives two (2) cipher keys during the location update procedure. One of the keys is time-stamped to be current one and the other is time-stamped to be the next one. Thus, the UE always has two cipher keys in memory. The Cipher Key Change Indicator in this broadcast message instructs the UE whether to use current or next cipher key for deciphering the received broadcast message. The UE shall interpret this IE as follows:

- **Ciphering Key Flag**(previous message) = **Ciphering Key Flag**(this message) => Deciphering Key not changed
- **Ciphering Key Flag**(previous message) <> **Ciphering Key Flag**(this message) => Deciphering Key changed

10.3.7.48 LCS GPS DGPS corrections

These fields specify the DGPS corrections to be used by the UE.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
GPS TOW	MP		Integer(0..604799)	Seconds. This field indicates the baseline time for which the corrections are valid.
Status/Health	MP		Enumerated(UDRE scale 1.0, UDRE scale 0.75, UDRE scale 0.5, UDRE scale 0.3, UDRE scale 0.2, UDRE scale 0.1, no data, invalid data)	This field indicates the status of the differential corrections
Satellite information	MP	1 to <maxSat>		
>SatID	MP		Enumerated(0..63)	Satellite ID
>IODE	MP		Bit string(8)	This IE is the sequence number for the ephemeris for the particular satellite. The UE can use this IE to determine if new ephemeris is used for calculating the corrections that are provided in the broadcast message. This eight-bit IE is incremented for each new set of ephemeris for the satellite and may occupy the numerical range of [0, 239] during normal operations. See [13] for details
>UDRE	MP		Enumerated(UDRE ≤ 1.0 m, 1.0m < UDRE ≤ 4.0m, 4.0m < UDRE ≤ 8.0m, 8.0m < UDRE)	User Differential Range Error. This field provides an estimate of the uncertainty (1-σ) in the corrections for the particular satellite. The value in this field shall be multiplied by the UDRE Scale Factor in the common Corrections Status/Health field to determine the final UDRE estimate for the particular satellite. See [13] for details
>PRC	MP		Integer(-2047..2047)	Scaling factor 0.32 meters See (different from [13])
>RRC	MP		Integer(-127.. 127)	Scaling factor 0.032 meters/sec (different from [13])
>Delta PRC2	MP		Integer(-127..127)	Meters. The difference in the pseudorange correction between the satellite's ephemeris identified by IODE and the previous ephemeris two issues ago IODE –2.

>Delta RRC2	MP		Integer(-7..7)	Scaling factor 0.032 meters/sec. The difference in the rate of the change of the pseudorange correction between the satellite's ephemeris identified by IODE and the previous ephemeris two issues ago IODE –2.
>Delta PRC3	MP		Integer(-127..127)	Meters. The difference in the pseudorange correction between the satellite's ephemeris identified by IODE and the previous ephemeris three issues ago IODE –3.
>Delta RRC3	MP		Integer(-7..7)	Scaling factor 0.032 meters/sec. The difference in the rate of the change of the pseudorange correction between the satellite's ephemeris identified by IODE and the previous ephemeris three issues ago IODE –3.

NOTE: Each UDRE value shall be adjusted based on the operation of an Integrity Monitor (IM) function which exists at the network (SRNC, GPS server, or reference GPS receiver itself). Positioning errors derived at the IM which are excessive relative to DGPS expected accuracy levels shall be used to scale the UDRE values to produce consistency.

10.3.7.49 LCS GPS ionospheric model

The Ionospheric Model contains fields needed to model the propagation delays of the GPS signals through the ionosphere. Proper use of these fields allows a single-frequency GPS receiver to remove approximately 50% of the ionospheric delay from the range measurements. The Ionospheric Model is valid for the entire constellation and changes slowly relative to the Navigation Model.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
α_0	MP		Bit string(8)	
α_1	MP		Bit string(8)	
α_2	MP		Bit string(8)	
α_3	MP		Bit string(8)	
β_0	MP		Bit string(8)	
β_1	MP		Bit string(8)	
β_2	MP		Bit string(8)	
β_3	MP		Bit string(8)	

10.3.7.50 LCS GPS measurement

The purpose of the GPS Measurement Information element is to provide GPS measurement information from the UE to the SRNC. This information includes the measurements of code phase and Doppler, which enables the network-based GPS method where the position is computed in the SRNC.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Reference SFN	OP		Integer(0..4095)	The SFN for which the location is valid
GPS TOW msec	MP		Integer(0..6.048*10^8-1)	GPS Time of Week in milliseconds (rounded down to the nearest millisecond unit). This time is the GPS TOW measured by the UE. If the Reference SFN field is present it is the ms flank closest to the beginning of that frame. GPS Time of Week in microseconds = 1000 * GPS TOW msec + GPS TOW rem usec
GPS TOW rem usec	CV-capability and request		Integer(0..999)	GPS Time of Week in microseconds MOD 1000.
Measurement Parameters	MP	1 to <maxSat>		
>Satellite ID	MP		Enumerated(0..63)	
>C/N_0	MP		Integer(0..63)	the estimate of the carrier-to-noise ratio of the received signal from the particular satellite used in the measurement. It is given in whole dBs. Typical levels observed by UE-based GPS units will be in the range of 20 – 50 dB.
>Doppler	MP		Integer(-32768..32768)	Hz, scale factor 0.2.
>Whole GPS Chips	MP		Integer(0..1023)	Unit in GPS chips
>Fractional GPS Chips	MP		Integer(0..(2^{10}-1))	Scale factor 2^{-10}
>Multipath Indicator	MP		Enumerated(NM, low, medium, high)	See note 1
>Pseudorange RMS Error	MP		Enumerated(range index 0..range index 63)	See note 2

Condition	Explanation
Capability and request	This field is included only if the UE has this capability *and* if it was requested in the LCS reporting quantity

NOTE 1: The following table gives the mapping of the multipath indicator field.

Value	Multipath Indication
NM	Not measured
Low	MP error < 5m
Medium	5m < MP error < 43m
High	MP error > 43m

NOTE 2: The following table gives the bitmapping of the Pseudorange RMS Error field.

Range Index	Mantissa	Exponent	Floating-Point value, x_i	Pseudorange value, P
0	000	000	0.5	P < 0.5
1	001	000	0.5625	0.5 <= P < 0.5625
I	X	Y	$0.5 * (1 + x/8) * 2^y$	x_{i-1} <= P < x_i
62	110	111	112	104 <= P < 112
63	111	111	--	112 <= P

10.3.7.51 LCS GPS navigation model

This IE contain information required to manage the transfer of precise navigation data to the GPS-capable UE. This information includes control bit fields as well as satellite ephemeris and clock corrections.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
N_SAT	MP		Integer(1..16)	The number of satellites included in this IE
Satellite information	MP	1 to <maxSat>		
>SatID	MP		Enumerated(0..63)	Satellite ID
>Satellite Status	MP		Enumerated(NS_NN, ES_SN, ES_NN, REVD)	See note 1
>C/A or P on L2	MP		Bit string(2)	Standard formats as defined in [12]
>URA Index	MP		Bit string(4)	
>SV Health	MP		Bit string(6)	
>IODC	MP		Bit string(10 (1))	
>L2 P Data Flag	MP		Bit string(1)	
>SF 1 Reserved	MP		Bit string(87)	
>T_{GD}	MP		Bit string(8)	
>t_{oc}	MP		Bit string(16 (1))	
>af_2	MP		Bit string(8)	
>af_1	MP		Bit string(16)	
>af_0	MP		Bit string(22)	
>C_{rs}	MP		Bit string(16)	
>Δn	MP		Bit string(16)	
>M_0	MP		Bit string(32)	
>C_{uc}	MP		Bit string(16)	
>e	MP		Bit string(32 (1))	
>C_{us}	MP		Bit string(16)	
>$(A)^{1/2}$	MP		Bit string(32 (1))	
>t_{oe}	MP		Bit string(16 (1))	
>Fit Interval Flag	MP		Bit string(1)	
>AODO	MP		Bit string(5)	
>C_{ic}	MP		Bit string(16)	
>$OMEGA_0$	MP		Bit string(32)	
>C_{is}	MP		Bit string(16)	
>i_0	MP		Bit string(32)	
>C_{rc}	MP		Bit string(16)	
>ω	MP		Bit string(32)	
>OMEGAdot	MP		Bit string(24)	
>Idot	MP		Bit string(14)	

NOTE 1: The UE shall interpret enumerated symbols as follows.

Symbol	Interpretation
NS_NN	New satellite, new Navigation Model
ES_SN	Existing satellite, same Navigation Model
ES_NN	Existing satellite, new Navigation Model
REVD	Reserved

Condition	Explanation
status	Group Included unless status is ES_SN

10.3.7.52 LCS GPS real-time integrity

Contains parameters that describe the real-time status of the GPS constellation. Primarily intended for non-differential applications, the real-time integrity of the satellite constellation is of importance as there is no differential correction data by which the mobile can determine the soundness of each satellite signal. The Real-Time GPS Satellite Integrity data communicates the health of the constellation to the mobile in real-time. The satellites identified in this IE should not be used for position fixes at the moment.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Satellite information	OP	1 to <maxSat>		N_BAD_SAT=the number of bad satellites included in this IE
>BadSatID	MP		Enumerated(0..63)	Satellite ID

10.3.7.53 LCS GPS reference time

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
GPS Week	MP		Integer(0..1023)	
GPS TOW msec	MP		Integer(0..6.048*10^{8}-1)	GPS Time of Week in milliseconds (rounded down to the nearest millisecond unit). GPS Time of Week in microseconds = 1000 * GPS TOW msec + GPS TOW rem usec
GPS TOW rem usec	MP		Integer(0..999)	GPS Time of Week in microseconds MOD 1000.
SFN	MP		Integer(0..4095)	The SFN which the GPS TOW time stamps
GPS TOW Assist	OP	1 to <maxSat>		Fields to help the UE with time-recovery (needed to predict satellite signal)
>SatID	MP		Enumerated(0..63)	Identifies the satellite for which the corrections are applicable
>TLM Message	MP		Bit string(14)	A 14-bit value representing the Telemetry Message (TLM) being broadcast by the GPS satellite identified by the particular SatID, with the MSB occurring first in the satellite transmission.
>Anti-Spoof	MP		Boolean	The Anti-Spoof and Alert flags that are being broadcast by the GPS satellite identified by SatID.
>Alert	MP		Boolean	
>TLM Reserved	MP		Bit string(2)	Two reserved bits in the TLM Word being broadcast by the GPS satellite identified by SatID, with the MSB occurring first in the satellite transmission.

10.3.7.54 LCS GPS UTC model

The UTC Model field contains a set of parameters needed to relate GPS time to Universal Time Coordinate (UTC).

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
A_1	MP		Bit string(24)	
A_0	MP		Bit string(32)	
t_{ot}	MP		Bit string(8)	
Δt_{LS}	MP		Bit string(8)	
WN_t	MP		Bit string(8)	
WN_{LSF}	MP		Bit string(8)	
DN	MP		Bit string(8)	
Δt_{LSF}	MP		Bit string(8)	

10.3.7.55 LCS IPDL parameters

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
IP spacing	MP		Integer(5,7,10,15,20,30,40,50)	The IPs are repeated every IP spacing frame.
IP length	MP		Integer(5,10)	The length in symbols of the idle periods
IP offset	MP		Integer(0..9)	Relates the BFN and SFN, should be same as T_cell defined in 25.402
Seed	MP		Integer(0..63)	Seed used to start the random number generator
Burst mode parameters	OP			
>Burst Start	MP		Integer(0..15)	The frame number where the 1st Idle Period Burst occurs within an SFN cycle. Scaling factor 256.
>Burst Length	MP		Integer(10..25)	Number of Idle Periods in a 'burst' of Idle Periods
>Burst freq	MP		Integer(1..16)	Number of 10ms frames between consecutive Idle Period bursts. Scaling factor 256.

The function IP_position(x) described below yields the position of the x^{th} Idle Period relative to a) the start of the SFN cycle when continuous mode or b) the start of a burst when in burst mode. The operator "%" denotes the modulo operator. Regardless of mode of operation, the Idle Period pattern is reset at the start of every SFN cycle. Continuous mode can be considered as a specific case of the burst mode with just one burst spanning the whole SFN cycle. Note also that x will be reset to x=1 for the first idle period in a SFN cycle for both continuous and burst modes and will also, in the case of burst mode, be reset for the first Idle Period in every burst.

Max_dev=150-IP length

rand(x)= (106.rand(x-1) + 1283)mod6075,

rand(0)=seed

IP_position(x) = x*IP_spacing*150 + rand(xmod64)modMax_dev+IP_offset

10.3.7.56 LCS measured results

Information Element/Group name	Need	Multi	Type and reference	Semantics description
LCS Multiple Sets	OP		LCS Multiple Sets 10.3.7.59	
LCS reference cell Identity	OP		Primary CPICH Info 10.3.6.51	
LCS OTDOA measurement	OP		LCS OTDOA measurement 10.3.7.62	
LCS Position	OP		LCS Position 10.3.7.65	
LCS GPS measurement	OP		LCS GPS measurement 10.3.7.50	
LCS error	OP		LCS error 10.3.7.43	Included if LCS error occurred

10.3.7.57 LCS measurement

Information Element/Group name	Need	Multi	Type and reference	Semantics description
LCS reporting quantity	MP		LCS reporting quantity 10.3.7.67	
CHOICE reporting criteria	MP			
>LCS reporting criteria			LCS reporting criteria 10.3.7.66	
>Periodical reporting criteria			Periodical reporting criteria 10.3.7.78	
>No reporting				(no data) Chosen when this measurement only is used as additional measurement to another measurement
LCS OTDOA assistance data	OP		LCS OTDOA assistance data 10.3.7.60	
LCS GPS assistance data	OP		LCS GPS assistance data 10.3.7.46	

10.3.7.58 LCS measurement event results

This IE contains the measurement event results that are reported to UTRAN for LCS measurements.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
CHOICE Event ID	MP			
>7a				
>>LCS Position	MP		LCS Position 10.3.7.65	
>7b				
>> LCS OTDOA measurement	MP		LCS OTDOA measurement 10.3.7.62	
>7c				
>> LCS GPS measurement	MP		LCS GPS measurement 10.3.7.50	

10.3.7.59 LCS multiple sets

This element indicates how many OTDOA Measurement Information sets or GPS Measurement Information sets, and Reference cells are included in this element. This element is optional. If this element is absent, a single measurement set is included.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Number of OTDOA-IPDL/GPS Measurement Information Sets	MP		Integer(2..3)	
Number of Reference Cells	MP		Integer(1..3)	
Reference Cell relation to Measurement Elements	OP		Enumerated(First reference cell is related to first and second OTDOA-IPDL/GPS Measurement Information Sets, and second reference cell is related to third OTDOA-IPDL/GPS Measurement Information Sets. First reference cell is related to first and third OTDOA-IPDL/GPS Measurement Information Sets, and second reference cell is related to second OTDOA-IPDL/GPS Measurement Information Sets. First reference cell is related to first OTDOA-IPDL/GPS Measurement Information Sets, and second reference cell is related to second and third OTDOA/GPS Measurement Information Sets.)	This field indicates how the reference cells listed in this element relate to measurement sets later in this component. This field is conditional and included only if Number of OTDOA-IPDL/GPS Measurement Information Sets is '3' and Number of Reference cells is '2'. If this field is not included, the relation between reference cell and Number of OTDOA-IPDL/GPS Measurement Information Sets is as follows: If there are three sets and three reference cells -> First reference cell relates to first set, second reference cell relates to second set, and third reference cell relates to third set. If there are two sets and two reference cells -> First reference cell relates to first set, and second reference cell relates to second set. If there is only one reference cell and 1-3 sets -> this reference cell relates to all sets.

10.3.7.60 LCS OTDOA assistance data

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
LCS OTDOA reference cell for assistance data	OP		LCS OTDOA reference cell for assistance data 10.3.7.64	
LCS OTDOA measurement assistance data	OP	1 to <maxCellMeas>	LCS OTDOA measurement assistance data 10.3.7.63	
LCS IPDL parameters	OP		LCS IPDL parameters 10.3.7.55	If this element is not included there are no idle periods present

10.3.7.61 LCS OTDOA assistance for SIB

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Ciphering parameters	OP			Determines if DGPS correction fields are ciphered
>Ciphering Key Flag	MP		Bitstring(1)	See note 1
>Ciphering Serial Number	MP		Integer(0..65535)	The serial number used in the DES ciphering algorithm
Search Window Size	MP		Integer(10, 20, 30, 40, 50, 60,70, infinity)	Specifies the maximum size of the search window in chips. Infinity means more
Reference Cell Position	MP		Ellipsoid point or Ellipsoid point with altitude as defined in 23.032	The position of the antenna which defines the serving cell. Used for the UE based method.
LCS IPDL parameters	OP		LCS IPDL parameters 10.3.7.55	If this element is not included there are no idle periods present
Cells to measure on	MP	1 to <maxCellMeas>		
>SFN-SFN drift	OP		Real(0,+0.33,+0.66,+1,+1.33,+1.66,+2,+2.5,+3,+4,+5,+7,+9,+11,+13,+15,-0.33,-0.66,-1,-1.33,-1.66,-2,-2.5,-3,-4,-5,-7,-9,-11,-13,-15)	The SFN-SFN drift value indicate the relative time drift in meters per second. Positive and negative values can be indicated as well as no drift value.
>Primary CPICH info	MP		Primary CPICH info 10.3.6.51	
>Frequency info	OP		Frequency info 10.3.6.30	Default the same. Included if different
>SFN-SFN observed time difference	MP		SFN-SFN observed time difference type 1. 10.3.7.88	Gives the relative timing compared to the reference cell
>Fine SFN-SFN	MP		Real(0,0.25, 0.5,0.75)	Gives finer resolution for UE-Based In chips
>Cell Position	MD			Default = Same as previous cell
>>Relative North	MP		Integer(-32767..32767)	Seconds, scale factor 0.03. Relative position compared to ref. cell.
>>Relative East	MP		Integer(-32767..327676)	Seconds, scale factor 0.03. Relative position compared to ref. cell.
>>Relative Altitude	MP		Integer(-4095..4095)	Relative altitude in meters compared to ref. cell.

NOTE 1: The UE always receives two (2) cipher keys during the location update procedure. One of the keys is time-stamped to be current one and the other is time-stamped to be the next one. Thus, the UE always has two cipher keys in memory. The Cipher Key Change Indicator in this broadcast message instructs the UE whether to use current or next cipher key for deciphering the received broadcast message. The UE shall interpret this IE as follows:

- **Ciphering Key Flag**(previous message) = **Ciphering Key Flag**(this message) => Deciphering Key not changed
- **Ciphering Key Flag**(previous message) <> **Ciphering Key Flag**(this message) => Deciphering Key changed

10.3.7.62 LCS OTDOA measurement

The purpose of the OTDOA Measurement Information element is to provide OTDOA measurements of signals sent from the reference and neighbor cells.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
SFN	MP		Integer(0..4095)	SFN during which the last measurement was performed
UE Rx-Tx time difference	MP		Real(876..1172 by step of 0.25)	The UE Rx-Tx timing can be used to determine the propagation delay In chips
Quality type	OP		Enumerated(STD_10,STD_50,CPICH Ec/N0)	Type of quality in the quality field, default=DEFAULT_QUALITY
CHOICE Quality type	MP			
>STD_10				
>>Reference Quality 10	MP		Integer(10..320 by step of 10)	Std of TOA measurements from the cell
>STD_50				
>>Reference Quality 50	MP		Integer(50..1600 by step of 50)	Std of TOA measurements from the cell
>CPICH Ec/N0				
>>CPICH Ec/N0	MP		Enumerated(<–24, -24 dB ≤ CPICH Ec/No < –23 dB,.. –1 dB ≤ CPICH Ec/No < –0 dB, >=0 dB)	CPICH Ec/N0 for the measurement
>DEFAULT_QUALITY				
>>Reference Quality	MP		Enumerated(0-19 meters, 20-39 meters, 40-79 meters, 80-159 meters, 160-319 meters, 320-639 meters, 640-1319 meters over 1320 meters)	Estimated error in meters.
Neighbors	MP	0..maxCellMeas		Number of neighbors included in this IE
>Neighbor Identity	OP		Primary CPICH info 10.3.6.51	If this field is left out it the identity is the same as in the first set of multiple sets.
>Neighbor Quality	MP		Bit string(depends on Quality type)	Quality of the OTDOA from the neighbor cell.
>SFN-SFN observed time difference	MP		SFN-SFN observed time difference 10.3.7.88	Gives the timing relative to the reference cell. Only type 2 is allowed. Type 2 means that only the slot timing is accounted for

CHOICE *Quality type*	Condition under which the given quality type is chosen
STD_10	Chosen when the quality type is standard deviation with a step-size of 10 m
STD_50	Chosen when the quality type is standard deviation with a step-size of 50 m
CPICH Ec/N0	Chosen when the quality type is CPICH Ec/N0
Default	Chosen if the quality type field is not included.

10.3.7.63 LCS OTDOA measurement assistance data

This IE gives approximate cell timing in order to decrease the search window.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Primary CPICH info	MP		Primary CPICH info 10.3.6.51	
Frequency info	OP		Frequency info 10.3.6.30	Default the same. Included if different
SFN-SFN observed time difference	MP		SFN-SFN observed time difference type 1. 10.3.7.88	Gives the relative timing compared to the reference cell
Fine SFN-SFN	OP		Real(0,0.25, 0.5,0.75)	Gives finer resolution for UE-Based
Search Window Size	MP		Integer(10, 20, 30, 40, 50, 60,70, infinity)	Specifies the maximum size of the search window in chips. Infinity means more
Relative North	OP		Integer(-20000..20000)	Seconds, scale factor 0.03. Relative position compared to ref. cell.
Relative East	OP		Integer(-20000..20000)	Seconds, scale factor 0.03. Relative position compared to ref. cell.
Relative Altitude	OP		Integer(-4000..4000)	Relative altitude in meters compared to ref. cell.

10.3.7.64 LCS OTDOA reference cell for assistance data

This IE defines the cell used for time references in all OTDOA measurements.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Primary CPICH info	MP		Primary CPICH info 10.3.6.51	
Frequency info	OP		Frequency info 10.3.6.30	Default the same. Included if different
Cell Position	OP		Ellipsoid point or Ellipsoid point with altitude as defined in 23.032	The position of the antenna which defines the cell. Can be used for the UE based method.

10.3.7.65 LCS position

The purpose of Location Information element is to provide the location estimate from the UE to the network, if the UE is capable of determining its own position.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Reference SFN	MP		Integer(0..4095)	The SFN for which the location is valid
GPS TOW msec	CV-Capability and request		Integer(0..6.048*10^8-1)	GPS Time of Week Week in milliseconds (rounded down to the nearest millisecond unit). This time-stamps the beginning of the frame defined in Reference SFN GPS Time of Week in microseconds = 1000 * GPS TOW msec + GPS TOW rem usec
GPS TOW rem usec	CV-Capability and request		Integer(0..999)	GPS Time of Week in microseconds MOD 1000.
Position estimate	MP		23.032, allowed types are Ellipsoid Point; Ellipsoid point with uncertainty circle; Ellipsoid point with uncertainty ellipse; Ellipsoid point with altitude; Ellipsoid point with altitude and uncertainty ellipse.	

Condition	Explanation
Capability and request	This field is included only if the UE has this capability *and* if it was requested in the LCS reporting quantity and if the method was UE-based GPS

10.3.7.66 LCS reporting criteria

The triggering of the event-triggered reporting for an LCS measurement. There are three types of events. The first, 7a, is for UE-based methods and is triggered when the position has changed more than a threshold. The second one, 7b, is primarily for UE assisted methods, but can be used also for UE based. It is triggered when the SFN-SFN measurement has changed more than a certain threshold. The third one, 7c, is triggered when the GPS time and the SFN time has drifted apart more than a certain threshold.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Parameters required for each event	OP	1 to <maxMeasEvent>		
>Event ID	MP		Enumerated (7a,7b,7c)	7a=Position change 7b=SFN-SFN change, 7c=SFN-GPS TOW change
>Amount of reporting	MP		Integer(1, 2, 4, 8, 16, 32, 64,infinite)	
>Report first fix	MP		Boolean	If true the UE reports the position once the measurement control is received, and then each time an event is triggered.
>Measurement interval	MP		Integer(5,15, 60,300,900,1800,3600,7200)	Indicates how often the UE should make the measurement In seconds
>CHOICE Event ID				
>>7a				
>>>Threshold Position Change	MP		Integer(10,20,30,40,50,100,200,300,500,1000,2000,5000,10000,20000,50000,100000)	Indicated how much the position should change compared to last reported position fix in order to trigger the event.
>>7b				
>>>Threshold SFN-SFN change	MP		Real(0.25,0.5,1,2,3,4,5,10,20,50,100,200,500,1000,2000,5000)	Chips. Indicates how much the SFN-SFN measurement of ANY measured cell is allowed to change before the event is triggered.
>>7c				
>>>Threshold SFN-GPS TOW	MP		Integer(1,2,3,5,10,20,50,100)	Time in ms. When the GPS TOW and SFN timer has drifted apart more than the specified value the event is triggered)

10.3.7.67 LCS reporting quantity

The purpose of the element is to express the allowed/required location method(s), and to provide information required QoS.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Method Type	MP		Enumerated(UE assisted, UE based, UE based is preferred but UE assisted is allowed, UE assisted is preferred but UE based is allowed)	
Positioning Methods	MP		Enumerated(OTDOA, GPS OTDOA or GPS)	Indicates which location method or methods should be used. The third option means that both can be reported. OTDOA includes IPDL if idle periods are present.
Response Time	MP		Integer(1,2,4, 8, 16, 32, 64, 128)	Indicates the desired response time in seconds
Accuracy	CV		Bit string(7)	Mandatory in all cases except when Method Type is UE assisted, then it is optional. 23.032
GPS timing of Cell wanted	MP		Boolean	If true the SRNC wants the UE to report the SFN-GPS timing of the reference cell. This is however optional in the UE.
Multiple Sets	MP		Boolean	This field indicates whether UE is requested to send multiple *OTDOA/GPS Measurement Information Sets*. The maximum number of measurement sets is three. This is field is mandatory. UE is expected to include the current measurement set.
Environment Characterisation	OP		Enumerated(possibly heavy multipath and NLOS conditions, no or light multipath and usually LOS conditions, not defined or mixed environment)	The first category correspond to e.g. Urban or Bad Urban channels. The second category corresponds to Rural or Suburban channels

10.3.7.68 Maximum number of reported cells on RACH

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Maximum number of reported cells	MP		Enumerated (no report, current cell, current cell + best neighbour, current cell+2 best neighbours, …, current cell+6 best neighbours)	

10.3.7.69 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. The list should be in the order of the value of the measurement quality (the first cell should be the best cell). The "best" FDD cell has the largest value when the measurement quantity is "Ec/No" or "RSCP". On the other hand, the "best" cell has the smallest value when the measurement quantity is "Pathloss". The "best" TDD cell has the largest value when measurement quantity is "Primary CCPCH RSCP".

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE Measurement	MP			
>Intra-frequency measured results list			Intra-frequency measured results list 10.3.7.35	
>Inter-frequency measured results list			Inter-frequency measured results list 10.3.7.15	
>Inter-system measured results list			Inter-system measured results list 10.3.7.26	
>Traffic volume measured results list			Traffic volume measured results list 10.3.7.92	
>Quality measured results list			Quality measured results list 10.3.7.80	
>UE Internal measured results			UE Internal measured results 10.3.7.101	
>LCS measured results			LCS measured results 10.3.7.56	

10.3.7.70 Measured results on RACH

Contains the measured results on RACH of the quantity indicated optionally by Reporting Quantity in the system information broadcast on BCH. The list should be in the order of the value of the measurement quality (the first cell should be the best cell). The "best" FDD cell has the largest value when the measurement quantity is "Ec/No" or "RSCP". On the other hand, the "best" cell has the smallest value when the measurement quantity is "Pathloss". The "best" TDD cell has the largest value when measurement quantity is "Primary CCPCH RSCP".

Information Element/group name	Need	Multi	Type and reference	Semantics description
Measurement result for current cell				
CHOICE *mode*	MP			
>FDD				
>>CHOICE measurement quantity	MP			
>>>CPICH Ec/N0			Integer(-20..0)	In dB
>>>CPICH RSCP			Integer(-115..-40)	In dBm
>>>Pathloss			Integer(46..158)	In dB
>TDD				
>>Timeslot List	OP	1 to 14		
>>>Timeslot ISCP	MP		Timeslot ISCP info 10.3.7.90	The UE shall report the Timeslot ISCP in the same order as indicated in the cell info
>>Primary CCPCH RSCP	OP		Primary CCPCH RSCP info 10.3.7.79	
Measurement results for monitored cells	OP	1 to 7		
>SFN-SFN observed time difference	OP		SFN-SFN observed time difference 10.3.7.88	It is absent for current cell
>CHOICE *mode*	MP			
>>FDD				
>>>Primary CPICH info	MP		Primary CPICH info 10.3.6.51	
>>>CHOICE measurement quantity	OP			It is absent for current cell
>>>>CPICH Ec/N0			Integer(-20..0)	In dB
>>>>CPICH RSCP			Integer(-115..-40)	In dBm
>>>>Pathloss			Integer(46..158)	In dB
>>TDD				
>>>Primary CCPCH info	MP		Primary CCPCH info 10.3.6.49	
>>>Primary CCPCH RSCP	OP		Primary CCPCH RSCP info 10.3.7.79	It is absent for current cell

NOTE 1: Monitored cells consist of current cell and neighbouring cells.

10.3.7.71 Measurement Command

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Measurement command	MP		Enumerated(Setup,Modify ,Release)	

10.3.7.72 Measurement control system information

Information element/Group name	Need	Multi	Type and reference	Semantics description
Intra-frequency measurement system information	OP		Intra-frequency measurement system information 10.3.7.40	
Inter-frequency measurement system information	OP		Inter-frequency measurement system information 10.3.7.20	
Inter-system measurement system information	OP		Inter-system measurement system information 10.3.7.31	
Traffic volume measurement system information	OP		Traffic volume measurement system information 10.3.7.98	
UE Internal measurement system information	OP		UE Internal measurement system information 10.3.7.106	

NOTE1: The reporting of intra-frequency measurements is activated when state CELL_DCH is entered.

10.3.7.73 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.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Measurement identity number	MP		Integer(1..16)	

10.3.7.74 Measurement reporting mode

Contains the type of Measurement Report transfer mode and the indication of periodical/event trigger.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Measurement Report Transfer Mode	MP		enumerated (Acknowledged mode RLC, Unacknowledged mode RLC)	
Periodical Reporting / Event Trigger Reporting Mode	MP		Enumerated (Periodical reporting, Event trigger)	

10.3.7.75 Measurement Type

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Measurement Type	MP		Enumerated(Intra-frequency, Inter-frequency, Inter-system, Traffic volume, Quality, UE internal, LCS)	

10.3.7.76 Measurement validity

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Resume/release	MP		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	CV – 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	This IE is mandatory if "Resume/Release" = Resume, otherwise the IE is not needed

10.3.7.77 Observed time difference to GSM cell

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Observed time difference to GSM cell	OP		Real(0.0..4095*3060/(4096*13 by step of 3060/(4096*13))	In ms

10.3.7.78 Periodical reporting criteria

Contains the periodical reporting criteria information. It is necessary only in the periodical reporting mode.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Amount of reporting	MD		Integer(1, 2, 4, 8, 16, 32, 64, Infinity)	Measurement is "released" after the indicated amount of reporting from the UE itself. The default value is infinity.
Reporting interval	MP		Integer(250, 500, 1000, 2000, 3000, 4000, 6000, 8000, 12000, 16000, 20000, 24000, 28000, 32000, 64000)	Indicates the interval of periodical report. Interval in miliseconds

10.3.7.79 Primary CCPCH RSCP info

NOTE: Only for TDD

Information Element/Group name	Need	Multi	IE type and reference	Semantics description
Primary CCPCH RSCP	MP		Enumerated (-115, -114 ... –25)	Granularity 1dB

10.3.7.80 Quality measured results list

Information Element/Group name	Need	Multi	Type and reference	Semantics description
BLER measurement results	OP	1 to <maxTrCH>		
>DL Transport channel identity	MP		Transport channel identity 10.3.5.18	
>DL Transport Channel BLER	OP		Real(0.00 ..1.00, by step of 0.02)	In dB= -Log10(Transport channel BLER)
CHOICE mode				
>FDD				
>>SIR	OP		Integer(-10..20)	In dB
>TDD				
>>SIR measurement results	OP	1 to <MaxCCTrCH>		SIR measurements for DL CCTrCH
>>>TFCS ID	MP		Enumerated (1...8)	
>>>Timeslot list	MP	1 to <maxTS>		for all timeslot on which the CCTrCH is mapped on
>>>>SIR	MP		Integer(-10...20)	the UE shall report in ascending timeslot order

10.3.7.81 Quality measurement

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Quality reporting quantity	OP		Quality reporting quantity 10.3.7.84	
CHOICE report criteria	MP			
>Quality measurement reporting criteria			Quality measurement reporting criteria 10.3.7.83	
>Periodical reporting criteria			Periodical reporting criteria 10.3.7.78	
>No reporting				(no data) Chosen when this measurement only is used as additional measurement to another measurement

10.3.7.82 Quality measurement event results (FFS)

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Transport channels causing the event	OP	1 to <maxTrCH>		
>Transport channel identity	MP		Transport channel identity 10.3.5.18	

10.3.7.83 Quality measurement reporting criteria

Event 5a: Number of bad CRCs on a certain transport channel exceeds a threshold.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Parameters sent for each transport channel	OP	1 to <maxTrCH>		
>Tranpsport channel identity	MP		Tranpsort channel identity 10.3.5.18	
>Total CRC	MP		Integer(1..512)	Number of CRCs
>Bad CRC	MP		Integer(1..512)	Number of CRCs
>Pending after trigger	MP		Integer(1..512)	Number of CRCs

10.3.7.84 Quality reporting quantity

Information Element/Group name	Need	Multi	Type and reference	Semantics description
DL Transport Channel BLER	MP		Boolean	TRUE means report requested
Transport channels for BLER reporting	CV BLER reporting	1 to <maxTrCH>		The default, if no transport channel identities are present, is that the BLER is reported for all downlink transport channels
>DL Transport channel identity	MP		Transport channel identity 10.3.5.18	
CHOICE mode				
>FDD				
>>SIR	MP		Boolean	TRUE means report requested
>TDD				
>>SIR measurement list	OP	1 to <maxCCTrCH>		SIR measurements shall be reported for all listed TFCS IDs
>>>TFCS ID	MP		Enumerated (1...8)	

Condition	Explanation
BLER reporting	This information element is absent if 'DL Transport Channel BLER' is 'False' and optional, if 'DL Transport Channel BLER' is 'True'

10.3.7.85 Reference time difference to cell

In the System Information message, the reference time difference to cell indicates the SFN-SFN time difference between the primary CCPCH of the current cell and the primary CCPCH of a neighbouring cell..

In the Measurement Control message, the the reference time difference to cell indicates the CFN-SFN time difference between UE uplink transmission timing and the primary CCPCH of a neighbouring cell.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *accuracy*	MP			
>40 chips				
>>Reference time difference	MP		Integer(0..38400 by step of 40)	In chips
>256 chips				
>>Reference time difference	MP		Integer(0.. 38400 by step of 256)	In chips
>2560 chips				
>>Reference time difference	MP		Integer(0.. 38400 by step of 2560)	In chips

10.3.7.86 Reporting Cell Status

Indicates maximum allowed number of cells to report and whether active set cells and/or virtual active set cells and/or monitored set cells on used frequency and/or monitored set cells on non used frequency should/should not be included in the IE "Measured results".

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Choice reporting cell	MP			
>Within active set cells				
>> Maximum number of reporting cells type1	MP		Integer(1..6)	
>Within monitored set cells on used frequency				
>> Maximum number of reporting cells type1	MP		Integer(1..6)	
>Within monitored cells on used frequency				
>> Maximum number of reporting cells type1	MP		Integer(1..6)	
>Include all active set cells + within monitored set cells on used frequency				
>> Maximum number of reporting cells type3	MP		Enumerated (virtual/active set cells+1, virtual/active set cells+2, …., virtual/active set cells+6)	
>Within virtual active set cells				
>> Maximum number of reporting cells type1	MP		Integer(1..6)	
>Within monitored set cells on non-used frequency				
>> Maximum number of reporting cells type1	MP		Integer(1..6)	
>Within monitored cells on non-used frequency				
>> Maximum number of reporting cells type1	MP		Integer(1..6)	
>Include all virtual active set cells + within monitored set cells on non-used frequency				
>> Maximum number of reporting cells type3	MP		Enumerated (virtual/active set cells+1, virtual/active set cells+2, …., virtual/active set cells+6)	
>Within active set cells or within virtual active set cells				
>> Maximum number of reporting cells type2	MP		Integer (1..12)	
>Within monitored cells on used frequency or within monitored cells on non-used frequency				
>> Maximum number of reporting cells type2	MP		Integer(1..12)	

10.3.7.87 Reporting information for state CELL_DCH

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Intra-frequency reporting quantity	MP		Intra-frequency reporting quantity 10.3.7.41	
Measurement Reporting Mode	MP		Measurement Reporting Mode 10.3.7.74	
CHOICE report criteria	MP			
>Intra-frequency measurement reporting criteria			Intra-frequency measurement reporting criteria 10.3.7.39	
>Periodical reporting criteria			Periodical reporting criteria 10.3.7.78	

10.3.7.88 SFN-SFN observed time difference

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *type*	MP			
>Type 1			Integer(0..9830399)	Number of chips
>Type 2			Real(-1279.75..1280.0 by step of 0.25)	Number of chips

10.3.7.89 Time to trigger

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Time to trigger	MP		Integer(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

10.3.7.90 Timeslot ISCP info

NOTE: Only for TDD

Information Element/Group name	Need	Multi	IE type and reference	Semantics description
Timeslot ISCP	MP		Integer (-115... –25)	In dB

10.3.7.91 Traffic volume event identity

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Traffic volume event identity	MP		Enumerated(4a, 4b)	

10.3.7.92 Traffic volume measured results list

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Traffic volume measurement results	OP	1 to <maxRB>		
>RB Identity	MP		RB Identity 10.3.4.13	
>RLC buffers payload	OP		Enumerated(0, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2K, 4K, 8K, 16K, 32K, 64K, 128K, 256K, 512K, 1024K)	In bytes And N Kbytes = N*1024 bytes
>Average RLC buffer payload	OP		Enumerated(0, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2K, 4K, 8K, 16K, 32K, 64K, 128K, 256K, 512K, 1024K)	In bytes And N Kbytes = N*1024 bytes
>Variance of RLC buffer payload	OP		Enumerated(0, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2K, 4K, 8K, 16K)	In bytes And N Kbytes = N*1024 bytes

10.3.7.93 Traffic volume measurement

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Traffic volume measurement Object	OP		Traffic volume measurement Object 10.3.7.95	
Traffic volume measurement quantity	OP		Traffic volume measurement quantity 10.3.7.96	
Traffic volume reporting quantity	OP		Traffic volume reporting quantity 10.3.7.99	
Measurement validity	OP		Measurement validity 10.3.7.76	
CHOICE report criteria	MP			
>Traffic volume measurement reporting criteria			Traffic volume measurement reporting criteria 10.3.7.97	
>Periodical reporting criteria			Periodical reporting criteria 10.3.7.78	
>No reporting				(no data) Chosen when this measurement only is used as additional measurement to another measurement

10.3.7.94 Traffic volume measurement event results

Contains the event result for a traffic volume measurement.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UL Transport Channel causing the event	MP		Transport channel identity 10.3.5.18	
Traffic volume event identity	MP		Traffic volume event identity 10.3.7.91	

10.3.7.95 Traffic volume measurement object

Contains the measurement object information for a traffic volume measurement.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Traffic volume measurement objects	MP	1 to <maxTrCH>		
>UL Target Transport Channel ID	MP		Transport channel identity 10.3.5.18	

10.3.7.96 Traffic volume measurement quantity

Contains the measurement quantity information for a traffic volume measurement.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Measurement quantity	MP		Enumerated(RLC buffer payload, Average RLC buffer payload, Variance of RLC buffer payload)	
Time Interval to take an average or a vaiance	CV-A/V		Integer(20, 40, ..260, by steps of 20)	In ms At least 3 spare values, Criticality: reject, are needed.

Condition	Explanation
A/V	This IE is present when "Average RLC buffer" or "Variance of RLC buffer payload" is chosen.

10.3.7.97 Traffic volume measurement reporting criteria

Contains the measurement reporting criteria information for a traffic volume measurement.

Event 4a: RLC buffer payload exceeds an absolute threshold.

Event 4b: RLC buffer payload becomes smaller than an absolute threshold.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Parameters sent for each transport channel	OP	1 to <maxTrCH>		
>UL Transport Channel ID	OP		Transport channel identity 10.3.5.18	If the transport channel identity is not included, the measurement reporting criteria are applied to all transport channels.
>Parameters required for each Event	OP	1 to <maxMeasperEvent>		
>>Traffic volume event identity	MP		Traffic volume event identity 10.3.7.91	
>>Reporting Threshold	MP		Integer(8,16, 32,64,128,256,512,1024,1536,2048,3072,4096,6144,8192)	Threshold in bytes
Time to trigger	OP		Time to trigger 10.3.7.89	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	OP		Integer(250, 500, 1000, 2000, 4000, 8000, 16000)	Time in seconds. 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 miliseconds
Tx interruption after trigger	OP		Integer (250, 500, 1000, 2000, 4000, 8000, 16000)	Time in miliseconds. Indicates whether or not the UE shall block DTCH transmissions on the RACH after a measurement report is triggered.
Amount of reporting	OP		Integer(1, 2, 4, 8, 16, 32, 64, Infinity)	Measurement is "released" after the indicated amount of reporting from the UE itself.

10.3.7.98 Traffic volume measurement system information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Traffic volume measurement identity number	MD		Measurement identity number 10.3.7.73	The traffic volume measurement identity number has default value 4.
Traffic volume measurement objects	OP		Traffic volume measurement objects 10.3.7.95	
Traffic volume measurement quantity	OP		Traffic volume measurement quantity 10.3.7.96	
Traffic volume reporting quantity	OP		Traffic volume reporting quantity 10.3.7.99	
Measurement validity	OP		Measurement validity 10.3.7.76	
Measurement Reporting Mode	MP		Measurement Reporting Mode 10.3.7.74	
CHOICE reporting criteria	MP			
>Traffic volume measurement reporting criteria			Traffic volume measurement reporting criteria 10.3.7.97	
>Periodical reporting criteria			Periodical reporting criteria 10.3.7.78	

10.3.7.99 Traffic volume reporting quantity

Contains the reporting quantity information for a traffic volume measurement.

For all boolean types TRUE means inclusion in the report is requested.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RLC buffer payload for each RB	MP		Boolean	
Average RLC buffer payload for each RB	MP		Boolean	
Variance of RLC buffer payload for each RB	MP		Boolean	

10.3.7.100 UE internal event identity

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UE internal event identity	MP		Enumerated(6a,6b,6c,6d, 6e, 6f, 6g)	

10.3.7.101 UE internal measured results

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *mode*	MP			
>FDD				
>>UE Transmitted Power	OP		Integer(-50..33)	UE transmitted power In dBm
>>UE Rx-Tx report entries	OP	1 to <maxRL>		
>>>Primary CPICH info	MP		Primary CPICH info 10.3.6.51	Primary CPICH info for each cell included in the active set
>>>UE Rx-Tx time difference	MP		UE Rx-Tx time difference 10.3.7.108	UE Rx-Tx time difference in chip for each RL included in the active set
>TDD				
>>UE transmitted Power list	OP	1 to <maxTS>		UE transmitted power for each used uplink timeslot in ascending timeslot number order
>>>UE transmitted power	MP		UE transmitted power info 10.3.7.109	
>>Applied TA	OP		Uplink Timing Advance 10.3.6.82	

10.3.7.102 UE internal measurement

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UE internal measurement quantity	OP		UE internal measurement quantity 10.3.7.104	
UE internal reporting quantity	OP		UE internal reporting quantity 10.3.7.107	
CHOICE report criteria	MP			
>UE internal measurement reporting criteria			UE internal measurement reporting criteria 10.3.7.105	
>Periodical reporting criteria			Periodical reporting criteria 10.3.7.78	
>No reporting				(no data) Chosen when this measurement only is used as additional measurement to another measurement

CHOICE *report criteria*	**Condition under which the given *report criteria* is chosen**
UE internal measurement reporting criteria	Chosen when UE internal measurement 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

10.3.7.103 UE internal measurement event results

This IE contains the measurement event results that are reported to UTRAN for UE internal measurements.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UE internal event identity	MP		UE internal event identity 10.3.7.100	
CHOICE *mode*	MP			
>FDD				
>Primary CPICH info	CV - clause 1		Primary CPICH info 10.3.6.51	
>TDD				(no data)

Condition	Explanation
Clause 1	This IE is mandatory if "UE internal event identity" is set to "6f" or "6g", otherwise the IE is not needed

10.3.7.104 UE internal measurement quantity

The quantity the UE shall measure in case of UE internal measurement.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE mode	MP			
>FDD				
>>Measurement quantity	MP		Enumerated(UE Transmitted Power, UTRA Carrier RSSI, UE Rx-Tx time difference)	
>TDD				
>>Measurement quantity	MP		Enumerated(UE Transmitted Power, UTRA Carrier RSSI)	
Filter coefficient	MP		Filter coefficient 10.3.7.9	

10.3.7.105 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 UEs dynamic receiver range

Event 6f: The UE Rx-Tx time difference for a RL included in the active set becomes larger than an absolute threshold

Event 6g: The UE Rx-Tx time difference for a RL included in the active set becomes less than an absolute threshold

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Parameters sent for each UE internal measurement event	OP	1 to <maxMeasEvent>		
> UE internal event identity	MP		UE internal event identity 10.3.7.100	
>Time-to-trigger	MP		Integer(0, 10, 20, 40, 60, 80, 100, 120, 160, 200, 240, 320, 640, 1280, 2560, 5000)	Time in ms. Indicates the period of time between the timing of event detection and the timing of sending Measurement Report.
>UE Transmitted power Tx power threshold	CV - clause 1		Integer(-50..33)	Power in dBm. In event 6a, 6b.
>UE Rx-Tx time difference threshold	CV - clause 2		Integer(769..1280)	Time difference in chip. In event 6f, 6g.

Condition	Explanation
Clause 1	The IE is mandatory if UE internal event identity" is set to "6a" or "6b", otherwise the IE is not needed
Clause 2	The IE is mandatory if "UE internal event identity" is set to "6f" or "6g", otherwise the IE is not needed

10.3.7.106 UE internal measurement system information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UE internal measurement identity number	MD		Measurement identity number 10.3.7.73	The UE internal measurement identity number has default value 5.
UE internal measurement quantity	MP		UE internal measurement quantity 10.3.7.104	

10.3.7.107 UE Internal reporting quantity

For all boolean types TRUE means inclusion in the report is requested.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UE Transmitted Power	MP		Boolean	
CHOICE mode	MP			
>FDD				
>>UE Rx-Tx time difference	MP		Boolean	
>TDD				
>>Applied TA	MP		Boolean	

10.3.7.108 UE Rx-Tx time difference

The difference in time between the UE uplink DPCCH/DPDCH frame transmission and the first significant path, of the downlink DPCH frame from the measured radio link. This measurement is for FDD only.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UE Rx-Tx time difference	MP		Integer(876.. 1172)	In chips.

10.3.7.109 UE Transmitted Power info

Information Element/Group name	Need	Multi	IE type and reference	Semantics description
UE Transmitted Power	MP		Integer (-50... 33)	In dB

10.3.8 Other Information elements

10.3.8.1 BCCH modification info

Indicates modification of the System Information on BCCH.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
MIB Value tag	MP		MIB Value tag 10.3.8.7	
BCCH Modification time	OP		Integer (0..8, 16, 24, .. 4088)	All SFN values in which MIB may be mapped are allowed.

10.3.8.2 BSIC

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Base transceiver Station Identity Code (BSIC)	MP			[TS 23.003]
>Network Colour Code (NCC)	MP		bit string(3)	
>Base Station Colour Code (BCC)	MP		bit string(3)	

10.3.8.3 CBS DRX Level 1 information

This information element contains the CBS discontinuous reception information to be broadcast for CBS DRX Level 1 calculations in the UE.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Period of CTCH allocation (N)	MP		Integer (1..256)	$M_{TTI} \le N \le 4096 - K$, N multiple of M_{TTI}
CBS frame offset (K)	MP		Integer (0..255)	$0 \le K \le N-1$, K multiple of M_{TTI}

10.3.8.4 Cell Value tag

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Cell Value tag	MP		Integer (1..4)	

10.3.8.5 Inter-System handover failure

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Inter-System handover failure cause	MD		Enumerated(Configuration unacceptable, physical channel failure, protocol error, unspecified)	Default value is "unspecified". At least 3 spare values, criticality = default, are required
Protocol error information	CV-*ProtErr*		Protocol error information 10.3.8.10	
Inter-System message	OP		Inter-System message 10.3.8.6	

Condition	Explanation
ProtErr	If the IE "Inter-system handover failure cause" has the value "Protocol error"

10.3.8.6 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	Need	Multi	Type and reference	Semantics description
System type	MP		Enumerated (GSM, cdma2000)	At least 14 spare values, Criticality: reject, are needed
CHOICE *system*	MP			At least 14 spare choices, Criticality: reject, are needed
>GSM				
>>Message(s)	MP	1.to.<maxInterSysMessages>	Bitstring (1..512)	Formatted and coded according to GSM specifications
>cdma2000				
>>cdma2000Message	MP	1.to.<maxInterSysMessages>		
>>>MSG_TYPE(s)	MP		Bitstring (8)	Formatted and coded according to cdma2000 specifications
>>>cdma2000Messagepayload(s)	MP		Bitstring (1..512)	Formatted and coded according to cdma2000 specifications

10.3.8.7 MIB Value tag

Information Element/Group name	Need	Multi	Type and reference	Semantics description
MIB Value tag	MP		Integer (1..8)	

10.3.8.8 PLMN Value tag

Information Element/Group name	Need	Multi	Type and reference	Semantics description
PLMN Value tag	MP		Integer (1..256)	

10.3.8.9 Predefined configuration identity and value tag

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Predefined configuration identity	MP		Predefined configuration identity 10.3.4.5	
Predefined configuration value tag	MP		Predefined configuration value tag 10.3.4.6	

10.3.8.10 Protocol error information

This information element contains diagnostics information returned by the receiver of a message that was not completely understood.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE diagnostics type	MP			At least one spare choice is needed.
> Protocol error cause			Protocol error cause 10.3.3.27	

10.3.8.11 References to other system information blocks

Information element/Group name	Need	Multi	Type and reference	Semantics description
References to other system information blocks	MP	1 to <maxSIB>		System information blocks for which multiple occurences are used, may appear more than once in this list
>Scheduling information	MP		Scheduling information, 10.3.8.12	

10.3.8.12 Scheduling information

Information Element/Group name	Need	Multi	Type and reference	Semantics description
SIB type	MP		SIB Type, 10.3.8.17	
CHOICE Value tag	OP			
>PLMN Value tag			PLMN Value tag 10.3.8.8	This IE is included if the following conditions are fulfilled: the area scope for the system information block is set to "PLMN" in table 8.1.1. a value tag is used to indicate changes in the system information block. the SIB type does not equal system information block type 16
>Predefined configuration identity and value tag			Predefined configuration identity and value tag 10.3.8.9	This IE is included if the following conditions are fulfilled: the SIB type equals system information block type 16
>Cell Value tag			Cell Value tag 10.3.8.4	This IE is included if the following conditions are fulfilled: the area scope for the system information block is set to "cell" in table 8.1.1. a value tag is used to indicate changes in the system information block.
Scheduling	MD			see below for default value
>SEG_COUNT	MD		SEG COUNT 10.3.8.13	Default value is 1
>SIB_REP	MP		Integer (4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096)	Repetition period for the SIB in frames
>SIB_POS	MP		Integer (0 ..Rep-2 by step of 2)	Position of the first segment Rep is the value of the SIB_REP IE
>SIB_POS offset info	MD	1..15		see below for default value
>>SIB_OFF	MP		Integer(2..32 by step of 2)	Offset of subsequent segments

Field	Default value
SIB_POS offset info	The default value is that all segments are consecutive, i.e., that the SIB_OFF = 2 for all segments.
Scheduling	The default value is the scheduling of the SIB as specified in another SIB.

10.3.8.13 SEG COUNT

Information Element/Group name	Need	Multi	Type and reference	Semantics description
SEG_COUNT	MP		Integer (1..16)	Number of segments in the system information block

10.3.8.14 Segment index

Each system information segment has an individual segment index.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Segment index	MP		Integer (0..15)	Segments of a system information block are numbered starting with 0 for the first part.

10.3.8.15 SIB data fixed

Contains the result of a master information block or a system information block after encoding and segmentation. The IE is used for segments with fixed length (segments filling an entire transport block).

Information Element/Group name	Need	Multi	Type and reference	Semantics description
SIB data fixed	MP		Bit string (222)	

10.3.8.16 SIB data variable

Contains either a complete system information block or a segment of a system information block. Contains the result of a master information block or a system information block after encoding and segmentation. The IE is used for segments with variable length. The system information blocks are defined in clauses 10.2.52.6.1 to 10.2.52.6.18.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
SIB data variable	MP		Bit string (1..214)	

10.3.8.17 SIB type

The SIB type identifies a specific system information block.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
SIB type	MP		Enumerated, see below	

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,

System Information Type 13,

System Information Type 13.1,

System Information Type 13.2,

System Information Type 13.3,

System Information Type 13.4,

System Information Type 14,

System Information Type 15,

System Information Type 16

in addition, at least 11 spare values, criticality : ignore, are needed.

10.3.9 ANSI-41 Information elements

10.3.9.1 ANSI 41 Core Network Information

Information element/Group name	Need	Multi	Type and reference	Semantics description
P_REV	MP		P_REV 10.3.9.10	
MIN_P_REV	MP		MIN_P_REV 10.3.9.8	
SID	MP		SID 10.3.9.11	
NID	MP		NID 10.3.9.9	

10.3.9.2 ANSI-41 Global Service Redirection information

This Information Element contains ANSI-41 Global Service Redirection information.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
ANSI-41 Global Service Redirection information	MP		ANSI-41 NAS parameter, 10.3.9.3	Formatted and coded according to the 3GPP2 document "G3G CDMA DS on ANSI-41"

10.3.9.3 ANSI-41 NAS parameter

This Information Element contains ANSI-41 User Zone Identification information.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
ANSI-41 NAS parameter	MP		Bit string (size (1..2048))	

10.3.9.4 ANSI-41 NAS system information

This Information Element contains ANSI-41 system information.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
NAS (ANSI-41) system information	MP		ANSI-41 NAS parameter, 10.3.9.3	Formatted and coded according to the 3GPP2 document "G3G CDMA DS on ANSI-41"

10.3.9.5 ANSI-41 Private Neighbor List information

This Information Element contains ANSI-41 Private Neighbor List information.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
ANSI-41 Private Neighbor List information	MP		ANSI-41 NAS parameter, 10.3.9.3	Formatted and coded according to the 3GPP2 document "G3G CDMA DS on ANSI-41"

10.3.9.6 ANSI-41 RAND information

This Information Element contains ANSI-41 RAND information.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
ANSI-41 RAND information	MP		ANSI-41 NAS parameter, 10.3.9.3	Formatted and coded according to the 3GPP2 document "G3G CDMA DS on ANSI-41"

10.3.9.7 ANSI-41 User Zone Identification information

This Information Element contains ANSI-41 User Zone Identification information.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
ANSI-41 User Zone Identification information	MP		ANSI-41 NAS parameter, 10.3.9.3	Formatted and coded according to the 3GPP2 document "G3G CDMA DS on ANSI-41"

10.3.9.8 MIN_P_REV

This Information Element contains minimum protocol revision level.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
MIN_P_REV	MP		Bitstring (8)	Minimum protocol revision level

10.3.9.9 NID

This Information Element contains Network identification.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
NID	MP		Bitstring (16)	Network identification

10.3.9.10 P_REV

This Information Element contains protocol revision level.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
P_REV	MP		Bitstring (8)	Protocol revision level

10.3.9.11 SID

This Information Element contains System identification.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
SID	MP		Bitstring (15)	System identification

10.3.10 Multiplicity values and type constraint values

The following table includes constants that are either used as multi bounds (name starting with "max") or as high or low value in a type specification (name starting with "lo" or "hi"). Constants are specified only for values appearing more than once in the RRC specification. In case a constant is related to one or more other constants, an expression is included in the "value" column instead of the actual value.

Constant	Explanation	Value
CN information		
maxCNdomains	Maximum number of CN domains	4
maxSignallingFlow	Maximum number of flow identifiers	16
UTRAN mobility information		
maxRAT	Maximum number or Radio Access Technologies	maxOtherRAT + 1
maxOtherRAT	Maximum number or other Radio Access Technologies	15
maxURA	Maximum number of URAs in a cell	8
maxInterSysMessages	Maximum number of Inter System Messages	4
maxRABsetup	Maximum number of RABs to be established	16
UE information		
maxPDCPalgoType	Maximum number of PDCP algorithm types	8
maxDRACclasses	Maximum number of UE classes which would require different DRAC parameters	8
maxFrequencybands	Maximum number of frequency bands supported by the UE as defined in 25.102	4
maxPage1	Number of Ues paged in the Paging Type 1 message	8
maxSystemCapability	Maximum number of system specific capabilities that can be requested in one message.	16
RB information		
maxPredefConfig	Maximum number of predefined configurations	16
maxRB	Maximum number of RBs	32
maxSRBsetup	Maximum number of signalling RBs to be established	8
maxRBperRAB	Maximum number of RBs per RAB	8
maxRBallRABs	Maximum number of non signalling RBs	27
maxRBMuxOptions	Maximum number of RB multiplexing options	8
maxLoCHperRLC	Maximum number of logical channels per RLC entity	2
TrCH information		
maxTrCH	Maximum number of transport channels used in one direction (UL or DL)	32
maxTrCHpreconf	Maximum number of preconfigured Transport channels, per direction	16
maxCCTrCH	Maximum number of CCTrCHs	8
maxTF	Maximum number of different transport formats that can be included in the Transport format set for one transport channel	32
maxTF-CPCH	Maximum number of TFs in a CPCH set	16
maxTFC	Maximum number of Transport Format Combinations	1024
maxTFCI-1-Combs	Maximum number of TFCI (field 1) combinations	512
maxTFCI-2-Combs	Maximum number of TFCI (field 2) combinations	512
maxCPCHsets	Maximum number of CPCH sets per Node B	16
maxSIBsegm	Maximum number of complete system information blocks per SYSTEM INFORMATION message	16
maxSIB	Maximum number of references to other system information blocks.	32
maxSIB-FACH	Maximum number of references to system information blocks on the FACH	8
PhyCH information		
maxSubCh	Maximum number of sub-channels on PRACH	12
maxPCPCH-APsubCH	Maximum number of available sub-channels for AP signature on PCPCH	12
maxPCPCH-CDsubCH	Maximum number of available sub-channels for CD signature on PCPCH	12
maxSig	Maximum number of signatures on PRACH	16
maxPCPCH-APsig	Maximum number of available signatures for AP on PCPCH	16
maxPCPCH-CDsig	Maximum number of available signatures for CD on PCPCH	16
maxAC	Maximum number of access classes	16
maxASC	Maximum number of access service classes	8
maxASCmap	Maximum number of access class to access service classes mappings	7
maxASCpersist	Maximum number of access service classes for which persistence scaling factors are specified	6
maxPRACH	Maximum number of PRACHs in a cell	16

maxFACH	Maximum number of FACHs mapped onto one secondary CCPCHs	8
maxRL	Maximum number of radio links	8
maxSCCPCH	Maximum number of secondary CCPCHs per cell	16
maxDPDCH-UL	Maximum number of DPDCHs per cell	6
maxDPCH-DLchan	Maximum number of channelisation codes used for DL DPCH	8
maxDPCHcodesPerTS	Maximum number of codes for one timeslots (TDD)	16
maxPUSCH	Maximum number of PUSCHs	(8)
maxPDSCH	Maximum number of PDSCHs	8
maxPDSCHcodes	Maximum number of codes for PDSCH	16
maxPDSCH-TFCIgroups	Maximum number of TFCI groups for PDSCH	256
maxPDSCHcodeGroups	Maximum number of code groups for PDSCH	256
maxPCPCHs	Maximum number of PCPCH channels in a CPCH Set	64
maxPCPCH-SF	Maximum number of available SFs on PCPCH	7
maxTS	Maximum number of timeslots used in one direction (UL or DL)	14
Measurement information		
maxAdditionalMeas	Maximum number of additional measurements for a given measurement identity	4
maxMeasEvent	Maximum number of events that can be listed in measurement reporting criteria	8
maxMeasParEvent	Maximum number of measurement parameters (e.g. thresholds) per event	2
maxMeasIntervals	Maximum number of intervals that define the mapping function between the measurements for the cell quality Q of a cell and the representing quality value	1
maxCellMeas	Maximum number of cells to measure	32
maxFreq	Maximum number of frequencies to measure	8
maxSat	Maximum number of satellites to measure	16
HiRM	Maximum number that could be set as rate matching attribute for a transport channel	256

11 Message and Information element abstract syntax (with ASN.1)

This clause contains definitions for RRC PDUs and IEs using a subset of ASN.1 as specified in TR 25.921. PDU and IE definitions are grouped into separate ASN.1 modules.

NOTE: The proposal is to keep both clause 10 and 11 (at least until all messages and information elements are fully discussed and agreed by 3GPP RAN WG2). Clause 10 is intended to give an abstract description (in English) of the messages and information elements whereas clause 11 should contain the exact normative definitions with all necessary details.

11.1 General message structure

```
Class-definitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    ActiveSetUpdate,
    ActiveSetUpdateComplete,
    ActiveSetUpdateFailure,
    CellUpdate,
    CellUpdateConfirm,
    CounterCheck,
    CounterCheckResponse,
    DownlinkDirectTransfer,
    DownlinkOuterLoopControl,
    HandoverToUTRANCommand,
    HandoverToUTRANComplete,
    InitialDirectTransfer,
    InterSystemHandoverCommand,
    InterSystemHandoverFailure,
    MeasurementControl,
    MeasurementControlFailure,
    MeasurementReport,
    PagingType1,
    PagingType2,
    PhysicalChannelReconfiguration,
    PhysicalChannelReconfigurationComplete,
    PhysicalChannelReconfigurationFailure,
    PhysicalSharedChannelAllocation,
    PUSCHCapacityRequest,
    RadioBearerReconfiguration,
    RadioBearerReconfigurationComplete,
    RadioBearerReconfigurationFailure,
    RadioBearerRelease,
    RadioBearerReleaseComplete,
    RadioBearerReleaseFailure,
    RadioBearerSetup,
    RadioBearerSetupComplete,
    RadioBearerSetupFailure,
    RNTIReallocation,
    RNTIReallocationComplete,
    RNTIReallocationFailure,
    RRCConnectionReEstablishment,
    RRCConnectionReEstablishment-CCCH,
    RRCConnectionReEstablishmentComplete,
    RRCConnectionReEstablishmentRequest,
    RRCConnectionReject,
    RRCConnectionRelease,
    RRCConnectionRelease-CCCH,
    RRCConnectionReleaseComplete,
    RRCConnectionReleaseComplete-CCCH,
    RRCConnectionRequest,
    RRCConnectionSetup,
    RRCConnectionSetupComplete,
    RRCStatus,
    SecurityModeCommand,
    SecurityModeComplete,
```

```
    SecurityModeFailure,
    SignallingConnectionRelease,
    SignallingConnectionReleaseRequest,
    SystemInformation-BCH,
    SystemInformation-FACH,
    SystemInformationChangeIndication,
    TransportChannelReconfiguration,
    TransportChannelReconfigurationComplete,
    TransportChannelReconfigurationFailure,
    TransportFormatCombinationControl,
    TransportFormatCombinationControlFailure,
    UECapabilityEnquiry,
    UECapabilityInformation,
    UECapabilityInformationConfirm,
    UplinkDirectTransfer,
    UplinkPhysicalChannelControl,
    URAUpdate,
    URAUpdateConfirm,
    URAUpdateConfirm-CCCH
FROM PDU-definitions

    IntegrityCheckInfo
FROM UserEquipment-IEs;

--**************************************************************
--
-- Downlink DCCH messages
--
--**************************************************************

DL-DCCH-Message ::= SEQUENCE {
    integrityCheckInfo      IntegrityCheckInfo      OPTIONAL,
    message                 DL-DCCH-MessageType
}

DL-DCCH-MessageType ::= CHOICE {
    activeSetUpdate                     ActiveSetUpdate,
    cellUpdateConfirm                   CellUpdateConfirm,
    counterCheck                        CounterCheck,
    downlinkDirectTransfer              DownlinkDirectTransfer,
    downlinkOuterLoopControl            DownlinkOuterLoopControl,
    interSystemHandoverCommand          InterSystemHandoverCommand,
    measurementControl                  MeasurementControl,
    pagingType2                         PagingType2,
    physicalChannelReconfiguration      PhysicalChannelReconfiguration,
    physicalSharedChannelAllocation     PhysicalSharedChannelAllocation,
    radioBearerReconfiguration          RadioBearerReconfiguration,
    radioBearerRelease                  RadioBearerRelease,
    radioBearerSetup                    RadioBearerSetup,
    rntiReallocation                    RNTIReallocation,
    rrcConnectionReEstablishment        RRCConnectionReEstablishment,
    rrcConnectionRelease                RRCConnectionRelease,
    securityModeCommand                 SecurityModeCommand,
    signallingConnectionRelease         SignallingConnectionRelease,
    transportChannelReconfiguration     TransportChannelReconfiguration,
    transportFormatCombinationControl   TransportFormatCombinationControl,
    ueCapabilityEnquiry                 UECapabilityEnquiry,
    ueCapabilityInformationConfirm      UECapabilityInformationConfirm,
    uplinkPhysicalChannelControl        UplinkPhysicalChannelControl,
    uraUpdateConfirm                    URAUpdateConfirm,
    extension                           NULL
}

--**************************************************************
--
-- Uplink DCCH messages
--
--**************************************************************

UL-DCCH-Message ::= SEQUENCE {
    integrityCheckInfo      IntegrityCheckInfo      OPTIONAL,
    message                 UL-DCCH-MessageType
}

UL-DCCH-MessageType ::= CHOICE {
    activeSetUpdateComplete             ActiveSetUpdateComplete,
    activeSetUpdateFailure              ActiveSetUpdateFailure,
    counterCheckResponse                CounterCheckResponse,
```

```
    handoverToUTRANComplete             HandoverToUTRANComplete,
    initialDirectTransfer               InitialDirectTransfer,
    interSystemHandoverFailure          InterSystemHandoverFailure,
    measurementControlFailure           MeasurementControlFailure,
    measurementReport                   MeasurementReport,
    physicalChannelReconfigurationComplete
                                        PhysicalChannelReconfigurationComplete,
    physicalChannelReconfigurationFailure
                                        PhysicalChannelReconfigurationFailure,
    radioBearerReconfigurationComplete  RadioBearerReconfigurationComplete,
    radioBearerReconfigurationFailure   RadioBearerReconfigurationFailure,
    radioBearerReleaseComplete          RadioBearerReleaseComplete,
    radioBearerReleaseFailure           RadioBearerReleaseFailure,
    radioBearerSetupComplete            RadioBearerSetupComplete,
    radioBearerSetupFailure             RadioBearerSetupFailure,
    rntiReallocationComplete            RNTIReallocationComplete,
    rntiReallocationFailure             RNTIReallocationFailure,
    rrcConnectionReEstablishmentComplete
                                        RRCConnectionReEstablishmentComplete,
    rrcConnectionReleaseComplete        RRCConnectionReleaseComplete,
    rrcConnectionSetupComplete          RRCConnectionSetupComplete,
    rrcStatus                           RRCStatus,
    securityModeComplete                SecurityModeComplete,
    securityModeFailure                 SecurityModeFailure,
    signallingConnectionReleaseRequest  SignallingConnectionReleaseRequest,
    transportChannelReconfigurationComplete
                                        TransportChannelReconfigurationComplete,
    transportChannelReconfigurationFailure
                                        TransportChannelReconfigurationFailure,
    transportFormatCombinationControlFailure
                                        TransportFormatCombinationControlFailure,
    ueCapabilityInformation             UECapabilityInformation,
    uplinkDirectTransfer                UplinkDirectTransfer,
    extension                           NULL
}

--**************************************************************
--
-- Downlink CCCH messages
--
--**************************************************************

DL-CCCH-Message ::= SEQUENCE {
    integrityCheckInfo      IntegrityCheckInfo      OPTIONAL,
    message                 DL-CCCH-MessageType
}

DL-CCCH-MessageType ::= CHOICE {
    rrcConnectionReEstablishment        RRCConnectionReEstablishment-CCCH,
    rrcConnectionReject                 RRCConnectionReject,
    rrcConnectionRelease                RRCConnectionRelease-CCCH,
    rrcConnectionSetup                  RRCConnectionSetup,
    uraUpdateConfirm                    URAUpdateConfirm-CCCH,
    extension                           NULL
}

--**************************************************************
--
-- Uplink CCCH messages
--
--**************************************************************

UL-CCCH-Message ::= SEQUENCE {
    integrityCheckInfo      IntegrityCheckInfo      OPTIONAL,
    message                 UL-CCCH-MessageType
}

UL-CCCH-MessageType ::= CHOICE {
    cellUpdate                          CellUpdate,
    rrcConnectionReEstablishmentRequest RRCConnectionReEstablishmentRequest,
    rrcConnectionReleaseComplete        RRCConnectionReleaseComplete-CCCH,
    rrcConnectionRequest                RRCConnectionRequest,
    uraUpdate                           URAUpdate,
    extension                           NULL
}

--**************************************************************
--
```

```
-- PCCH messages
--
--***************************************************************

PCCH-Message ::= SEQUENCE {
    message             PCCH-MessageType
}

PCCH-MessageType ::= CHOICE {
    pagingType1                         PagingType1,
    extension                           NULL
}

--***************************************************************
--
-- Downlink SHCCH messages
--
--***************************************************************

DL-SHCCH-Message ::= SEQUENCE {
    integrityCheckInfo      IntegrityCheckInfo      OPTIONAL,
    message                 DL-SHCCH-MessageType
}

DL-SHCCH-MessageType ::= CHOICE {
    physicalSharedChannelAllocation     PhysicalSharedChannelAllocation,
    extension                           NULL
}

--***************************************************************
--
-- Uplink SHCCH messages
--
--***************************************************************

UL-SHCCH-Message ::= SEQUENCE {
    integrityCheckInfo      IntegrityCheckInfo      OPTIONAL,
    message                 UL-SHCCH-MessageType
}

UL-SHCCH-MessageType ::= CHOICE {
    puschCapacityRequest                PUSCHCapacityRequest,
    extension                           NULL
}

--***************************************************************
--
-- Handover to UTRAN command
--
--***************************************************************

HO-ToUTRAN-CommandMessage ::= SEQUENCE {
    message                 HandoverToUTRANCommand
}

--***************************************************************
--
-- BCCH messages sent on FACH
--
--***************************************************************

BCCH-FACH-Message ::= SEQUENCE {
    message             BCCH-FACH-MessageType
}

BCCH-FACH-MessageType ::= CHOICE {
    systemInformation                   SystemInformation-FACH,
    systemInformationChangeIndication   SystemInformationChangeIndication,
    extension                           NULL
}

--***************************************************************
--
-- BCCH messages sent on BCH
--
--***************************************************************

BCCH-BCH-Message ::= SEQUENCE {
```

```
    message             SystemInformation-BCH
}

END
```

11.2 PDU definitions

```
--***************************************************************
--
-- TABULAR: The message type and integrity check info are not
-- visible in this module as they are defined in the class module.
-- Also, all FDD/TDD specific choices have the FDD option first
-- and TDD second, just for consistency.
--
--***************************************************************

PDU-definitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

--***************************************************************
--
-- IE parameter types from other modules
--
--***************************************************************

IMPORTS

    CN-DomainIdentity,
    CN-InformationInfo,
    FlowIdentifier,
    NAS-Message,
    PagingRecordTypeID,
    ServiceDescriptor,
    SignallingFlowInfoList
FROM CoreNetwork-IEs

    URA-Identity
FROM UTRANMobility-IEs

    ActivationTime,
    C-RNTI,
    CapabilityUpdateRequirement,
    CellUpdateCause,
    CipheringAlgorithm,
    CipheringModeInfo,
    DRX-Indicator,
    EstablishmentCause,
    FailureCauseWithProtErr,
    HyperFrameNumber,
    InitialUE-Identity,
    IntegrityProtActivationInfo,
    IntegrityProtectionModeInfo,
    PagingCause,
    PagingRecordList,
    ProtocolErrorIndicator,
    ProtocolErrorIndicatorWithInfo,
    Re-EstablishmentTimer,
    RedirectionInfo,
    RejectionCause,
    ReleaseCause,
    RRC-MessageTX-Count,
    SecurityCapability,
    STARTList,
    U-RNTI,
    U-RNTI-Short,
    UE-RadioAccessCapability,
    URA-UpdateCause,
    UTRAN-DRX-CycleLengthCoefficient,
    WaitTime
FROM UserEquipment-IEs

    PredefinedConfigIdentity,
    RAB-Info,
    RAB-InformationSetupList,
    RB-ActivationTimeInfo,
    RB-ActivationTimeInfoList,
```

```
    RB-COUNT-C-InformationList,
    RB-COUNT-C-MSB-InformationList,
    RB-IdentityList,
    RB-InformationAffectedList,
    RB-InformationReconfigList,
    RB-InformationReleaseList,
    RB-InformationSetupList,
    RB-WithPDCP-InfoList,
    SRB-InformationSetupList,
    SRB-InformationSetupList2
FROM RadioBearer-IEs

    CPCH-SetID,
    DL-AddReconfTransChInfo2List,
    DL-AddReconfTransChInfoList,
    DL-CommonTransChInfo,
    DL-DeletedTransChInfoList,
    DRAC-StaticInformationList,
    TFC-Subset,
    UL-AddReconfTransChInfoList,
    UL-CommonTransChInfo,
    UL-DeletedTransChInfoList
FROM TransportChannel-IEs

    AllocationPeriodInfo,
    CCTrCH-PowerControlInfo,
    ConstantValue,
    CPCH-SetInfo,
    DL-CommonInformation,
    DL-CommonInformationPost,
    DL-InformationPerRL,
    DL-InformationPerRL-List,
    DL-InformationPerRL-ListPost,
    DL-DPCH-PowerControlInfo,
    DL-OuterLoopControl,
    DL-PDSCH-Information,
    DPCH-CompressedModeStatusInfo,
    FrequencyInfo,
    IndividualTS-InterferenceList,
    MaxAllowedUL-TX-Power,
    PDSCH-Info,
    PRACH-RACH-Info,
    PrimaryCCPCH-TX-Power,
    PUSCH-CapacityAllocationInfo,
    RL-AdditionInformationList,
    RL-RemovalInformationList,
    SSDT-Information,
    TFC-ControlDuration,
    TimeslotList,
    TX-DiversityMode,
    UL-ChannelRequirement,
    UL-DPCH-Info,
    UL-DPCH-InfoPost,
    UL-TimingAdvance
FROM PhysicalChannel-IEs

    AdditionalMeasurementID-List,
    EventResults,
    MeasuredResults,
    MeasuredResultsList,
    MeasuredResultsOnRACH,
    MeasurementCommand,
    MeasurementIdentityNumber,
    MeasurementReportingMode,
    PrimaryCCPCH-RSCP,
    TimeslotListWithISCP,
    TrafficVolumeMeasuredResultsList
FROM Measurement-IEs

    BCCH-ModificationInfo,
    InterSystemHO-Failure,
    InterSystemMessage,
    ProtocolErrorInformation,
    SegCount,
    SegmentIndex,
    SFN-Prime,
    SIB-Data-fixed,
    SIB-Data-variable,
```

```
    SIB-Type
FROM Other-IEs

    maxSIBsegm
FROM Constant-definitions;

-- ***************************************************
--
-- ACTIVE SET UPDATE (FDD only)
--
-- ***************************************************

ActiveSetUpdate ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        activationTime                  ActivationTime                      OPTIONAL,
        newU-RNTI                       U-RNTI                              OPTIONAL,
    -- Core network IEs
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- Radio bearer IEs
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Physical channel IEs
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
        rl-AdditionInformationList      RL-AdditionInformationList          OPTIONAL,
        rl-RemovalInformationList       RL-RemovalInformationList           OPTIONAL,
        tx-DiversityMode                TX-DiversityMode                    OPTIONAL,
        ssdt-Information                SSDT-Information                    OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- ACTIVE SET UPDATE COMPLETE (FDD only)
--
-- ***************************************************

ActiveSetUpdateComplete ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
    -- Radio bearer IEs
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfo               OPTIONAL,
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- ACTIVE SET UPDATE FAILURE (FDD only)
--
-- ***************************************************

ActiveSetUpdateFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- CELL UPDATE
--
-- ***************************************************

CellUpdate ::= SEQUENCE {
    -- User equipment IEs
        u-RNTI                          U-RNTI,
        hyperFrameNumber                HyperFrameNumber,
        am-RLC-ErrorIndicationC-plane   BOOLEAN,
        am-RLC-ErrorIndicationU-plane   BOOLEAN,
        cellUpdateCause                 CellUpdateCause,
        protocolErrorIndicator          ProtocolErrorIndicatorWithInfo,
        -- TABULAR: Protocol error information is nested in
        -- ProtocolErrorIndicatorWithInfo.
```

```
    -- Measurement IEs
        measuredResultsOnRACH           MeasuredResultsOnRACH               OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- CELL UPDATE CONFIRM
--
-- ***************************************************

CellUpdateConfirm ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
        rlc-ResetIndicatorC-Plane       BOOLEAN,
        rlc-ResetIndicatorU-Plane       BOOLEAN,
 -- CN information elements
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- UTRAN mobility IEs
        ura-Identity                    URA-Identity                        OPTIONAL,
    -- Radio bearer IEs
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Physical channel IEs
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
        prach-RACH-Info                 PRACH-RACH-Info                     OPTIONAL,
        dl-InformationPerRL             DL-InformationPerRL                 OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- COUNTER CHECK
--
-- ***************************************************

CounterCheck ::= SEQUENCE {
    -- Radio bearer IEs
        rb-COUNT-C-MSB-InformationList  RB-COUNT-C-MSB-InformationList,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- COUNTER CHECK RESPONSE
--
-- ***************************************************

CounterCheckResponse ::= SEQUENCE {
    -- Radio bearer IEs
        rb-COUNT-C-InformationList      RB-COUNT-C-InformationList          OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- DOWNLINK DIRECT TRANSFER
--
-- ***************************************************

DownlinkDirectTransfer ::= SEQUENCE {
    -- Core network IEs
        cn-DomainIdentity               CN-DomainIdentity,
        nas-Message                     NAS-Message,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}
```

```
-- ***************************************************
--
-- DOWNLINK OUTER LOOP CONTROL
--
-- ***************************************************

DownlinkOuterLoopControl ::= SEQUENCE {
    -- Physical channel IEs
        dl-OuterLoopControl             DL-OuterLoopControl,
        dl-DPCH-PowerControlInfo        DL-DPCH-PowerControlInfo            OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- HANDOVER TO UTRAN COMMAND
--
-- ***************************************************

HandoverToUTRANCommand ::= SEQUENCE {
    -- User equipment IEs
        new-U-RNTI                      U-RNTI-Short,
        activationTime                  ActivationTime                      OPTIONAL,
        cipheringAlgorithm              CipheringAlgorithm                  OPTIONAL,
    -- Radio bearer IEs
        rab-Info                        RAB-Info,
    -- Specification mode information
        specificationMode               CHOICE {
            complete                        SEQUENCE {
                re-EstablishmentTimer           Re-EstablishmentTimer,
                srb-InformationSetupList        SRB-InformationSetupList,
                rb-InformationSetupList         RB-InformationSetupList,
                ul-CommonTransChInfo            UL-CommonTransChInfo,
                ul-AddReconfTransChInfoList     UL-AddReconfTransChInfoList,
                dl-CommonTransChInfo            DL-CommonTransChInfo,
                dl-AddReconfTransChInfoList     DL-AddReconfTransChInfoList,
                ul-DPCH-Info                    UL-DPCH-Info,
                modeSpecificInfo                CHOICE {
                    fdd                             SEQUENCE {
                        dl-CommonInformation            DL-CommonInformation,
                        dl-PDSCH-Information            DL-PDSCH-Information OPTIONAL,
                        cpch-SetInfo                    CPCH-SetInfo        OPTIONAL
                    },
                    tdd                             NULL
                },
                dl-InformationPerRL-List        DL-InformationPerRL-List
            },
            preconfiguration                SEQUENCE {
                predefinedConfigIdentity        PredefinedConfigIdentity,
                ul-DPCH-Info                    UL-DPCH-InfoPost,
                modeSpecificInfo                CHOICE {
                    fdd                             SEQUENCE {
                        dl-CommonInformationPost        DL-CommonInformationPost
                    },
                    tdd                                 NULL
                },
                dl-InformationPerRL-List        DL-InformationPerRL-ListPost
            }
        },
    -- Physical channel IEs
        frequencyInfo                   FrequencyInfo,
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power,
        modeSpecificPhysChInfo          CHOICE {
            fdd                             NULL,
            tdd                             SEQUENCE {
                primaryCCPCH-TX-Power           PrimaryCCPCH-TX-Power
            }
        },
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
```

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

HandoverToUTRANComplete ::= SEQUENCE {
    -- User equipment IEs
    -- TABULAR: the IE below is conditional on history.
        startList                   STARTList                           OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions       SEQUENCE {}                         OPTIONAL
}

-- **************************************************
--
-- INITIAL DIRECT TRANSFER
--
-- **************************************************

InitialDirectTransfer ::= SEQUENCE {
    -- Core network IEs
        serviceDescriptor           ServiceDescriptor,
        flowIdentifier              FlowIdentifier,
        cn-DomainIdentity           CN-DomainIdentity,
        nas-Message                 NAS-Message,
    -- Measurement IEs
        measuredResultsOnRACH       MeasuredResultsOnRACH               OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions       SEQUENCE {}                         OPTIONAL
}

-- **************************************************
--
-- INTER-SYSTEM HANDOVER COMMAND
--
-- **************************************************

InterSystemHandoverCommand ::= SEQUENCE {
    -- User equipment IEs
        activationTime              ActivationTime                      OPTIONAL,
    -- Radio bearer IEs
        remainingRAB-Info           RAB-Info                            OPTIONAL,
    -- Other IEs
        interSystemMessage          InterSystemMessage,
    -- Extension mechanism for non- release99 information
        criticalExtension           SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions       SEQUENCE {}                         OPTIONAL
}

-- **************************************************
--
-- INTER-SYSTEM HANDOVER FAILURE
--
-- **************************************************

InterSystemHandoverFailure ::= SEQUENCE {
    -- Other IEs
        interSystemHO-Failure       InterSystemHO-Failure               OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions       SEQUENCE {}                         OPTIONAL
}

-- **************************************************
--
-- MEASUREMENT CONTROL
--
-- **************************************************

MeasurementControl ::= SEQUENCE {
    -- Measurement IEs
        measurementIdentityNumber       MeasurementIdentityNumber,
        measurementCommand              MeasurementCommand,
        -- TABULAR: The measurement type is included in MeasurementCommand.
        measurementReportingMode        MeasurementReportingMode        OPTIONAL,
        additionalMeasurementList       AdditionalMeasurementID-List    OPTIONAL,
    -- Physical channel IEs
        dpch-CompressedModeStatusInfo   DPCH-CompressedModeStatusInfo   OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                     OPTIONAL,
```

```
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- MEASUREMENT CONTROL FAILURE
--
-- ***************************************************

MeasurementControlFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- MEASUREMENT REPORT
--
-- ***************************************************

MeasurementReport ::= SEQUENCE {
    -- Measurement IEs
        measurementIdentityNumber       MeasurementIdentityNumber,
        measuredResults                 MeasuredResults                     OPTIONAL,
        additionalMeasuredResults       MeasuredResultsList                 OPTIONAL,
        eventResults                    EventResults                        OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- PAGING TYPE 1
--
-- ***************************************************

PagingType1 ::= SEQUENCE {
    -- User equipment IEs
        pagingRecordList                PagingRecordList                    OPTIONAL,
    -- Other IEs
        bcch-ModificationInfo           BCCH-ModificationInfo               OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- PAGING TYPE 2
--
-- ***************************************************

PagingType2 ::= SEQUENCE {
    -- User equipment IEs
        pagingCause                     PagingCause,
    -- Core network IEs
        cn-DomainIdentity               CN-DomainIdentity,
        pagingRecordTypeID              PagingRecordTypeID,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- PHYSICAL CHANNEL RECONFIGURATION
--
-- ***************************************************

PhysicalChannelReconfiguration ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        activationTime                  ActivationTime                      OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
```

```
    -- Core network IEs
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- Radio bearer IEs
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Physical channel IEs
        frequencyInfo                   FrequencyInfo                       OPTIONAL,
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
        ul-ChannelRequirement           UL-ChannelRequirement               OPTIONAL,
        -- TABULAR: UL-ChannelRequirement contains the choice
        -- between UL DPCH info and PRACH info for RACH.
        modeSpecificInfo                CHOICE {
            fdd                             SEQUENCE {
                dl-CommonInformation            DL-CommonInformation        OPTIONAL,
                dl-PDSCH-Information            DL-PDSCH-Information        OPTIONAL,
                cpch-SetInfo                    CPCH-SetInfo                OPTIONAL
            },
            tdd                             NULL
        },
        dl-InformationPerRL-List        DL-InformationPerRL-List            OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- PHYSICAL CHANNEL RECONFIGURATION COMPLETE
--
-- ***************************************************

PhysicalChannelReconfigurationComplete ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
        -- TABULAR: UL-TimingAdvance is applicable for TDD mode only.
        ul-TimingAdvance                UL-TimingAdvance                    OPTIONAL,
    -- Radio bearer IEs
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfo               OPTIONAL,
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- PHYSICAL CHANNEL RECONFIGURATION FAILURE
--
-- ***************************************************

PhysicalChannelReconfigurationFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- PHYSICAL SHARED CHANNEL ALLOCATION (TDD only)
--
-- ***************************************************

PhysicalSharedChannelAllocation ::= SEQUENCE {
    -- User equipment IEs
        c-RNTI                          C-RNTI                              OPTIONAL,
    -- Physical channel IEs
        ul-TimingAdvance                UL-TimingAdvance                    OPTIONAL,
        allocationPeriodInfo            AllocationPeriodInfo                OPTIONAL,
        pusch-CapacityAllocationInfo    PUSCH-CapacityAllocationInfo        OPTIONAL,
        pdsch-Info                      PDSCH-Info                          OPTIONAL,
        timeslotList                    TimeslotList                        OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- PUSCH CAPACITY REQUEST (TDD only)
--
```

```
-- ***************************************************

PUSCHCapacityRequest ::= SEQUENCE {
    -- User equipment IEs
        c-RNTI                          C-RNTI                              OPTIONAL,
    -- Measurement IEs
        trafficVolumeMeasuredResultsList
                                        TrafficVolumeMeasuredResultsList,
        timeslotListWithISCP            TimeslotListWithISCP                OPTIONAL,
        primaryCCPCH-RSCP               PrimaryCCPCH-RSCP                   OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER RECONFIGURATION
--
-- ***************************************************

RadioBearerReconfiguration ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        activationTime                  ActivationTime                      OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
    -- Core network IEs
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- Radio bearer IEs
        rb-InformationReconfigList      RB-InformationReconfigList,
        rb-InformationAffectedList      RB-InformationAffectedList          OPTIONAL,
    -- Transport channel IEs
        ul-CommonTransChInfo            UL-CommonTransChInfo                OPTIONAL,
        ul-deletedTransChInfoList       UL-DeletedTransChInfoList           OPTIONAL,
        ul-AddReconfTransChInfoList     UL-AddReconfTransChInfoList         OPTIONAL,
        modeSpecificTransChInfo         CHOICE {
            fdd                             SEQUENCE {
                cpch-SetID                      CPCH-SetID                  OPTIONAL,
                addReconfTransChDRAC-Info       DRAC-StaticInformationList  OPTIONAL
            },
            tdd                             NULL
        }                                                                   OPTIONAL,
        dl-CommonTransChInfo            DL-CommonTransChInfo                OPTIONAL,
        dl-DeletedTransChInfoList       DL-DeletedTransChInfoList           OPTIONAL,
        dl-AddReconfTransChInfoList     DL-AddReconfTransChInfo2List        OPTIONAL,
    -- Physical channel IEs
        frequencyInfo                   FrequencyInfo                       OPTIONAL,
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
        ul-ChannelRequirement           UL-ChannelRequirement               OPTIONAL,
        modeSpecificPhysChInfo          CHOICE {
            fdd                             SEQUENCE {
                dl-CommonInformation            DL-CommonInformation        OPTIONAL,
                dl-PDSCH-Information            DL-PDSCH-Information        OPTIONAL,
                cpch-SetInfo                    CPCH-SetInfo                OPTIONAL
            },
            tdd                             NULL
        },
        dl-InformationPerRL-List        DL-InformationPerRL-List,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER RECONFIGURATION COMPLETE
--
-- ***************************************************

RadioBearerReconfigurationComplete ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
        -- TABULAR: UL-TimingAdvance is applicable for TDD mode only.
        ul-TimingAdvance                UL-TimingAdvance                    OPTIONAL,
    -- Radio bearer IEs
```

```
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfo               OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER RECONFIGURATION FAILURE
--
-- ***************************************************

RadioBearerReconfigurationFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Radio bearer IEs
        potentiallySuccesfulBearerList  RB-IdentityList                     OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER RELEASE
--
-- ***************************************************

RadioBearerRelease ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        activationTime                  ActivationTime                      OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
    -- Core network IEs
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- Radio bearer IEs
        rb-InformationReleaseList       RB-InformationReleaseList,
        rb-InformationAffectedList      RB-InformationAffectedList          OPTIONAL,
    -- Transport channel IEs
        ul-CommonTransChInfo            UL-CommonTransChInfo                OPTIONAL,
        ul-deletedTransChInfoList       UL-DeletedTransChInfoList           OPTIONAL,
        ul-AddReconfTransChInfoList     UL-AddReconfTransChInfoList         OPTIONAL,
        modeSpecificTransChInfo         CHOICE {
            fdd                             SEQUENCE {
                cpch-SetID                      CPCH-SetID                  OPTIONAL,
                addReconfTransChDRAC-Info       DRAC-StaticInformationList  OPTIONAL
            },
            tdd                             NULL
        }                                                                   OPTIONAL,
        dl-CommonTransChInfo            DL-CommonTransChInfo                OPTIONAL,
        dl-DeletedTransChInfoList       DL-DeletedTransChInfoList           OPTIONAL,
        dl-AddReconfTransChInfoList     DL-AddReconfTransChInfo2List        OPTIONAL,
    -- Physical channel IEs
        frequencyInfo                   FrequencyInfo                       OPTIONAL,
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
        ul-ChannelRequirement           UL-ChannelRequirement               OPTIONAL,
        modeSpecificPhysChInfo          CHOICE {
            fdd                             SEQUENCE {
                dl-CommonInformation            DL-CommonInformation        OPTIONAL,
                dl-PDSCH-Information            DL-PDSCH-Information        OPTIONAL,
                cpch-SetInfo                    CPCH-SetInfo                OPTIONAL
            },
            tdd                         NULL
        },
        dl-InformationPerRL-List        DL-InformationPerRL-List            OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER RELEASE COMPLETE
--
-- ***************************************************
```

```
RadioBearerReleaseComplete ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
        -- TABULAR: UL-TimingAdvance is applicable for TDD mode only.
        ul-TimingAdvance                UL-TimingAdvance                    OPTIONAL,
    -- Radio bearer IEs
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfo               OPTIONAL,
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER RELEASE FAILURE
--
-- ***************************************************

RadioBearerReleaseFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Radio bearer IEs
        potentiallySuccesfulBearerList  RB-IdentityList                     OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER SETUP
--
-- ***************************************************

RadioBearerSetup ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        activationTime                  ActivationTime                      OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
    -- Core network IEs
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- Radio bearer IEs
        srb-InformationSetupList        SRB-InformationSetupList            OPTIONAL,
        rab-InformationSetupList        RAB-InformationSetupList,
        rb-InformationAffectedList      RB-InformationAffectedList          OPTIONAL,
    -- Transport channel IEs
        ul-CommonTransChInfo            UL-CommonTransChInfo                OPTIONAL,
        ul-deletedTransChInfoList       UL-DeletedTransChInfoList           OPTIONAL,
        ul-AddReconfTransChInfoList     UL-AddReconfTransChInfoList         OPTIONAL,
        modeSpecificTransChInfo         CHOICE {
            fdd                             SEQUENCE {
                cpch-SetID                      CPCH-SetID                  OPTIONAL,
                addReconfTransChDRAC-Info       DRAC-StaticInformationList  OPTIONAL
            },
            tdd                             NULL
        }                                                                   OPTIONAL,
        dl-CommonTransChInfo            DL-CommonTransChInfo                OPTIONAL,
        dl-DeletedTransChInfoList       DL-DeletedTransChInfoList           OPTIONAL,
        dl-AddReconfTransChInfoList     DL-AddReconfTransChInfoList         OPTIONAL,
    -- Physical channel IEs
        frequencyInfo                   FrequencyInfo                       OPTIONAL,
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
        ul-ChannelRequirement           UL-ChannelRequirement               OPTIONAL,
        modeSpecificPhysChInfo          CHOICE {
            fdd                             SEQUENCE {
                dl-CommonInformation            DL-CommonInformation        OPTIONAL,
                dl-PDSCH-Information            DL-PDSCH-Information        OPTIONAL,
                cpch-SetInfo                    CPCH-SetInfo                OPTIONAL
            },
            tdd                             NULL
        },
        dl-InformationPerRL-List        DL-InformationPerRL-List            OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
```

```
}

-- ***************************************************
--
-- RADIO BEARER SETUP COMPLETE
--
-- ***************************************************

RadioBearerSetupComplete ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
        -- TABULAR: UL-TimingAdvance is applicable for TDD mode only.
        ul-TimingAdvance                UL-TimingAdvance                    OPTIONAL,
        hyperFrameNumber                HyperFrameNumber                    OPTIONAL,
    -- Radio bearer IEs
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfo               OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER SETUP FAILURE
--
-- ***************************************************

RadioBearerSetupFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Radio bearer IEs
        potentiallySuccesfulBearerList  RB-IdentityList                     OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RNTI REALLOCATION
--
-- ***************************************************

RNTIReallocation ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
    -- CN information elements
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- Radio bearer IEs
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RNTI REALLOCATION COMPLETE
--
-- ***************************************************

RNTIReallocationComplete ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
    -- Radio bearer IEs
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfo               OPTIONAL,
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RNTI REALLOCATION FAILURE
--
-- ***************************************************
```

```
RNTIReallocationFailure ::= SEQUENCE {
    -- UE information elements
        failureCause                FailureCauseWithProtErr,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions       SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION RE-ESTABLISHMENT
--
-- ***************************************************

RRCConnectionReEstablishment ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        activationTime                  ActivationTime                      OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
        rlc-ResetIndicatorC-plane       BOOLEAN,
        rlc-ResetIndicatorU-plane       BOOLEAN,
    -- Core network IEs
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- Radio bearer IEs
        srb-InformationSetupList        SRB-InformationSetupList            OPTIONAL,
        rab-InformationSetupList        RAB-InformationSetupList            OPTIONAL,
        rb-InformationReleaseList       RB-InformationReleaseList           OPTIONAL,
        rb-InformationReconfigList      RB-InformationReconfigList          OPTIONAL,
        rb-InformationAffectedList      RB-InformationAffectedList          OPTIONAL,
    -- Transport channel IEs
        ul-CommonTransChInfo            UL-CommonTransChInfo                OPTIONAL,
        ul-deletedTransChInfoList       UL-DeletedTransChInfoList           OPTIONAL,
        ul-AddReconfTransChInfoList     UL-AddReconfTransChInfoList         OPTIONAL,
        modeSpecificTransChInfo         CHOICE {
            fdd                             SEQUENCE {
                cpch-SetID                      CPCH-SetID                  OPTIONAL,
                addReconfTransChDRAC-Info       DRAC-StaticInformationList  OPTIONAL
            },
            tdd                             NULL
        },
        dl-CommonTransChInfo            DL-CommonTransChInfo                OPTIONAL,
        dl-DeletedTransChInfoList       DL-DeletedTransChInfoList           OPTIONAL,
        dl-AddReconfTransChInfoList     DL-AddReconfTransChInfoList         OPTIONAL,
    -- Physical channel IEs
        frequencyInfo                   FrequencyInfo                       OPTIONAL,
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
        ul-ChannelRequirement           UL-ChannelRequirement               OPTIONAL,
        modeSpecificPhysChInfo          CHOICE {
            fdd                             SEQUENCE {
                dl-CommonInformation            DL-CommonInformation        OPTIONAL,
                dl-PDSCH-Information            DL-PDSCH-Information        OPTIONAL,
                cpch-SetInfo                    CPCH-SetInfo                OPTIONAL
            },
            tdd                             NULL
        },
        dl-InformationPerRL-List        DL-InformationPerRL-List            OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION RE-ESTABLISHMENT for CCCH
--
-- ***************************************************

RRCConnectionReEstablishment-CCCH ::= SEQUENCE {
    -- User equipment IEs
        u-RNTI                          U-RNTI,
    -- The rest of the message is identical to the one sent on DCCH.
        rrcConnectionReEstablishment    RRCConnectionReEstablishment
}
```

```
-- ***************************************************
--
-- RRC CONNECTION RE-ESTABLISHMENT COMPLETE
--
-- ***************************************************

RRCConnectionReEstablishmentComplete ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
        -- TABULAR: UL-TimingAdvance is applicable for TDD mode only.
        ul-TimingAdvance                UL-TimingAdvance                    OPTIONAL,
        hyperFrameNumber                HyperFrameNumber,
    -- Radio bearer IEs
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfo               OPTIONAL,
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION RE-ESTABLISHMENT REQUEST
--
-- ***************************************************

RRCConnectionReEstablishmentRequest ::= SEQUENCE {
    -- User equipment IEs
        u-RNTI                          U-RNTI,
        hyperFrameNumber                HyperFrameNumber,
        am-RLC-ErrorIndicationC-plane   BOOLEAN,
        am-RLC-ErrorIndicationU-plane   BOOLEAN,
        protocolErrorIndicator          ProtocolErrorIndicatorWithInfo,
        -- TABULAR: The IE above is MD in tabular, but making a 2-way choice
        -- optional wastes one bit (using PER) and produces no additional
        -- information.
    -- Measurement IEs
        measuredResultsOnRACH           MeasuredResultsOnRACH               OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION REJECT
--
-- ***************************************************

RRCConnectionReject ::= SEQUENCE {
    -- User equipment IEs
        initialUE-Identity              InitialUE-Identity,
        rejectionCause                  RejectionCause,
        waitTime                        WaitTime,
        redirectionInfo                 RedirectionInfo                     OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION RELEASE
--
-- ***************************************************

RRCConnectionRelease ::= SEQUENCE {
    -- User equipment IEs
        rrc-MessageTX-Count             RRC-MessageTX-Count                 OPTIONAL,
        -- The IE above is conditional on the UE state.
        releaseCause                    ReleaseCause,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION RELEASE for CCCH
--
```

```
-- ***************************************************

RRCConnectionRelease-CCCH ::= SEQUENCE {
    -- User equipment IEs
        u-RNTI                          U-RNTI,
    -- The rest of the message is identical to the one sent on DCCH.
        rrcConnectionRelease            RRCConnectionRelease
}

-- ***************************************************
--
-- RRC CONNECTION RELEASE COMPLETE
--
-- ***************************************************

RRCConnectionReleaseComplete ::= SEQUENCE {
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION RELEASE COMPLETE for CCCH
--
-- ***************************************************

RRCConnectionReleaseComplete-CCCH ::= SEQUENCE {
    -- User equipment IEs
        u-RNTI                          U-RNTI,
    -- The rest of the message is identical to the one sent on DCCH.
        rrcConnectionReleaseComplete    RRCConnectionReleaseComplete
}

-- ***************************************************
--
-- RRC CONNECTION REQUEST
--
-- ***************************************************

RRCConnectionRequest ::= SEQUENCE {
    -- User equipment IEs
        initialUE-Identity              InitialUE-Identity,
        establishmentCause              EstablishmentCause,
        protocolErrorIndicator          ProtocolErrorIndicator,
        -- The IE above is MD, but for compactness reasons no default value
        -- has been assigned to it.
    -- Measurement IEs
        measuredResultsOnRACH           MeasuredResultsOnRACH               OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION SETUP
--
-- ***************************************************

RRCConnectionSetup ::= SEQUENCE {
    -- User equipment IEs
        initialUE-Identity              InitialUE-Identity,
        activationTime                  ActivationTime                      OPTIONAL,
        new-U-RNTI                      U-RNTI,
        new-c-RNTI                      C-RNTI                              OPTIONAL,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient,
        capabilityUpdateRequirement     CapabilityUpdateRequirement         OPTIONAL,
        -- TABULAR: If the IE is not present, the default value defined in 10.3.3.2 shall
        -- be used.
    -- Radio bearer IEs
        srb-InformationSetupList        SRB-InformationSetupList2,
    -- Transport channel IEs
        ul-CommonTransChInfo            UL-CommonTransChInfo                OPTIONAL,
        ul-AddReconfTransChInfoList     UL-AddReconfTransChInfoList,
        dl-CommonTransChInfo            DL-CommonTransChInfo                OPTIONAL,
        dl-AddReconfTransChInfoList     DL-AddReconfTransChInfoList,
    -- Physical channel IEs
        frequencyInfo                   FrequencyInfo                       OPTIONAL,
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
```

```
        ul-ChannelRequirement           UL-ChannelRequirement               OPTIONAL,
        modeSpecificInfo                CHOICE {
            fdd                             SEQUENCE {
                dl-CommonInformation            DL-CommonInformation        OPTIONAL
            },
            tdd                             NULL
        },
        dl-InformationPerRL-List        DL-InformationPerRL-List            OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION SETUP COMPLETE
--
-- ***************************************************

RRCConnectionSetupComplete ::= SEQUENCE {
    -- User equipment IEs
        startList                       STARTList,
        ue-RadioAccessCapability        UE-RadioAccessCapability,
        ue-SystemSpecificCapability     InterSystemMessage                  OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC STATUS
--
-- ***************************************************

RRCStatus ::= SEQUENCE {
    -- Other IEs
        protocolErrorInformation        ProtocolErrorInformation,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- SECURITY MODE COMMAND
--
-- ***************************************************

SecurityModeCommand ::= SEQUENCE {
    -- User equipment IEs
        cipheringAlgorithm              SecurityCapability,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
    -- Core network IEs
        cn-DomainIdentity               CN-DomainIdentity,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- SECURITY MODE COMPLETE
--
-- ***************************************************

SecurityModeComplete ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
    -- Radio bearer IEs
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfoList           OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- SECURITY MODE FAILURE
--
```

```
-- ***************************************************

SecurityModeFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- SIGNALLING CONNECTION RELEASE
--
-- ***************************************************

SignallingConnectionRelease ::= SEQUENCE {
    -- Core network IEs
        signallingFlowInfoList          SignallingFlowInfoList,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}


-- ***************************************************
--
-- SIGNALLING CONNECTION RELEASE REQUEST
--
-- ***************************************************

SignallingConnectionReleaseRequest ::= SEQUENCE {
    -- Core network IEs
        signallingFlowInfoList          SignallingFlowInfoList,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL}

-- ***************************************************
--
-- SYSTEM INFORMATION for BCH
--
-- ***************************************************

SystemInformation-BCH ::= SEQUENCE {
    -- Other information elements
        sfn-Prime                       SFN-Prime,
        payload                         CHOICE {
            noSegment                       NULL,
            firstSegment                    FirstSegment,
            subsequentSegment               SubsequentSegment,
            lastSegment                     LastSegment,
            lastAndFirst                    SEQUENCE {
                lastSegment                     LastSegment,
                firstSegment                    FirstSegmentShort
            },
            lastAndComplete                 SEQUENCE {
                completeSIB-List                CompleteSIB-List,
                lastSegment                     LastSegment
            },
            lastAndCompleteAndFirst         SEQUENCE {
                lastSegment                     LastSegment,
                completeSIB-List                CompleteSIB-List,
                firstSegment                    FirstSegmentShort
            },
            completeSIB-List                CompleteSIB-List,
            completeAndFirst                SEQUENCE {
                completeSIB-List                CompleteSIB-List,
                firstSegment                    FirstSegmentShort
            }
        }
}

-- ***************************************************
--
-- SYSTEM INFORMATION for FACH
--
-- ***************************************************

SystemInformation-FACH ::= SEQUENCE {
```

```
    -- Other information elements
        payload                         CHOICE {
            noSegment                       NULL,
            firstSegment                    FirstSegment,
            subsequentSegment               SubsequentSegment,
            lastSegment                     LastSegment,
            lastAndFirst                    SEQUENCE {
                lastSegment                     LastSegment,
                firstSegment                    FirstSegmentShort
            },
            lastAndComplete                 SEQUENCE {
                completeSIB-List                CompleteSIB-List,
                lastSegment                     LastSegment
            },
            lastAndCompleteAndFirst         SEQUENCE {
                lastSegment                     LastSegment,
                completeSIB-List                CompleteSIB-List,
                firstSegment                    FirstSegmentShort
            },
            completeSIB-List                CompleteSIB-List,
            completeAndFirst                SEQUENCE {
                completeSIB-List                CompleteSIB-List,
                firstSegment                    FirstSegmentShort
            }
        }
}

-- ***************************************************
--
-- First segment
--
-- ***************************************************

FirstSegment ::=                    SEQUENCE {
    -- Other information elements
        sib-Type                        SIB-Type,
        seg-Count                       SegCount,
        sib-Data-fixed                  SIB-Data-fixed
}

-- ***************************************************
--
-- First segment (short)
--
-- ***************************************************

FirstSegmentShort ::=               SEQUENCE {
    -- Other information elements
        sib-Type                        SIB-Type,
        seg-Count                       SegCount,
        sib-Data-variable               SIB-Data-variable
}

-- ***************************************************
--
-- Subsequent segment
--
-- ***************************************************

SubsequentSegment ::=               SEQUENCE {
    -- Other information elements
        sib-Type                        SIB-Type,
        segmentIndex                    SegmentIndex,
        sib-Data-fixed                  SIB-Data-fixed
}

-- ***************************************************
--
-- Last segment
--
-- ***************************************************

LastSegment ::=                     SEQUENCE {
    -- Other information elements
        sib-Type                        SIB-Type,
        segmentIndex                    SegmentIndex,
        sib-Data-variable               SIB-Data-variable
}
```

```
-- ***************************************************
--
-- Complete SIB
--
-- ***************************************************

CompleteSIB-List ::=                SEQUENCE (SIZE (1..maxSIBsegm)) OF
                                        CompleteSIB

CompleteSIB ::=                     SEQUENCE {
    -- Other information elements
        sib-Type                        SIB-Type,
        sib-Data-variable               SIB-Data-variable
}

-- ***************************************************
--
-- SYSTEM INFORMATION CHANGE INDICATION
--
-- ***************************************************

SystemInformationChangeIndication ::=   SEQUENCE {
    -- Other IEs
        bcch-ModificationInfo               BCCH-ModificationInfo,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- TRANSPORT CHANNEL RECONFIGURATION
--
-- ***************************************************

TransportChannelReconfiguration ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        activationTime                  ActivationTime                      OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
    -- Core network IEs
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- Radio bearer IEs
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Transport channel IEs
        ul-CommonTransChInfo            UL-CommonTransChInfo                OPTIONAL,
        ul-AddReconfTransChInfoList     UL-AddReconfTransChInfoList,
        modeSpecificTransChInfo         CHOICE {
            fdd                             SEQUENCE {
                cpch-SetID                      CPCH-SetID                  OPTIONAL,
                addReconfTransChDRAC-Info       DRAC-StaticInformationList  OPTIONAL
            },
            tdd                             NULL
        }                                                                   OPTIONAL,
        dl-CommonTransChInfo            DL-CommonTransChInfo                OPTIONAL,
        dl-AddReconfTransChInfoList     DL-AddReconfTransChInfoList,
    -- Physical channel IEs
        frequencyInfo                   FrequencyInfo                       OPTIONAL,
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
        ul-ChannelRequirement           UL-ChannelRequirement               OPTIONAL,
        modeSpecificPhysChInfo          CHOICE {
            fdd                             SEQUENCE {
                dl-CommonInformation            DL-CommonInformation        OPTIONAL,
                dl-PDSCH-Information            DL-PDSCH-Information        OPTIONAL,
                cpch-SetInfo                    CPCH-SetInfo                OPTIONAL
            },
            tdd                         NULL
        },
        dl-InformationPerRL-List        DL-InformationPerRL-List            OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}
```

```
-- ***************************************************
--
-- TRANSPORT CHANNEL RECONFIGURATION COMPLETE
--
-- ***************************************************

TransportChannelReconfigurationComplete ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
        -- TABULAR: UL-TimingAdvance is applicable for TDD mode only.
        ul-TimingAdvance                UL-TimingAdvance                    OPTIONAL,
    -- Radio bearer IEs
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfo               OPTIONAL,
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- TRANSPORT CHANNEL RECONFIGURATION FAILURE
--
-- ***************************************************

TransportChannelReconfigurationFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- TRANSPORT FORMAT COMBINATION CONTROL
--
-- ***************************************************

TransportFormatCombinationControl ::= SEQUENCE {
    dpch-TFCS-InUplink                  TFC-Subset,
    tfc-ControlDuration                 TFC-ControlDuration                 OPTIONAL,
    -- The information element is not included when transmitting the message
    -- on the transparent mode signalling DCCH and is optional otherwise
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- TRANSPORT FORMAT COMBINATION CONTROL FAILURE
--
-- ***************************************************

TransportFormatCombinationControlFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- UE CAPABILITY ENQUIRY
--
-- ***************************************************

UECapabilityEnquiry ::= SEQUENCE {
    -- User equipment IEs
        capabilityUpdateRequirement     CapabilityUpdateRequirement,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- UE CAPABILITY INFORMATION
--
-- ***************************************************
```

```
UECapabilityInformation ::= SEQUENCE {
    -- User equipment IEs
        ue-RadioAccessCapability        UE-RadioAccessCapability            OPTIONAL,
    -- Other IEs
        ue-SystemSpecificCapability     InterSystemMessage                  OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- UE CAPABILITY INFORMATION CONFIRM
--
-- ***************************************************

UECapabilityInformationConfirm ::= SEQUENCE {
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- UPLINK DIRECT TRANSFER
--
-- ***************************************************

UplinkDirectTransfer ::= SEQUENCE {
    -- Core network IEs
        flowIdentifier                  FlowIdentifier,
        nas-Message                     NAS-Message,
    -- Measurement IEs
        measuredResultsOnRACH           MeasuredResultsOnRACH               OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- UPLINK PHYSICAL CHANNEL CONTROL
--
-- ***************************************************

UplinkPhysicalChannelControl ::= SEQUENCE {
    -- Physical channel IEs
        ccTrCH-PowerControlInfo         CCTrCH-PowerControlInfo             OPTIONAL,
        timingAdvance                   UL-TimingAdvance                    OPTIONAL,
        individualTS-InterferenceList   IndividualTS-InterferenceList       OPTIONAL,
        prach-ConstantValue             ConstantValue                       OPTIONAL,
        dpch-ConstantValue              ConstantValue                       OPTIONAL,
        pusch-ConstantValue             ConstantValue                       OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- URA UPDATE
--
-- ***************************************************

URAUpdate ::= SEQUENCE {
    -- User equipment IEs
        u-RNTI                          U-RNTI,
        ura-UpdateCause                 URA-UpdateCause,
        protocolErrorIndicator          ProtocolErrorIndicatorWithInfo,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- URA UPDATE CONFIRM
--
-- ***************************************************
```

```
URAUpdateConfirm ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
    -- CN information elements
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- UTRAN mobility IEs
        ura-Identity                    URA-Identity                        OPTIONAL,
    -- Radio bearer IEs
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- URA UPDATE CONFIRM for CCCH
--
-- ***************************************************

URAUpdateConfirm-CCCH ::= SEQUENCE {
    -- User equipment IEs
        u-RNTI                          U-RNTI,
    -- The rest of the message is identical to the one sent on DCCH.
        uraUpdateConfirm                URAUpdateConfirm
}

END
```

11.3 Information element definitions

11.3.1 Core network information elements

```
CoreNetwork-IEs DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    CN-DRX-CycleLengthCoefficient
FROM UserEquipment-IEs

    Min-P-REV,
    NAS-SystemInformationANSI-41,
    NID,
    P-REV,
    SID
FROM ANSI-41-IEs

    maxCNdomains,
    maxSignallingFlow
FROM Constant-definitions;

CN-DomainIdentity ::=               ENUMERATED {
                                        cs-domain,
                                        ps-domain,
                                        not-important,
                                        spare1 }

CN-DomainInformation ::=            SEQUENCE {
    cn-DomainIdentity                   CN-DomainIdentity,
    cn-DomainSpecificNAS-Info           NAS-SystemInformationGSM-MAP
}

CN-DomainInformationList ::=        SEQUENCE (SIZE (1..maxCNdomains)) OF
                                        CN-DomainInformation

CN-DomainSysInfo ::=                SEQUENCE {
    cn-DomainIdentity                   CN-DomainIdentity,
    cn-Type                             CHOICE {
        gsm-MAP                             NAS-SystemInformationGSM-MAP,
```

```
        ansi-41                             NAS-SystemInformationANSI-41
    },
    cn-DRX-CycleLengthCoeff             CN-DRX-CycleLengthCoefficient
}

CN-DomainSysInfoList ::=            SEQUENCE (SIZE (1..maxCNdomains)) OF
                                        CN-DomainSysInfo

CN-InformationInfo ::=              SEQUENCE {
    plmn-Identity                       PLMN-Identity                   OPTIONAL,
    cn-CommonGSM-MAP-NAS-SysInfo        NAS-SystemInformationGSM-MAP    OPTIONAL,
    cn-DomainInformationList            CN-DomainInformationList        OPTIONAL
}

Digit ::=                           INTEGER (0..9)

FlowIdentifier ::=                  INTEGER (0..63)

IMEI ::=                            SEQUENCE (SIZE (15)) OF
                                        IMEI-Digit

IMEI-Digit ::=                      INTEGER (0..15)

IMSI-GSM-MAP ::=                    SEQUENCE (SIZE (6..15)) OF
                                        Digit

LAI ::=                             SEQUENCE {
    plmn-Identity                       PLMN-Identity,
    lac                                 BIT STRING (SIZE (16))
}

MCC ::=                             SEQUENCE (SIZE (3)) OF
                                        Digit

MNC ::=                             SEQUENCE (SIZE (2..3)) OF
                                        Digit

NAS-Message ::=                     OCTET STRING (SIZE (1..4095))

NAS-SystemInformationGSM-MAP ::=    OCTET STRING (SIZE (1..8))

P-TMSI-GSM-MAP ::=                  BIT STRING (SIZE (32))

PagingRecordTypeID ::=              ENUMERATED {
                                        imsi-GSM-MAP,
                                        tmsi-GSM-MAP-P-TMSI,
                                        imsi-DS-41,
                                        tmsi-DS-41 }

PLMN-Identity ::=                   SEQUENCE {
    mcc                                 MCC,
    mnc                                 MNC
}

PLMN-Type ::=                       CHOICE {
    gsm-MAP                             SEQUENCE {
        plmn-Identity                       PLMN-Identity
    },
    ansi-41                         SEQUENCE {
        p-REV                           P-REV,
        min-P-REV                       Min-P-REV,
        sid                             SID,
        nid                             NID
    },
    gsm-MAP-and-ANSI-41             SEQUENCE {
        plmn-Identity                   PLMN-Identity,
        p-REV                           P-REV,
        min-P-REV                       Min-P-REV,
        sid                             SID,
        nid                             NID
    },
    spare                           NULL
}

RAB-Identity ::=                    CHOICE {
    gsm-MAP-RAB-Identity                BIT STRING (SIZE (8)),
    ansi-41-RAB-Identity                BIT STRING (SIZE (8))
}
```

```
RAI ::=                             SEQUENCE {
    lai                                 LAI,
    rac                                 RoutingAreaCode
}

RoutingAreaCode ::=                 BIT STRING (SIZE (8))

ServiceDescriptor ::=               CHOICE {
    gsm-MAP                             BIT STRING (SIZE (4)),
    ansi-41                             BIT STRING (SIZE (4))
}

SignallingFlowInfoList ::=          SEQUENCE (SIZE (1..maxSignallingFlow)) OF
                                        FlowIdentifier

TMSI-GSM-MAP ::=                    BIT STRING (SIZE (32))

END
```

11.3.2 UTRAN mobility information elements

```
UTRANMobility-IEs DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    MaxAllowedUL-TX-Power
FROM PhysicalChannel-IEs

    HCS-ServingCellInformation,
    Q-QualMin,
    Q-RxlevMin
FROM Measurement-IEs

    maxAC,
    maxMeasIntervals,
    maxOtherRAT,
    maxRAT,
    maxURA
FROM Constant-definitions;

AccessClassBarred ::=               ENUMERATED {
                                        barred, notBarred }

AccessClassBarredList ::=           SEQUENCE (SIZE (maxAC)) OF
                                        AccessClassBarred

AllowedIndicator ::=                ENUMERATED {
                                        allowed, notAllowed }

CellAccessRestriction ::=           SEQUENCE {
    cellBarred                          CellBarred,
    cellReservedForOperatorUse          ReservedIndicator,
    cellReservedForSOLSA                ReservedIndicator,
    accessClassBarredList               AccessClassBarredList               OPTIONAL
}

CellBarred ::=                      CHOICE {
    barred                              SEQUENCE {
        intraFreqCellReselectionInd         AllowedIndicator,
        t-Barred                            T-Barred
    },
    notBarred                           NULL
}

CellIdentity ::=                    BIT STRING (SIZE (28))

CellSelectQualityMeasure ::=        ENUMERATED {
                                        cpich-Ec-N0, cpich-RSCP }

CellSelectReselectInfoSIB-3-4 ::=   SEQUENCE {
    mappingInfo                         MappingInfo                         OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            cellSelectQualityMeasure            CellSelectQualityMeasure,
            s-Intrasearch                       S-SearchFDD                 OPTIONAL,
```

```
            s-Intersearch                       S-SearchFDD                 OPTIONAL,
            s-SearchHCS                         S-SearchFDD                 OPTIONAL,
            rat-List                            RAT-FDD-InfoList            OPTIONAL,
            q-QualMin                           Q-QualMin                   OPTIONAL,
            q-RxlevMin                          Q-RxlevMin                  OPTIONAL
        },
        tdd                                 SEQUENCE {
            s-Intrasearch                       S-SearchTDD                 OPTIONAL,
            s-Intersearch                       S-SearchTDD                 OPTIONAL,
            s-SearchHCS                         S-SearchTDD                 OPTIONAL,
            rat-List                            RAT-TDD-InfoList            OPTIONAL,
            q-RxlevMin                          Q-RxlevMin                  OPTIONAL
        }
    },  q-Hyst-S                            Q-Hyst-S,
    t-Reselection-S                     T-Reselection-S,
    hcs-ServingCellInformation          HCS-ServingCellInformation          OPTIONAL,
    maxAllowedUL-TX-Power               MaxAllowedUL-TX-Power
}

MapParameter ::=                    INTEGER (0..99)

Mapping ::=                         SEQUENCE {
    rat                                 RAT,
    mappingFunctionParameterList        MappingFunctionParameterList
}

MappingFunctionParameter ::=        SEQUENCE {
    functionType                        MappingFunctionType,
    mapParameter1                       MapParameter                        OPTIONAL,
    mapParameter2                       MapParameter,
    upperLimit                          UpperLimit                          OPTIONAL
    -- The parameter is conditional on the number of repetition
}

MappingFunctionParameterList ::=    SEQUENCE (SIZE (1..maxMeasIntervals)) OF
                                        MappingFunctionParameter

MappingFunctionType ::=             ENUMERATED {
                                        linear,
                                        functionType2,
                                        functionType3,
                                        functionType4 }

MappingInfo ::=                     SEQUENCE (SIZE (1..maxRAT)) OF
                                        Mapping

-- Actual value = IE value * 2
Q-Hyst-S ::=                        INTEGER (0..20)

RAT ::=                             ENUMERATED {
                                        utra-FDD,
                                        utra-TDD,
                                        gsm,
                                        cdma2000 }

RAT-FDD-Info ::=                    SEQUENCE {
    rat-Identifier                      RAT-Identifier,
    s-SearchRAT                         S-SearchFDD,
    s-HCS-RAT                           S-SearchFDD                         OPTIONAL
}

RAT-FDD-InfoList ::=                SEQUENCE (SIZE (1..maxOtherRAT)) OF
                                        RAT-FDD-Info

RAT-Identifier ::=                  ENUMERATED {
                                        gsm, cdma2000,
                                        spare1, spare2 }

RAT-TDD-Info ::=                    SEQUENCE {
    rat-Identifier                      RAT-Identifier,
    s-SearchRAT                         S-SearchTDD,
    s-HCS-RAT                           S-SearchTDD                         OPTIONAL
}

RAT-TDD-InfoList ::=                SEQUENCE (SIZE (1..maxOtherRAT)) OF
                                        RAT-TDD-Info

ReservedIndicator ::=               ENUMERATED {
```

```
                                        reserved,
                                        notReserved }

-- Actual value = IE value * 2
S-SearchFDD ::=                     INTEGER (-16..10)

-- Actual value = (IE value * 2) + 1
S-SearchTDD ::=                     INTEGER (-53..45)

T-Barred ::=                        ENUMERATED {
                                        s10, s20, s40, s80,
                                        s160, s320, s640, s1280 }

T-Reselection-S ::=                 INTEGER (0..31)

-- The used range depends on the RAT used.
UpperLimit ::=                      INTEGER (1..91)

URA-Identity ::=                    BIT STRING (SIZE (16))

URA-IdentityList ::=                SEQUENCE (SIZE (1..maxURA)) OF
                                        URA-Identity

END
```

11.3.3 User equipment information elements

```
UserEquipment-IEs DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    CN-DomainIdentity,
    IMEI,
    IMSI-GSM-MAP,
    LAI,
    P-TMSI-GSM-MAP,
    RAI,
    TMSI-GSM-MAP
FROM CoreNetwork-IEs

    RB-ActivationTimeInfoList
FROM RadioBearer-IEs

    FrequencyInfo,
    PowerControlAlgorithm
FROM PhysicalChannel-IEs

    InterSystemInfo
FROM Measurement-IEs

    ProtocolErrorInformation
FROM Other-IEs

    maxASC,
    maxCNdomains,
    maxDRACclasses,
    maxFrequencybands,
    maxPage1,
    maxSystemCapability
FROM Constant-definitions;

ActivationTime ::=                  INTEGER (0..255)

BackoffControlParams ::=            SEQUENCE {
    n-AP-RetransMax                     N-AP-RetransMax,
    n-AccessFails                       N-AccessFails,
    nf-BO-NoAICH                        NF-BO-NoAICH,
    ns-BO-Busy                          NS-BO-Busy,
    nf-BO-AllBusy                       NF-BO-AllBusy,
    nf-BO-Mismatch                      NF-BO-Mismatch,
    t-CPCH                              T-CPCH
}

C-RNTI ::=                          BIT STRING (SIZE (16))

CapabilityUpdateRequirement ::=     SEQUENCE {
```

```
    ue-RadioCapabilityUpdateRequirement BOOLEAN,
    systemSpecificCapUpdateReqList      SystemSpecificCapUpdateReqList      OPTIONAL
}

CellUpdateCause ::=                 ENUMERATED {
                                        cellReselection,
                                        periodicCellUpdate,
                                        ul-DataTransmission,
                                        pagingResponse,
                                        rb-ControlResponse,
                                        spare1, spare2, spare3 }

ChipRateCapability ::=              ENUMERATED {
                                        mcps3-84, mcps1-28 }

CipheringAlgorithm ::=              BIT STRING (SIZE (4))

CipheringModeCommand ::=            CHOICE {
    startRestart                        CipheringAlgorithm,
    stopCiphering                       NULL
}

CipheringModeInfo ::=               SEQUENCE {
    cipheringModeCommand                CipheringModeCommand,
    -- TABULAR: The ciphering algorithm is included in
    -- the CipheringModeCommand.
    activationTimeForDPCH               ActivationTime                      OPTIONAL,
    rb-DL-CiphActivationTimeInfo        RB-ActivationTimeInfoList           OPTIONAL
}

CN-DRX-CycleLengthCoefficient ::=   INTEGER (6..12)

CN-PagedUE-Identity ::=             CHOICE {
    imsi-GSM-MAP                        IMSI-GSM-MAP,
    tmsi-GSM-MAP                        TMSI-GSM-MAP,
    p-TMSI-GSM-MAP                      P-TMSI-GSM-MAP,
    imsi-DS-41                          IMSI-DS-41,
    tmsi-DS-41                          TMSI-DS-41,
    spare1                              NULL,
    spare2                              NULL,
    spare3                              NULL
}

CompressedModeMeasCapability ::=    SEQUENCE {
    fdd-Measurements                    BOOLEAN,
    -- TABULAR: The IEs below are made optional since they are conditional based
    -- on another information element. Their absence corresponds to the case where
    -- the condition is not true.
    tdd-Measurements                    BOOLEAN                             OPTIONAL,
    gsm-Measurements                    GSM-Measurements                    OPTIONAL,
    multiCarrierMeasurements            BOOLEAN                             OPTIONAL
}


CPCH-Parameters ::=                 SEQUENCE {
    initialPriorityDelayList            InitialPriorityDelayList            OPTIONAL,
    backoffControlParams                BackoffControlParams,
    powerControlAlgorithm               PowerControlAlgorithm,
    -- TABULAR: TPC step size nested inside PowerControlAlgorithm
    dl-DPCCH-BER                        DL-DPCCH-BER
}

DL-DPCCH-BER ::=                    INTEGER (0..63)

DL-PhysChCapabilityFDD ::=          SEQUENCE {
    maxSimultaneousCCTrCH-Count         MaxSimultaneousCCTrCH-Count,
    maxNoDPCH-PDSCH-Codes               INTEGER (1..8),
    maxNoPhysChBitsReceived             MaxNoPhysChBitsReceived,
    supportForSF-512                    BOOLEAN,
    supportOfPDSCH                      BOOLEAN,
    simultaneousSCCPCH-DPCH-Reception   SimultaneousSCCPCH-DPCH-Reception
}

DL-PhysChCapabilityTDD ::=          SEQUENCE {
    maxSimultaneousCCTrCH-Count         MaxSimultaneousCCTrCH-Count,
    maxTS-PerFrame                      MaxTS-PerFrame,
    maxPhysChPerFrame                   MaxPhysChPerFrame,
    minimumSF                           MinimumSF-DL,
```

```
    supportOfPDSCH                      BOOLEAN
}

DL-TransChCapability ::=            SEQUENCE {
    maxNoBitsReceived                   MaxNoBits,
    maxConvCodeBitsReceived             MaxNoBits,
    turboDecodingSupport                TurboSupport,
    maxSimultaneousTransChs             MaxSimultaneousTransChsDL,
    maxReceivedTransportBlocks          MaxTransportBlocksDL,
    maxNumberOfTFC-InTFCS               MaxNumberOfTFC-InTFCS-DL,
    maxNumberOfTF                       MaxNumberOfTF
}

DRAC-SysInfo ::=                    SEQUENCE {
    transmissionProbability             TransmissionProbability,
    maximumBitRate                      MaximumBitRate
}

DRAC-SysInfoList ::=                SEQUENCE (SIZE (1..maxDRACclasses)) OF
                                        DRAC-SysInfo

DRX-Indicator ::=                   ENUMERATED {
                                        noDRX,
                                        drxWithCellUpdating,
                                        drxWithURA-Updating,
                                        spare1 }

ESN-DS-41 ::=                       BIT STRING (SIZE (32))

EstablishmentCause ::=              ENUMERATED {
                                        originatingConversationalCall,
                                        originatingStreamingCall,
                                        originatingInteractiveCall,
                                        originatingBackgroundCall,
                                        terminatingConversationalCall,
                                        terminatingStreamingCall,
                                        terminatingInteractiveCall,
                                        terminatingBackgroundCall,
                                        emergencyCall,
                                        interSystemCellReselection,
                                        registration,
                                        detach,
                                        sms,
                                        callRe-establishment,
                                        spare1, spare2, spare3, spare4,
                                        spare5, spare6, spare7, spare8,
                                        spare9, spare10, spare11, spare12,
                                        spare13, spare14, spare15, spare16,
                                        spare17, spare18 }

FailureCauseWithProtErr ::=         CHOICE {
    configurationUnacceptable           NULL,
    physicalChannelFailure              NULL,
    incompatibleSimultaneousReconfiguration
                                        NULL,
    protocolError                       ProtocolErrorInformation,
    spare1                              NULL,
    spare2                              NULL,
    spare3                              NULL
}

GSM-Measurements ::=                SEQUENCE {
    gsm900                              BOOLEAN,
    dcs1800                             BOOLEAN,
    gsm1900                             BOOLEAN
}

HyperFrameNumber ::=                BIT STRING (SIZE (20))

ICS-Version ::=                     ENUMERATED {
                                        r99,
                                        spare1, spare2, spare3, spare4,
                                        spare5, spare6, spare7 }

IMSI-and-ESN-DS-41 ::=              SEQUENCE {
    imsi-DS-41                          IMSI-DS-41,
    esn-DS-41                           ESN-DS-41
}
```

```
IMSI-DS-41 ::=                      OCTET STRING (SIZE (5..7))

InitialPriorityDelayList ::=        SEQUENCE (SIZE (maxASC)) OF
                                        NS-IP

InitialUE-Identity ::=              CHOICE {
    imsi                                IMSI-GSM-MAP,
    tmsi-and-LAI                        TMSI-and-LAI-GSM-MAP,
    p-TMSI-and-RAI                      P-TMSI-and-RAI-GSM-MAP,
    imei                                IMEI,
    esn-DS-41                           ESN-DS-41,
    imsi-DS-41                          IMSI-DS-41,
    imsi-and-ESN-DS-41                  IMSI-and-ESN-DS-41,
    tmsi-DS-41                          TMSI-DS-41,
    spare1                              NULL,
    spare2                              NULL,
    spare3                              NULL,
    spare4                              NULL,
    spare5                              NULL,
    spare6                              NULL,
    spare7                              NULL,
    spare8                              NULL
}

IntegrityCheckInfo ::=              SEQUENCE {
    messageAuthenticationCode           MessageAuthenticationCode,
    rrc-MessageSequenceNumber           RRC-MessageSequenceNumber
}

IntegrityProtActivationInfo ::=     SEQUENCE {
    rrc-MessageSequenceNumberList       RRC-MessageSequenceNumberList
}

IntegrityProtectionAlgorithm ::=    BIT STRING (SIZE (4))

IntegrityProtectionModeCommand ::=  CHOICE {
    startIntegrityProtection            SEQUENCE {
        integrityProtInitNumber             IntegrityProtInitNumber
    },
    modify                              SEQUENCE {
        dl-IntegrityProtActivationInfo      IntegrityProtActivationInfo
    },
    spare1                              NULL,
    spare2                              NULL
}

IntegrityProtectionModeInfo ::=     SEQUENCE {
    integrityProtectionModeCommand      IntegrityProtectionModeCommand,
    -- TABULAR: DL integrity protection activation info and Integrity
    -- protection intialisation number have been nested inside
    -- IntegrityProtectionModeCommand.
    integrityProtectionAlgorithm        IntegrityProtectionAlgorithm        OPTIONAL
}

IntegrityProtInitNumber ::=         BIT STRING (SIZE (32))

LCS-Capability ::=                  SEQUENCE {
    standaloneLocMethodsSupported       BOOLEAN,
    ue-BasedOTDOA-Supported             BOOLEAN,
    networkAssistedGPS-Supported        NetworkAssistedGPS-Supported,
    gps-ReferenceTimeCapable            BOOLEAN,
    supportForIDL                       BOOLEAN
}


MaxHcContextSpace ::=                   ENUMERATED  {
                                            by512, by1024, by2048, by4096,
                                            by8192, spare1, spare2, spare3 }


MaximumAM-EntityNumberRLC-Cap ::=   ENUMERATED {
                                        am3, am4, am5, am6,
                                        am8, am16, am32, spare1 }

-- Actual value = IE value * 16
MaximumBitRate ::=                  INTEGER (0..32)
```

```
MaxNoDPDCH-BitsTransmitted ::=      ENUMERATED {
                                        b600, b1200, b2400, b4800,
                                        b9600, b19200, b28800, b38400,
                                        b48000, b57600, spare1, spare2,
                                        spare3, spare4, spare5, spare6 }

MaxNoBits ::=                       ENUMERATED {
                                        b640, b1280, b2560, b3840, b5120,
                                        b6400, b7680, b8960, b10240,
                                        b20480, b40960, b81920, b163840,
                                        spare1, spare2, spare3 }


MaxNoPhysChBitsReceived ::=         ENUMERATED {
                                        b600, b1200, b2400, b3600,
                                        b4800, b7200, b9600, b14400,
                                        b19200, b28800, b38400, b48000,
                                        b57600, b67200, b76800, spare1 }

MaxNoSCCPCH-RL ::=                  ENUMERATED {
                                        rl1, spare1, spare2, spare3,
                                        spare4, spare5, spare6, spare7 }

MaxNumberOfTF ::=                   ENUMERATED {
                                        tf32, tf64, tf128, tf256,
                                        tf512, tf1024, spare1, spare2 }

MaxNumberOfTFC-InTFCS-DL ::=        ENUMERATED {
                                        tfc16, tfc32, tfc48, tfc64, tfc96,
                                        tfc128, tfc256, tfc512, tfc1024,
                                        spare1, spare2, spare3, spare4,
                                        spare5, spare6, spare7 }

MaxNumberOfTFC-InTFCS-UL ::=        ENUMERATED {
                                        tfc4, tfc8, tfc16, tfc32, tfc48, tfc64,
                                        tfc96, tfc128, tfc256, tfc512, tfc1024,
                                        spare1, spare2, spare3, spare4,
                                        spare5 }


-- TABULAR: Used range in Release99 is 1..224, values 225-256 are spare values
MaxPhysChPerFrame ::=               INTEGER (1..256)

MaxPhysChPerTimeslot ::=            ENUMERATED {
                                        ts1, ts2 }

MaxSimultaneousCCTrCH-Count ::=     INTEGER (1..8)

MaxSimultaneousTransChsDL ::=       ENUMERATED {
                                        e4, e8, e16, e32 }

MaxSimultaneousTransChsUL ::=       ENUMERATED {
                                        e2, e4, e8, e16, e32,
                                        spare1, spare2, spare3 }

MaxTransportBlocksDL ::=            ENUMERATED {
                                        tb4, tb8, tb16, tb32, tb48,
                                        tb64, tb96, tb128, tb256, tb512,
                                        spare1, spare2, spare3,
                                        spare4, spare5, spare6 }

MaxTransportBlocksUL ::=            ENUMERATED {
                                        tb2, tb4, tb8, tb16, tb32, tb48,
                                        tb64, tb96, tb128, tb256, tb512,
                                        spare1, spare2, spare3,
                                        spare4, spare5 }

-- TABULAR: Used range in Release99 is 1..14
MaxTS-PerFrame ::=                  INTEGER (1..16)

-- TABULAR: This IE contains dependencies to UE-MultiModeRAT-Capability,
-- the conditional fields have been left mandatory for now.
MeasurementCapability ::=           SEQUENCE {
    downlinkCompressedMode              CompressedModeMeasCapability,
    uplinkCompressedMode                CompressedModeMeasCapability
}
```

```
MessageAuthenticationCode ::=       BIT STRING (SIZE (32))

MinimumSF-DL ::=                    ENUMERATED {
                                        sf1, sf16 }

MinimumSF-UL ::=                    ENUMERATED {
                                        sf1, sf2, sf4, sf8, sf16,
                                        spare1, spare2, spare3 }

MultiModeCapability ::=             ENUMERATED {
                                        tdd, fdd, fdd-tdd }


MultiRAT-Capability ::=             SEQUENCE {
    supportOfGSM                        BOOLEAN,
    supportOfMulticarrier               BOOLEAN
}
N-300 ::=                           INTEGER (1..8)

N-302 ::=                           INTEGER (1..8)

N-303 ::=                           INTEGER (1..8)

N-304 ::=                           INTEGER (1..8)

N-310 ::=                           INTEGER (1..8)

N-312 ::=                           ENUMERATED {
                                        s1, s50, s100, s200, s400,
                                        s600, s800, s1000 }

N-313 ::=                           ENUMERATED {
                                        s1, s50, s100, s200, s400,
                                        s600, s800, s1000 }

N-315 ::=                           ENUMERATED {
                                        s1, s50, s100, s200, s400,
                                        s600, s800, s1000 }

N-AccessFails ::=                   INTEGER (1..64)

N-AP-RetransMax ::=                 INTEGER (1..64)

NetworkAssistedGPS-Supported ::=    ENUMERATED {
                                        networkBased,
                                        ue-Based,
                                        bothNetworkAndUE-Based,
                                        noNetworkAssistedGPS }

NF-BO-AllBusy ::=                   INTEGER (0..31)

NF-BO-NoAICH ::=                    INTEGER (0..31)

NF-BO-Mismatch ::=                  INTEGER (0..127)

NS-BO-Busy ::=                      INTEGER (0..63)

NS-IP ::=                           INTEGER (0..28)

P-TMSI-and-RAI-GSM-MAP ::=          SEQUENCE {
    p-TMSI                              P-TMSI-GSM-MAP,
    rai                                 RAI
}


PagingCause ::=                     ENUMERATED {
                                        terminatingConversationalCall,
                                        terminatingStreamingCall,
                                        terminatingInteractiveCall,
                                        terminatingBackgroundCall,
                                        sms,
                                        spare1, spare2, spare3, spare4 }

PagingRecord ::=                    CHOICE {
    cn-Page                             SEQUENCE {
        pagingCause                         PagingCause,
        cn-DomainIdentity                   CN-DomainIdentity,
        cn-pagedUE-Identity                 CN-PagedUE-Identity
```

```
    },
    utran-Page                          U-RNTI
}

PagingRecordList ::=                SEQUENCE (SIZE (1..maxPage1)) OF
                                        PagingRecord


PDCP-Capability ::=                 SEQUENCE {
    losslessSRNS-RelocationSupport      BOOLEAN,
    supportForRfc2507                   CHOICE {
        notSupported                        NULL,
        supported                           MaxHcContextSpace
    }
}

PhysicalChannelCapability ::=       SEQUENCE {
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            downlinkPhysChCapability            DL-PhysChCapabilityFDD,
            uplinkPhysChCapability              UL-PhysChCapabilityFDD
        },
        tdd                                 SEQUENCE {
            downlinkPhysChCapability            DL-PhysChCapabilityTDD,
            uplinkPhysChCapability              UL-PhysChCapabilityTDD
        }
    }
}

ProtocolErrorCause ::=              ENUMERATED {
                                        asn1-ViolationOrEncodingError,
                                        messageTypeNonexistent,
                                        messageNotCompatibleWithReceiverState,
                                        ie-ValueNotComprehended,
                                        conditionalInformationElementError,
                                        messageExtensionNotComprehended,
                                        spare1, spare2 }

ProtocolErrorIndicator ::=          ENUMERATED {
                                        noError, errorOccurred }

ProtocolErrorIndicatorWithInfo ::= CHOICE {
    noError                             NULL,
    errorOccurred                       ProtocolErrorInformation
}

RadioFrequencyBand ::=              ENUMERATED {
                                        a, b, c,
                                        spare1 }

RadioFrequencyBandList ::=          SEQUENCE (SIZE (1..maxFrequencybands)) OF
                                        RadioFrequencyBand


Re-EstablishmentTimer ::=           CHOICE {
    t-314                               T-314Value,
    t-315                               T-315Value
}

RedirectionInfo ::=                 CHOICE {
    frequencyInfo                       FrequencyInfo,
    interSystemInfo                     InterSystemInfo,
    spare                               NULL
}

RejectionCause ::=                  ENUMERATED {
                                        congestion,
                                        unspecified,
                                        spare1, spare2 }

ReleaseCause ::=                    ENUMERATED {
                                        normalEvent,
                                        unspecified,
                                        pre-emptiveRelease,
                                        congestion,
                                        re-establishmentReject,
                                        spare1, spare2, spare3 }
```

```
RF-Capability ::=                   SEQUENCE {
    modeSpecificInfo                    CHOICE {
        fdd                             SEQUENCE {
            ue-PowerClass                   UE-PowerClass,
            txRxFrequencySeparation         TxRxFrequencySeparation
        },
        tdd                         SEQUENCE {
            ue-PowerClass               UE-PowerClass,
            radioFrequencyBandList      RadioFrequencyBandList,
            chipRateCapability          ChipRateCapability
        }
    }
}


RLC-Capability ::=                  SEQUENCE {
    totalRLC-AM-BufferSize              TotalRLC-AM-BufferSize,
    maximumAM-EntityNumber              MaximumAM-EntityNumberRLC-Cap
}

RRC-MessageSequenceNumber ::=       INTEGER (0..15)


RRC-MessageSequenceNumberList ::=   SEQUENCE (SIZE (4..5)) OF
                                        RRC-MessageSequenceNumber

RRC-MessageTX-Count ::=             INTEGER (1..8)

S-RNTI ::=                          BIT STRING (SIZE (20))

S-RNTI-2 ::=                        INTEGER (0..1023)

SecurityCapability ::=              SEQUENCE {
    cipheringAlgorithm                  BIT STRING (SIZE (16)),
    integrityProtectionAlgorithm        BIT STRING (SIZE (16))
}


SimultaneousSCCPCH-DPCH-Reception ::= CHOICE {
    notSupported                        NULL,
    supported                           SEQUENCE {
        maxNoSCCPCH-RL                      MaxNoSCCPCH-RL,
        simultaneousSCCPCH-DPCH-DPDCH-Reception
                                            BOOLEAN
        -- The IE above is applicable only if IE Support of PDSCH = TRUE
    }
}

SRNC-Identity ::=                   BIT STRING (SIZE (12))


STARTList ::=                       SEQUENCE (SIZE (1..maxCNdomains)) OF
                                        STARTSingle


STARTSingle ::=                     SEQUENCE {
    cn-DomainIdentity                   CN-DomainIdentity,
    startValue                          HyperFrameNumber
}

SystemSpecificCapUpdateReq ::=      ENUMERATED {
                                        gsm, spare1, spare2, spare3,
                                        spare4, spare5, spare6, spare7,
                                        spare8, spare9, spare10, spare11,
                                        spare12, spare13, spare14, spare15 }

SystemSpecificCapUpdateReqList ::= SEQUENCE (SIZE (1..maxSystemCapability)) OF
                                        SystemSpecificCapUpdateReq

T-300 ::=                           INTEGER (1..8)

T-301 ::=                           INTEGER (1..8)

T-302 ::=                           INTEGER (1..8)

T-303 ::=                           INTEGER (1..8)

T-304 ::=                           ENUMERATED {
```

```
                                        ms100, ms200, ms400,
                                        ms1000, ms2000,
                                        spare1, spare2, spare3 }

T-305 ::=                           ENUMERATED {
                                        noUpdate, m5, m10, m30,
                                        m60, m120, m360, m720 }

T-306 ::=                           ENUMERATED {
                                        noUpdate, m5, m10, m30,
                                        m60, m120, m360, m720 }

T-307 ::=                           ENUMERATED {
                                        s5, s10, s15, s20,
                                        s30, s40, s50, spare1 }

T-308 ::=                           ENUMERATED {
                                        ms40, ms80, ms160, ms320 }

T-309 ::=                           INTEGER (1..8)

T-310 ::=                           ENUMERATED {
                                        ms40, ms80, ms120, ms160,
                                        ms200, ms240, ms280, ms320 }

T-311 ::=                           ENUMERATED {
                                        ms250, ms500, ms750, ms1000,
                                        ms1250, ms1500, ms1750, ms2000 }

T-312 ::=                           INTEGER (0..15)

T-313 ::=                           INTEGER (0..15)


T-314 ::=                           ENUMERATED {
                                        s0, s2, s4, s6, s8,
                                        s12, s16, s20 }


T-314Value ::=                      SEQUENCE {
    t-314                               T-314                               OPTIONAL
}


T-315 ::=                           ENUMERATED {
                                        s0, s10, s30, s60, s180,
                                        s600, s1200, s1800 }


T-315Value ::=                      SEQUENCE {
    t-315                               T-315                               OPTIONAL
}

T-CPCH ::=                          ENUMERATED {
                                        ct0, ct1 }

TMSI-and-LAI-GSM-MAP ::=            SEQUENCE {
    tmsi                                TMSI-GSM-MAP,
    lai                                 LAI
}

TMSI-DS-41 ::=                      OCTET STRING (SIZE (2..12))

TotalRLC-AM-BufferSize ::=          ENUMERATED {
                                        kb2, kb10, kb50, kb100,
                                        kb150, kb500, kb1000,
                                        spare1 }

-- Actual value = IE value * 0.125
TransmissionProbability ::=         INTEGER (1..8)

TransportChannelCapability ::=      SEQUENCE {
    dl-TransChCapability                DL-TransChCapability,
    ul-TransChCapability                UL-TransChCapability
}

TurboSupport ::=                    CHOICE {
    notSupported                        NULL,
```

```
    supported                           MaxNoBits
}

TxRxFrequencySeparation ::=         ENUMERATED {
                                        mhz190, mhz174-8-205-2,
                                        mhz134-8-245-2, spare1 }

U-RNTI ::=                          SEQUENCE {
    srnc-Identity                       SRNC-Identity,
    s-RNTI                              S-RNTI
}

U-RNTI-Short ::=                    SEQUENCE {
    srnc-Identity                       SRNC-Identity,
    s-RNTI-2                            S-RNTI-2
}


UE-ConnTimersAndConstants ::=       SEQUENCE {
    t-301                               T-301                               DEFAULT 1,
    t-302                               T-302                               DEFAULT 5,
    n-302                               N-302                               DEFAULT 3,
    t-303                               T-303                               DEFAULT 8,
    n-303                               N-303                               DEFAULT 3,
    t-304                               T-304                               DEFAULT ms2000,
    n-304                               N-304                               DEFAULT 2,
    t-305                               T-305                               DEFAULT m60,
    t-306                               T-306                               DEFAULT m60,
    t-307                               T-307                               DEFAULT s30,
    t-308                               T-308                               DEFAULT ms320,
    t-309                               T-309                               DEFAULT 5,
    t-310                               T-310                               OPTIONAL,
    n-310                               N-310                               OPTIONAL,
    t-311                               T-311                               OPTIONAL,
    t-312                               T-312                               DEFAULT 1,
    n-312                               N-312                               DEFAULT s1,
    t-313                               T-313                               DEFAULT 3,
    n-313                               N-313                               DEFAULT s50,
    t-314                               T-314                               DEFAULT s12,
    t-315                               T-315                               DEFAULT s180,
    n-315                               N-315                               DEFAULT s1
}

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UE-DCHTimersAndConstants ::=        SEQUENCE {
    t-304                               T-304                               DEFAULT ms2000,
    n-304                               N-304                               DEFAULT 2,
    t-308                               T-308                               DEFAULT ms320,
    t-309                               T-309                               DEFAULT 5,
    t-310                               T-310                               OPTIONAL,
    n-310                               N-310                               OPTIONAL,
    t-311                               T-311                               OPTIONAL,
    t-313                               T-313                               DEFAULT 3,
    n-313                               N-313                               DEFAULT s50,
    t-314                               T-314                               DEFAULT s12,
    t-315                               T-315                               DEFAULT s180,
    n-315                               N-315                               DEFAULT s1
}

UE-IdleTimersAndConstants ::=       SEQUENCE {
    t-300                               T-300,
    n-300                               N-300,
    t-312                               T-312,
    n-312                               N-312
}

UE-MultiModeRAT-Capability ::=      SEQUENCE {
    multiRAT-CapabilityList             MultiRAT-Capability,
    multiModeCapability                 MultiModeCapability
}

UE-PowerClass ::=                   INTEGER (1..4)

UE-RadioAccessCapability ::=        SEQUENCE {
    ics-Version                         ICS-Version,
    pdcp-Capability                     PDCP-Capability,
    rlc-Capability                      RLC-Capability,
    transportChannelCapability          TransportChannelCapability,
```

```
    rf-Capability                       RF-Capability,
    physicalChannelCapability           PhysicalChannelCapability,
    ue-MultiModeRAT-Capability          UE-MultiModeRAT-Capability,
    securityCapability                  SecurityCapability,
    lcs-Capability                      LCS-Capability,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            measurementCapability               MeasurementCapability
        },
        tdd                                 NULL
    }
}

UL-PhysChCapabilityFDD ::=          SEQUENCE {
    maxNoDPDCH-BitsTransmitted          MaxNoDPDCH-BitsTransmitted,
    supportOfPCPCH                      BOOLEAN
}

UL-PhysChCapabilityTDD ::=          SEQUENCE {
    maxSimultaneousCCTrCH-Count         MaxSimultaneousCCTrCH-Count,
    maxTS-PerFrame                      MaxTS-PerFrame,
    maxPhysChPerTimeslot                MaxPhysChPerTimeslot,
    minimumSF                           MinimumSF-UL,
    supportOfPUSCH                      BOOLEAN
}

UL-TransChCapability ::=            SEQUENCE {
    maxNoBitsTransmitted                MaxNoBits,
    maxConvCodeBitsTransmitted          MaxNoBits,
    turboDecodingSupport                TurboSupport,
    maxSimultaneousTransChs             MaxSimultaneousTransChsUL,
    maxTransmittedBlocks                MaxTransportBlocksUL,
    maxNumberOfTFC-InTFCS               MaxNumberOfTFC-InTFCS-UL,
    maxNumberOfTF                       MaxNumberOfTF
}

URA-UpdateCause ::=                 ENUMERATED {
                                        changeOfURA,
                                        periodicURAUpdate,
                                        re-enteredServiceArea,
                                        spare1, spare2, spare3,
                                        spare4, spare5 }

UTRAN-DRX-CycleLengthCoefficient ::= INTEGER (3..12)

WaitTime ::=                        INTEGER (0..15)

END
```

11.3.4 Radio bearer information elements

```
RadioBearer-IEs DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    CN-DomainIdentity,
    RAB-Identity
FROM CoreNetwork-IEs

    Re-EstablishmentTimer
FROM UserEquipment-IEs

    PreDefTransChConfiguration,
    TransportChannelIdentity
FROM TransportChannel-IEs

    PreDefPhyChConfiguration
FROM PhysicalChannel-IEs

    maxLoCHperRLC,
    maxPDCPAlgoType,
    maxRABsetup,
    maxRB,
    maxRBallRABs,
    maxRBMuxOptions,
    maxRBperRAB,
```

```
    maxSRBsetup
FROM Constant-definitions;


AlgorithmSpecificInfo ::=           CHOICE {
    rfc2507-Info                        RFC2507-Info,
    spare1                              NULL,
    spare2                              NULL,
    spare3                              NULL,
    spare4                              NULL,
    spare5                              NULL,
    spare6                              NULL,
    spare7                              NULL
}


-- Upper limit is 2^32 - 1
COUNT-C ::=                         INTEGER (0..4294967295)


-- Upper limit is 2^25 - 1
COUNT-C-MSB ::=                     INTEGER (0..33554431)


DL-AM-RLC-Mode ::=                  SEQUENCE {
    inSequenceDelivery                  BOOLEAN,
    receivingWindowSize                 ReceivingWindowSize,
    dl-RLC-StatusInfo                   DL-RLC-StatusInfo
}


DL-LogicalChannelMapping ::=        SEQUENCE {
    -- TABULAR: DL-TransportChannelType contains TransportChannelIdentity as well.
    dl-TransportChannelType             DL-TransportChannelType,
    logicalChannelIdentity              LogicalChannelIdentity              OPTIONAL
}

DL-LogicalChannelMappingList ::=    SEQUENCE (SIZE (1..maxLoCHperRLC)) OF
                                        DL-LogicalChannelMapping


DL-RLC-Mode ::=                     CHOICE {
    dl-AM-RLC-Mode                      DL-AM-RLC-Mode,
    dl-UM-RLC-Mode                      NULL,
    dl-TM-RLC-Mode                      DL-TM-RLC-Mode,
    spare                               NULL
}

DL-RLC-StatusInfo ::=               SEQUENCE {
    timerStatusProhibit                 TimerStatusProhibit                 OPTIONAL,
    timerEPC                            TimerEPC                            OPTIONAL,
    missingPU-Indicator                 BOOLEAN,
    timerStatusPeriodic                 TimerStatusPeriodic                 OPTIONAL
}


DL-TM-RLC-Mode ::=                  SEQUENCE {
    segmentationIndication                  BOOLEAN
}


DL-TransportChannelType ::=         CHOICE {
    dch                                 TransportChannelIdentity,
    fach                                NULL,
    dsch                                TransportChannelIdentity
}

ExpectReordering ::=                ENUMERATED {
                                        reorderingNotExpected,
                                        reorderingExpected }

ExplicitDiscard ::=                 SEQUENCE {
    timerMRW                            TimerMRW,
    timerDiscard                        TimerDiscard,
    maxMRW                              MaxMRW
}

HeaderCompressionInfo ::=           SEQUENCE {
```

```
    algorithmSpecificInfo               AlgorithmSpecificInfo
}

HeaderCompressionInfoList ::=       SEQUENCE (SIZE (1..maxPDCPAlgoType)) OF
                                        HeaderCompressionInfo


LogicalChannelIdentity ::=          INTEGER (1..15)


LogicalChannelMaxLoss ::=           ENUMERATED {
                                        lcm0, lcm5, lcm10, lcm15, lcm20, lcm25,
                                        lcm30, lcm35, lcm40, lcm45, lcm50, lcm55,
                                        lcm60, lcm65, lcm70, lcm75, lcm80, lcm85,
                                        lcm90, lcm95, lcm100 }


LosslessSRNS-RelocSupport ::=       CHOICE {
    supported                           MaxPDCP-SN,
    notSupported                        NULL
}

MAC-LogicalChannelPriority ::=      INTEGER (1..8)

MaxDAT ::=                          ENUMERATED {
                                        dat1, dat2, dat3, dat4, dat5, dat6,
                                        dat7, dat8, dat9, dat10, dat15, dat20,
                                        dat25, dat30, dat35, dat40 }


MaxDAT-Retransmissions ::=          SEQUENCE {
    maxDAT                              MaxDAT,
    timerMRW                            TimerMRW,
    maxMRW                              MaxMRW
}

MaxMRW ::=                          ENUMERATED {
                                        mm1, mm4, mm6, mm8, mm12, mm16,
                                        mm24, mm32, spare1, spare2, spare3,
                                        spare4, spare5, spare6, spare7, spare8 }


MaxPDCP-SN ::=                      ENUMERATED {
                                        sn255, sn65535 }

MaxRST ::=                          ENUMERATED {
                                        rst1, rst4, rst6, rst8, rst12,
                                        rst16, rst24, rst32,
                                        spare1, spare2, spare3, spare4,
                                        spare5, spare6, spare7, spare8 }


NoExplicitDiscard ::=               ENUMERATED {
                                        dt10, dt20, dt30, dt40, dt50,
                                        dt60, dt70, dt80, dt90, dt100 }


PDCP-Info ::=                       SEQUENCE {
    losslessSRNS-RelocSupport           LosslessSRNS-RelocSupport           OPTIONAL,
    pdcp-PDU-Header                     PDCP-PDU-Header,
    -- TABULAR: The IE above is MD in the tabular format and it can be encoded
    -- in one bit, so the OPTIONAL is removed for compactness.
    headerCompressionInfoList           HeaderCompressionInfoList           OPTIONAL
}

PDCP-InfoReconfig ::=               SEQUENCE {
    pdcp-Info                           PDCP-Info,
    pdcp-SN-Info                        PDCP-SN-Info
}

PDCP-PDU-Header ::=                 ENUMERATED {
                                        present, absent }

PDCP-SN-Info ::=                    INTEGER (0..65535)

Poll-PU ::=                         ENUMERATED {
                                        pu1, pu2, pu4, pu8, pu16,
                                        pu32, pu64, pu128,
```

```
                                        spare1, spare2, spare3, spare4,
                                        spare5, spare6, spare7, spare8 }

Poll-SDU ::=                        ENUMERATED {
                                        sdu1, sdu4, sdu16, sdu64,
                                        spare1, spare2, spare3, spare4 }

PollingInfo ::=                     SEQUENCE {
    timerPollProhibit                   TimerPollProhibit                   OPTIONAL,
    timerPoll                           TimerPoll                           OPTIONAL,
    poll-PU                             Poll-PU                             OPTIONAL,
    poll-SDU                            Poll-SDU                            OPTIONAL,
    lastTransmissionPU-Poll             BOOLEAN,
    lastRetransmissionPU-Poll           BOOLEAN,
    pollWindow                          PollWindow                          OPTIONAL,
    timerPollPeriodic                   TimerPollPeriodic                   OPTIONAL
}

PollWindow ::=                      ENUMERATED {
                                        pw50, pw60, pw70, pw80, pw85,
                                        pw90, pw95, pw99,
                                        spare1, spare2, spare3, spare4,
                                        spare5, spare6, spare7, spare8 }

PredefinedConfigIdentity ::=        INTEGER (0..15)

PredefinedConfigValueTag ::=        INTEGER (0..15)


PredefinedRB-Configuration ::=      SEQUENCE {
    srb-InformationList                 SRB-InformationSetupList,
    rb-InformationList                  RB-InformationSetupList
}


PreDefRadioConfiguration ::=        SEQUENCE {
    -- User equipment IEs
    re-EstablishmentTimer               Re-EstablishmentTimer,
    -- Radio bearer IEs
    predefinedRB-Configuration          PredefinedRB-Configuration,
    -- Transport channel IEs
    preDefTransChConfiguration          PreDefTransChConfiguration,
    -- Physical channel IEs
    preDefPhyChConfiguration            PreDefPhyChConfiguration
}


RAB-Info ::=                        SEQUENCE {
    rab-Identity                        RAB-Identity,
    cn-DomainIdentity                   CN-DomainIdentity,
    re-EstablishmentTimer               Re-EstablishmentTimer
}

RAB-InformationSetup ::=            SEQUENCE {
    rab-Info                            RAB-Info,
    rb-InformationSetupList             RB-InformationSetupList
}

RAB-InformationSetupList ::=        SEQUENCE (SIZE (1..maxRABsetup)) OF
                                        RAB-InformationSetup

RB-ActivationTimeInfo ::=           SEQUENCE {
    rb-Identity                         RB-Identity,
    rlc-SequenceNumber                  RLC-SequenceNumber
}

RB-ActivationTimeInfoList ::=       SEQUENCE (SIZE (1..maxRB)) OF
                                        RB-ActivationTimeInfo


RB-COUNT-C-Information ::=          SEQUENCE {
    rb-Identity                         RB-Identity,
    count-C-UL                          COUNT-C,
    count-C-DL                          COUNT-C
}


RB-COUNT-C-InformationList ::=      SEQUENCE (SIZE (1..maxRBallRABs)) OF
```

```
                                        RB-COUNT-C-Information


RB-COUNT-C-MSB-Information ::=      SEQUENCE {
    rb-Identity                         RB-Identity,
    count-C-MSB-UL                      COUNT-C-MSB,
    count-C-MSB-DL                      COUNT-C-MSB
}


RB-COUNT-C-MSB-InformationList ::=  SEQUENCE (SIZE (1..maxRBallRABs)) OF
                                        RB-COUNT-C-MSB-Information

RB-Identity ::=                     INTEGER (0..31)


RB-IdentityList ::=                 SEQUENCE (SIZE (1..maxRB)) OF
                                        RB-Identity

RB-InformationAffected ::=          SEQUENCE {
    rb-Identity                         RB-Identity,
    rb-MappingInfo                      RB-MappingInfo
}

RB-InformationAffectedList ::=      SEQUENCE (SIZE (1..maxRB)) OF
                                        RB-InformationAffected


RB-InformationReconfig ::=          SEQUENCE {
    rb-Identity                         RB-Identity,
    pdcp-Info                           PDCP-InfoReconfig                   OPTIONAL,
    rlc-InfoChoice                      RLC-InfoChoice                      OPTIONAL,
    rb-MappingInfo                      RB-MappingInfo                      OPTIONAL,
    rb-SuspendResume                    RB-SuspendResume                    OPTIONAL
}

RB-InformationReconfigList ::=      SEQUENCE (SIZE (1..maxRB)) OF
                                        RB-InformationReconfig

RB-InformationReleaseList ::=       SEQUENCE (SIZE (1..maxRB)) OF
                                        RB-Identity

RB-InformationSetup ::=             SEQUENCE {
    rb-Identity                         RB-Identity,
    pdcp-Info                           PDCP-Info                           OPTIONAL,
    rlc-Info                            RLC-Info,
    rb-MappingInfo                      RB-MappingInfo
}

RB-InformationSetupList ::=         SEQUENCE (SIZE (1..maxRBperRAB)) OF
                                        RB-InformationSetup

RB-MappingInfo ::=                  SEQUENCE (SIZE (1..maxRBMuxOptions)) OF
                                        RB-MappingOption


RB-MappingOption ::=                SEQUENCE {
    ul-LogicalChannelMappings           UL-LogicalChannelMappings           OPTIONAL,
    dl-LogicalChannelMappingList        DL-LogicalChannelMappingList        OPTIONAL
}

RB-SuspendResume ::=                ENUMERATED {
                                        suspend, resume }

RB-WithPDCP-Info ::=                SEQUENCE {
    rb-Identity                         RB-Identity,
    pdcp-SN-Info                        PDCP-SN-Info
}

RB-WithPDCP-InfoList ::=            SEQUENCE (SIZE (1..maxRBallRABs)) OF
                                        RB-WithPDCP-Info


ReceivingWindowSize ::=             ENUMERATED {
                                        rw1, rw8, rw16, rw32, rw128, rw256,
                                        rw512, rw768, rw1024, rw1536, rw2047,
                                        rw2560, rw3072, rw3584, rw4095, spare1 }
```

```
5
RFC2507-Info ::=                    SEQUENCE {
    f-MAX-PERIOD                        INTEGER (1..655355)             DEFAULT 256,
    f-MAX-TIME                          INTEGER (1..255)                DEFAULT 5,
    max-HEADER                          INTEGER (60..65535)             DEFAULT 168,
    tcp-SPACE                           INTEGER (3..255)                DEFAULT 15,
    non-TCP-SPACE                       INTEGER (3..65535)              DEFAULT 15,
    expectReordering                    ExpectReordering
    -- TABULAR: The IE above has only two possible values, so using Optional or Default
    -- would be wasteful
}

RLC-Info ::=                        SEQUENCE {
    ul-RLC-Mode                         UL-RLC-Mode                     OPTIONAL,
    dl-RLC-Mode                         DL-RLC-Mode                     OPTIONAL
}

RLC-InfoChoice ::=                  CHOICE {
    rlc-Info                            RLC-Info,
    spare                               NULL
}

RLC-SequenceNumber ::=              INTEGER (0..4095)


SRB-InformationSetup ::=            SEQUENCE {
    rb-Identity                         RB-Identity                     OPTIONAL,
    -- The default value for the IE above is the smallest value not used yet.
    rlc-InfoChoice                      RLC-InfoChoice,
    rb-MappingInfo                      RB-MappingInfo
}

SRB-InformationSetupList ::=        SEQUENCE (SIZE (1..maxSRBsetup)) OF
                                        SRB-InformationSetup


SRB-InformationSetupList2 ::=       SEQUENCE (SIZE (4..5)) OF
                                        SRB-InformationSetup

TimerDiscard ::=                    ENUMERATED {
                                        td0-1, td0-25, td0-5, td0-75,
                                        td1, td1-25, td1-5, td1-75,
                                        td2, td2-5, td3, td3-5, td4,
                                        td4-5, td5, td7-5 }


TimerEPC ::=                        ENUMERATED {
                                        te50, te60, te70, te80, te90,
                                        te100, te120, te140, te160, te180,
                                        te200, te300, te400, te500, te700,
                                        te900, spare1, spare2, spare3,
                                        spare4, spare5, spare6, spare7,
                                        spare8, spare9, spare10, spare11,
                                        spare12, spare13, spare14, spare15,
                                        spare16 }


TimerMRW ::=                        ENUMERATED {
                                        te50, te0, te70, te80, te90, te100,
                                        te120, te140, te160, te180, te200,
                                        te300, te400, te500, te700, te900,
                                        spare1, spare2, spare3, spare4, spare5,
                                        spare6, spare7, spare8, spare9, spare10,
                                        spare11, spare12, spare13, spare14,
                                        spare15, spare16 }


TimerPoll ::=                       ENUMERATED {
                                        tp10, tp20, tp30, tp40, tp50,
                                        tp60, tp70, tp80, tp90, tp100,
                                        tp110, tp120, tp130, tp140, tp150,
                                        tp160, tp170, tp180, tp190, tp200,
                                        tp210, tp220, tp230, tp240, tp250,
                                        tp260, tp270, tp280, tp290, tp300,
                                        tp310, tp320, tp330, tp340, tp350,
                                        tp360, tp370, tp380, tp390, tp400,
                                        tp410, tp420, tp430, tp440, tp450,
```

```
                                        tp460, tp470, tp480, tp490, tp500,
                                        tp510, tp520, tp530, tp540, tp550,
                                        tp600, tp650, tp700, tp750, tp800,
                                        tp850, tp900, tp950, tp1000,

                                        spare1, spare2, spare3, spare4, spare5,
                                        spare6, spare7, spare8, spare9, spare10,
                                        spare11, spare12, spare13, spare14,
                                        spare15, spare16 }

TimerPollPeriodic ::=               ENUMERATED {
                                        tper100, tper200, tper300, tper400,
                                        tper500, tper750, tper1000, tper2000,
                                        spare1, spare2, spare3, spare4,
                                        spare5, spare6, spare7, spare8 }


TimerPollProhibit ::=               ENUMERATED {
                                        tpp10, tpp20, tpp30, tpp40, tpp50,
                                        tpp60, tpp70, tpp80, tpp90, tpp100,
                                        tpp110, tpp120, tpp130, tpp140, tpp150,
                                        tpp160, tpp170, tpp180, tpp190, tpp200,
                                        tpp210, tpp220, tpp230, tpp240, tpp250,
                                        tpp260, tpp270, tpp280, tpp290, tpp300,
                                        tpp310, tpp320, tpp330, tpp340, tpp350,
                                        tpp360, tpp370, tpp380, tpp390, tpp400,
                                        tpp410, tpp420, tpp430, tpp440, tpp450,
                                        tpp460, tpp470, tpp480, tpp490, tpp500,
                                        tpp510, tpp520, tpp530, tpp540, tpp550,
                                        tpp600, tpp650, tpp700, tpp750, tpp800,
                                        tpp850, tpp900, tpp950, tpp1000,
                                        spare1, spare2, spare3, spare4, spare5,
                                        spare6, spare7, spare8, spare9, spare10,
                                        spare11, spare12, spare13, spare14,
                                        spare15, spare16 }

TimerRST ::=                        ENUMERATED {
                                        tr50, tr100, tr150, tr200, tr250, tr300,
                                        tr350, tr400, tr450, tr500, tr550,
                                        tr600, tr700, tr800, tr900, tr1000,
                                        spare1, spare2, spare3, spare4, spare5,
                                        spare6, spare7, spare8, spare9, spare10,
                                        spare11, spare12, spare13, spare14,
                                        spare15, spare16 }

TimerStatusPeriodic ::=             ENUMERATED {
                                        tsp100, tsp200, tsp300, tsp400, tsp500,
                                        tsp750, tsp1000, tsp2000 }


TimerStatusProhibit ::=             ENUMERATED {
                                        tsp10,tsp20,tsp30,tsp40,tsp50,
                                        tsp60,tsp70,tsp80,tsp90,tsp100,
                                        tsp110,tsp120,tsp130,tsp140,tsp150,
                                        tsp160,tsp170,tsp180,tsp190,tsp200,
                                        tsp210,tsp220,tsp230,tsp240,tsp250,
                                        tsp260,tsp270,tsp280,tsp290,tsp300,
                                        tsp310,tsp320,tsp330,tsp340,tsp350,
                                        tsp360,tsp370,tsp380,tsp390,tsp400,
                                        tsp410,tsp420,tsp430,tsp440,tsp450,
                                        tsp460,tsp470,tsp480,tsp490,tsp500,
                                        tsp510,tsp520,tsp530,tsp540,tsp550,
                                        tsp600,tsp650,tsp700,tsp750,tsp800,
                                        tsp850,tsp900,tsp950,tsp1000,
                                        spare1, spare2, spare3, spare4, spare5,
                                        spare6, spare7, spare8, spare9, spare10,
                                        spare11, spare12, spare13, spare14,
                                        spare15, spare16 }


TransmissionRLC-Discard ::=         CHOICE {
    timerBasedExplicit                  ExplicitDiscard,
    timerBasedNoExplicit                NoExplicitDiscard,
    maxDAT-Retransmissions              MaxDAT-Retransmissions,
    noDiscard                           MaxDAT
}
```

```
TransmissionWindowSize ::=          ENUMERATED {
                                        tw1, tw8, tw16, tw32, tw128, tw256,
                                        tw512, tw768, tw1024, tw1536, tw2047,
                                        tw2560, tw3072, tw3584, tw4095, spare1 }


UL-AM-RLC-Mode ::=                  SEQUENCE {
    transmissionRLC-Discard             TransmissionRLC-Discard,
    transmissionWindowSize              TransmissionWindowSize,
    receivingWindowSize                 ReceivingWindowSize,
    timerRST                            TimerRST,
    max-RST                             MaxRST,
    pollingInfo                         PollingInfo
}


UL-LogicalChannelMapping ::=        SEQUENCE {
    -- TABULAR: UL-TransportChannelType contains TransportChannelIdentity as well.
    ul-TransportChannelType             UL-TransportChannelType,
    logicalChannelIdentity              LogicalChannelIdentity              OPTIONAL,
    mac-LogicalChannelPriority          MAC-LogicalChannelPriority,
    logicalChannelMaxLoss               LogicalChannelMaxLoss               DEFAULT lcm0
}


UL-LogicalChannelMapping2 ::=       SEQUENCE {
    rlc-LogicalChannelMappingIndicator  BOOLEAN,
    -- TABULAR: UL-TransportChannelType contains TransportChannelIdentity as well.
    ul-TransportChannelType             UL-TransportChannelType,
    logicalChannelIdentity              LogicalChannelIdentity              OPTIONAL,
    mac-LogicalChannelPriority          MAC-LogicalChannelPriority,
    logicalChannelMaxLoss               LogicalChannelMaxLoss               DEFAULT lcm0
}

UL-LogicalChannelMappingList ::=    SEQUENCE (SIZE (maxLoCHperRLC)) OF
                                        UL-LogicalChannelMapping2

UL-LogicalChannelMappings ::=       CHOICE {
    oneLogicalChannel                   UL-LogicalChannelMapping,
    twoLogicalChannels                  UL-LogicalChannelMappingList
}


UL-RLC-Mode ::=                     CHOICE {
    ul-AM-RLC-Mode                      UL-AM-RLC-Mode,
    ul-UM-RLC-Mode                      TransmissionRLC-Discard,
    ul-TM-RLC-Mode                      UL-TM-RLC-Mode,
    spare                               NULL
}


UL-TM-RLC-Mode ::=                  SEQUENCE {
    transmissionRLC-Discard             TransmissionRLC-Discard             OPTIONAL
}


UL-TransportChannelType ::=         CHOICE {
    dch                                 TransportChannelIdentity,
    rach                                NULL,
    cpch                                NULL,
    usch                                NULL
}

END
```

11.3.5 Transport channel information elements

```
TransportChannel-IEs DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    hiRM,
    maxCCTrCH,
    maxCPCHsets,
    maxDRACclasses,
    maxPDSCH-TFCIgroups,
```

```
    maxTF,
    maxTFC,
    maxTrCH
FROM Constant-definitions;

AllowedTFC-List ::=                 SEQUENCE (SIZE (1..maxTFC)) OF
                                        TFC-Value

AllowedTFI-List ::=                 SEQUENCE (SIZE (1..maxTF)) OF
                                        INTEGER (0..31)

BitModeRLC-SizeInfo ::=             CHOICE {
    sizeType1                           INTEGER (1..127),
    sizeType2                           SEQUENCE {
        part1                               INTEGER (0..15),
        part2                               INTEGER (1..7)                  OPTIONAL
        -- Actual size = (part1 * 8) + 128 + part2
    },
    sizeType3                           SEQUENCE {
        part1                               INTEGER (0..47),
        part2                               INTEGER (1..15)                 OPTIONAL
        -- Actual size = (part1 * 16) + 256 + part2
    },
    sizeType4                           SEQUENCE {
        part1                               INTEGER (0..62),
        part2                               INTEGER (1..63)                 OPTIONAL
        -- Actual size = (part1 * 64) + 1024 + part2
    }
}

BLER-QualityValue ::=               INTEGER (0..63)

ChannelCodingType ::=               CHOICE {
    noCoding                            NULL,
    convolutional                       CodingRate,
    turbo                               NULL
}

CodingRate ::=                      ENUMERATED {
                                        half,
                                        third }


CommonDynamicTF-Info ::=            SEQUENCE {
    numberOfTransportBlocks             NumberOfTransportBlocks,
    rlc-Size                            CHOICE {
        fdd                                 SEQUENCE {
            octetModeRLC-SizeInfoType2          OctetModeRLC-SizeInfoType2  OPTIONAL
        },
        tdd                                 SEQUENCE {
            commonTDD-Choice                    CHOICE {
                bitModeRLC-SizeInfo                 BitModeRLC-SizeInfo,
                octetModeRLC-SizeInfoType1          OctetModeRLC-SizeInfoType1
            }                                                               OPTIONAL
        }
    }
}


CommonDynamicTF-Info-DynamicTTI ::= SEQUENCE {
    numberOfTransportBlocks             NumberOfTransportBlocks,
    transmissionTimeInterval            TransmissionTimeInterval,
    commonTDD-Choice                    CHOICE {
        bitModeRLC-SizeInfo                 BitModeRLC-SizeInfo,
        octetModeRLC-SizeInfoType1          OctetModeRLC-SizeInfoType1
    }                                                                       OPTIONAL
}

CommonDynamicTF-InfoList ::=        SEQUENCE (SIZE (1..maxTF)) OF
                                        CommonDynamicTF-Info


CommonDynamicTF-InfoList-DynamicTTI ::= SEQUENCE (SIZE (1..maxTF)) OF
                                        CommonDynamicTF-Info-DynamicTTI


CommonTransChTFS ::=                SEQUENCE {
    tti                                 CHOICE {
```

```
        tti10                               CommonDynamicTF-InfoList,
        tti20                               CommonDynamicTF-InfoList,
        tti40                               CommonDynamicTF-InfoList,
        tti80                               CommonDynamicTF-InfoList,
        dynamic                             CommonDynamicTF-InfoList-DynamicTTI
    },
    semistaticTF-Information            SemistaticTF-Information
}

CPCH-SetID ::=                      INTEGER (1..maxCPCHsets)

CRC-Size ::=                        ENUMERATED {
                                        crc0, crc8, crc12, crc16, crc24 }


DedicatedDynamicTF-Info ::=         SEQUENCE {
    numberOfTransportBlocks             NumberOfTransportBlocks,
    rlc-Size                            CHOICE {
        bitMode                             BitModeRLC-SizeInfo,
        octetModeType1                      OctetModeRLC-SizeInfoType1
    }                                                                   OPTIONAL
}


DedicatedDynamicTF-Info-DynamicTTI ::= SEQUENCE {
    numberOfTransportBlocks             NumberOfTransportBlocks,
    transmissionTimeInterval            TransmissionTimeInterval,
    rlc-Size                            CHOICE {
        bitMode                             BitModeRLC-SizeInfo,
        octetModeType1                      OctetModeRLC-SizeInfoType1
    }                                                                   OPTIONAL
}

DedicatedDynamicTF-InfoList ::=     SEQUENCE (SIZE (1..maxTF)) OF
                                        DedicatedDynamicTF-Info


DedicatedDynamicTF-InfoList-DynamicTTI ::= SEQUENCE (SIZE (1..maxTF)) OF
                                        DedicatedDynamicTF-Info-DynamicTTI


DedicatedTransChTFS ::=             SEQUENCE {
    tti                                 CHOICE {
        tti10                               DedicatedDynamicTF-InfoList,
        tti20                               DedicatedDynamicTF-InfoList,
        tti40                               DedicatedDynamicTF-InfoList,
        tti80                               DedicatedDynamicTF-InfoList,
        dynamic                             DedicatedDynamicTF-InfoList-DynamicTTI
    },
    semistaticTF-Information            SemistaticTF-Information
}



DL-AddReconfTransChInfo2List ::=    SEQUENCE (SIZE (1..maxTrCH)) OF
                                        DL-AddReconfTransChInformation2

DL-AddReconfTransChInfoList ::=     SEQUENCE (SIZE (1..maxTrCH)) OF
                                        DL-AddReconfTransChInformation


DL-AddReconfTransChInformation ::=  SEQUENCE {
    dl-transportChannelIdentity         TransportChannelIdentity,
    tfs-SignallingMode                  CHOICE {
        explicit                            TransportFormatSet,
        sameAsULTrCH                        TransportChannelIdentity
    },
    dch-QualityTarget                   QualityTarget                   OPTIONAL,
    tm-SignallingInfo                   TM-SignallingInfo               OPTIONAL
}


DL-AddReconfTransChInformation2 ::= SEQUENCE {
    transportChannelIdentity            TransportChannelIdentity,
    tfs-SignallingMode                  CHOICE {
        explicit                            TransportFormatSet,
        sameAsULTrCH                        TransportChannelIdentity
    },
```

```
    qualityTarget                       QualityTarget
}


DL-CommonTransChInfo ::=            SEQUENCE {
    sccpch-TFCS                         TFCS                                OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            tfcs-SignallingMode                 CHOICE {
                explicit                            TFCS,
                sameAsUL                            NULL
            }                                                               OPTIONAL
        },
        tdd                                 SEQUENCE {
            individualDL-CCTrCH-InfoList        IndividualDL-CCTrCH-InfoList
                                                                            OPTIONAL
        }
    }
}

DL-DeletedTransChInfoList ::=       SEQUENCE (SIZE (1..maxTrCH)) OF
                                        TransportChannelIdentity



DRAC-ClassIdentity ::=              INTEGER (1..maxDRACclasses)

DRAC-StaticInformation ::=          SEQUENCE {
    transmissionTimeValidity            TransmissionTimeValidity,
    timeDurationBeforeRetry             TimeDurationBeforeRetry,
    drac-ClassIdentity                  DRAC-ClassIdentity
}

DRAC-StaticInformationList ::=      SEQUENCE (SIZE (1..maxTrCH)) OF
                                        DRAC-StaticInformation


ExplicitTFCS-Configuration ::=      CHOICE {
    complete                            TFCS-ReconfAdd,
    addition                            TFCS-ReconfAdd,
    removal                             TFCS-RemovalList,
    replacement                         SEQUENCE {
        tfcsRemoval                         TFCS-RemovalList,
        tfcsAdd                             TFCS-ReconfAdd
    }
}

GainFactor ::=                      INTEGER (0..15)

GainFactorInformation ::=           CHOICE {
    signalledGainFactors                SignalledGainFactors,
    computedGainFactors                 ReferenceTFC-ID
}


IndividualDL-CCTrCH-Info ::=        SEQUENCE {
    dl-TFCS-Identity                    TFCS-Identity,
    tfcs-SignallingMode                 CHOICE {
        explicit                            TFCS,
        sameAsUL                            TFCS-Identity
    }
}

IndividualDL-CCTrCH-InfoList ::=    SEQUENCE (SIZE (1..maxCCTrCH)) OF
                                        IndividualDL-CCTrCH-Info

IndividualUL-CCTrCH-Info ::=        SEQUENCE {
    ul-TFCS-Identity                    TFCS-Identity,
    ul-TFCS                             TFCS
}

IndividualUL-CCTrCH-InfoList ::=    SEQUENCE (SIZE (1..maxCCTrCH)) OF
                                        IndividualUL-CCTrCH-Info


MessType ::=                        ENUMERATED {
                                        transportFormatCombinationControl, spare1 }
```

```
Non-allowedTFC-List ::=             SEQUENCE (SIZE (1..maxTFC)) OF
                                        TFC-Value


NumberOfTransportBlocks::=          CHOICE {
    zero                                NULL,
    one                                 NULL,
    small                               INTEGER (2..17),
    long                                INTEGER (18..512)
}

OctetModeRLC-SizeInfoType1 ::=      CHOICE {
    sizeType1                           INTEGER (0..31),
    -- Actual size = (8 * sizeType1) + 16
    sizeType2                           SEQUENCE {
        part1                               INTEGER (0..23),
        part2                               INTEGER (1..3)                  OPTIONAL
        -- Actual size = (32 * part1) + 272 + (part2 * 8)
    },
    sizeType3                           SEQUENCE {
        part1                               INTEGER (0..61),
        part2                               INTEGER (1..7)                  OPTIONAL
        -- Actual size = (64 * part1) + 1040 + (part2 * 8)
    }
}

OctetModeRLC-SizeInfoType2 ::=      CHOICE {
    sizeType1                           INTEGER (0..31),
    -- Actual size = (sizeType1 * 8) + 48
    sizeType2                           INTEGER (0..63),
    -- Actual size = (sizeType2 * 16) + 312
    sizeType3                           INTEGER (0..56)
    -- Actual size = (sizeType3 *64) + 1384
}


PowerOffsetInformation ::=          SEQUENCE {
    gainFactorInformation               GainFactorInformation,
    powerOffsetPp-m                     PowerOffsetPp-m                     OPTIONAL
}

PowerOffsetPp-m ::=                 INTEGER (-5..10)

PreDefTransChConfiguration ::=      SEQUENCE {
    ul-CommonTransChInfo                UL-CommonTransChInfo,
    ul-AddReconfTrChInfoList            UL-AddReconfTransChInfoList,
    dl-CommonTransChInfo                DL-CommonTransChInfo,
    dl-TrChInfoList                     DL-AddReconfTransChInfoList
}

QualityTarget ::=                   SEQUENCE {
    bler-QualityValue                   BLER-QualityValue
}

RateMatchingAttribute ::=           INTEGER (1..hiRM)


ReferenceTFC-ID ::=                 INTEGER (0..3)




RestrictedTrChInfo ::=              SEQUENCE {
    restrictedTrChIdentity              TransportChannelIdentity,
    allowedTFI-List                     AllowedTFI-List                     OPTIONAL
}

RestrictedTrChInfoList ::=          SEQUENCE (SIZE (1..maxTrCH)) OF
                                        RestrictedTrChInfo


SemistaticTF-Information ::=        SEQUENCE {
    -- TABULAR: Transmission time interval has been included in the IE CommonTransChTFS.
    channelCodingType                   ChannelCodingType,
    rateMatchingAttribute               RateMatchingAttribute,
    crc-Size                            CRC-Size
}
```

```
SignalledGainFactors ::=            SEQUENCE {
    gainFactorBetaC                     GainFactor,
    gainFactorBetaD                     GainFactor,
    referenceTFC-ID                     ReferenceTFC-ID                     OPTIONAL
}


SplitTFCI-Signalling ::=            SEQUENCE {
    splitType                           SplitType                       OPTIONAL,
    tfci-Field2-Length                  INTEGER (1..10)                 OPTIONAL,
    tfci-Field1-Information             ExplicitTFCS-Configuration      OPTIONAL,
    tfci-Field2-Information             TFCI-Field2-Information         OPTIONAL
}


SplitType ::=                       ENUMERATED {
                                        hardSplit, logicalSplit }



TFC-Subset ::=                      CHOICE {
    minimumAllowedTFC-Number            TFC-Value,
    allowedTFC-List                     AllowedTFC-List,
    non-allowedTFC-List                 Non-allowedTFC-List,
    restrictedTrChInfoList              RestrictedTrChInfoList
}

TFC-Value ::=                       INTEGER (0..1023)




TFCI-Field2-Information ::=         CHOICE {
    tfci-Range                          TFCI-RangeList,
    explicit                            ExplicitTFCS-Configuration
}


TFCI-Range ::=                      SEQUENCE {
    maxTFCIField2Value                  INTEGER (1..1023),
    tfcs-InfoForDSCH                    TFCS-InfoForDSCH
}


TFCI-RangeList ::=                  SEQUENCE (SIZE (1..maxPDSCH-TFCIgroups)) OF
                                        TFCI-Range


TFCS ::=                            CHOICE {
    normalTFCI-Signalling               ExplicitTFCS-Configuration,
    splitTFCI-Signalling                SplitTFCI-Signalling
}

TFCS-Identity ::=                   SEQUENCE {
    tfcs-ID                             INTEGER (1..8)                      DEFAULT 1,
    sharedChannelIndicator              BOOLEAN
}


TFCS-IdentityPlain ::=              INTEGER (1..8)


TFCS-InfoForDSCH ::=                CHOICE {
    ctfc2bit                            INTEGER (0..3),
    ctfc4bit                            INTEGER (0..15),
    ctfc6bit                            INTEGER (0..63),
    ctfc8bit                            INTEGER (0..255),
    ctfc12bit                           INTEGER (0..4095),
    ctfc16bit                           INTEGER (0..65535),
    ctfc24bit                           INTEGER (0..16777215),
    spare                               NULL
}


TFCS-ReconfAdd ::=                  SEQUENCE{
    ctfcSize                            CHOICE{
```

```
        ctfc2Bit                            SEQUENCE (SIZE (1..maxTFC)) OF SEQUENCE {
            ctfc2                               INTEGER (0..3),
            gainFactorInformation               PowerOffsetInformation          OPTIONAL
        },
        ctfc4Bit                            SEQUENCE (SIZE (1..maxTFC)) OF SEQUENCE {
            ctfc4                               INTEGER (0..15),
            gainFactorInformation               PowerOffsetInformation          OPTIONAL
        },
        ctfc6Bit                            SEQUENCE (SIZE (1..maxTFC)) OF SEQUENCE {
            ctfc8                               INTEGER (0..63),
            gainFactorInformation               PowerOffsetInformation          OPTIONAL
        },
        ctfc8Bit                            SEQUENCE (SIZE (1..maxTFC)) OF SEQUENCE {
            ctfc16                              INTEGER (0..255),
            gainFactorInformation               PowerOffsetInformation          OPTIONAL
        },
        ctfc12Bit                           SEQUENCE (SIZE(1..maxTFC)) OF SEQUENCE {
            ctfc12                              INTEGER (0..4095),
            gainFactorInformation               PowerOffsetInformation          OPTIONAL
        },
        ctfc16Bit                           SEQUENCE (SIZE (1..maxTFC)) OF SEQUENCE {
            ctfc16                              INTEGER(0..65535),
            gainFactorInformation               PowerOffsetInformation          OPTIONAL
        },
        ctfc24Bit                           SEQUENCE (SIZE (1..maxTFC)) OF SEQUENCE {
            ctfc24                              INTEGER(0..16777215),
            gainFactorInformation               PowerOffsetInformation          OPTIONAL
        },
        spare                               NULL
    }
}


TFCS-Removal ::=                    SEQUENCE {
    tfci                                INTEGER (0..1023)
}


TFCS-RemovalList ::=                SEQUENCE (SIZE (1..maxTFC)) OF
                                        TFCS-Removal

TimeDurationBeforeRetry ::=         INTEGER (1..256)


TM-SignallingInfo   ::=             SEQUENCE {
    messType                            MessType,
    tm-SignallingMode                   CHOICE {
        mode1                               NULL,
        mode2                               SEQUENCE {
            ul-controlledTrChList               UL-ControlledTrChList
        }
    }
}



TransmissionTimeInterval ::=        ENUMERATED {
                                        tti10, tti20, tti40, tti80,
                                        spare1, spare2, spare3, spare4 }

TransmissionTimeValidity ::=        INTEGER (1..256)


TransportChannelIdentity ::=        INTEGER (1..32)

TransportFormatSet ::=              CHOICE {
    dedicatedTransChTFS                 DedicatedTransChTFS,
    commonTransChTFS                    CommonTransChTFS
}

UL-AddReconfTransChInfoList ::=     SEQUENCE (SIZE (1..maxTrCH)) OF
                                        UL-AddReconfTransChInformation


UL-AddReconfTransChInformation ::= SEQUENCE {
    transportChannelIdentity            TransportChannelIdentity,
    transportFormatSet                  TransportFormatSet
}
```

```
UL-CommonTransChInfo ::=            SEQUENCE {
    tfc-Subset                          TFC-Subset                          OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            ul-TFCS                         TFCS
        },
        tdd                                 SEQUENCE {

            individualUL-CCTrCH-InfoList        IndividualUL-CCTrCH-InfoList
                                                                            OPTIONAL,
            ul-TFCS                             TFCS
        }
    }                                                                       OPTIONAL
}


UL-ControlledTrChList ::=           SEQUENCE (SIZE (1..maxTrCH)) OF
                                        TransportChannelIdentity

UL-DeletedTransChInfoList ::=       SEQUENCE (SIZE (1..maxTrCH)) OF
                                        TransportChannelIdentity

END
```

11.3.6 Physical channel information elements

```
PhysicalChannel-IEs DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    maxASC,
    maxASCmap,
    maxASCpersist,
    maxCCTrCH,
    maxCPCHsets,
    maxDPCH-DLchan,
    maxDPCHcodesPerTS,
    maxDPDCH-UL,
    maxFACH,
    maxPCPCH-APsig,
    maxPCPCH-APsubCh,
    maxPCPCH-CDsig,
    maxPCPCH-CDsubCh,
    maxPCPCH-SF,
    maxPCPCHs,
    maxPDSCH,
    maxPDSCH-TFCIgroups,
    maxPRACH,
    maxPUSCH,
    maxRL,
    maxRL-1,
    maxSCCPCH,
    maxSig,
    maxSubCh,
    maxTF-CPCH,
    maxTFCI-2-Combs,
    maxTGPS,
    maxTS
FROM Constant-definitions

    ActivationTime
FROM UserEquipment-IEs

    CPCH-SetID,
    TFCS,
    TFCS-Identity,
    TransportChannelIdentity,
    TransportFormatSet
FROM TransportChannel-IEs

    SIB-ReferenceListFACH
FROM Other-IEs;

AC-To-ASC-Mapping ::=               INTEGER (0..7)
```

```
AC-To-ASC-MappingTable ::=          SEQUENCE (SIZE (maxASCmap)) OF
                                        AC-To-ASC-Mapping

AccessServiceClass ::=              SEQUENCE {
    availableSignatureStartIndex        INTEGER (0..15),
    availableSignatureEndIndex          INTEGER (0..15),
    availableSubChannelStartIndex       INTEGER (0..11),
    availableSubChannelEndIndex         INTEGER (0..11)
}

AccessServiceClassIndex ::=         INTEGER (1..8)

AICH-Info ::=                       SEQUENCE {
    secondaryScramblingCode             SecondaryScramblingCode             OPTIONAL,
    channelisationCode256               ChannelisationCode256,
    sttd-Indicator                      BOOLEAN,
    aich-TransmissionTiming             AICH-TransmissionTiming
}

AICH-PowerOffset ::=                INTEGER (-10..5)

AICH-TransmissionTiming ::=         ENUMERATED {
                                        e0, e1 }

AllocationPeriodInfo ::=            SEQUENCE {
    allocationActivationTime            INTEGER (1..256),
    allocationDuration                  INTEGER (1..256)
}

AP-AICH-ChannelisationCode ::=      INTEGER (0..255)



AP-PreambleScramblingCode ::=       INTEGER (0..79)

AP-Signature ::=                    INTEGER (0..15)


AP-Signature-VCAM ::=               SEQUENCE {
    ap-Signature                        AP-Signature,
    availableAP-SubchannelList          AvailableAP-SubchannelList OPTIONAL
}

AP-Subchannel ::=                   INTEGER (0..11)


ASC ::=                             SEQUENCE {
    accessServiceClass                  AccessServiceClassIndex,
    repetitionPeriodAndOffset           ASC-RepetitionPeriodAndOffset       OPTIONAL
    -- TABULAR: The offset is nested in the repetition period
}


ASC-RepetitionPeriodAndOffset ::=   CHOICE {
    rp1                                 NULL,
    rp2                                 INTEGER (0..1),
    rp4                                 INTEGER (0..3),
    rp8                                 INTEGER (0..7)
}


AvailableAP-Signature-VCAMList ::=  SEQUENCE (SIZE (1..maxPCPCH-APsig)) OF
                                        AP-Signature-VCAM

AvailableAP-SignatureList ::=       SEQUENCE (SIZE (1..maxPCPCH-APsig)) OF
                                        AP-Signature

AvailableAP-SubchannelList ::=      SEQUENCE (SIZE (1..maxPCPCH-APsubCh)) OF
                                        AP-Subchannel

AvailableMinimumSF-ListVCAM ::=     SEQUENCE (SIZE (1..maxPCPCH-SF)) OF
                                        AvailableMinimumSF-VCAM


AvailableMinimumSF-VCAM ::=         SEQUENCE {
    minimumSpreadingFactor              MinimumSpreadingFactor,
    nf-Max                              NF-Max,
```

```
    maxAvailablePCPCH-Number            MaxAvailablePCPCH-Number,
    availableAP-Signature-VCAMList      AvailableAP-Signature-VCAMList
}

AvailableSignatureList ::=          SEQUENCE (SIZE (1..maxSig)) OF
                                        Signature

AvailableSubChannelNumber ::=       INTEGER (0..11)

AvailableSubChannelNumberList ::=   SEQUENCE (SIZE (1..maxSubCh)) OF
                                        AvailableSubChannelNumber

BurstType ::=                       ENUMERATED {
                                        short1, long2 }

BurstType1 ::=                      ENUMERATED { ms4, ms8, ms16 }

BurstType2 ::=                      ENUMERATED { ms3, ms6 }

CCTrCH-PowerControlInfo ::=         SEQUENCE {
    tfcs-Identity                       TFCS-Identity                       OPTIONAL,
    ul-DPCH-PowerControlInfo            UL-DPCH-PowerControlInfo
}

CD-AccessSlotSubchannel ::=         INTEGER (0..11)

CD-AccessSlotSubchannelList ::=     SEQUENCE (SIZE (1..maxPCPCH-CDsubCh)) OF
                                        CD-AccessSlotSubchannel

CD-CA-ICH-ChannelisationCode ::=    INTEGER (0..255)


CD-PreambleScramblingCode ::=       INTEGER (0..79)

CD-SignatureCode ::=                INTEGER (0..15)

CD-SignatureCodeList ::=            SEQUENCE (SIZE (1..maxPCPCH-CDsig)) OF
                                        CD-SignatureCode

CellParametersID ::=                INTEGER (0..127)


ChannelAssignmentActive ::=         CHOICE {
    notActive                           NULL,
    isActive                            AvailableMinimumSF-ListVCAM
}

ChannelisationCode256 ::=           INTEGER (0..255)


ChannelReqParamsForUCSM ::=         SEQUENCE {
    availableAP-SignatureList           AvailableAP-SignatureList,
    availableAP-SubchannelList          AvailableAP-SubchannelList          OPTIONAL
}

ClosedLoopTimingAdjMode ::=         ENUMERATED {
                                        slot1, slot2 }

CodeNumberDSCH ::=                  INTEGER (0..255)

CodeRange ::=                       SEQUENCE {
    pdsch-CodeMapList                   PDSCH-CodeMapList,
    codeNumberStart                     CodeNumberDSCH,
    codeNumberStop                      CodeNumberDSCH
}

CodeWordSet ::=                     ENUMERATED {
                                        longCWS,
                                        mediumCWS,
                                        shortCWS,
                                        ssdtOff }

CommonTimeslotInfo ::=              SEQUENCE {
    -- TABULAR: The IE below is MD, but since it can be encoded in a single
    -- bit it is not defined as OPTIONAL.
    secondInterleavingMode              SecondInterleavingMode,
    tfci-Coding                         TFCI-Coding                         OPTIONAL,
    puncturingLimit                     PuncturingLimit,
```

```
    repetitionPeriodAndLength           RepetitionPeriodAndLength           OPTIONAL
}

CommonTimeslotInfoSCCPCH ::=        SEQUENCE {
    -- TABULAR: The IE below is MD, but since it can be encoded in a single
    -- bit it is not defined as OPTIONAL.
    secondInterleavingMode              SecondInterleavingMode,
    tfci-Coding                         TFCI-Coding                         OPTIONAL,
    puncturingLimit                     PuncturingLimit,
    repetitionPeriodLengthAndOffset     RepetitionPeriodLengthAndOffset     OPTIONAL
}


-- Values from -10 to 10 are used in Release 99
ConstantValue ::=                   INTEGER (-10..21)

CPCH-PersistenceLevels ::=          SEQUENCE {
    cpch-SetID                          CPCH-SetID,
    dynamicPersistenceLevelTF-List      DynamicPersistenceLevelTF-List
}

CPCH-PersistenceLevelsList ::=      SEQUENCE (SIZE (1..maxCPCHsets)) OF
                                        CPCH-PersistenceLevels


CPCH-SetInfo ::=                    SEQUENCE {
    cpch-SetID                          CPCH-SetID,
    transportFormatSet                  TransportFormatSet,
    tfcs                                TFCS,
    ap-PreambleScramblingCode           AP-PreambleScramblingCode,
    ap-AICH-ScramblingCode              SecondaryScramblingCode             OPTIONAL,
    ap-AICH-ChannelisationCode          AP-AICH-ChannelisationCode,
    cd-PreambleScramblingCode           CD-PreambleScramblingCode,
    cd-CA-ICH-ScramblingCode            SecondaryScramblingCode             OPTIONAL,
    cd-CA-ICH-ChannelisationCode        CD-CA-ICH-ChannelisationCode,
    cd-AccessSlotSubchannelList         CD-AccessSlotSubchannelList         OPTIONAL,
    cd-SignatureCodeList                CD-SignatureCodeList                OPTIONAL,
    deltaPp-m                           DeltaPp-m,
    ul-DPCCH-SlotFormat                 UL-DPCCH-SlotFormat,
    n-StartMessage                      N-StartMessage,
    n-EOT                               N-EOT,
    channelAssignmentActive             ChannelAssignmentActive,
    -- TABULAR: VCAM info has been nested inside ChannelAssignmentActive,
    -- which in turn is mandatory since it's only a binary choice.
    cpch-StatusIndicationMode           CPCH-StatusIndicationMode,
    pcpch-ChannelInfoList               PCPCH-ChannelInfoList
}

CPCH-SetInfoList ::=                SEQUENCE (SIZE (1..maxCPCHsets)) OF
                                        CPCH-SetInfo

CPCH-StatusIndicationMode ::=       ENUMERATED {
                                        pcpch-Availability,
                                        pcpch-AvailabilityAndMinAvailableSF }


CSICH-PowerOffset ::=               INTEGER (-10..5)

-- Actual value = IE value * 512, only values from 0 to 599 used in Release 99.
DefaultDPCH-OffsetValue ::=         INTEGER (0..1023)


DeltaPp-m ::=                       INTEGER (-10..10)


-- Actual value = IE value * 0.1
DeltaSIR ::=                        INTEGER (0..30)


DL-CCTrCh ::=                       SEQUENCE {
    tfcs-Identity                       TFCS-Identity                       OPTIONAL,
    timeInfo                            TimeInfo,
    commonTimeslotInfo                  CommonTimeslotInfo                  OPTIONAL,
    individualTS-InfoDL-CCTrCHList      IndividualTS-InfoDL-CCTrCHList      OPTIONAL
}
```

```
DL-CCTrCh-Post ::=                      SEQUENCE {
    timeInfo                                TimeInfo,
    commonTimeslotInfo                      CommonTimeslotInfo,
    individualTS-InfoDL-CCTrCHList          IndividualTS-InfoDL-CCTrCHList
}


DL-CCTrChList ::=                       SEQUENCE (SIZE (1..maxCCTrCH)) OF
                                            DL-CCTrCh



DL-ChannelisationCode ::=               SEQUENCE {
    secondaryScramblingCode                 SecondaryScramblingCode             OPTIONAL,
    sf-AndCodeNumber                        SF512-AndCodeNumber,
    scramblingCodeChange                    ScramblingCodeChange                OPTIONAL
}

DL-ChannelisationCodeList ::=           SEQUENCE (SIZE (1..maxDPCH-DLchan)) OF
                                            DL-ChannelisationCode


DL-CommonInformation ::=                SEQUENCE {
    dl-DPCH-InfoCommon                      DL-DPCH-InfoCommon                  OPTIONAL,
    defaultDPCH-OffsetValue                 DefaultDPCH-OffsetValue             DEFAULT 0,
    dpch-CompressedModeInfo                 DPCH-CompressedModeInfo             OPTIONAL,
    tx-DiversityMode                        TX-DiversityMode                    OPTIONAL,
    ssdt-Information                        SSDT-Information                    OPTIONAL
}


DL-CommonInformationPost ::=            SEQUENCE {
    dl-DPCH-InfoCommon                      DL-DPCH-InfoCommonPost              OPTIONAL
}


DL-CommonInformationPredef ::=          SEQUENCE {
    dl-DPCH-InfoCommon                      DL-DPCH-InfoCommonPredef            OPTIONAL,
    defaultDPCH-OffsetValue                 DefaultDPCH-OffsetValue             OPTIONAL
}


DL-CompressedModeMethod ::=             ENUMERATED {
                                            puncturing, sf-2,
                                            higherLayerScheduling }

DL-DPCH-InfoCommon ::=                  SEQUENCE {
    dl-DPCH-PowerControlInfo                DL-DPCH-PowerControlInfo            OPTIONAL,
    spreadingFactorAndPilot                 SF512-AndPilot,
    -- TABULAR: The number of pilot bits is nested inside the spreading factor.
    positionFixedOrFlexible                 PositionFixedOrFlexible,
    tfci-Existence                          BOOLEAN
}


DL-DPCH-InfoCommonPost ::=              SEQUENCE {
    dl-DPCH-PowerControlInfo                DL-DPCH-PowerControlInfo                OPTIONAL
}


DL-DPCH-InfoCommonPredef ::=            SEQUENCE {
    spreadingFactorAndPilot                 SF512-AndPilot,
    -- TABULAR: The number of pilot bits is nested inside the spreading factor.
    positionFixedOrFlexible                 PositionFixedOrFlexible,
    tfci-Existence                          BOOLEAN
}


DL-DPCH-InfoPerRL ::=                   CHOICE {
    fdd                                     SEQUENCE {
        pCPICH-UsageForChannelEst               PCPICH-UsageForChannelEst,
        dcph-FrameOffset                        DPCH-FrameOffset,
        secondaryCPICH-Info                     SecondaryCPICH-Info             OPTIONAL,
        dl-ChannelisationCodeList               DL-ChannelisationCodeList,
        tpc-CombinationIndex                    TPC-CombinationIndex,
        ssdt-CellIdentity                       SSDT-CellIdentity               OPTIONAL,
        closedLoopTimingAdjMode                 ClosedLoopTimingAdjMode         OPTIONAL
    },
```

```
    tdd                                 DL-CCTrChList
}


DL-DPCH-InfoPerRL-Post ::=              CHOICE {
    fdd                                     SEQUENCE {
        pCPICH-UsageForChannelEst               PCPICH-UsageForChannelEst       OPTIONAL,
        dl-ChannelisationCode                   DL-ChannelisationCode,
        tpc-CombinationIndex                    TPC-CombinationIndex
    },
    tdd                                     SEQUENCE {
        dl-CCTrCh-Post                      DL-CCTrCh-Post
    }
}

DL-DPCH-PowerControlInfo ::=            SEQUENCE {
    -- TABULAR: DPC-Mode is applicable for FDD mode only.
    dpc-Mode                                DPC-Mode                        OPTIONAL
}

DL-FrameType ::=                    ENUMERATED {
                                        dl-FrameTypeA, dl-FrameTypeB }




DL-InformationPerRL ::=             SEQUENCE {
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            primaryCPICH-Info                   PrimaryCPICH-Info,
            pdsch-SHO-DCH-Info                  PDSCH-SHO-DCH-Info          OPTIONAL,
            pdsch-CodeMapping                   PDSCH-CodeMapping           OPTIONAL
        },
        tdd                                 PrimaryCCPCH-Info
    },
    dl-DPCH-InfoPerRL                   DL-DPCH-InfoPerRL                   OPTIONAL,
    secondaryCCPCH-Info                 SecondaryCCPCH-Info                 OPTIONAL,
    tfcs                                TFCS                                OPTIONAL,
    fach-PCH-InformationList            FACH-PCH-InformationList            OPTIONAL,
    sib-ReferenceList                   SIB-ReferenceListFACH               OPTIONAL
}

DL-InformationPerRL-List ::=        SEQUENCE (SIZE (1..maxRL)) OF
                                        DL-InformationPerRL


DL-InformationPerRL-ListPost ::=    SEQUENCE (SIZE (1..maxRL)) OF
                                        DL-InformationPerRL-Post

DL-InformationPerRL-Post ::=        SEQUENCE {
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            primaryCPICH-Info                   PrimaryCPICH-Info
        },
        tdd                                 SEQUENCE {
            primaryCCPCH-Info                   PrimaryCCPCH-Info           OPTIONAL
        }
    },
    dl-DPCH-InfoPerRL                   DL-DPCH-InfoPerRL-Post
}

DL-OuterLoopControl ::=             ENUMERATED {
                                        increaseAllowed, increaseNotAllowed }

DL-PDSCH-Information ::=            SEQUENCE {
    pdsch-SHO-DCH-Info                  PDSCH-SHO-DCH-Info                  OPTIONAL,
    pdsch-CodeMapping                   PDSCH-CodeMapping                   OPTIONAL
}

DL-TS-ChannelisationCode ::=        ENUMERATED {
                                        cc16-1, cc16-2, cc16-3, cc16-4,
                                        cc16-5, cc16-6, cc16-7, cc16-8,
                                        cc16-9, cc16-10, cc16-11, cc16-12,
                                        cc16-13, cc16-14, cc16-15, cc16-16 }

DL-TS-ChannelisationCodeList ::=    SEQUENCE (SIZE (1..maxDPCHcodesPerTS)) OF
                                        DL-TS-ChannelisationCode
```

```
DPC-Mode ::=                        ENUMERATED {
                                        singleTPC,
                                        tpcTripletInSoft }

-- The actual value of DPCCH power offset is the value of this IE * 2.
DPCCH-PowerOffset ::=               INTEGER (-82..-3)


DPCH-CompressedModeInfo ::=         SEQUENCE {
    tgp-SequenceList                    TGP-SequenceList
}


DPCH-CompressedModeStatusInfo ::=   SEQUENCE (SIZE (1..maxTGPS)) OF
                                        TGP-SequenceShort


-- TABULAR: Actual value = IE value * 256
DPCH-FrameOffset::=                 INTEGER (0..149)




DSCH-Mapping ::=                    SEQUENCE {
    maxTFCI-Field2Value                 MaxTFCI-Field2Value,
    spreadingFactor                     SF-PDSCH,
    codeNumber                          CodeNumberDSCH,
    multiCodeInfo                       MultiCodeInfo
}

DSCH-MappingList ::=                SEQUENCE (SIZE (1..maxPDSCH-TFCIgroups)) OF
                                        DSCH-Mapping

DSCH-RadioLinkIdentifier ::=        INTEGER (0..511)

DurationTimeInfo ::=                INTEGER (1..4096)

DynamicPersistenceLevel ::=         INTEGER (1..8)

DynamicPersistenceLevelList ::=     SEQUENCE (SIZE (1..maxPRACH)) OF
                                        DynamicPersistenceLevel

DynamicPersistenceLevelTF-List ::= SEQUENCE (SIZE (1..maxTF-CPCH)) OF
                                        DynamicPersistenceLevel


FACH-PCH-Information ::=            SEQUENCE {
    transportFormatSet                  TransportFormatSet,
    transportChannelIdentity            TransportChannelIdentity,
    ctch-Indicator                      BOOLEAN
}


FACH-PCH-InformationList ::=        SEQUENCE (SIZE (1..maxFACH)) OF
                                        FACH-PCH-Information

FrequencyInfo ::=                   SEQUENCE {
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            uarfcn-UL                           UARFCN,
            uarfcn-DL                           UARFCN                      OPTIONAL
        },
        tdd                                 SEQUENCE {
            uarfcn-Nt                           UARFCN
        }
    }
}


IndividualTimeslotInfo ::=          SEQUENCE {
    timeslotNumber                      TimeslotNumber,
    tfci-Existence                      BOOLEAN                             OPTIONAL,
    burstType                           CHOICE {
        type-1                              SEQUENCE {
            midambleShift                       MidambleShiftLong           OPTIONAL
        },
        type-2                              SEQUENCE {
            midambleShift                       MidambleShiftShort          OPTIONAL
```

```
        }
    }
}

IndividualTS-InfoDL-CCTrCH ::=      SEQUENCE {
    individualTimeslotInfo              IndividualTimeslotInfo,
    dl-TS-ChannelisationCodeList        DL-TS-ChannelisationCodeList
}

IndividualTS-InfoDL-CCTrCHList ::= SEQUENCE (SIZE (1..maxTS)) OF
                                        IndividualTS-InfoDL-CCTrCH


IndividualTS-InfoPDSCH ::=          SEQUENCE {
    individualTimeslotInfo              IndividualTimeslotInfo,
    pdsch-ChannelisationCode            DL-TS-ChannelisationCodeList
}

IndividualTS-InfoPDSCH-List ::=     SEQUENCE (SIZE (1..maxTS)) OF
                                        IndividualTS-InfoPDSCH


IndividualTS-InfoPUSCH ::=          SEQUENCE {
    individualTimeslotInfo              IndividualTimeslotInfo,
    ul-ChannelisationCode           UL-TS-ChannelisationCodeList
}

IndividualTS-InfoPUSCH-List ::=     SEQUENCE (SIZE (1..maxTS)) OF
                                        IndividualTS-InfoPUSCH


IndividualTS-InfoUL-CCTrCH ::=      SEQUENCE {
    individualTimeslotInfo              IndividualTimeslotInfo,
    channelisationCodeList              UL-TS-ChannelisationCodeList
}

IndividualTS-InfoUL-CCTrCH-List ::= SEQUENCE (SIZE (1..maxTS)) OF
                                        IndividualTS-InfoUL-CCTrCH

IndividualTS-Interference ::=       SEQUENCE {
    timeslot                            TimeslotNumber,
    ul-TimeslotInterference             UL-Interference
}

IndividualTS-InterferenceList ::=   SEQUENCE (SIZE (1..maxTS)) OF
                                        IndividualTS-Interference


ITP ::=                             ENUMERATED {
                                        mode0, mode1 }

-- Value range of -50..33 is used for Release 99
MaxAllowedUL-TX-Power ::=           INTEGER (-50..77)

MaxAvailablePCPCH-Number ::=        INTEGER (1..64)

MaxTFCI-Field2Value ::=             INTEGER (1..1023)

MidambleConfiguration ::=           SEQUENCE {
    burstType1                          BurstType1                          DEFAULT ms8,
    -- TABULAR: The default value for BurstType2 has not been specified due to
    -- compactness reasons.
    burstType2                          BurstType2
}


MidambleShiftLong ::=               INTEGER (0..15)


MidambleShiftShort ::=              INTEGER (0..5)

MinimumSpreadingFactor ::=          ENUMERATED {
                                        sf4, sf8, sf16, sf32,
                                        sf64, sf128, sf256 }

MultiCodeInfo ::=                   INTEGER (1..16)
```

```
N-EOT ::=                           INTEGER (0..7)

N-GAP ::=                           ENUMERATED {
                                        f2, f4, f8 }

N-PCH ::=                           INTEGER (1..8)

N-StartMessage ::=                  INTEGER (1..8)


NB01 ::=                            INTEGER (0..50)

NF-Max ::=                          INTEGER (1..64)

NumberOfDPDCH ::=                   INTEGER (1..maxDPDCH-UL)

NumberOfFBI-Bits ::=                INTEGER (1..2)

PagingIndicatorLength ::=           ENUMERATED {
                                        pi2, pi4, pi8 }


PC-Preamble ::=                     ENUMERATED {
                                        pcp0, pcp15 }



PCP-Length ::=                      ENUMERATED {
                                        as0, as8 }


PCPCH-ChannelInfo ::=               SEQUENCE {
    pcpch-UL-ScramblingCode             INTEGER (0..79),
    pcpch-DL-ChannelisationCode         INTEGER (0..511),
    pcpch-DL-ScramblingCode             SecondaryScramblingCode             OPTIONAL,
    pcp-Length                          PCP-Length,
    ucsm-Info                           UCSM-Info                           OPTIONAL
}

PCPCH-ChannelInfoList ::=           SEQUENCE (SIZE (1..maxPCPCHs)) OF
                                        PCPCH-ChannelInfo

PCPICH-UsageForChannelEst ::=       ENUMERATED {
                                        mayBeUsed,
                                        shallNotBeUsed }


PDSCH-CodeInfo ::=                  SEQUENCE {
    spreadingFactor                     SF-PDSCH,
    codeNumber                          CodeNumberDSCH,
    multiCodeInfo                       MultiCodeInfo
}

PDSCH-CodeInfoList ::=              SEQUENCE (SIZE (1..maxTFCI-2-Combs)) OF
                                        PDSCH-CodeInfo

PDSCH-CodeMap ::=                   SEQUENCE {
    spreadingFactor                     SF-PDSCH,
    multiCodeInfo                       MultiCodeInfo
}

PDSCH-CodeMapList ::=               SEQUENCE (SIZE (1..maxPDSCH-TFCIgroups)) OF
                                        PDSCH-CodeMap

PDSCH-CodeMapping ::=               SEQUENCE {
    dl-ScramblingCode                   SecondaryScramblingCode             OPTIONAL,
    signallingMethod                    CHOICE {
        codeRange                           CodeRange,
        tfci-Range                          DSCH-MappingList,
        explicit                            PDSCH-CodeInfoList,
        replace                             ReplacedPDSCH-CodeInfoList
    }
}


PDSCH-Info ::=                      SEQUENCE {
    tfcs-Identity                       TFCS-Identity                       OPTIONAL,
    sfn-TimeInfo                        SFN-TimeInfo                        OPTIONAL,
```

```
    commonTimeslotInfo                  CommonTimeslotInfo                  OPTIONAL,
    individualTimeslotInfoList          IndividualTS-InfoPDSCH-List         OPTIONAL
}

PDSCH-SHO-DCH-Info ::=              SEQUENCE {
    dsch-RadioLinkIdentifier            DSCH-RadioLinkIdentifier,
    tfci-CombiningSet                   TFCI-CombiningSet                   OPTIONAL,
    rl-IdentifierList                   RL-IdentifierList                   OPTIONAL
}


PDSCH-SysInfo ::=                   SEQUENCE {
    pdsch-Info                          PDSCH-Info,
    dsch-TFS                            TransportFormatSet,
    dsch-TFCS                           TFCS
}

PDSCH-SysInfoList ::=               SEQUENCE (SIZE (1..maxPDSCH)) OF
                                        PDSCH-SysInfo

PersistenceScalingFactor ::=        ENUMERATED {
                                        psf0-9, psf0-8, psf0-7, psf0-6,
                                        psf0-5, psf0-4, psf0-3, psf0-2 }

PersistenceScalingFactorList ::=    SEQUENCE (SIZE (1..maxASCpersist)) OF
                                        PersistenceScalingFactor

PI-CountPerFrame ::=                ENUMERATED {
                                        e18, e36, e72, e144 }

PICH-Info ::=                       CHOICE {
    fdd                                 SEQUENCE {
        secondaryScramblingCode             SecondaryScramblingCode         OPTIONAL,
        channelisationCode256               ChannelisationCode256,
        pi-CountPerFrame                    PI-CountPerFrame,
        sttd-Indicator                      BOOLEAN
    },
    tdd                                 SEQUENCE {
        channelisationCode                  TDD-PICH-CCode                  OPTIONAL,
        timeslot                            TimeslotNumber                  OPTIONAL,
        burstType                           CHOICE {
            type-1                              MidambleShiftLong,
            type-2                              MidambleShiftShort
        }                                                                   OPTIONAL,
        repetitionPeriodLengthOffset        RepPerLengthOffset-PICH         OPTIONAL,
        pagingIndicatorLength               PagingIndicatorLength           DEFAULT pi2,
        n-GAP                               N-GAP                           DEFAULT f4,
        n-PCH                               N-PCH                           DEFAULT 2
    }
}

PICH-PowerOffset ::=                INTEGER (-10..5)

PilotBits128 ::=                    ENUMERATED {
                                        pb4, pb8 }

PilotBits256 ::=                    ENUMERATED {
                                        pb2, pb4, pb8 }

PositionFixedOrFlexible ::=         ENUMERATED {
                                        fixed,
                                        flexible }

PowerControlAlgorithm ::=           CHOICE {
    algorithm1                          TPC-StepSize,
    algorithm2                          NULL
}

PowerOffsetP0 ::=                   INTEGER (1..8)

PRACH-Midamble ::=                  ENUMERATED {
                                        direct,
                                        direct-Inverted }


PRACH-Partitioning ::=              CHOICE {
    fdd                                 SEQUENCE (SIZE (1..maxASC)) OF
                                            AccessServiceClass,
```

```
    tdd                                 SEQUENCE (SIZE (1..maxASC)) OF
                                            ASC
}

PRACH-PowerOffset ::=               SEQUENCE {
    powerOffsetP0                       PowerOffsetP0,
    preambleRetransMax                  PreambleRetransMax
}


PRACH-RACH-Info ::=                 SEQUENCE {
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            availableSignatureList              AvailableSignatureList,
            availableSF                         SF-PRACH,
            scramblingCodeWordNumber            ScramblingCodeWordNumber,
            puncturingLimit                     PuncturingLimit,
            availableSubChannelNumberList       AvailableSubChannelNumberList
        },
        tdd                                 SEQUENCE {
            timeslot                            TimeslotNumber,
            channelisationCode                  TDD-PRACH-CCodeList,
            prach-Midamble                      PRACH-Midamble              OPTIONAL
        }
    }
}


PRACH-SystemInformation ::=         SEQUENCE {
    prach-RACH-Info                     PRACH-RACH-Info,
    transportChannelIdentity            TransportChannelIdentity,
    rach-TransportFormatSet             TransportFormatSet                  OPTIONAL,
    rach-TFCS                           TFCS                                OPTIONAL,
    prach-Partitioning                  PRACH-Partitioning                  OPTIONAL,
    persistenceScalingFactorList        PersistenceScalingFactorList        OPTIONAL,
    ac-To-ASC-MappingTable              AC-To-ASC-MappingTable              OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            primaryCPICH-TX-Power               PrimaryCPICH-TX-Power       OPTIONAL,
            constantValue                       ConstantValue               OPTIONAL,
            prach-PowerOffset                   PRACH-PowerOffset           OPTIONAL,
            rach-TransmissionParameters         RACH-TransmissionParameters OPTIONAL,
            aich-Info                           AICH-Info                   OPTIONAL
        },
        tdd                                 NULL
    }
}

PRACH-SystemInformationList ::=     SEQUENCE (SIZE (1..maxPRACH)) OF
                                        PRACH-SystemInformation

PreambleRetransMax ::=              INTEGER (1..64)


PreDefPhyChConfiguration ::=        SEQUENCE {
    ul-DPCH-InfoPredef                  UL-DPCH-InfoPredef,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            dl-CommonInformationPredef          DL-CommonInformationPredef  OPTIONAL
        },
        tdd                                 NULL
    }
}


PrimaryCCPCH-Info ::=               CHOICE {
    fdd                                 SEQUENCE {
        tx-DiversityIndicator               BOOLEAN
    },
    tdd                                 SEQUENCE {
        syncCase                            CHOICE {
            syncCase1                           SEQUENCE {
                timeslot                            TimeslotNumber
            },
            syncCase2                           SEQUENCE {
                timeslotSync2                       TimeslotSync2
            }
        }                                                                   OPTIONAL,
```

```
        cellParametersID                    CellParametersID                OPTIONAL,
        blockSTTD-Indicator                 BOOLEAN
    }
}


PrimaryCCPCH-TX-Power ::=           INTEGER (6..43)

PrimaryCPICH-Info ::=               SEQUENCE {
    primaryScramblingCode               PrimaryScramblingCode
}

-- Value range -10 .. 50 used for Release 99
PrimaryCPICH-TX-Power ::=           INTEGER (-10..53)

PrimaryScramblingCode ::=           INTEGER (0..511)


PuncturingLimit ::=                 ENUMERATED {
                                        pl0-40, pl0-44, pl0-48, pl0-52, pl0-56,
                                        pl0-60, pl0-64, pl0-68, pl0-72, pl0-76,
                                        pl0-80, pl0-84, pl0-88, pl0-92, pl0-96, pl1 }



PUSCH-CapacityAllocationInfo ::=    SEQUENCE {
    pusch-Allocation                    CHOICE {
        pusch-AllocationPending             NULL,
        pusch-AllocationAssignment          SEQUENCE {
            pusch-PowerControlInfo              UL-TargetSIR                OPTIONAL,
            pusch-Info                          PUSCH-Info
        }
    }
}



PUSCH-Info ::=                      SEQUENCE {
    tfcs-Identity                       TFCS-Identity                       OPTIONAL,
    sfn-timeInfo                        SFN-TimeInfo                        OPTIONAL,
    commonTimeslotInfo                  CommonTimeslotInfo                  OPTIONAL,
    timeslotInfoList                    IndividualTS-InfoPUSCH-List         OPTIONAL
}


PUSCH-SysInfo ::=                   SEQUENCE {
    pusch-Info                          PUSCH-Info,
    usch-TFS                            TransportFormatSet,
    usch-TFCS                           TFCS
}

PUSCH-SysInfoList ::=               SEQUENCE (SIZE (1..maxPUSCH)) OF
                                        PUSCH-SysInfo


RACH-TransmissionParameters ::=     SEQUENCE {
    mmax                                INTEGER (1..32),
    nb01Min                             NB01,
    nb01Max                             NB01
}

ReducedScramblingCodeNumber ::=     INTEGER (0..8191)

RepetitionPeriodAndLength ::=       CHOICE {
    repetitionPeriod1                   NULL,
    repetitionPeriod2                   INTEGER (1..1),
    -- repetitionPeriod2 could just as well be NULL also.
    repetitionPeriod4                   INTEGER (1..3),
    repetitionPeriod8                   INTEGER (1..7),
    repetitionPeriod16                  INTEGER (1..15),
    repetitionPeriod32                  INTEGER (1..31),
    repetitionPeriod64                  INTEGER (1..63)
}

RepetitionPeriodLengthAndOffset ::= CHOICE {
    repetitionPeriod1                   NULL,
    repetitionPeriod2                   SEQUENCE {
        length                              NULL,
```

```
        offset                              INTEGER (0..1)
    },
    repetitionPeriod4                   SEQUENCE {
        length                              INTEGER (1..3),
        offset                              INTEGER (0..3)
    },
    repetitionPeriod8                   SEQUENCE {
        length                              INTEGER (1..7),
        offset                              INTEGER (0..7)
    },
    repetitionPeriod16                  SEQUENCE {
        length                              INTEGER (1..15),
        offset                              INTEGER (0..15)
    },
    repetitionPeriod32                  SEQUENCE {
        length                              INTEGER (1..31),
        offset                              INTEGER (0..31)
    },
    repetitionPeriod64                  SEQUENCE {
        length                              INTEGER (1..63),
        offset                              INTEGER (0..63)
    }
}

ReplacedPDSCH-CodeInfo ::=          SEQUENCE {
    tfci-Field2                         MaxTFCI-Field2Value,
    spreadingFactor                     SF-PDSCH,
    codeNumber                          CodeNumberDSCH,
    multiCodeInfo                       MultiCodeInfo
}

ReplacedPDSCH-CodeInfoList ::=      SEQUENCE (SIZE (1..maxTFCI-2-Combs)) OF
                                        ReplacedPDSCH-CodeInfo

RepPerLengthOffset-PICH ::=         CHOICE {
    rpp4-2                              INTEGER (0..3),
    rpp8-2                              INTEGER (0..7),
    rpp8-4                              INTEGER (0..7),
    rpp16-2                             INTEGER (0..15),
    rpp16-4                             INTEGER (0..15),
    rpp32-2                             INTEGER (0..31),
    rpp32-4                             INTEGER (0..31),
    rpp64-2                             INTEGER (0..63),
    rpp64-4                             INTEGER (0..63)
}

RL-AdditionInformation ::=          SEQUENCE {
    primaryCPICH-Info                   PrimaryCPICH-Info,
    dl-DPCH-InfoPerRL                   DL-DPCH-InfoPerRL,
    tfci-CombiningIndicator             BOOLEAN,
    secondaryCCPCH-Info                 SecondaryCCPCH-Info                 OPTIONAL,
    tfcs                                TFCS                                OPTIONAL,
    fach-PCH-InformationList            FACH-PCH-InformationList            OPTIONAL,
    sib-ReferenceListFACH               SIB-ReferenceListFACH               OPTIONAL
}

RL-AdditionInformationList ::=      SEQUENCE (SIZE (1..maxRL-1)) OF
                                        RL-AdditionInformation

RL-IdentifierList ::=               SEQUENCE (SIZE (1..maxRL)) OF
                                        PrimaryCPICH-Info

RL-RemovalInformationList ::=       SEQUENCE (SIZE (1..maxRL)) OF
                                        PrimaryCPICH-Info


RPP ::=                             ENUMERATED {
                                        mode0, mode1 }

S-Field ::=                         ENUMERATED {
                                        e1bit, e2bits }

SCCPCH-ChannelisationCode ::=       ENUMERATED {
                                        cc16-1, cc16-2, cc16-3, cc16-4,
                                        cc16-5, cc16-6, cc16-7, cc16-8,
                                        cc16-9, cc16-10, cc16-11, cc16-12,
                                        cc16-13, cc16-14, cc16-15, cc16-16 }
```

```
SCCPCH-ChannelisationCodeList ::=   SEQUENCE (SIZE (1..16)) OF
                                        SCCPCH-ChannelisationCode


SCCPCH-SystemInformation ::=        SEQUENCE {
    secondaryCCPCH-Info                 SecondaryCCPCH-Info,
    tfcs                                TFCS                                OPTIONAL,
    fach-PCH-InformationList            FACH-PCH-InformationList            OPTIONAL,
    pich-Info                           PICH-Info                           OPTIONAL
}

SCCPCH-SystemInformationList ::=    SEQUENCE (SIZE (1..maxSCCPCH)) OF
                                        SCCPCH-SystemInformation

ScramblingCodeChange ::=            ENUMERATED {
                                        codeChange, noCodeChange }

ScramblingCodeType ::=              ENUMERATED {
                                        shortSC,
                                        longSC }

ScramblingCodeWordNumber ::=        INTEGER (0..15)


SecondaryCCPCH-Info ::=             SEQUENCE {
    selectionIndicator                  SelectionIndicator                  OPTIONAL,
    -- The IE above is conditional on the logical channel type.
    modeSpecificInfo                CHOICE {
        fdd                             SEQUENCE {
            pCPICH-UsageForChannelEst       PCPICH-UsageForChannelEst,
            secondaryCPICH-Info             SecondaryCPICH-Info             OPTIONAL,
            secondaryScramblingCode         SecondaryScramblingCode         OPTIONAL,
            sttd-Indicator                  BOOLEAN,
            sf-AndCodeNumber                SF256-AndCodeNumber,
            pilotSymbolExistence            BOOLEAN,
            tfci-Existence                  BOOLEAN,
            positionFixedOrFlexible         PositionFixedOrFlexible,
            timingOffset                    TimingOffset                    DEFAULT 0
        },
        tdd                             SEQUENCE {
            -- TABULAR: the offset is included in CommonTimeslotInfoSCCPCH
            commonTimeslotInfo              CommonTimeslotInfoSCCPCH,
            individualTimeslotInfo          IndividualTimeslotInfo,
            channelisationCode              SCCPCH-ChannelisationCodeList
        }
    }
}

SecondaryCPICH-Info ::=             SEQUENCE {
    secondaryDL-ScramblingCode          SecondaryScramblingCode             OPTIONAL,
    channelisationCode                  ChannelisationCode256
}

-- Value range 1..15 used for Release 99
SecondaryScramblingCode ::=         INTEGER (1..16)

SecondInterleavingMode ::=          ENUMERATED {
                                        frameRelated, timeslotRelated }

SelectionIndicator ::=              ENUMERATED {
                                        on, off }


-- SF256-AndCodeNumber encodes both "Spreading factor" and "Code Number"
SF256-AndCodeNumber ::=             CHOICE {
    sf4                                 INTEGER (0..3),
    sf8                                 INTEGER (0..7),
    sf16                                INTEGER (0..15),
    sf32                                INTEGER (0..31),
    sf64                                INTEGER (0..63),
    sf128                               INTEGER (0..127),
    sf256                               INTEGER (0..255)
}


-- SF512-AndCodeNumber encodes both "Spreading factor" and "Code Number"
SF512-AndCodeNumber ::=             CHOICE {
```

```
    sf4                                 INTEGER (0..3),
    sf8                                 INTEGER (0..7),
    sf16                                INTEGER (0..15),
    sf32                                INTEGER (0..31),
    sf64                                INTEGER (0..63),
    sf128                               INTEGER (0..127),
    sf256                               INTEGER (0..255),
    sf512                               INTEGER (0..511)
}


-- SF512-AndPilot encodes both "Spreading factor" and "Number of bits for Pilot bits"
SF512-AndPilot ::=                  CHOICE {
    sfd4                                NULL,
    sfd8                                NULL,
    sfd16                               NULL,
    sfd32                               NULL,
    sfd64                               NULL,
    sfd128                              PilotBits128,
    sfd256                              PilotBits256,
    sfd512                              NULL
}
SF-PDSCH ::=                        ENUMERATED {
                                        sfp4, sfp8, sfp16, sfp32,
                                        sfp64, sfp128, sfp256, spare }

SF-PRACH ::=                        ENUMERATED {
                                        sfpr32, sfpr64, sfpr128, sfpr256 }


SFN-TimeInfo ::=                    SEQUENCE {
    activationTime                  INTEGER (0..4094)               OPTIONAL,
    physChDuration                  DurationTimeInfo                OPTIONAL
}

Signature ::=                       INTEGER (0..15)



SpreadingFactor::=                  ENUMERATED {
                                        sf4, sf8, sf16, sf32,
                                        sf64, sf128, sf256 }

SSDT-CellIdentity ::=               ENUMERATED {
                                        ssdt-id-a, ssdt-id-b, ssdt-id-c,
                                        ssdt-id-d, ssdt-id-e, ssdt-id-f,
                                        ssdt-id-g, ssdt-id-h }

SSDT-Information ::=                SEQUENCE {
    s-Field                             S-Field,
    codeWordSet                         CodeWordSet
}

TDD-PICH-CCode ::=                  ENUMERATED {
                                        cc16-1, cc16-2, cc16-3, cc16-4,
                                        cc16-5, cc16-6, cc16-7, cc16-8,
                                        cc16-9, cc16-10, cc16-11, cc16-12,
                                        cc16-13, cc16-14, cc16-15, cc16-16 }


TDD-PRACH-CCode8 ::=                ENUMERATED {
                                        cc8-1, cc8-2, cc8-3, cc8-4,
                                        cc8-5, cc8-6, cc8-7, cc8-8 }


TDD-PRACH-CCode16 ::=               ENUMERATED {
                                        cc16-1, cc16-2, cc16-3, cc16-4,
                                        cc16-5, cc16-6, cc16-7, cc16-8,
                                        cc16-9, cc16-10, cc16-11, cc16-12,
                                        cc16-13, cc16-14, cc16-15, cc16-16 }


TDD-PRACH-CCodeList ::=             CHOICE {
    sf8                                 SEQUENCE (SIZE (1..8)) OF
                                            TDD-PRACH-CCode8,
    sf16                                SEQUENCE (SIZE (1..8)) OF
                                            TDD-PRACH-CCode16
}
```

```
TFC-ControlDuration ::=             ENUMERATED {
                                        tfc-cd1, tfc-cd16, tfc-cd24, tfc-cd32,
                                        tfc-cd48, tfc-cd64, tfc-cd128,
                                        tfc-cd192, tfc-cd256, tfc-cd512,
                                        spare1, spare2, spare3, spare4,
                                        spare5, spare6, spare7, spare8 }

TFCI-Coding ::=                     ENUMERATED {
                                        tfci-bits-4, tfci-bits-8,
                                        tfci-bits-16, tfci-bits-32 }

-- **TODO**, not defined
TFCI-CombiningSet ::=               SEQUENCE {
}


TGCFN ::=                           INTEGER (0..255)


-- The value 270 represents "undefined" in the tabular description.
TGD ::=                             INTEGER (15..270)

TGL ::=                             INTEGER (1..14)


TGMP ::=                            ENUMERATED {
                                        tdd-Measurement, fdd-Measurement,
                                        gsm-Measurement, otherMP }


TGP-Sequence ::=                    SEQUENCE {
    tgpsi                               TGPSI,
    tgps-StatusFlag                     TGPS-StatusFlag,
    tgps-ConfigurationParams            TGPS-ConfigurationParams            OPTIONAL
}

TGP-SequenceList ::=                SEQUENCE (SIZE (1..maxTGPS)) OF
                                        TGP-Sequence


TGP-SequenceShort ::=               SEQUENCE {
    tgpsi                               TGPSI,
    tgps-StatusFlag                     TGPS-StatusFlag
}

TGPL ::=                            INTEGER (1..144)

-- TABULAR: The value 0 represents "infinity" in the tabular description.
TGPRC ::=                           INTEGER (0..63)


TGPS-ConfigurationParams ::=        SEQUENCE {
    tgmp                                TGMP,
    tgprc                               TGPRC,
    tgcfn                               TGCFN,
    tgsn                                TGSN,
    tgl1                                TGL,
    tgl2                                TGL                                 OPTIONAL,
    tgd                                 TGD,
    tgpl1                               TGPL,
    tgpl2                               TGPL                                OPTIONAL,
    rpp                                 RPP,
    itp                                 ITP,
    ul-DL-Mode                          UL-DL-Mode,
    -- TABULAR: Compressed mode method is nested inside UL-DL-Mode
    dl-FrameType                        DL-FrameType,
    deltaSIR1                           DeltaSIR,
    deltaSIRAfter1                      DeltaSIR,
    deltaSIR2                           DeltaSIR                            OPTIONAL,
    deltaSIRAfter2                      DeltaSIR                            OPTIONAL
}


TGPS-StatusFlag ::=                 ENUMERATED {
                                        tgpsActive, tgpsInactive }

TGPSI ::=                           INTEGER (1..maxTGPS)
```

```
TGSN ::=                            INTEGER (0..14)

TimeInfo ::=                        SEQUENCE {
    activationTime                      ActivationTime                      OPTIONAL,
    durationTimeInfo                    DurationTimeInfo                    OPTIONAL
}

TimeslotList ::=                    SEQUENCE (SIZE (1..maxTS)) OF
                                        TimeslotNumber

TimeslotNumber ::=                      INTEGER (0..14)


TimeslotSync2 ::=               INTEGER (0..6)

-- Actual value = IE value * 256
TimingOffset ::=                    INTEGER (0..149)

TPC-CombinationIndex ::=            INTEGER (0..5)

TPC-StepSize ::=                    INTEGER (0..1)

TX-DiversityMode ::=                ENUMERATED {
                                        noDiversity,
                                        sttd,
                                        closedLoopMode1,
                                        closedLoopMode2 }

UARFCN ::=                      INTEGER (0..16383)


UCSM-Info ::=                       SEQUENCE {
    minimumSpreadingFactor              MinimumSpreadingFactor,
    nf-Max                              NF-Max,
    channelReqParamsForUCSM             ChannelReqParamsForUCSM
}

UL-CCTrCH ::=                       SEQUENCE {
    tfcs-Identity                       TFCS-Identity                       OPTIONAL,
    timeInfo                            TimeInfo,
    commonTimeslotInfo                  CommonTimeslotInfo                  OPTIONAL,
    timeslotInfoList                    IndividualTS-InfoUL-CCTrCH-List     OPTIONAL
}

UL-CCTrCHList ::=                   SEQUENCE (SIZE (1..maxCCTrCH)) OF
                                        UL-CCTrCH

UL-ChannelRequirement ::=           CHOICE {
    ul-DPCH-Info                        UL-DPCH-Info,
    prach-RACH-Info                     PRACH-RACH-Info,
    spare                               NULL
}


UL-CompressedModeMethod ::=         ENUMERATED {
                                        sf-2, noCompressing,
                                        higherLayerScheduling }

UL-DL-Mode ::=                      CHOICE {
    ul                                  UL-CompressedModeMethod,
    dl                                  DL-CompressedModeMethod
}


UL-DPCCH-SlotFormat ::=             ENUMERATED {
                                        slf0, slf1, slf2 }


UL-DPCH-Info ::=                    SEQUENCE {
    ul-DPCH-PowerControlInfo            UL-DPCH-PowerControlInfo            OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            scramblingCodeType                  ScramblingCodeType,
            scramblingCode                      UL-ScramblingCode,
            numberOfDPDCH                       NumberOfDPDCH               DEFAULT 1,
            spreadingFactor                     SpreadingFactor,
            tfci-Existence                      BOOLEAN,
```

```
            numberOfFBI-Bits                    NumberOfFBI-Bits            OPTIONAL,
            -- The IE above is conditional based on history
            puncturingLimit                     PuncturingLimit
        },
        tdd                                 SEQUENCE {
            ul-TimingAdvance                    UL-TimingAdvance            OPTIONAL,
            ul-CCTrCHList                       UL-CCTrCHList
        }
    }
}


UL-DPCH-InfoPost ::=                SEQUENCE {
    ul-DPCH-PowerControlInfo            UL-DPCH-PowerControlInfoPost,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            scramblingCodeType                  ScramblingCodeType,
            reducedScramblingCodeNumber         ReducedScramblingCodeNumber,
            spreadingFactor                     SpreadingFactor
        },
        tdd                                 SEQUENCE {
            ul-TimingAdvance                    UL-TimingAdvance            OPTIONAL,
            timeInfo                            TimeInfo,
            commonTimeslotInfo                  CommonTimeslotInfo,
            timeslotInfoList                    IndividualTS-InfoUL-CCTrCH-List
        }
    }
}


UL-DPCH-InfoPredef ::=              SEQUENCE {
    ul-DPCH-PowerControlInfo            UL-DPCH-PowerControlInfoPredef,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            tfci-Existence                      BOOLEAN,
            puncturingLimit                     PuncturingLimit
        },
        tdd                                 NULL
    }
}

UL-DPCH-PowerControlInfo ::=        CHOICE {
    fdd                                 SEQUENCE {
        dpcch-PowerOffset                   DPCCH-PowerOffset,
        pc-Preamble                         PC-Preamble,
        powerControlAlgorithm               PowerControlAlgorithm
        -- TABULAR: TPC step size nested inside PowerControlAlgorithm
    },
    tdd                                 SEQUENCE {
        ul-TargetSIR                        UL-TargetSIR,
        handoverGroup                       SEQUENCE {
            individualTS-InterferenceList       IndividualTS-InterferenceList,
            dpch-ConstantValue                  ConstantValue
        }                                                                   OPTIONAL
    }
}


UL-DPCH-PowerControlInfoPost ::=    SEQUENCE {
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            powerControlAlgorithm               PowerControlAlgorithm
            -- TABULAR: TPC step size nested inside PowerControlAlgorithm
        },
        tdd                                 SEQUENCE {
            ul-TargetSIR                        UL-TargetSIR,
            individualTS-InterferenceList       IndividualTS-InterferenceList
        }
    }
}


UL-DPCH-PowerControlInfoPredef ::=      CHOICE {
    fdd                                 SEQUENCE {
        dpcch-PowerOffset                   DPCCH-PowerOffset,
        pc-Preamble                         PC-Preamble
    },
```

```
    tdd                                 SEQUENCE {
        dpch-ConstantValue                  ConstantValue
    }
}

-- Value range -110 .. -70 used for Release 99
UL-Interference ::=                 INTEGER (-110..-47)

--
UL-ScramblingCode ::=               INTEGER (0..16777215)

-- Actual value = (IE value * 0.5) - 11
UL-TargetSIR ::=                    INTEGER (0..62)

UL-TimingAdvance ::=                INTEGER (0..63)

UL-TS-ChannelisationCode ::=        ENUMERATED {
                                        cc1-1, cc2-1, cc2-2,
                                        cc4-1, cc4-2, cc4-3, cc4-4,
                                        cc8-1, cc8-2, cc8-3, cc8-4,
                                        cc8-5, cc8-6, cc8-7, cc8-8,
                                        cc16-1, cc16-2, cc16-3, cc16-4,
                                        cc16-5, cc16-6, cc16-7, cc16-8,
                                        cc16-9, cc16-10, cc16-11, cc16-12,
                                        cc16-13, cc16-14, cc16-15, cc16-16 }


UL-TS-ChannelisationCodeList ::=    SEQUENCE (SIZE (1..2)) OF
                                        UL-TS-ChannelisationCode
END
```

11.3.7 Measurement information elements

```
Measurement-IEs DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    CellIdentity
FROM UTRANMobility-IEs

    UTRAN-DRX-CycleLengthCoefficient
FROM UserEquipment-IEs

    RB-Identity
FROM RadioBearer-IEs

    TFCS-IdentityPlain,
    TransportChannelIdentity
FROM TransportChannel-IEs

    BurstType,
    FrequencyInfo,
    MaxAllowedUL-TX-Power,
    PrimaryCCPCH-Info,
    PrimaryCCPCH-TX-Power,
    PrimaryCPICH-Info,
    PrimaryCPICH-TX-Power,
    TimeslotNumber,
    UL-TimingAdvance
FROM PhysicalChannel-IEs

    BSIC
FROM Other-IEs

    maxAdditionalMeas,
    maxCCTrCH,
    maxCellMeas,
    maxCellMeas-1,
    maxFreq,
    maxMeasEvent,
    maxMeasParEvent,
•   maxOtherRAT,
    maxRB,
    maxRL,
    maxRL-1,
    maxSat,
```

```
    maxTrCH,
    maxTS
FROM Constant-definitions;

AcquisitionSatInfo ::=              SEQUENCE {
    satID                               INTEGER (0..63),
    doppler0thOrder                     INTEGER (-2048..2047),
    extraDopplerInfo                    ExtraDopplerInfo                    OPTIONAL,
    codePhase                           INTEGER (0..1022),
    integerCodePhase                    INTEGER (0..19),
    gps-BitNumber                       INTEGER (0..3),
    codePhaseSearchWindow               CodePhaseSearchWindow,
    azimuthAndElevation                 AzimuthAndElevation                 OPTIONAL
}

AcquisitionSatInfoList ::=          SEQUENCE (SIZE (1..maxSat)) OF
                                        AcquisitionSatInfo

AdditionalAssistanceData ::=        OCTET STRING (SIZE (1..38))

AdditionalMeasurementID-List ::=    SEQUENCE (SIZE (1..maxAdditionalMeas)) OF
                                        MeasurementIdentityNumber


AlmanacSatInfo ::=                  SEQUENCE {
    satID                               INTEGER (0..63),
    e                                   BIT STRING (SIZE (16)),
    t-oa                                BIT STRING (SIZE (8)),
    deltaI                              BIT STRING (SIZE (16)),
    omegaDot                            BIT STRING (SIZE (16)),
    satHealth                           BIT STRING (SIZE (8)),
    a-Sqrt                              BIT STRING (SIZE (24)),
    omega0                              BIT STRING (SIZE (24)),
    m0                                  BIT STRING (SIZE (24)),
    omega                               BIT STRING (SIZE (24)),
    af0                                 BIT STRING (SIZE (11)),
    af1                                 BIT STRING (SIZE (11))
}

AlmanacSatInfoList ::=              SEQUENCE (SIZE (1..maxSat)) OF
                                        AlmanacSatInfo

AverageRLC-BufferPayload ::=        ENUMERATED {
                                        pla0, pla4, pla8, pla16, pla32,
                                        pla64, pla128, pla256, pla512,
                                        pla1024, pla2k, pla4k, pla8k, pla16k,
                                        pla32k, pla64k, pla128k, pla256k,
                                        pla512k, pla1024k }

AzimuthAndElevation ::=             SEQUENCE {
    azimuth                             INTEGER (0..31),
    elevation                           INTEGER (0..7)
}

BadSatList ::=                      SEQUENCE (SIZE (1..maxSat)) OF
                                        INTEGER (0..63)

BCCH-ARFCN ::=                      INTEGER (0..1023)

BLER-MeasurementResults ::=         SEQUENCE {
    transportChannelIdentity            TransportChannelIdentity,
    dl-TransportChannelBLER             DL-TransportChannelBLER             OPTIONAL
}

BLER-MeasurementResultsList ::=     SEQUENCE (SIZE (1..maxTrCH)) OF
                                        BLER-MeasurementResults

BLER-TransChIdList ::=              SEQUENCE (SIZE (1..maxTrCH)) OF
                                        TransportChannelIdentity


BSIC-VerificationRequired ::=       ENUMERATED {
                                        required, notRequired }


BurstModeParameters ::=             SEQUENCE {
    burstStart                          INTEGER (0..15),
    burstLength                         INTEGER (10..25),
```

```
    burstFreq                           INTEGER (1..16)
}



CellDCH-ReportCriteria ::=          CHOICE {
    intraFreqReportingCriteria          IntraFreqReportingCriteria,
    periodicalReportingCriteria         PeriodicalReportingCriteria
}

-- Actual value = IE value * 0.5
CellIndividualOffset ::=            INTEGER (-20..20)


CellInfo ::=                        SEQUENCE {
    cellIndividualOffset                CellIndividualOffset                DEFAULT 0,
    referenceTimeDifferenceToCell       ReferenceTimeDifferenceToCell       OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            primaryCPICH-Info                   PrimaryCPICH-Info           OPTIONAL,
            primaryCPICH-TX-Power               PrimaryCPICH-TX-Power       OPTIONAL,
            readSFN-Indicator                   BOOLEAN,
            tx-DiversityIndicator               BOOLEAN
        },
        tdd                                 SEQUENCE {
            primaryCCPCH-Info                   PrimaryCCPCH-Info,
            primaryCCPCH-TX-Power               PrimaryCCPCH-TX-Power       OPTIONAL,
            timeslotInfoList                    TimeslotInfoList            OPTIONAL
        }
    }
}


CellInfoSI ::=                      SEQUENCE {
    cellIndividualOffset                CellIndividualOffset                DEFAULT 0,
    referenceTimeDifferenceToCell       ReferenceTimeDifferenceToCell       OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            primaryCPICH-Info                   PrimaryCPICH-Info           OPTIONAL,
            primaryCPICH-TX-Power               PrimaryCPICH-TX-Power       OPTIONAL,
            readSFN-Indicator                   BOOLEAN,
            tx-DiversityIndicator               BOOLEAN
        },
        tdd                                 SEQUENCE {
            primaryCCPCH-Info                   PrimaryCCPCH-Info,
            primaryCCPCH-TX-Power               PrimaryCCPCH-TX-Power       OPTIONAL,
            timeslotInfoList                    TimeslotInfoList            OPTIONAL
        }
    },
    cellSelectionReselectionInfo        CellSelectReselectInfoSIB-11-12     OPTIONAL
}


CellMeasuredResults ::=             SEQUENCE {
    cellIdentity                        CellIdentity                        OPTIONAL,
    sfn-SFN-ObsTimeDifference           SFN-SFN-ObsTimeDifference           OPTIONAL,
    cfn-SFN-ObsTimeDifference           CFN-SFN-ObsTimeDifference           OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            primaryCPICH-Info                   PrimaryCPICH-Info,
            cpich-Ec-N0                         CPICH-Ec-N0                 OPTIONAL,
            cpich-RSCP                          CPICH-RSCP                  OPTIONAL,
            pathloss                            Pathloss                    OPTIONAL
        },
        tdd                                 SEQUENCE {
            primaryCCPCH-Info                   PrimaryCCPCH-Info,
            primaryCCPCH-RSCP                   PrimaryCCPCH-RSCP           OPTIONAL,
            timeslotISCP-List                   TimeslotISCP-List           OPTIONAL
        }
    }
}

CellMeasurementEventResults ::=     CHOICE {
    fdd                                 SEQUENCE (SIZE (1..maxCellMeas)) OF
                                            PrimaryCPICH-Info,
    tdd                                 SEQUENCE (SIZE (1..maxCellMeas)) OF
                                            PrimaryCCPCH-Info
}
```

```
CellPosition ::=                    SEQUENCE {
    relativeNorth                       INTEGER (-32767..32767),
    relativeEast                        INTEGER (-32767..32767),
    relativeAltitude                    INTEGER (-4095..4095)
}


CellReportingQuantities ::=         SEQUENCE {
    sfn-SFN-OTD-Type                    SFN-SFN-OTD-Type,
    cellIdentity                        BOOLEAN,
    cfn-SFN-ObsTimeDifference           BOOLEAN,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            cpich-Ec-N0                         BOOLEAN,
            cpich-RSCP                          BOOLEAN,
            pathloss                            BOOLEAN
        },
        tdd                                 SEQUENCE {
            timeslotISCP                        BOOLEAN,
            primaryCCPCH-RSCP                   BOOLEAN,
            pathloss                            BOOLEAN
        }
    }
}


CellSelectReselectInfoSIB-11-12 ::= SEQUENCE {
    q-OffsetS-N                     Q-OffsetS-N                     DEFAULT 0,
    maxAllowedUL-TX-Power               MaxAllowedUL-TX-Power               OPTIONAL,
    hcs-NeighbouringCellInformation     HCS-NeighbouringCellInformation     OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            q-QualMin                           Q-QualMin                   OPTIONAL,
            q-RxlevMin                          Q-RxlevMin                  OPTIONAL
        },
        tdd                                 SEQUENCE {
            q-RxlevMin                          Q-RxlevMin                  OPTIONAL
        }
    }
}

CellToMeasure ::=                   SEQUENCE {
    sfn-sfn-Drift                       INTEGER (0..30)                     OPTIONAL,
    primaryCPICH-Info                   PrimaryCPICH-Info,
    frequencyInfo                       FrequencyInfo                       OPTIONAL,
    sfn-SFN-ObservedTimeDifference      SFN-SFN-ObsTimeDifference1,
    fineSFN-SFN                         FineSFN-SFN,
    cellPosition                        CellPosition                        OPTIONAL
}

CellToMeasureInfoList ::=           SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        CellToMeasure

CellToReport ::=                    SEQUENCE {
    frequency                           Frequency,
    bsic                                BSIC
}

CellToReportList ::=                SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        CellToReport


CFN-SFN-ObsTimeDifference ::=       CHOICE {
    fdd-ChipDiff                        INTEGER (0..157286399),
    tdd-FrameDiff                       INTEGER (0..4095)
}

CodePhaseSearchWindow ::=           ENUMERATED {
                                        w1023, w1, w2, w3, w4, w6, w8,
                                        w12, w16, w24, w32, w48, w64,
                                        w96, w128, w192 }

CPICH-Ec-N0 ::=                     INTEGER (-20..0)

-- IE value 0 = <-24 dB, 1 = between -24 and -23 and so on
CPICH-Ec-N0-OTDOA ::=               INTEGER (0..26)
```

```
CPICH-RSCP ::=                    INTEGER (-115..-40)


DeltaPRC ::=                      INTEGER (-127..127)

DeltaRRC ::=                      INTEGER (-7..7)

DGPS-CorrectionSatInfo ::=        SEQUENCE {
    satID                             INTEGER (0..63),
    iode                              BIT STRING (SIZE (8)),
    udre                              UDRE,
    prc                               PRC,
    rrc                               RRC,
    deltaPRC2                         DeltaPRC,
    deltaRRC2                         DeltaRRC,
    deltaPRC3                         DeltaPRC,
    deltaRRC3                         DeltaRRC
}

DGPS-CorrectionSatInfoList ::=    SEQUENCE (SIZE (1..maxSat)) OF
                                      DGPS-CorrectionSatInfo

DGPS-Information ::=              SEQUENCE {
    satID                             SatID,
    iode                              IODE,
    udre                              UDRE,
    prc                               PRC,
    rrc                               RRC,
    deltaPRC2                         DeltaPRC,
    deltaRRC2                         DeltaRRC
}

DGPS-InformationList ::=          SEQUENCE (SIZE (1..maxSat)) OF
                                      DGPS-Information

DiffCorrectionStatus ::=          ENUMERATED {
                                      udre-1-0, udre-0-75, udre-0-5, udre-0-3,
                                      udre-0-2, udre-0-1, noData, invalidData }


-- Actual value = IE value * 0.02
DL-PhysicalChannelBER ::=         INTEGER (0..255)

-- Actual value = IE value * 0.02
DL-TransportChannelBLER ::=       INTEGER (0..255)

DopplerUncertainty ::=            ENUMERATED {
                                      hz12-5, hz25, hz50, hz100, hz200 }

EllipsoidPoint ::=                OCTET STRING (SIZE (7))

EllipsoidPointAltitude ::=        OCTET STRING (SIZE (9))

EllipsoidPointAltitudeEllipse ::= OCTET STRING (SIZE (14))

EllipsoidPointUncertCircle ::=    OCTET STRING (SIZE (8))

EllipsoidPointUncertEllipse ::=   OCTET STRING (SIZE (11))

EnvironmentCharacterization ::=   ENUMERATED {
                                      possibleHeavyMultipathNLOS,
                                      lightMultipathLOS,
                                      notDefined }


Event1a ::=                       SEQUENCE {
    triggeringCondition               TriggeringCondition,
    reportingRange                    ReportingRange,
    forbiddenAffectCellList           ForbiddenAffectCellList            OPTIONAL,
    w                                 W,
    reportDeactivationThreshold       ReportDeactivationThreshold
}


Event1b ::=                       SEQUENCE {
    triggeringCondition               TriggeringCondition,
    reportingRange                    ReportingRange,
    forbiddenAffectCellList           ForbiddenAffectCellList            OPTIONAL,
```

```
    w                                   W
}


Event1c ::=                         SEQUENCE {
    replacementActivationThreshold      ReplacementActivationThreshold
}


Event1ef ::=                        SEQUENCE {
    triggeringCondition                 TriggeringCondition,
    thresholdUsedFrequency              ThresholdUsedFrequency
}


Event2a ::=                         SEQUENCE {
    usedFreqThreshold                   Threshold,
    usedFreqW                           W,
    hysteresis                          HysteresisInterFreq,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL,
    nonUsedFreqParameterList            NonUsedFreqParameterList            OPTIONAL
}


Event2b ::=                         SEQUENCE {
    usedFreqThreshold                   Threshold,
    usedFreqW                           W,
    hysteresis                          HysteresisInterFreq,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL,
    nonUsedFreqParameterList            NonUsedFreqParameterList            OPTIONAL
}


Event2c ::=                         SEQUENCE {
    hysteresis                          HysteresisInterFreq,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL,
    nonUsedFreqParameterList            NonUsedFreqParameterList            OPTIONAL
}


Event2d ::=                         SEQUENCE {
    usedFreqThreshold                   Threshold,
    usedFreqW                           W,
    hysteresis                          HysteresisInterFreq,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL
}


Event2e ::=                         SEQUENCE {
    hysteresis                          HysteresisInterFreq,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL,
    nonUsedFreqParameterList            NonUsedFreqParameterList            OPTIONAL
}


Event2f ::=                         SEQUENCE {
    usedFreqThreshold                   Threshold,
    usedFreqW                           W,
    hysteresis                          HysteresisInterFreq,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL
```

```
}


Event3a ::=                         SEQUENCE {
    thresholdOwnSystem                  Threshold,
    w                                   W,
    thresholdOtherSystem                Threshold,
    hysteresis                          Hysteresis,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL
}


Event3b ::=                         SEQUENCE {
    thresholdOtherSystem                Threshold,
    hysteresis                          Hysteresis,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL

}


Event3c ::=                         SEQUENCE {
    thresholdOtherSystem                Threshold,
    hysteresis                          Hysteresis,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL

}


Event3d ::=                         SEQUENCE {
    hysteresis                          Hysteresis,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL

}

EventIDInterFreq ::=                ENUMERATED {
                                        e2a, e2b, e2c, e2d, e2e, e2f }

EventIDInterSystem ::=              ENUMERATED {
                                        e3a, e3b, e3c, e3d }


EventIDIntraFreq ::=                ENUMERATED {
                                        e1a, e1b, e1c, e1d, e1e,
                                        e1f, e1g, e1h, e1i }

EventResults ::=                    CHOICE {
    intraFreqEventResults               IntraFreqEventResults,
    interFreqEventResults               InterFreqEventResults,
    interSystemEventResults             InterSystemEventResults,
    trafficVolumeEventResults           TrafficVolumeEventResults,
    qualityEventResults                 QualityEventResults,
    ue-InternalEventResults             UE-InternalEventResults,
    lcs-MeasurementEventResults         LCS-MeasurementEventResults
}

ExtraDopplerInfo ::=                SEQUENCE {
    doppler1stOrder                     INTEGER (-42..21),
    dopplerUncertainty                  DopplerUncertainty
}


FACH-MeasurementOccasionInfo ::=    SEQUENCE {
    k-UTRA                              UTRAN-DRX-CycleLengthCoefficient,
    otherRAT-InSysInfoList              OtherRAT-InSysInfoList              OPTIONAL
}
```

```
FilterCoefficient ::=               ENUMERATED {
                                        fc0, fc1, fc2, fc3, fc4, fc5,
                                        fc6, fc7, fc8, fc9, fc11, fc13,
                                        fc15, fc17, fc19, spare1 }

FineSFN-SFN ::=                     ENUMERATED {
                                        fs0, fs0-25, fs0-5, fs0-75 }

ForbiddenAffectCell ::=             CHOICE {
    fdd                                 PrimaryCPICH-Info,
    tdd                                 PrimaryCCPCH-Info
}

ForbiddenAffectCellList ::=         SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        ForbiddenAffectCell

FreqQualityEstimateQuantity-FDD ::= ENUMERATED {
                                        cpich-Ec-N0,
                                        cpich-RSCP }

FreqQualityEstimateQuantity-TDD ::= ENUMERATED {
                                        primaryCCPCH-RSCP }

-- **TODO**, not defined yet
Frequency ::=                       SEQUENCE {
}

GSM-CarrierRSSI ::=                 BIT STRING (SIZE (6))

GPS-MeasurementParam ::=            SEQUENCE {
    satelliteID                         INTEGER (0..63),
    c-N0                                INTEGER (0..63),
    doppler                             INTEGER (-32768..32768),
    wholeGPS-Chips                      INTEGER (0..1023),
    fractionalGPS-Chips                 INTEGER (0..1023),
    multipathIndicator                  MultipathIndicator,
    pseudorangeRMS-Error                INTEGER (0..63)
}

GPS-MeasurementParamList ::=        SEQUENCE (SIZE (1..maxSat)) OF
                                        GPS-MeasurementParam

-- **TODO**, not defined yet
GSM-OutputPower ::=                 SEQUENCE {
}


GPS-TOW-1msec ::=                   INTEGER (0..604799999)


GPS-TOW-1usec ::=                   SEQUENCE {
    tow-1msec                           GPS-TOW-1msec,
    tow-rem-usec                        GPS-TOW-rem-usec
}

GPS-TOW-Assist ::=                  SEQUENCE {
    satID                               INTEGER (0..63),
    tlm-Message                         BIT STRING (SIZE (14)),
    antiSpoof                           BOOLEAN,
    alert                               BOOLEAN,
    tlm-Reserved                        BIT STRING (SIZE (2))
}

GPS-TOW-AssistList ::=              SEQUENCE (SIZE (1..maxSat)) OF
                                        GPS-TOW-Assist


GPS-TOW-rem-usec ::=                INTEGER (0..999)

HCS-CellReselectInformation ::=     SEQUENCE {
    penaltyTime                         PenaltyTime                         OPTIONAL
    -- TABULAR: The default value is "notUsed", temporary offset is nested inside PenaltyTime
}

HCS-NeighbouringCellInformation ::= SEQUENCE {
    hcs-PRIO                            HCS-PRIO                            DEFAULT 0,
    q-HCS                               Q-HCS                               DEFAULT 0,
```

```
    hcs-CellReselectInformation         HCS-CellReselectInformation         OPTIONAL
}

HCS-PRIO ::=                        INTEGER (0..7)

HCS-ServingCellInformation ::=      SEQUENCE {
    hcs-PRIO                            HCS-PRIO                            DEFAULT 0,
    q-HCS                               Q-HCS                               DEFAULT 0,
    t-CR-Max                            T-CRMax                             OPTIONAL
}

-- Actual value = IE value * 0.5
Hysteresis ::=                      INTEGER (0..15)

-- Actual value = IE value * 0.5
HysteresisInterFreq ::=             INTEGER (0..29)

InterFreqCell ::=                   SEQUENCE {
    frequencyInfo                       FrequencyInfo,
    nonFreqRelatedEventResults          CellMeasurementEventResults
}

InterFreqCellID ::=                 INTEGER (0..maxCellMeas-1)
•
InterFreqCellInfoList ::=           SEQUENCE {
    removedInterFreqCellList            RemovedInterFreqCellList            OPTIONAL,
    newInterFreqCellList                NewInterFreqCellList                OPTIONAL
}

InterFreqCellInfoSI-List ::=        SEQUENCE {
    removedInterFreqCellList            RemovedInterFreqCellList            OPTIONAL,
    newInterFreqCellList                NewInterFreqCellSI-List             OPTIONAL
}

InterFreqCellList ::=               SEQUENCE (SIZE (1..maxFreq)) OF
                                        InterFreqCell

InterFreqCellMeasuredResultsList ::= SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        CellMeasuredResults

InterFreqEvent ::=                  CHOICE {
    event2a                             Event2a,
    event2b                             Event2b,
    event2c                             Event2c,
    event2d                             Event2d,
    event2e                             Event2e,
    event2f                             Event2f
}

InterFreqEventList ::=              SEQUENCE (SIZE (1..maxMeasEvent)) OF
                                        InterFreqEvent


InterFreqEventResults ::=           SEQUENCE {
    eventID                             EventIDInterFreq,
    interFreqCellList                   InterFreqCellList                   OPTIONAL
}


InterFreqMeasQuantity ::=           SEQUENCE {
    reportingCriteria                   CHOICE {
        intraFreqReportingCriteria          SEQUENCE {
            intraFreqMeasQuantity               IntraFreqMeasQuantity
        },
        interFreqReportingCriteria          SEQUENCE {
            filterCoefficient                   FilterCoefficient           DEFAULT fc0,
            modeSpecificInfo                    CHOICE {
                fdd                                 SEQUENCE {
                    freqQualityEstimateQuantity-FDD     FreqQualityEstimateQuantity-FDD
                },
                tdd                                 SEQUENCE {
                    freqQualityEstimateQuantity-TDD     FreqQualityEstimateQuantity-TDD
                }
            }
        }
    }
}
```

```
InterFreqMeasuredResults ::=        SEQUENCE {
    frequencyInfo                       FrequencyInfo                       OPTIONAL,
    utra-CarrierRSSI                    UTRA-CarrierRSSI                    OPTIONAL,
    interFreqCellMeasuredResultsList    InterFreqCellMeasuredResultsList    OPTIONAL
}

InterFreqMeasuredResultsList ::=    SEQUENCE (SIZE (1..maxFreq)) OF
                                        InterFreqMeasuredResults


InterFreqMeasurementSysInfo ::=     SEQUENCE {
    interFreqMeasurementID              MeasurementIdentityNumber           DEFAULT 2,
    interFreqCellInfoSI-List            InterFreqCellInfoSI-List            OPTIONAL,
    interFreqMeasQuantity               InterFreqMeasQuantity               OPTIONAL,
    interFreqReportingCriteria          InterFreqReportingCriteria          OPTIONAL
}


InterFreqReportCriteria ::=         CHOICE {
    intraFreqReportingCriteria          IntraFreqReportingCriteria,
    interFreqReportingCriteria          InterFreqReportingCriteria,
    periodicalReportingCriteria         PeriodicalWithReportingCellStatus,
    noReporting                         ReportingCellStatusOpt
}

InterFreqReportingCriteria ::=      SEQUENCE {
    interFreqEventList                  InterFreqEventList                  OPTIONAL
}

InterFreqReportingQuantity ::=      SEQUENCE {
    utra-Carrier-RSSI                   BOOLEAN,
    frequencyQualityEstimate            BOOLEAN,
    nonFreqRelatedQuantities            CellReportingQuantities
}


InterFrequencyMeasurement ::=       SEQUENCE {
    interFreqCellInfoList               InterFreqCellInfoList,
    interFreqMeasQuantity               InterFreqMeasQuantity               OPTIONAL,
    interFreqReportingQuantity          InterFreqReportingQuantity          OPTIONAL,
    measurementValidity                 MeasurementValidity                 OPTIONAL,
    interFreqSetUpdate                  UE-AutonomousUpdateMode             OPTIONAL,
    reportCriteria                      InterFreqReportCriteria
}

InterSystemCellID ::=               INTEGER (0..maxCellMeas-1)

InterSystemCellInfoList ::=         SEQUENCE {
    removedInterSystemCellList          RemovedInterSystemCellList,
    newInterSystemCellList              NewInterSystemCellList
}

InterSystemEvent ::=                CHOICE {
    event3a                             Event3a,
    event3b                             Event3b,
    event3c                             Event3c,
    event3d                             Event3d
}

InterSystemEventList ::=            SEQUENCE (SIZE (1..maxMeasEvent)) OF
                                        InterSystemEvent

InterSystemEventResults ::=         SEQUENCE {
    eventID                             EventIDInterSystem,
    cellToReportList                    CellToReportList
}

InterSystemInfo ::=                 ENUMERATED {
                                        gsm, spare1 }


InterSystemMeasQuantity ::=             SEQUENCE {
    measQuantityUTRAN-QualityEstimate       IntraFreqMeasQuantity,
    systemSpecificInfo                      CHOICE {
        gsm                                     SEQUENCE {
            measurementQuantity                     MeasurementQuantityGSM,
            filterCoefficient                       FilterCoefficient       DEFAULT fc1,
            bsic-VerificationRequired               BSIC-VerificationRequired
```

```
        },
        is-2000                                 SEQUENCE {
            tadd-EcIo                               INTEGER (0..63),
            tcomp-EcIo                              INTEGER (0..15),
            softSlope                               INTEGER (0..63)         OPTIONAL,
            addIntercept                            INTEGER (0..63)         OPTIONAL
        }
    }
}

InterSystemMeasuredResults ::=      CHOICE {
    gsm                                 SEQUENCE {
        frequency                           Frequency,
        gsm-CarrierRSSI                     GSM-CarrierRSSI                 OPTIONAL,
        pathloss                            Pathloss                        OPTIONAL,
        bsic                                BSIC                            OPTIONAL,
        observedTimeDifferenceToGSM         ObservedTimeDifferenceToGSM     OPTIONAL
    },
    spare                               NULL
}

InterSystemMeasuredResultsList ::= SEQUENCE (SIZE (1..maxOtherRAT)) OF
                                        InterSystemMeasuredResults


InterSystemMeasurement ::=          SEQUENCE {
    interSystemCellInfoList             InterSystemCellInfoList             OPTIONAL,
    interSystemMeasQuantity             InterSystemMeasQuantity             OPTIONAL,
    interSystemReportingQuantity        InterSystemReportingQuantity        OPTIONAL,
    reportCriteria                      InterSystemReportCriteria
}

InterSystemMeasurementSysInfo ::=   SEQUENCE {
    interSystemMeasurementID            MeasurementIdentityNumber           DEFAULT 3,
    interSystemCellInfoList             InterSystemCellInfoList             OPTIONAL,
    interSystemMeasQuantity             InterSystemMeasQuantity             OPTIONAL
}


InterSystemReportCriteria ::=       CHOICE {
    interSystemReportingCriteria        InterSystemReportingCriteria,
    periodicalReportingCriteria         PeriodicalWithReportingCellStatus,
    noReporting                         ReportingCellStatusOpt
}

InterSystemReportingCriteria ::=    SEQUENCE {
    interSystemEventList                InterSystemEventList                OPTIONAL
}

InterSystemReportingQuantity ::=    SEQUENCE {
    utran-EstimatedQuality              BOOLEAN,
    systemSpecificInfo                  CHOICE {
        gsm                                 SEQUENCE {
            pathloss                            BOOLEAN,
            observedTimeDifferenceGSM           BOOLEAN,
            gsm-Carrier-RSSI                    BOOLEAN,
            bsic                                BOOLEAN
        },
        spare1                              NULL
    }
}

IntraFreqCellID ::=                 INTEGER (0..maxCellMeas-1)

IntraFreqCellInfoList ::=           SEQUENCE {
    removedIntraFreqCellList            RemovedIntraFreqCellList            OPTIONAL,
    newIntraFreqCellList                NewIntraFreqCellList                OPTIONAL
}


IntraFreqCellInfoSI-List ::=        SEQUENCE {
    removedIntraFreqCellList            RemovedIntraFreqCellList            OPTIONAL,
    newIntraFreqCellList                NewIntraFreqCellSI-List
}


IntraFreqEvent ::=                  CHOICE {
    e1a                                 Event1a,
```

```
    e1b                                 Event1b,
    e1c                                 Event1c,
    e1d                                 NULL,
    e1e                                 Event1ef,
    e1f                                 Event1ef,
    e1g                                 NULL,
    e1h                                 ThresholdUsedFrequency,
    e1i                                 ThresholdUsedFrequency
}


IntraFreqEventCriteria ::=          SEQUENCE {
    event                               IntraFreqEvent,
    hysteresis                          Hysteresis,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL
}

IntraFreqEventCriteriaList ::=      SEQUENCE (SIZE (1..maxMeasEvent)) OF
                                        IntraFreqEventCriteria

IntraFreqEventResults ::=           SEQUENCE {
    eventID                             EventIDIntraFreq,
    cellMeasurementEventResults         CellMeasurementEventResults
}


IntraFreqMeasQuantity ::=           SEQUENCE {
    filterCoefficient                   FilterCoefficient                   DEFAULT fc1,
    modeSpecificInfo                    CHOICE {
        fdd                             SEQUENCE {
            intraFreqMeasQuantity-FDD       IntraFreqMeasQuantity-FDD
        },
        tdd                             SEQUENCE {
            intraFreqMeasQuantity-TDDList   IntraFreqMeasQuantity-TDDList
        }
    }
}


IntraFreqMeasQuantity-FDD ::=       ENUMERATED {
                                        cpich-Ec-NO,
                                        cpich-RSCP,
                                        pathloss,
                                        utra-CarrierRSSI }

IntraFreqMeasQuantity-TDD ::=       ENUMERATED {
                                        primaryCCPCH-RSCP,
                                        pathloss,
                                        timeslotISCP,
                                        utra-CarrierRSSI }


IntraFreqMeasQuantity-TDDList ::=   SEQUENCE (SIZE (1..4)) OF
                                        IntraFreqMeasQuantity-TDD

IntraFreqMeasuredResultsList ::=    SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        CellMeasuredResults

IntraFreqMeasurementSysInfo ::=     SEQUENCE {
    intraFreqMeasurementID              MeasurementIdentityNumber           DEFAULT 1,
    intraFreqCellInfoSI-List            IntraFreqCellInfoSI-List            OPTIONAL,
    intraFreqMeasQuantity               IntraFreqMeasQuantity               OPTIONAL,
    intraFreqReportingQuantityForRACH   IntraFreqReportingQuantityForRACH   OPTIONAL,
    maxReportedCellsOnRACH              MaxReportedCellsOnRACH              OPTIONAL,
    reportingInfoForCellDCH             ReportingInfoForCellDCH             OPTIONAL
}

IntraFreqReportCriteria ::=         CHOICE {
    intraFreqReportingCriteria          IntraFreqReportingCriteria,
    periodicalReportingCriteria         PeriodicalWithReportingCellStatus,
    noReporting                         ReportingCellStatusOpt
}

IntraFreqReportingCriteria ::=      SEQUENCE {
    eventCriteriaList                   IntraFreqEventCriteriaList
```

```
}


IntraFreqReportingQuantity ::=      SEQUENCE {
    activeSetReportingQuantities        CellReportingQuantities,
    monitoredSetReportingQuantities     CellReportingQuantities,
    detectedSetReportingQuantities      CellReportingQuantities             OPTIONAL
}


IntraFreqReportingQuantityForRACH ::= SEQUENCE {
    sfn-SFN-OTD-Type                    SFN-SFN-OTD-Type,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            intraFreqRepQuantityRACH-FDD        IntraFreqRepQuantityRACH-FDD
        },
        tdd                                 SEQUENCE {
            intraFreqRepQuantityRACH-TDDList    IntraFreqRepQuantityRACH-TDDList
        }
    }
}


IntraFreqRepQuantityRACH-FDD ::=    ENUMERATED {
                                        cpich-EcN0, cpich-RSCP,
                                        pathloss, noReport }

IntraFreqRepQuantityRACH-TDD ::=    ENUMERATED {
                                        timeslotISCP,
                                        primaryCCPCH-RSCP,
                                        noReport }


IntraFreqRepQuantityRACH-TDDList ::= SEQUENCE (SIZE (1..2)) OF
                                        IntraFreqRepQuantityRACH-TDD

IntraFrequencyMeasurement ::=       SEQUENCE {
    intraFreqCellInfoList               IntraFreqCellInfoList               OPTIONAL,
    intraFreqMeasQuantity               IntraFreqMeasQuantity               OPTIONAL,
    intraFreqReportingQuantity          IntraFreqReportingQuantity          OPTIONAL,
    measurementValidity                 MeasurementValidity                 OPTIONAL,
    reportCriteria                      IntraFreqReportCriteria
}

IODE ::=                            INTEGER (0..255)

IP-Length ::=                       ENUMERATED {
                                        ipl5, ipl10 }

IP-Spacing ::=                      ENUMERATED {
                                        e5, e7, e10, e15, e20,
                                        e30, e40, e50 }

IS-2000SpecificMeasInfo ::=         ENUMERATED {
                                        frequency, timeslot, colourcode,
                                        outputpower, pn-Offset }

K-InterRAT ::=                      INTEGER (0..12)

LCS-Accuracy ::=                    BIT STRING (SIZE (7))


--  For sfID=0 (sf4), pageNo=18, and sfID=0 & sfID=1 (sf4 & sf5), pageNo=25,
--  the IE fileds for word3 – word110 are the same as LCS-GPS-IonosphericModel
--  and LCS-GPS-UTC-Model. For the rest of the pages, they are the same as
--  LCS-GPS-Almanac.
LCS-Alma-SIB-Data ::=                   SEQUENCE {
    sfID                                INTEGER (0..1),
    dataID                              INTEGER (0..3),
    pageNo                              INTEGER (0..63),
    word3                               BIT STRING (SIZE (16)),
    word4                               BIT STRING (SIZE (24)),
    word5                               BIT STRING (SIZE (24)),
    word6                               BIT STRING (SIZE (24)),
    word7                               BIT STRING (SIZE (24)),
    word8                               BIT STRING (SIZE (24)),
    word9                               BIT STRING (SIZE (24)),
    word10                              BIT STRING (SIZE (22))
```

```
}

LCS-Alma-SIB-DataList ::=           SEQUENCE (SIZE (1..3)) OF
                                        LCS-Alma-SIB-Data

LCS-CipherParameters ::=            SEQUENCE {
    cipheringKeyFlag                    BIT STRING (SIZE (1)),
    cipheringSerialNumber               INTEGER (0..65535)                  OPTIONAL
}

LCS-DGPS-SIB-Data ::=               SEQUENCE {
    nodeBClockDrift                     NodeB-ClockDrift                    OPTIONAL,
    referenceLocationforSIB ReferenceLocationforSIB,
    referenceSFN                        ReferenceSFN                        OPTIONAL,
    referenceGPS-TOW                    GPS-TOW-1usec,
    statusHealth                        DiffCorrectionStatus,
    dgps-InformationList                DGPS-InformationList
}

LCS-Ephe-SIB-Data ::=               SEQUENCE {
    transmissiontTOW                    INTEGER (0..1048575),
    satID                               INTEGER (0..63),
    tlmMessage                          BIT STRING (SIZE (14)),
    tlmRevd                             BIT STRING (SIZE (2)),
    how                                 BIT STRING (SIZE (22)),
    wn                                  BIT STRING (SIZE (10)),
    navModel                            NavModel
}

LCS-Error ::=                       SEQUENCE {
    errorReason                         LCS-ErrorCause,
    additionalAssistanceData            AdditionalAssistanceData
}

LCS-ErrorCause ::=                  ENUMERATED {
                                        notEnoughOTDOA-Cells,
                                        notEnoughGPS-Satellites,
                                        assistanceDataMissing,
                                        methodNotSupported,
                                        undefinedError,
                                        requestDeniedByUser,
                                        notProcessedAndTimeout }

LCS-EventID ::=                     ENUMERATED {
                                        e7a, e7b, e7c }

LCS-EventParam ::=                  SEQUENCE {
    eventID                             LCS-EventID,
    reportingAmount                     ReportingAmount,
    reportFirstFix                      BOOLEAN,
    measurementInterval                 LCS-MeasurementInterval,
    eventSpecificInfo                   LCS-EventSpecificInfo
}

LCS-EventParamList ::=              SEQUENCE (SIZE (1..maxMeasEvent)) OF
                                        LCS-EventParam

LCS-EventSpecificInfo ::=           CHOICE {
    e7a                                 ThresholdPositionChange,
    e7b                                 ThresholdSFN-SFN-Change,
    e7c                                 ThresholdSFN-GPS-TOW
}


LCS-GPS-AcquisitionAssistance ::=   SEQUENCE {
    referenceTime                       CHOICE {
        utran-ReferenceTime                 UTRAN-ReferenceTime,
        gps-ReferenceTimeOnly               INTEGER (0..604799999)
    },
    satelliteInformationList            AcquisitionSatInfoList
}

0
LCS-GPS-Almanac ::=                 SEQUENCE {
    wn-a                                BIT STRING (SIZE (8)),
    almanacSatInfoList                  AlmanacSatInfoList
}
```

```
LCS-GPS-AssistanceData ::=          SEQUENCE {
    lcs-GPS-ReferenceTime               LCS-GPS-ReferenceTime               OPTIONAL,
    lcs-GPS-ReferenceLocation           EllipsoidPointAltitude              OPTIONAL,
    lcs-GPS-DGPS-Corrections            LCS-GPS-DGPS-Corrections            OPTIONAL,
    lcs-GPS-NavigationModel             LCS-GPS-NavigationModel             OPTIONAL,
    lcs-GPS-IonosphericModel            LCS-GPS-IonosphericModel            OPTIONAL,
    lcs-GPS-UTC-Model                   LCS-GPS-UTC-Model                   OPTIONAL,
    lcs-GPS-Almanac                     LCS-GPS-Almanac                     OPTIONAL,
    lcs-GPS-AcquisitionAssistance       LCS-GPS-AcquisitionAssistance       OPTIONAL,
    lcs-GPS-Real-timeIntegrity          BadSatList                          OPTIONAL
}

LCS-GPS-AssistanceSIB ::=           SEQUENCE {
    lcs-CipherParameters                LCS-CipherParameters
}

LCS-GPS-DGPS-Corrections ::=        SEQUENCE {
    gps-TOW                             INTEGER (0..604799),
    statusHealth                        DiffCorrectionStatus,
    dgps-CorrectionSatInfoList          DGPS-CorrectionSatInfoList
}

LCS-GPS-IonosphericModel ::=        SEQUENCE {
    alfa0                               BIT STRING (SIZE (8)),
    alfa1                               BIT STRING (SIZE (8)),
    alfa2                               BIT STRING (SIZE (8)),
    alfa3                               BIT STRING (SIZE (8)),
    beta0                               BIT STRING (SIZE (8)),
    beta1                               BIT STRING (SIZE (8)),
    beta2                               BIT STRING (SIZE (8)),
    beta3                               BIT STRING (SIZE (8))
}


LCS-GPS-Measurement ::=             SEQUENCE {
    referenceSFN                        ReferenceSFN                        OPTIONAL,
    gps-TOW-1msec                       GPS-TOW-1msec,
    gps-TOW-rem-usec                    GPS-TOW-rem-usec                    OPTIONAL,
    gps-MeasurementParamList            GPS-MeasurementParamList
}

LCS-GPS-NavigationModel ::=         SEQUENCE {
    n-SAT                               INTEGER (1..16),
    navigationModelSatInfoList          NavigationModelSatInfoList
}


LCS-GPS-ReferenceTime ::=           SEQUENCE {
    gps-Week                            INTEGER (0..1023),
    gps-TOW                             GPS-TOW-1usec,
    sfn                                 INTEGER (0..4095),
    gps-TOW-AssistList                  GPS-TOW-AssistList                  OPTIONAL
}

LCS-GPS-UTC-Model ::=               SEQUENCE {
    a1                                  BIT STRING (SIZE (24)),
    a0                                  BIT STRING (SIZE (32)),
    t-ot                                BIT STRING (SIZE (8)),
    wn-t                                BIT STRING (SIZE (8)),
    delta-t-LS                          BIT STRING (SIZE (8)),
    wn-lsf                              BIT STRING (SIZE (8)),
    dn                                  BIT STRING (SIZE (8)),
    delta-t-LSF                         BIT STRING (SIZE (8))
}

LCS-IPDL-Parameters ::=             SEQUENCE {
    ip-Spacing                          IP-Spacing,
    ip-Length                           IP-Length,
    ip-Offset                           INTEGER (0..9),
    seed                                INTEGER (0..63),
    burstModeParameters                 BurstModeParameters
}

LCS-MeasuredResults ::=             SEQUENCE {
    lcs-MultipleSets                    LCS-MultipleSets                    OPTIONAL,
    lcs-ReferenceCellIdentity           PrimaryCPICH-Info                   OPTIONAL,
    lcs-OTDOA-Measurement               LCS-OTDOA-Measurement               OPTIONAL,
    lcs-Position                        LCS-Position                        OPTIONAL,
```

```
    lcs-GPS-Measurement                 LCS-GPS-Measurement                 OPTIONAL,
    lcs-Error                           LCS-Error                           OPTIONAL
}

LCS-Measurement ::=                 SEQUENCE {
    lcs-ReportingQuantity               LCS-ReportingQuantity,
    reportCriteria                      LCS-ReportCriteria,
    lcs-OTDOA-AssistanceData            LCS-OTDOA-AssistanceData            OPTIONAL,
    lcs-GPS-AssistanceData              LCS-GPS-AssistanceData              OPTIONAL
}

LCS-MeasurementEventResults ::=     SEQUENCE {
    event7a                             LCS-Position,
    event7b                             LCS-OTDOA-Measurement,
    event7c                             LCS-GPS-Measurement
}

LCS-MeasurementInterval ::=         ENUMERATED {
                                        e5, e15, e60, e300,
                                        e900, e1800, e3600, e7200 }

LCS-MethodType ::=                  ENUMERATED {
                                        ue-Assisted,
                                        ue-Based,
                                        ue-BasedPreferred,
                                        ue-AssistedPreferred }

LCS-MultipleSets ::=                SEQUENCE {
    numberOfOTDOA-IPDL-GPS-Sets         INTEGER (2..3),
    numberOfReferenceCells              INTEGER (1..3),
    referenceCellRelation               ReferenceCellRelation
}

LCS-OTDOA-AssistanceData ::=        SEQUENCE {
    lcs-OTDOA-ReferenceCell             LCS-OTDOA-ReferenceCell             OPTIONAL,
    lcs-OTDOA-MeasurementAssistDataList LCS-OTDOA-MeasurementAssistDataList OPTIONAL,
    lcs-IPDL-Parameters                 LCS-IPDL-Parameters                 OPTIONAL
}

LCS-OTDOA-AssistanceSIB ::=         SEQUENCE {
    lcs-CipherParameters                LCS-CipherParameters,
    searchWindowSize                    OTDOA-SearchWindowSize,
    referenceCellPosition               ReferenceCellPosition,
    lcs-IPDL-Parameters                 LCS-IPDL-Parameters                 OPTIONAL,
    cellToMeasureInfoList               CellToMeasureInfoList
}

LCS-OTDOA-Measurement ::=           SEQUENCE {
    sfn                                 INTEGER (0..4095),
    -- Actual value = IE value * 0.25 + 876
    ue-Rx-Tx-TimeDifference             INTEGER (0..1184),
    qualityType                         QualityType,
    qualityChoice                       CHOICE {
        std-10                              ReferenceQuality10,
        std-50                              ReferenceQuality50,
        cpich-EcN0                          CPICH-Ec-N0-OTDOA,
        defaultQuality                      ReferenceQuality
    },
    neighborList                        NeighborList                        OPTIONAL
}

LCS-OTDOA-MeasurementAssistData ::= SEQUENCE {
    primaryCPICH-Info                   PrimaryCPICH-Info,
    frequencyInfo                       FrequencyInfo                       OPTIONAL,
    sfn-SFN-ObsTimeDifference           SFN-SFN-ObsTimeDifference1,
    fineSFN-SFN                         FineSFN-SFN                         OPTIONAL,
    searchWindowSize                    OTDOA-SearchWindowSize,
    relativeNorth                       INTEGER (-20000..20000)             OPTIONAL,
    relativeEast                        INTEGER (-20000..20000)             OPTIONAL,
    relativeAltitude                    INTEGER (-4000..4000)               OPTIONAL
}

LCS-OTDOA-MeasurementAssistDataList ::= SEQUENCE (SIZE (1..maxCellMeas)) OF
                                            LCS-OTDOA-MeasurementAssistData

LCS-OTDOA-ReferenceCell ::=         SEQUENCE {
    primaryCPICH-Info                   PrimaryCPICH-Info,
    frequencyInfo                       FrequencyInfo                       OPTIONAL,
```

```
    cellPosition                        ReferenceCellPosition               OPTIONAL
}


LCS-Position ::=                    SEQUENCE {
    referenceSFN                        ReferenceSFN,
    gps-TOW                             GPS-TOW-1usec,
    positionEstimate                    PositionEstimate
}

LCS-ReportCriteria ::=              CHOICE {
    lcs-ReportingCriteria               LCS-EventParamList,
    periodicalReportingCriteria         PeriodicalReportingCriteria,
    noReporting                         NULL
}

LCS-ReportingQuantity ::=           SEQUENCE {
    methodType                          LCS-MethodType,
    positioningMethod                   PositioningMethod,
    responseTime                        LCS-ResponseTime,
    accuracy                            LCS-Accuracy                        OPTIONAL,
    gps-TimingOfCellWanted              BOOLEAN,
    multipleSets                        BOOLEAN,
    environmentCharacterization         EnvironmentCharacterization         OPTIONAL
}

LCS-ResponseTime ::=                ENUMERATED {
                                        s1, s2, s4, s8, s16,
                                        s32, s64, s128 }


MaxNumberOfReportingCellsType1 ::=  ENUMERATED {
                                        e1, e2, e3, e4, e5, e6}

MaxNumberOfReportingCellsType2 ::=  ENUMERATED {
                                        e1, e2, e3, e4, e5, e6, e7, e8, e9, e10, e11, e12}

MaxNumberOfReportingCellsType3 ::=  ENUMERATED {
                                        viactCellsPlus1,
                                        viactCellsPlus2,
                                        viactCellsPlus3,
                                        viactCellsPlus4,
                                        viactCellsPlus5,
                                        viactCellsPlus6 }

MaxReportedCellsOnRACH ::=          ENUMERATED {
                                        noReport,
                                        currentCell,
                                        currentAnd-1-BestNeighbour,
                                        currentAnd-2-BestNeighbour,
                                        currentAnd-3-BestNeighbour,
                                        currentAnd-4-BestNeighbour,
                                        currentAnd-5-BestNeighbour,
                                        currentAnd-6-BestNeighbour }

MeasuredResults ::=                 CHOICE {
    intraFreqMeasuredResultsList        IntraFreqMeasuredResultsList,
    interFreqMeasuredResultsList        InterFreqMeasuredResultsList,
    interSystemMeasuredResultsList      InterSystemMeasuredResultsList,
    trafficVolumeMeasuredResultsList    TrafficVolumeMeasuredResultsList,
    qualityMeasuredResults              QualityMeasuredResults,
    ue-InternalMeasuredResults          UE-InternalMeasuredResults,
    lcs-MeasuredResults                 LCS-MeasuredResults
}

MeasuredResultsList ::=             SEQUENCE (SIZE (1..maxAdditionalMeas)) OF
                                        MeasuredResults


MeasuredResultsOnRACH ::=           SEQUENCE {
    currentCell                         SEQUENCE {
        modeSpecificInfo                    CHOICE {
            fdd                                 SEQUENCE {
                measurementQuantity                 CHOICE {
                    cpich-Ec-N0                         CPICH-Ec-N0,
                    cpich-RSCP                          CPICH-RSCP,
                    pathloss                            Pathloss
                }
```

```
            },
            tdd                                 SEQUENCE {
                timeslotISCP                        TimeslotISCP-List       OPTIONAL,
                primaryCCPCH-RSCP                   PrimaryCCPCH-RSCP       OPTIONAL
            }
        }
    },
    monitoredCells                      MonitoredCellRACH-List              OPTIONAL
}

MeasurementCommand ::=              CHOICE {
    setup                               MeasurementType,
    modify                              SEQUENCE {
        measurementType                     MeasurementType                 OPTIONAL
    },
    release                             NULL
}

MeasurementControlSysInfo ::=       SEQUENCE {
    intraFreqMeasurementSysInfo         IntraFreqMeasurementSysInfo         OPTIONAL,
    interFreqMeasurementSysInfo         InterFreqMeasurementSysInfo         OPTIONAL,
    interSystemMeasurementSysInfo       InterSystemMeasurementSysInfo       OPTIONAL,
    trafficVolumeMeasSysInfo            TrafficVolumeMeasSysInfo            OPTIONAL,
    ue-InternalMeasurementSysInfo       UE-InternalMeasurementSysInfo       OPTIONAL
}


MeasurementIdentityNumber ::=       INTEGER (1..16)

MeasurementQuantityGSM ::=          ENUMERATED {
                                        gsm-CarrierRSSI,
                                        pathloss }

MeasurementReportingMode ::=        SEQUENCE {
    measurementReportTransferMode       TransferMode,
    periodicalOrEventTrigger            PeriodicalOrEventTrigger
}

MeasurementType ::=                 CHOICE {
    intraFrequencyMeasurement           IntraFrequencyMeasurement,
    interFrequencyMeasurement           InterFrequencyMeasurement,
    interSystemMeasurement              InterSystemMeasurement,
    lcs-Measurement                     LCS-Measurement,
    trafficVolumeMeasurement            TrafficVolumeMeasurement,
    qualityMeasurement                  QualityMeasurement,
    ue-InternalMeasurement              UE-InternalMeasurement
}

MeasurementValidity ::=             SEQUENCE {
    resume-Release                      Resume-Release
}

MonitoredCellRACH-List ::=          SEQUENCE (SIZE (1..7)) OF
                                        MonitoredCellRACH-Result


MonitoredCellRACH-Result ::=        SEQUENCE {
    sfn-SFN-ObsTimeDifference           SFN-SFN-ObsTimeDifference           OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            primaryCPICH-Info                   PrimaryCPICH-Info,
            measurementQuantity                 CHOICE {
                cpich-Ec-N0                         CPICH-Ec-N0,
                cpich-RSCP                          CPICH-RSCP,
                pathloss                            Pathloss
            }                                                               OPTIONAL
        },
        tdd                                 SEQUENCE {
            primaryCCPCH-Info                   PrimaryCCPCH-Info,
            primaryCCPCH-RSCP                   PrimaryCCPCH-RSCP           OPTIONAL
        }
    }
}

MultipathIndicator ::=              ENUMERATED {
                                        nm,
                                        low,
                                        medium,
```

```
                                        high }

N-CR-T-CRMaxHyst ::=                SEQUENCE {
    n-CR                                INTEGER (1..16)                     DEFAULT 8,
    t-CRMaxHyst                         T-CRMaxHyst
}

NavigationModelSatInfo ::=          SEQUENCE {
    satID                               INTEGER (0..63),
    satelliteStatus                     SatelliteStatus,
    navModel                            NavModel
}

NavigationModelSatInfoList ::=      SEQUENCE (SIZE (1..maxSat)) OF
                                        NavigationModelSatInfo

NavModel ::=                        SEQUENCE {
    codeOnL2                            BIT STRING (SIZE (2)),
    uraIndex                            BIT STRING (SIZE (4)),
    satHealth                           BIT STRING (SIZE (6)),
    iodc                                BIT STRING (SIZE (10)),
    l2Pflag                             BIT STRING (SIZE (1)),
    sf1Revd                             SubFrame1Reserved,
    t-GD                                BIT STRING (SIZE (8)),
    t-oc                                BIT STRING (SIZE (16)),
    af2                                 BIT STRING (SIZE (8)),
    af1                                 BIT STRING (SIZE (16)),
    af0                                 BIT STRING (SIZE (22)),
    c-rs                                BIT STRING (SIZE (16)),
    delta-n                             BIT STRING (SIZE (16)),
    m0                                  BIT STRING (SIZE (32)),
    c-uc                                BIT STRING (SIZE (16)),
    e                                   BIT STRING (SIZE (32)),
    c-us                                BIT STRING (SIZE (16)),
    a-Sqrt                              BIT STRING (SIZE (32)),
    t-oe                                BIT STRING (SIZE (16)),
    fitInterval                         BIT STRING (SIZE (1)),
    aodo                                BIT STRING (SIZE (5)),
    c-ic                                BIT STRING (SIZE (16)),
    omega0                              BIT STRING (SIZE (32)),
    c-is                                BIT STRING (SIZE (16)),
    i0                                  BIT STRING (SIZE (32)),
    c-rc                                BIT STRING (SIZE (16)),
    omega                               BIT STRING (SIZE (32)),
    omegaDot                            BIT STRING (SIZE (24)),
    iDot                                BIT STRING (SIZE (14))
}

Neighbor ::=                        SEQUENCE {
    neighborIdentity                    PrimaryCPICH-Info                   OPTIONAL,
    neignborQuantity                    NeighborQuantity,
    sfn-SFN-ObsTimeDifference2          SFN-SFN-ObsTimeDifference2
}

NeighborList ::=                    SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        Neighbor

-- **TODO**, to be defined fully
NeighborQuantity ::=                SEQUENCE {
}

NewInterFreqCell ::=                SEQUENCE {
    interFreqCellID                     InterFreqCellID                     OPTIONAL,
    frequencyInfo                       FrequencyInfo                       OPTIONAL,
    cellInfo                            CellInfo
}

NewInterFreqCellList ::=            SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        NewInterFreqCell

NewInterFreqCellSI ::=              SEQUENCE {
    interFreqCellID                     InterFreqCellID                     OPTIONAL,
    frequencyInfo                       FrequencyInfo                       OPTIONAL,
    cellInfo                            CellInfoSI
}

NewInterFreqCellSI-List ::=         SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        NewInterFreqCellSI
```

```
NewInterSystemCell ::=              SEQUENCE {
    technologySpecificInfo              CHOICE {
        gsm                                 SEQUENCE {
            q-Offset                            Q-Offset                    OPTIONAL,
            hcs-NeighbouringCellInformation     HCS-NeighbouringCellInformation
                                                                            OPTIONAL,
            q-RxlevMin                          Q-RxlevMin,
            maxAllowedUL-TX-Power               MaxAllowedUL-TX-Power,
            bsic                                BSIC,
            bcch-ARFCN                          BCCH-ARFCN,
            gsm-OutputPower                     GSM-OutputPower             OPTIONAL
        },
        is-2000                             SEQUENCE {
            is-2000SpecificMeasInfo             IS-2000SpecificMeasInfo
        },
        spare                               NULL
    }
}


NewInterSystemCellList ::=          SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        NewInterSystemCell

NewIntraFreqCell ::=                SEQUENCE {
    intraFreqCellID                     IntraFreqCellID                     OPTIONAL,
    cellInfo                            CellInfo
}

NewIntraFreqCellList ::=            SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        NewIntraFreqCell

NewIntraFreqCellSI ::=              SEQUENCE {
    intraFreqCellID                     IntraFreqCellID                     OPTIONAL,
    cellInfo                            CellInfoSI
}

NewIntraFreqCellSI-List ::=         SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        NewIntraFreqCellSI

NodeB-ClockDrift ::=                INTEGER (0..15)

NonUsedFreqParameter ::=            SEQUENCE {
    nonUsedFreqThreshold                Threshold,
    nonUsedFreqW                        W
}

NonUsedFreqParameterList ::=        SEQUENCE (SIZE (1..maxFreq)) OF
                                        NonUsedFreqParameter

ObservedTimeDifferenceToGSM ::=     INTEGER (0..4095)

OTDOA-SearchWindowSize ::=          ENUMERATED {
                                        c10, c20, c30, c40, c50,
                                        c60, c70, moreThan70 }

OtherRAT-InSysInfo ::=              SEQUENCE {
    rat-Type                            RAT-Type,
    k-InterRAT                          K-InterRAT
}

OtherRAT-InSysInfoList ::=          SEQUENCE (SIZE (1..maxOtherRAT)) OF
                                        OtherRAT-InSysInfo

Pathloss ::=                        INTEGER (46..158)

PenaltyTime ::=                     CHOICE {
    notUsed                             NULL,
    pt10                                TemporaryOffset,
    pt20                                TemporaryOffset,
    pt30                                TemporaryOffset,
    pt40                                TemporaryOffset,
    pt50                                TemporaryOffset,
    pt60                                TemporaryOffset
}

PendingTimeAfterTrigger ::=         ENUMERATED {
```

```
                                        ptat0-25, ptat0-5, ptat1,
                                        ptat2, ptat4, ptat8, ptat16 }

PeriodicalOrEventTrigger ::=        ENUMERATED {
                                        periodical,
                                        eventTrigger }


PeriodicalReportingCriteria ::=     SEQUENCE {
    reportingAmount                     ReportingAmount                 DEFAULT ra-Infinity,
    reportingInterval                   ReportingIntervalLong
}


PeriodicalWithReportingCellStatus ::= SEQUENCE {
    periodicalReportingCriteria         PeriodicalReportingCriteria,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL
}

PositionEstimate ::=                CHOICE {
    ellipsoidPoint                      EllipsoidPoint,
    ellipsoidPointUncertCircle          EllipsoidPointUncertCircle,
    ellipsoidPointUncertEllipse         EllipsoidPointUncertEllipse,
    ellipsoidPointAltitude              EllipsoidPointAltitude,
    ellipsoidPointAltitudeEllipse       EllipsoidPointAltitudeEllipse
}

PositioningMethod ::=               ENUMERATED {
                                        otdoa,
                                        gps,
                                        otdoaOrGPS }

PRC ::=                             INTEGER (-2047..2047)


PrimaryCCPCH-RSCP ::=               INTEGER (-115..-25)

Q-HCS ::=                           INTEGER (0..99)

Q-Offset ::=                        INTEGER (-50..50)

Q-OffsetS-N ::=                     INTEGER (-50..50)

Q-QualMin ::=                       INTEGER (-20..0)

-- Actual value = (IE value * 2) + 1
Q-RxlevMin ::=                      INTEGER (-58..-13)

QualityEventResults ::=             SEQUENCE (SIZE (1..maxTrCH)) OF
                                        TransportChannelIdentity


QualityMeasuredResults ::=          SEQUENCE {
    blerMeasurementResultsList          BLER-MeasurementResultsList         OPTIONAL,
    dl-PhysicalChannelBER               DL-PhysicalChannelBER               OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            sir                                 SIR                         OPTIONAL
        },
        tdd                                 SEQUENCE {
            sir-MeasurementResults              SIR-MeasurementList         OPTIONAL
        }
    }
}


QualityMeasurement ::=              SEQUENCE {
    qualityReportingQuantity            QualityReportingQuantity            OPTIONAL,
    reportCriteria                      QualityReportCriteria
}


QualityReportCriteria ::=           CHOICE {
    qualityReportingCriteria            QualityReportingCriteria,
    periodicalReportingCriteria         PeriodicalReportingCriteria,
    noReporting                         NULL
}
```

```
QualityReportingCriteria ::=        SEQUENCE (SIZE (1..maxTrCH)) OF
                                        QualityReportingCriteriaSingle

QualityReportingCriteriaSingle ::=  SEQUENCE {
    transportChannelIdentity            TransportChannelIdentity,
    totalCRC                            INTEGER (1..512),
    badCRC                              INTEGER (1..512),
    pendingAfterTrigger                 INTEGER (1..512)
}


QualityReportingQuantity ::=        SEQUENCE {
    dl-TransChBLER                      BOOLEAN,
    bler-dl-TransChIdList               BLER-TransChIdList                  OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            sir                                 BOOLEAN
        },
        tdd                                 SEQUENCE {
            sir-TFCS-List                       SIR-TFCS-List               OPTIONAL
        }
    }
}

QualityType ::=                     ENUMERATED {
                                        std-10, std-50, cpich-Ec-N0 }

RAT-Type ::=                        ENUMERATED {
                                        gsm, is2000, spare1, spare2,
                                        spare3, spare4, spare5, spare6,
                                        spare7, spare8, spare9, spare10,
                                        spare11, spare12, spare13, spare14 }

ReferenceCellPosition ::=           CHOICE {
    ellipsoidPoint                      EllipsoidPoint,
    ellipsoidPointWithAltitude          EllipsoidPointAltitude
}

ReferenceCellRelation ::=           ENUMERATED {
                                        first-12-second-3,
                                        first-13-second-2,
                                        first-1-second-23 }

, the reference to ReferenceGPS-TOW is replaced with GPS-TOW-1usec
-- As defined in 23.032 (2D with 24bits for each coordinate)
ReferenceLocationforSIB ::=         SEQUENCE {
    ellipsoidPoint                      EllipsoidPoint
}

ReferenceQuality ::=                ENUMERATED {
                                        m0-19, m20-39, m40-79,
                                        m80-159, m160-319, m320-639,
                                        m640-1319, m1320Plus }

-- Actual value = IE value * 10
ReferenceQuality10 ::=              INTEGER (1..32)

-- Actual value = IE value * 50
ReferenceQuality50 ::=              INTEGER (1..32)

ReferenceSFN ::=                    INTEGER (0..4095)

-- Actual value = IE value * 512
ReferenceTimeDifferenceToCell ::=   CHOICE {
    -- Actual value = IE value * 40
    accuracy40                          INTEGER (0..960),
    -- Actual value = IE value * 256
    accuracy256                         INTEGER (0..150),
    -- Actual value = IE value * 2560
    accuracy2560                        INTEGER (0..15)
}

RemovedInterFreqCellList ::=        SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        InterFreqCellID

RemovedInterSystemCellList ::=      SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        InterSystemCellID
```

```
RemovedIntraFreqCellList ::=        SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        IntraFreqCellID

ReplacementActivationThreshold ::=  ENUMERATED {
                                        notApplicable, t1, t2,
                                        t3, t4, t5, t6, t7 }

ReportDeactivationThreshold ::=     ENUMERATED {
                                        notApplicable, t1, t2,
                                        t3, t4, t5, t6, t7 }

ReportingAmount ::=                 ENUMERATED {
                                        ra1, ra2, ra4, ra8, ra16, ra32,
                                        ra64, ra-Infinity }


ReportingCellStatus ::=             CHOICE{
    withinActiveSet                     MaxNumberOfReportingCellsType1,
    withinMonitoredSetUsedFreq          MaxNumberOfReportingCellsType1,
    withinMonitoredUsedFreq             MaxNumberOfReportingCellsType1,
    allActiveplusMonitoredSet           MaxNumberOfReportingCellsType3,
    withinVirtualActSet                 MaxNumberOfReportingCellsType1,
    withinMonitoredSetNonUsedFreq       MaxNumberOfReportingCellsType1,
    withinMonitoredNonUsedFreq          MaxNumberOfReportingCellsType1,
    allVirtualActSetplusMonitoredSetNonUsedFreq
                                        MaxNumberOfReportingCellsType3,
    withinActSetOrVirtualActSet         MaxNumberOfReportingCellsType2,
    withinMonitoredUsedFreqOrMonitoredNonUsedFreq
                                        MaxNumberOfReportingCellsType2
}


ReportingCellStatusOpt ::=          SEQUENCE {
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL
}


ReportingInfoForCellDCH ::=         SEQUENCE {
    intraFreqReportingQuantity          IntraFreqReportingQuantity,
    measurementReportingMode            MeasurementReportingMode,
    reportCriteria                      CellDCH-ReportCriteria
}

ReportingInterval ::=               ENUMERATED {
                                        noPeriodicalreporting, ri0-25,
                                        ri0-5, ri1, ri2, ri4, ri8, ri16 }

ReportingIntervalLong ::=           ENUMERATED {
                                        ril0, ril0-25, ril0-5, ril1,
                                        ril2, ril3, ril4, ril6, ril8,
                                        ril12, ril16, ril20, ril24,
                                        ril28, ril32, ril64 }

-- Actual value = IE value * 0.5
ReportingRange ::=                  INTEGER (0..29)

Resume-Release ::=                  CHOICE {
    resume                              UE-State,
    release                             NULL
}

RL-AdditionInfoList ::=             SEQUENCE (SIZE (1..maxRL-1)) OF
                                        PrimaryCPICH-Info

RL-InformationLists ::=             SEQUENCE {
    rl-AdditionInfoList                 RL-AdditionInfoList                 OPTIONAL,
    rl-RemovalInfoList                  RL-RemovalInfoList                  OPTIONAL
}

RL-RemovalInfoList ::=              SEQUENCE (SIZE (1..maxRL)) OF
                                        PrimaryCPICH-Info

RLC-BuffersPayload ::=              ENUMERATED {
                                        pl0, pl4, pl8, pl16, pl32, pl64, pl128,
                                        pl256, pl512, pl1024, pl2k, pl4k,
                                        pl8k, pl16k, pl32k, pl64k, pl128k,
                                        pl256k, pl512k, pl1024k }
```

```
RRC ::=                             INTEGER (-127..127)

SatelliteStatus ::=                 ENUMERATED {
                                        ns-NN-U,
                                        es-SN,
                                        es-NN-U,
                                        es-NN-C }

SatID ::=                           INTEGER (0..31)

SFN-SFN-ObsTimeDifference ::=       CHOICE {
    type1                               SFN-SFN-ObsTimeDifference1,
    -- Actual value for type2 = IE value * 0.25
    type2                               SFN-SFN-ObsTimeDifference2
}

SFN-SFN-ObsTimeDifference1 ::=      INTEGER (0..9830399)

SFN-SFN-ObsTimeDifference2 ::=      INTEGER (-5119..5120)

SFN-SFN-OTD-Type ::=                ENUMERATED {
                                        noReport,
                                        type1,
                                        type2 }

SIR ::=                             INTEGER (-10..20)


SIR-MeasurementList ::=             SEQUENCE (SIZE (1..maxCCTrCH)) OF
                                        SIR-MeasurementResults


SIR-MeasurementResults ::=          SEQUENCE {
    tfcs-ID                             TFCS-IdentityPlain,
    sir-TimeslotList                    SIR-TimeslotList
}


SIR-TFCS ::=                        TFCS-IdentityPlain


SIR-TFCS-List ::=                   SEQUENCE (SIZE (1..maxCCTrCH)) OF
                                        SIR-TFCS


SIR-TimeslotList ::=                SEQUENCE (SIZE (1..maxTS)) OF
                                        SIR

-- Reserved bits in subframe 1 of the GPS navigation message
SubFrame1Reserved ::=               SEQUENCE {
    reserved1                           BIT STRING (SIZE (23)),
    reserved2                           BIT STRING (SIZE (24)),
    reserved3                           BIT STRING (SIZE (24)),
    reserved4                           BIT STRING (SIZE (16))
}

T-CRMax ::=                         CHOICE {
    notUsed                             NULL,
    t30                                 N-CR-T-CRMaxHyst,
    t60                                 N-CR-T-CRMaxHyst,
    t120                                N-CR-T-CRMaxHyst,
    t180                                N-CR-T-CRMaxHyst,
    t240                                N-CR-T-CRMaxHyst
}

T-CRMaxHyst ::=                     ENUMERATED {
                                        notUsed, t10, t20, t30,
                                        t40, t50, t60, t70 }

TemporaryOffset ::=                 ENUMERATED {
                                        to10, to20, to30, to40, to50,
                                        to60, to70, infinite }

Threshold ::=                       INTEGER (-115..0)

ThresholdPositionChange ::=         ENUMERATED {
                                        pc10, pc20, pc30, pc40, pc50,
                                        pc100, pc200, pc300, pc500,
```

```
                                    pc1000, pc2000, pc5000, pc10000,
                                    pc20000, pc50000, pc100000 }

ThresholdSFN-GPS-TOW ::=            ENUMERATED {
                                    ms1, ms2, ms3, ms5, ms10,
                                    ms20, ms50, ms100 }

ThresholdSFN-SFN-Change ::=         ENUMERATED {
                                    c0-25, c0-5, c1, c2, c3, c4, c5,
                                    c10, c20, c50, c100, c200, c500,
                                    c1000, c2000, c5000 }

ThresholdUsedFrequency ::=          INTEGER (-125..165)


-- Actual value = IE value * 20, IE values 14-16 are spare values.
TimeInterval ::=                    INTEGER (1..16)


TimeslotInfo ::=                    SEQUENCE {
    timeslotNumber                      TimeslotNumber,
    burstType                           BurstType
}


TimeslotInfoList ::=                SEQUENCE (SIZE (1..maxTS)) OF
                                        TimeslotInfo

TimeslotISCP ::=                    INTEGER (-115..-25)


TimeslotISCP-List ::=               SEQUENCE (SIZE (1..maxTS)) OF
                                        TimeslotISCP

TimeslotListWithISCP ::=            SEQUENCE (SIZE (1..maxTS)) OF
                                        TimeslotWithISCP

TimeslotWithISCP ::=                SEQUENCE {
    timeslot                            TimeslotNumber,
    timeslotISCP                        TimeslotISCP
}

TimeToTrigger ::=                   ENUMERATED {
                                        ttt0, ttt10, ttt20, ttt40, ttt60,
                                        ttt80, ttt100, ttt120, ttt160,
                                        ttt200, ttt240, tt320, ttt640,
                                        ttt1280, ttt2560, ttt5000 }

TrafficVolumeEventParam ::=         SEQUENCE {
    eventID                             TrafficVolumeEventType,
    reportingThreshold                  TrafficVolumeThreshold
}

TrafficVolumeEventResults ::=       SEQUENCE {
    ul-transportChannelCausingEvent     TransportChannelIdentity,
    trafficVolumeEventIdentity          TrafficVolumeEventType
}

TrafficVolumeEventType ::=          ENUMERATED {
                                        e4a,
                                        e4b }


TrafficVolumeMeasQuantity ::=       CHOICE {
    rlc-BufferPayload                   NULL,
    averageRLC-BufferPayload            TimeInterval,
    varianceOfRLC-BufferPayload         TimeInterval
}


TrafficVolumeMeasSysInfo ::=        SEQUENCE {
    trafficVolumeMeasurementID          MeasurementIdentityNumber           DEFAULT 4,
    trafficVolumeMeasurementObjectList  TrafficVolumeMeasurementObjectList  OPTIONAL,
    trafficVolumeMeasQuantity           TrafficVolumeMeasQuantity           OPTIONAL,
    trafficVolumeReportingQuantity      TrafficVolumeReportingQuantity      OPTIONAL,
    trafficVolumeMeasRepCriteria        TrafficVolumeReportingCriteria      OPTIONAL,
    measurementValidity                 MeasurementValidity                 OPTIONAL,
    measurementReportingMode            MeasurementReportingMode,
```

```
    reportCriteriaSysInf                TrafficVolumeReportCriteriaSysInfo

}

TrafficVolumeMeasuredResults ::=    SEQUENCE {
    rb-Identity                         RB-Identity,
    rlc-BuffersPayload                  RLC-BuffersPayload                  OPTIONAL,
    averageRLC-BufferPayload            AverageRLC-BufferPayload            OPTIONAL,
    varianceOfRLC-BufferPayload         VarianceOfRLC-BufferPayload         OPTIONAL
}

TrafficVolumeMeasuredResultsList ::= SEQUENCE (SIZE (1..maxRB)) OF
                                        TrafficVolumeMeasuredResults

TrafficVolumeMeasurement ::=        SEQUENCE {
    trafficVolumeMeasurementObjectList  TrafficVolumeMeasurementObjectList  OPTIONAL,
    trafficVolumeMeasQuantity           TrafficVolumeMeasQuantity           OPTIONAL,
    trafficVolumeReportingQuantity      TrafficVolumeReportingQuantity      OPTIONAL,
    measurementValidity                 MeasurementValidity                 OPTIONAL,
    reportCriteria                      TrafficVolumeReportCriteria
}

TrafficVolumeMeasurementObjectList ::= SEQUENCE (SIZE (1..maxTrCH)) OF
                                            TransportChannelIdentity

TrafficVolumeReportCriteria ::=     CHOICE {
    trafficVolumeReportingCriteria      TrafficVolumeReportingCriteria,
    periodicalReportingCriteria         PeriodicalReportingCriteria,
    noReporting                         NULL
}


TrafficVolumeReportCriteriaSysInfo ::=  CHOICE {
    trafficVolumeReportingCriteria      TrafficVolumeReportingCriteria,
    periodicalReportingCriteria         PeriodicalReportingCriteria
}


TrafficVolumeReportingCriteria ::= SEQUENCE {
    transChCriteriaList                 TransChCriteriaList                 OPTIONAL,
    timeToTrigger                       TimeToTrigger                       OPTIONAL,
    pendingTimeAfterTrigger             PendingTimeAfterTrigger             OPTIONAL,
    tx-InterruptionAfterTrigger         TX-InterruptionAfterTrigger         OPTIONAL,
    reportingAmount                     ReportingAmount                     OPTIONAL
}

TrafficVolumeReportingQuantity ::= SEQUENCE {
    rlc-RB-BufferPayload                BOOLEAN,
    rlc-RB-BufferPayloadAverage         BOOLEAN,
    rlc-RB-BufferPayloadVariance        BOOLEAN
}

TrafficVolumeThreshold ::=          ENUMERATED {
                                        th8, th16, th32, th64, th128,
                                        th256, th512, th1024, th1536,
                                        th2048, th3072, th4096, th6144,
                                        th8192 }


TransChCriteria ::=                 SEQUENCE {
    ul-transportChannelID               TransportChannelIdentity        OPTIONAL,
    eventSpecificParameters             SEQUENCE (SIZE (1..maxMeasParEvent)) OF
                                            TrafficVolumeEventParam         OPTIONAL
}

TransChCriteriaList ::=         SEQUENCE (SIZE (1..maxTrCH)) OF
                                        TransChCriteria

TransferMode ::=                    ENUMERATED {
                                        acknowledgedModeRLC,
                                        unacknowledgedModeRLC }

TransmittedPowerThreshold ::=       INTEGER (-50..33)

TriggeringCondition ::=             ENUMERATED {
                                        activeSetCellsOnly,
                                        monitoredCellsOnly,
                                        activeSetAndMonitoredCells }
```

```
TX-InterruptionAfterTrigger ::=     ENUMERATED {
                                        txiat0-25, txiat0-5, txiat1,
                                        txiat2, txiat4, txiat8, txiat16 }

UDRE ::=                            ENUMERATED {
                                        lessThan1,
                                        between1-and-4,
                                        between4-and-8,
                                        over8 }

UE-6AB-Event ::=                    SEQUENCE {
    timeToTrigger                       TimeToTrigger,
    transmittedPowerThreshold           TransmittedPowerThreshold
}

UE-6FG-Event ::=                    SEQUENCE {
    timeToTrigger                       TimeToTrigger,
    ue-RX-TX-TimeDifferenceThreshold    UE-RX-TX-TimeDifferenceThreshold
}

UE-AutonomousUpdateMode ::=         CHOICE {
    on                                  NULL,
    onWithNoReporting                   NULL,
    off                                 RL-InformationLists
}


UE-InternalEventParam ::=           CHOICE {
    event6a                             UE-6AB-Event,
    event6b                             UE-6AB-Event,
    event6c                             TimeToTrigger,
    event6d                             TimeToTrigger,
    event6e                             TimeToTrigger,
    event6f                             UE-6FG-Event,
    event6g                             UE-6FG-Event
}

UE-InternalEventParamList ::=       SEQUENCE (SIZE (1..maxMeasEvent)) OF
                                        UE-InternalEventParam

UE-InternalEventResults ::=         CHOICE {
    event6a                             NULL,
    event6b                             NULL,
    event6c                             NULL,
    event6d                             NULL,
    event6e                             NULL,
    event6f                             PrimaryCPICH-Info,
    event6g                             PrimaryCPICH-Info
}

UE-InternalMeasQuantity ::=         SEQUENCE {
    measurementQuantity                 UE-MeasurementQuantity,
    filterCoefficient                   FilterCoefficient                   DEFAULT fc1
}


UE-InternalMeasuredResults ::=      SEQUENCE {
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            ue-TransmittedPowerFDD              UE-TransmittedPower         OPTIONAL,
            ue-RX-TX-ReportEntryList            UE-RX-TX-ReportEntryList    OPTIONAL
        },
        tdd                                 SEQUENCE {
            ue-TransmittedPowerTDD-List         UE-TransmittedPowerTDD-List OPTIONAL,
            appliedTA                           UL-TimingAdvance            OPTIONAL
        }
    }
}

UE-InternalMeasurement ::=          SEQUENCE {
    ue-InternalMeasQuantity             UE-InternalMeasQuantity             OPTIONAL,
    ue-InternalReportingQuantity        UE-InternalReportingQuantity        OPTIONAL,
    reportCriteria                      UE-InternalReportCriteria
}

UE-InternalMeasurementSysInfo ::=   SEQUENCE {
    ue-InternalMeasurementID            MeasurementIdentityNumber           DEFAULT 5,
```

```
    ue-InternalMeasQuantity             UE-InternalMeasQuantity
}

UE-InternalReportCriteria ::=       CHOICE {
    ue-InternalReportingCriteria        UE-InternalReportingCriteria,
    periodicalReportingCriteria         PeriodicalReportingCriteria,
    noReporting                         NULL
}

UE-InternalReportingCriteria ::=    SEQUENCE {
    ue-InternalEventParamList           UE-InternalEventParamList           OPTIONAL
}


UE-InternalReportingQuantity ::=    SEQUENCE {
    ue-TransmittedPower                 BOOLEAN,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            ue-RX-TX-TimeDifferece              BOOLEAN
        },
        tdd                                 SEQUENCE {
            appliedTA                           BOOLEAN
        }
    }
}


-- TABULAR: For TDD only the first two values are used.
UE-MeasurementQuantity ::=          ENUMERATED {
                                        ue-TransmittedPower,
                                        utra-Carrier-RSSI,
                                        ue-RX-TX-TimeDifference }

UE-RX-TX-ReportEntry ::=            SEQUENCE {
    primaryCPICH-Info                   PrimaryCPICH-Info,
    ue-RX-TX-TimeDifference             UE-RX-TX-TimeDifference
}

UE-RX-TX-ReportEntryList ::=        SEQUENCE (SIZE (1..maxRL)) OF
                                        UE-RX-TX-ReportEntry

UE-RX-TX-TimeDifference ::=         INTEGER (876..1172)

UE-RX-TX-TimeDifferenceThreshold ::= INTEGER (769..1280)

UE-State ::=                        ENUMERATED {
                                        cell-DCH, all-But-Cell-DCH, all-States }


UE-TransmittedPower ::=             INTEGER (-50..33)


UE-TransmittedPowerTDD-List ::=     SEQUENCE (SIZE (1..maxTS)) OF
                                        UE-TransmittedPower

UTRA-CarrierRSSI ::=                INTEGER (-95..-30)


UTRAN-ReferenceTime ::=             SEQUENCE {
    gps-TOW                             GPS-TOW-1usec,
    sfn                                 INTEGER (0..4095)
}

VarianceOfRLC-BufferPayload ::=     ENUMERATED {
                                        plv0, plv4, plv8, plv16, plv32, plv64,
                                        plv128, plv256, plv512, plv1024,
                                        plv2k, plv4k, plv8k, plv16k }

-- Actual value = IE value * 0.1
W ::=                               INTEGER (0..20)

END
```

11.3.8 Other information elements

```
Other-IEs DEFINITIONS AUTOMATIC TAGS ::=

BEGIN
```

```
IMPORTS

    CN-DomainSysInfoList,
    NAS-SystemInformationGSM-MAP,
    PLMN-Type
FROM CoreNetwork-IEs

    CellAccessRestriction,
    CellIdentity,
    CellSelectReselectInfoSIB-3-4,
    URA-IdentityList
FROM UTRANMobility-IEs

    CapabilityUpdateRequirement,
    CPCH-Parameters,
    DRAC-SysInfoList,
    ProtocolErrorCause,
    UE-ConnTimersAndConstants,
    UE-DCHTimersAndConstants,
    UE-IdleTimersAndConstants
FROM UserEquipment-IEs

    PredefinedConfigIdentity,
    PredefinedConfigValueTag,
    PreDefRadioConfiguration
FROM RadioBearer-IEs

    AICH-PowerOffset,
    ConstantValue,
    CPCH-PersistenceLevelsList,
    CPCH-SetInfoList,
    CSICH-PowerOffset,
    DynamicPersistenceLevelList,
    IndividualTS-InterferenceList,
    MidambleConfiguration,
    PDSCH-SysInfoList,
    PICH-PowerOffset,
    PRACH-SystemInformationList,
    PrimaryCCPCH-Info,
    PrimaryCCPCH-TX-Power,
    PUSCH-SysInfoList,
    SCCPCH-SystemInformationList,
    UL-Interference
FROM PhysicalChannel-IEs

    FACH-MeasurementOccasionInfo,
    LCS-Alma-SIB-DataList,
    LCS-DGPS-SIB-Data,
    LCS-Ephe-SIB-Data,
    LCS-GPS-AssistanceSIB,
    LCS-OTDOA-AssistanceSIB,
    MeasurementControlSysInfo
FROM Measurement-IEs

    ANSI-41-GlobalServiceRedirectInfo,
    ANSI-41-PrivateNeighborListInfo,
    ANSI-41-RAND-Information,
    ANSI-41-UserZoneID-Information
FROM ANSI-41-IEs

    maxInterSysMessages,
    maxSIB,
    maxSIB-FACH
FROM Constant-definitions;

BCC ::=                             INTEGER (0..7)

BCCH-ModificationInfo ::=           SEQUENCE {
    mib-ValueTag                        MIB-ValueTag,
    bcch-ModificationTime               BCCH-ModificationTime               OPTIONAL
}


-- Actual value = IE value * 8
BCCH-ModificationTime ::=           INTEGER (0..511)

BSIC ::=                            SEQUENCE {
```

```
    ncc                                 NCC,
    bcc                                 BCC
}

CBS-DRX-Level1Information ::=       SEQUENCE {
    ctch-AllocationPeriod               INTEGER (1..256),
    cbs-FrameOffset                     INTEGER (0..255)
}

CDMA2000-Message ::=                SEQUENCE {
    msg-Type                            BIT STRING (SIZE (8)),
    payload                             BIT STRING (SIZE (1..512))
}

CDMA2000-MessageList ::=            SEQUENCE (SIZE (1..maxInterSysMessages)) OF
                                        CDMA2000-Message

CellValueTag ::=                    INTEGER (1..4)

GSM-MessageList ::=                 SEQUENCE (SIZE (1..maxInterSysMessages)) OF
                                        BIT STRING (SIZE (1..512))

InterSystemHO-Failure ::=           SEQUENCE {
    interSystemHO-FailureCause          InterSystemHO-FailureCause          OPTIONAL,
    interSystemMessage                  InterSystemMessage                  OPTIONAL
}

InterSystemHO-FailureCause ::=      CHOICE {
    configurationUnacceptable           NULL,
    physicalChannelFailure              NULL,
    protocolError                       ProtocolErrorInformation,
    unspecified                         NULL,
    spare1                              NULL,
    spare2                              NULL,
    spare3                              NULL
}

InterSystemMessage ::=              CHOICE {
    gsm                                 SEQUENCE {
        gsm-MessageList                     GSM-MessageList
    },
    cdma2000                            SEQUENCE {
        cdma2000-MessageList                CDMA2000-MessageList
    },
    spare1                              NULL,
    spare2                              NULL,
    spare3                              NULL,
    spare4                              NULL,
    spare5                              NULL,
    spare6                              NULL
}

MasterInformationBlock ::=          SEQUENCE {
        mib-ValueTag                    MIB-ValueTag,
        plmn-Type                       PLMN-Type,
        -- TABULAR: The PLMN identity and ANSI-41 core network information
        -- are included in PLMN-Type.
        sib-ReferenceList               SIB-ReferenceList,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

MIB-ValueTag ::=                    INTEGER (1..8)

NCC ::=                             INTEGER (0..7)

PLMN-ValueTag ::=                   INTEGER (1..256)


PredefinedConfigIdentityAndValueTag ::= SEQUENCE {
    predefinedConfigIdentity                PredefinedConfigIdentity,
    predefinedConfigValueTag                PredefinedConfigValueTag
}

ProtocolErrorInformation ::=        SEQUENCE {
    diagnosticsType                     CHOICE {
        type1                               SEQUENCE {
            protocolErrorCause                  ProtocolErrorCause
```

```
        },
        spare                           NULL
    }
}


SchedulingInformation ::=           SEQUENCE {
    sib-Type                            SIB-TypeAndTag,
    scheduling                          SEQUENCE {
        segCount                            SegCount                    DEFAULT 1,
        sib-Pos                             CHOICE {
            -- The element name indicates the repetition period and the value
            -- (multiplied by two) indicates the position of the first segment.
            rep4                                INTEGER (0..1),
            rep8                                INTEGER (0..3),
            rep16                               INTEGER (0..7),
            rep32                               INTEGER (0..15),
            rep64                               INTEGER (0..31),
            rep128                              INTEGER (0..63),
            rep256                              INTEGER (0..127),
            rep512                              INTEGER (0..255),
            rep1024                             INTEGER (0..511),
            rep2048                             INTEGER (0..1023),
            rep4096                             INTEGER (0..2047)
        },
        sib-PosOffsetInfo                   SibOFF-List                OPTIONAL
    }                                                                  OPTIONAL
}

SegCount ::=                        INTEGER (1..16)

SegmentIndex ::=                    INTEGER (0..15)

-- Actual value = 2 * IE value
SFN-Prime ::=                       INTEGER (0..2047)


SIB-Data-fixed ::=                  BIT STRING (SIZE (222))


SIB-Data-variable ::=               BIT STRING (SIZE (1..214))

SIB-ReferenceList ::=               SEQUENCE (SIZE (1..maxSIB)) OF
                                        SchedulingInformation

SIB-ReferenceListFACH ::=           SEQUENCE (SIZE (1..maxSIB-FACH)) OF
                                        SchedulingInformation

SIB-Type ::=                        ENUMERATED {
                                        masterInformationBlock,
                                        systemInformationBlockType1,
                                        systemInformationBlockType2,
                                        systemInformationBlockType3,
                                        systemInformationBlockType4,
                                        systemInformationBlockType5,
                                        systemInformationBlockType6,
                                        systemInformationBlockType7,
                                        systemInformationBlockType8,
                                        systemInformationBlockType9,
                                        systemInformationBlockType10,
                                        systemInformationBlockType11,
                                        systemInformationBlockType12,
                                        systemInformationBlockType13,
                                        systemInformationBlockType13-1,
                                        systemInformationBlockType13-2,
                                        systemInformationBlockType13-3,
                                        systemInformationBlockType13-4,
                                        systemInformationBlockType14,
                                        systemInformationBlockType15,
                                        systemInformationBlockType15-1,
                                        systemInformationBlockType15-2,
                                        systemInformationBlockType15-3,
                                        systemInformationBlockType16,
                                        spare1, spare2, spare3, spare4,
                                        spare5, spare6, spare7, spare8 }

SIB-TypeAndTag ::=                  CHOICE {
    sysInfoType1                        PLMN-ValueTag,
```

```
    sysInfoType2                        PLMN-ValueTag,
    sysInfoType3                        CellValueTag,
    sysInfoType4                        CellValueTag,
    sysInfoType5                        CellValueTag,
    sysInfoType6                        CellValueTag,
    sysInfoType7                        NULL,
    sysInfoType8                        CellValueTag,
    sysInfoType9                        NULL,
    sysInfoType10                       NULL,
    sysInfoType11                       CellValueTag,
    sysInfoType12                       CellValueTag,
    sysInfoType13                       CellValueTag,
    sysInfoType13-1                     CellValueTag,
    sysInfoType13-2                     CellValueTag,
    sysInfoType13-3                     CellValueTag,
    sysInfoType13-4                     CellValueTag,
    sysInfoType14                       CellValueTag,
    sysInfoType15                       CellValueTag,
    sysInfoType16                       PredefinedConfigIdentityAndValueTag
}

SibOFF ::=                          ENUMERATED {
                                        so2, so4, so6, so8, so10,
                                        so12, so14, so16, so18,
                                        so20, so22, so24, so26,
                                        so28, so30, so32 }

SibOFF-List ::=                     SEQUENCE (SIZE (1..15)) OF
                                        SibOFF


SysInfoType1 ::=                    SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Core network IEs
        cn-CommonGSM-MAP-NAS-SysInfo    NAS-SystemInformationGSM-MAP,
        cn-DomainSysInfoList            CN-DomainSysInfoList,
    -- User equipment IEs
        ue-IdleTimersAndConstants       UE-IdleTimersAndConstants,
        ue-DCHTimersAndConstants        UE-DCHTimersAndConstants,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}


SysInfoType2 ::=                    SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- UTRAN mobility IEs
        ura-IdentityList                URA-IdentityList,
    -- User equipment IEs
        ue-ConnTimersAndConstants       UE-ConnTimersAndConstants,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}


SysInfoType3 ::=                    SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- UTRAN mobility IEs
        cellIdentity                    CellIdentity,
        cellSelectReselectInfo          CellSelectReselectInfoSIB-3-4,
        cellAccessRestriction           CellAccessRestriction,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}


SysInfoType4 ::=                    SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- UTRAN mobility IEs
        cellIdentity                    CellIdentity,
        cellSelectReselectInfo          CellSelectReselectInfoSIB-3-4,
        cellAccessRestriction           CellAccessRestriction,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
```

```
}


SysInfoType5 ::=                    SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Physical channel IEs
        modeSpecificInfo                CHOICE {
            fdd                             SEQUENCE {
                pich-PowerOffset                PICH-PowerOffset,
                aich-PowerOffset                AICH-PowerOffset
            },
            tdd                             SEQUENCE {
                pusch-SysInfo                   PUSCH-SysInfoList           OPTIONAL,
                pdsch-SysInfo                   PDSCH-SysInfoList           OPTIONAL,
                midambleConfiguration           MidambleConfiguration       OPTIONAL
            }
        },
        primaryCCPCH-Info               PrimaryCCPCH-Info                   OPTIONAL,
        prach-SystemInformationList     PRACH-SystemInformationList,
        sCCPCH-SystemInformationList    SCCPCH-SystemInformationList,
        cbs-DRX-Level1Information       CBS-DRX-Level1Information           OPTIONAL,
        -- Conditional on any of the CTCH indicator IEs in
        -- sCCPCH-SystemInformationList
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}


SysInfoType6 ::=                    SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Physical channel IEs
        modeSpecificInfo                CHOICE {
            fdd                             SEQUENCE {
                pich-PowerOffset                PICH-PowerOffset,
                aich-PowerOffset                AICH-PowerOffset,
                csich-PowerOffset               CSICH-PowerOffset           OPTIONAL
            },
            tdd                             SEQUENCE {
                pusch-SysInfo                   PUSCH-SysInfoList           OPTIONAL,
                pdsch-SysInfo                   PDSCH-SysInfoList           OPTIONAL,
                midambleConfiguration           MidambleConfiguration       OPTIONAL
            }
        },
        primaryCCPCH-Info               PrimaryCCPCH-Info                   OPTIONAL,
        prach-SystemInformationList     PRACH-SystemInformationList,
        sCCPCH-SystemInformationList    SCCPCH-SystemInformationList,
        cbs-DRX-Level1Information       CBS-DRX-Level1Information           OPTIONAL,
        -- Conditional on any of the CTCH indicator IEs in
        -- sCCPCH-SystemInformationList
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}


SysInfoType7 ::=                    SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Physical channel IEs
        modeSpecificInfo                CHOICE {
            fdd                             SEQUENCE {
                ul-Interference                 UL-Interference
            },
            tdd                             NULL
        },
        prach-Information-SIB5-List     DynamicPersistenceLevelList,
        prach-Information-SIB6-List     DynamicPersistenceLevelList         OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}


SysInfoType8 ::=                    SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- User equipment IEs
        cpch-Parameters                 CPCH-Parameters,
```

```
    -- Physical channel IEs
        cpch-SetInfoList                CPCH-SetInfoList,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}


SysInfoType9 ::=                    SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Physical channel IEs
        cpch-PersistenceLevelsList      CPCH-PersistenceLevelsList,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}


SysInfoType10 ::=                   SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- User equipment IEs
        drac-SysInfoList                DRAC-SysInfoList,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

SysInfoType11 ::=                   SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Measurement IEs
        fach-MeasurementOccasionInfo    FACH-MeasurementOccasionInfo        OPTIONAL,
        measurementControlSysInfo       MeasurementControlSysInfo,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

SysInfoType12 ::=                   SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Measurement IEs
        fach-MeasurementOccasionInfo    FACH-MeasurementOccasionInfo        OPTIONAL,
        measurementControlSysInfo       MeasurementControlSysInfo,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

SysInfoType13 ::=                   SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Core network IEs
        cn-DomainSysInfoList            CN-DomainSysInfoList,
    -- User equipment IEs
        ue-IdleTimersAndConstants       UE-IdleTimersAndConstants           OPTIONAL,
        capabilityUpdateRequirement     CapabilityUpdateRequirement         OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

SysInfoType13-1 ::=                 SEQUENCE {
    -- ANSI-41 IEs
        ansi-41-RAND-Information        ANSI-41-RAND-Information,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

SysInfoType13-2 ::=                 SEQUENCE {
    -- ANSI-41 IEs
        ansi-41-UserZoneID-Information  ANSI-41-UserZoneID-Information,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

SysInfoType13-3 ::=                 SEQUENCE {
    -- ANSI-41 IEs
        ansi-41-PrivateNeighborListInfo ANSI-41-PrivateNeighborListInfo,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}
```

```
SysInfoType13-4 ::=                 SEQUENCE {
    -- ANSI-41 IEs
        ansi-41-GlobalServiceRedirectInfo
                                        ANSI-41-GlobalServiceRedirectInfo,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}


SysInfoType14 ::=                   SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Physical channel IEs
        primaryCCPCH-TX-Power           PrimaryCCPCH-TX-Power               OPTIONAL,
        individualTS-InterferenceList   IndividualTS-InterferenceList,
        prach-ConstantValue             ConstantValue                       OPTIONAL,
        dpch-ConstantValue              ConstantValue                       OPTIONAL,
        pusch-ConstantValue             ConstantValue                       OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

SysInfoType15 ::=                   SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Measurement IEs
        lcs-GPS-Assistance              LCS-GPS-AssistanceSIB               OPTIONAL,
        lcs-OTDOA-Assistance            LCS-OTDOA-AssistanceSIB             OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

SysInfoType15-1 ::=                 SEQUENCE {
    -- DGPS corrections
        lcs-DGPS-SIB-Data               LCS-DGPS-SIB-Data
}

SysInfoType15-2 ::=                 SEQUENCE {
-- Ephemeris and clock corrections
    lcs-Ephe-SIB-Data               LCS-Ephe-SIB-Data
}

SysInfoType15-3 ::=                 SEQUENCE {
    -- Almanac and other data
        transmissionTOW                 INTEGER (0..1048575),
        satMask                         BIT STRING (SIZE (32)),
        lsbTOW                          BIT STRING (SIZE (8)),
        lcs-Alma-SIB-DataList           LCS-Alma-SIB-DataList
}


SysInfoType16 ::=                   SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Radio bearer IEs
        preDefinedRadioConfiguration    PreDefRadioConfiguration,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

END
```

11.3.9 ANSI-41 information elements

```
ANSI-41-IEs DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

ANSI-41-GlobalServiceRedirectInfo ::=   ANSI-41-NAS-Parameter
ANSI-41-PrivateNeighborListInfo ::=     ANSI-41-NAS-Parameter
ANSI-41-RAND-Information ::=            ANSI-41-NAS-Parameter
ANSI-41-UserZoneID-Information ::=      ANSI-41-NAS-Parameter
ANSI-41-NAS-Parameter ::=               BIT STRING (SIZE (1..2048))

Min-P-REV ::=                           BIT STRING (SIZE (8))

NAS-SystemInformationANSI-41 ::=        ANSI-41-NAS-Parameter
```

```
NID ::=                                 BIT STRING (SIZE (16))

P-REV ::=                               BIT STRING (SIZE (8))

SID ::=                                 BIT STRING (SIZE (15))

END
```

11.4 Constant definitions

```
Constant-definitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

hiRM                        INTEGER ::= 256
maxAC                       INTEGER ::= 16
maxAdditionalMeas           INTEGER ::= 4
maxASC                      INTEGER ::= 8
maxASCmap                   INTEGER ::= 7
maxASCpersist               INTEGER ::= 6
maxCCTrCH                   INTEGER ::= 8
maxCellMeas                 INTEGER ::= 32
maxCellMeas-1                           INTEGER ::= 31

maxCNdomains                INTEGER ::= 4
maxCPCHsets                 INTEGER ::= 16
maxDPCH-DLchan              INTEGER ::= 8
maxDPCHcodesPerTS           INTEGER ::= 16

-- **TODO**
maxDPDCH-UL                 INTEGER ::= 6
maxDRACclasses              INTEGER ::= 8
-- **TODO**
maxFACH                     INTEGER ::= 8
maxFreq                     INTEGER ::= 8
maxFrequencybands           INTEGER ::= 4
maxInterSysMessages         INTEGER ::= 4
maxLoCHperRLC               INTEGER ::= 2
maxMeasEvent                INTEGER ::= 8
maxMeasIntervals            INTEGER ::= 3
maxMeasParEvent             INTEGER ::= 2
maxNoOfMeas                 INTEGER ::= 16
maxOtherRAT                 INTEGER ::= 15
maxPage1                    INTEGER ::= 8
maxPCPCH-APsig              INTEGER ::= 16
maxPCPCH-APsubCh            INTEGER ::= 12
maxPCPCH-CDsig              INTEGER ::= 16
maxPCPCH-CDsubCh            INTEGER ::= 12
maxPCPCH-SF                 INTEGER ::= 7
maxPCPCHs                   INTEGER ::= 64
maxPDCPAlgoType             INTEGER ::= 8
maxPDSCH                    INTEGER ::= 8
maxPDSCH-TFCIgroups         INTEGER ::= 256
maxPRACH                    INTEGER ::= 16
maxPUSCH                    INTEGER ::= 8
maxRABsetup                 INTEGER ::= 16
maxRAT                      INTEGER ::= 16

maxRB                       INTEGER ::= 32
maxRBallRABs                INTEGER ::= 27
maxRBMuxOptions             INTEGER ::= 8
maxRBperRAB                 INTEGER ::= 8
maxRL                       INTEGER ::= 8
maxRL-1                     INTEGER ::= 7
maxSat                      INTEGER ::= 16
maxSCCPCH                   INTEGER ::= 16
maxSIB                      INTEGER ::= 32
-- **TODO**
maxSIB-FACH                 INTEGER ::= 8
maxSIBsegm                  INTEGER ::= 16
maxSig                      INTEGER ::= 16
maxSignallingFlow           INTEGER ::= 16
maxSRBsetup                 INTEGER ::= 8
maxSubCh                    INTEGER ::= 12
maxSystemCapability         INTEGER ::= 16
maxTF                       INTEGER ::= 32
maxTF-CPCH                  INTEGER ::= 16
```

```
maxTFC                      INTEGER ::= 1024
maxTFCI-2-Combs             INTEGER ::= 512
maxTGPS                     INTEGER ::= 6
maxTrCH                     INTEGER ::= 32
maxTrCHpreconf              INTEGER ::= 16
maxTS                       INTEGER ::= 14
maxURA                      INTEGER ::= 8

END
```

11.5 RRC information between network nodes

```
Internode-definitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    HandoverToUTRANCommand,
    MeasurementReport,
    PhysicalChannelReconfiguration,
    RadioBearerReconfiguration,
    RadioBearerRelease,
    RadioBearerSetup,
    TransportChannelReconfiguration,
    UECapabilityInformation
FROM PDU-definitions

    CN-DomainInformationList,
    NAS-SystemInformationGSM-MAP
FROM CoreNetwork-IEs

    CellIdentity,
    URA-Identity
FROM UTRANMobility-IEs

    C-RNTI,
    HyperFrameNumber,
    RRC-MessageSequenceNumber,
    U-RNTI,
    UE-RadioAccessCapability
FROM UserEquipment-IEs

    PDCP-InfoReconfig,
    RAB-Info,
    RB-Identity,
    RB-MappingInfo,
    RLC-Info,
    RLC-SequenceNumber,
    SRB-InformationSetup
FROM RadioBearer-IEs

    TFC-Subset,
    TFCS,
    TransportChannelIdentity,
    TransportFormatSet
FROM TransportChannel-IEs

    MeasurementIdentityNumber,
    MeasurementReportingMode,
    MeasurementType,
    AdditionalMeasurementID-List
FROM Measurement-IEs

    InterSystemMessage
FROM Other-IEs

    maxNoOfMeas,
    maxRABsetup,
    maxRB,
    maxSRBsetup,
    maxTrCH
FROM Constant-definitions;


CalculationTimeForCiphering ::=     SEQUENCE {
    cell-Id                             CellIdentity,
```

```
    sfn                                 INTEGER (0..4095)
}

CipheringInfoPerRB ::=              SEQUENCE {
    dl-HFN                              HyperFrameNumber,
    ul-HFN                              HyperFrameNumber,
    dl-RLC-SequenceNumber               RLC-SequenceNumber,
    ul-RLC-SequenceNumber               RLC-SequenceNumber
}

-- TABULAR: Multiplicity value numberOfRadioBearers has been replaced
-- with maxRB.
CipheringInfoPerRB-List ::=         SEQUENCE (SIZE (1..maxRB)) OF
                                        CipheringInfoPerRB

CipheringStatus ::=                 ENUMERATED {
                                        started, notStarted }

ImplementationSpecificParams ::=    BIT STRING (SIZE (1..512))

-- **TODO** Upper limit N316 is undefined! An arbitrary upper limit of
-- 7 has been used here instead.
IntegrityProtectionFailureCount ::= INTEGER (0..7)

IntegrityProtectionStatus ::=       ENUMERATED {
                                        started, notStarted }

MeasurementCommandWithType ::=      CHOICE {
    setup                               MeasurementType,
    modify                              NULL,
    release                             NULL
}

OngoingMeasRep ::=                  SEQUENCE {
    measurementIdentityNumber           MeasurementIdentityNumber,
    measurementCommandWithType          MeasurementCommandWithType,
    -- TABULAR: The CHOICE Measurement in the tabular description is included
    -- in the IE above.
    measurementReportingMode            MeasurementReportingMode            OPTIONAL,
    additionalMeasurementID-List        AdditionalMeasurementID-List        OPTIONAL
}

OngoingMeasRepList ::=              SEQUENCE (SIZE (1..maxNoOfMeas)) OF
                                        OngoingMeasRep

RAB-Information ::=                 SEQUENCE {
    rab-Info                            RAB-Info,
    rb-InformationList                  RB-InformationList                  OPTIONAL
}

RAB-InformationList ::=             SEQUENCE (SIZE (1..maxRABsetup)) OF
                                        RAB-Information

RB-Information ::=                  SEQUENCE {
    rb-Identity                         RB-Identity,
    rlc-Info                            RLC-Info,
    pdcp-Info                           PDCP-InfoReconfig                   OPTIONAL,
    rb-MappingInfo                      RB-MappingInfo
}

RB-InformationList ::=              SEQUENCE (SIZE (1..maxRB)) OF
                                        RB-Information

-- ***************************************************
--
-- Source RNC to target RNC
--
-- ***************************************************


SourceRNCToTargetRNC ::=            SEQUENCE {
    -- Non-RRC IEs
        stateOfRRC                      StateOfRRC,
        stateOfRRC-Procedure            StateOfRRC-Procedure,
        cipheringStatus                 CipheringStatus,
        calculationTimeForCiphering     CalculationTimeForCiphering         OPTIONAL,
        cipheringInfoPerRB-List         CipheringInfoPerRB-List             OPTIONAL,
        integrityProtectionStatus       IntegrityProtectionStatus,
```

```
        integrityProtectionFailureCount IntegrityProtectionFailureCount,
        srb-SpecificIntegrityProtInfo   SRB-SpecificIntegrityProtInfoList,
        implementationSpecificParams    ImplementationSpecificParams        OPTIONAL,
    -- User equipment IEs
        u-RNTI                          U-RNTI,
        c-RNTI                          C-RNTI                              OPTIONAL,
        ue-RadioAccessCapability        UE-RadioAccessCapability,
    -- Other IEs
        interSystemMessage              InterSystemMessage                  OPTIONAL,
    -- UTRAN mobility IEs
        ura-Identity                    URA-Identity                        OPTIONAL,
    -- Core network IEs
        cn-CommonGSM-MAP-NAS-SysInfo    NAS-SystemInformationGSM-MAP,
        cn-DomainInformationList        CN-DomainInformationList            OPTIONAL,
    -- Measurement IEs
        ongoingMeasRepList              OngoingMeasRepList                  OPTIONAL,
    -- Radio bearer IEs
        srb-InformationList             SRB-InformationList,
        rab-InformationList             RAB-InformationList                 OPTIONAL,
    -- Transport channel IEs
        ul-DCH-TFCS                     TFCS                                OPTIONAL,
        dl-DCH-TFCS                     TFCS                                OPTIONAL,
        ul-DCH-TFC-Subset               TFC-Subset                          OPTIONAL,
        usch-TFCS                       TFCS                                OPTIONAL,
        dsch-TFCS                       TFCS                                OPTIONAL,
        usch-TFC-Subset                 TFC-Subset                          OPTIONAL,
        ul-TransChInfoList              TransChInfoList                     OPTIONAL,
        dl-TransChInfoList              TransChInfoList                     OPTIONAL,
    -- Measurement report
        measurementReport               MeasurementReport                   OPTIONAL
}

-- ***************************************************
--
-- Source system to target RNC
--
-- ***************************************************

SourceSystemToTargetRNC ::=         CHOICE {
    ueCapabilityInformation             UECapabilityInformation,
    spare                               NULL
}

SRB-InformationList ::=             SEQUENCE (SIZE (3..maxSRBsetup)) OF
                                        SRB-InformationSetup

SRB-SpecificIntegrityProtInfo ::=   SEQUENCE {
    ul-HFN                              HyperFrameNumber,
    dl-HFN                              HyperFrameNumber,
    ul-RRC-SequenceNumber               RRC-MessageSequenceNumber,
    dl-RRC-SequenceNumber               RRC-MessageSequenceNumber
}

SRB-SpecificIntegrityProtInfoList ::= SEQUENCE (SIZE (3..maxSRBsetup)) OF
                                        SRB-SpecificIntegrityProtInfo

StateOfRRC ::=                      ENUMERATED {
                                        cell-DCH, cell-FACH,
                                        cell-PCH, ura-PCH }

StateOfRRC-Procedure ::=            ENUMERATED {
                                        awaitNoRRC-Message,
                                        awaitRRC-ConnectionRe-establishmentComplete,
                                        awaitRB-SetupComplete,
                                        awaitRB-ReconfigurationComplete,
                                        awaitTransportCH-ReconfigurationComplete,
                                        awaitPhysicalCH-ReconfigurationComplete,
                                        awaitActiveSetUpdateComplete,
                                        awaitHandoverComplete,
                                        otherStates }

-- ***************************************************
--
-- Target system to source RNC
--
-- ***************************************************

TargetSystemToSourceRNC ::=         CHOICE {
```

```
    radioBearerSetup                    RadioBearerSetup,
    radioBearerReconfiguration          RadioBearerReconfiguration,
    radioBearerRelease                  RadioBearerRelease,
    transportChannelReconfiguration     TransportChannelReconfiguration,
    physicalChannelReconfiguration      PhysicalChannelReconfiguration,
    handoverToUTRANCommand              HandoverToUTRANCommand
}

TransChInfo ::=                     SEQUENCE {
    transportChannelIdentity            TransportChannelIdentity,
    transportFormatSet                  TransportFormatSet
}

TransChInfoList ::=                 SEQUENCE (SIZE (1..maxTrCH)) OF
                                        TransChInfo

END
```

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 ECN module defined for each ASN.1 module. How special encoding is used is defined in TR 25.921.

12.1 Padding of RRC messages using RLC transparent mode

Padding is applicable for all UL and DL RRC messages using transparent RLC mode.

On the transmitter side, padding is inserted after the message has been encoded using the specified encoding rule. The RRC layer shall insert padding at the end of the message until the size of the RRC PDU equals the transport block size.

If the TFS contains more than one transport block size, the RRC layer shall select the smallest possible transport block size to use for the transfer of the message. Padding shall be inserted at the end of the message until the size of the RRC PDU equals the size of the selected transport block.

The value of the padding bits shall be "0".

On the receiver side, the padding bits shall be ignored.

12.2 ECN link module for RRC

```
RRC-ECN-Link-Module LINK-DEFINITIONS ::=
BEGIN
    Class-definitions ENCODED BY perUnaligned WITH Class-definitions-ECN-Module
    PDU-definitions ENCODED BY perUnaligned WITH PDU-definitions-ECN-Module
    CoreNetwork-IEs ENCODED BY perUnaligned WITH CoreNetwork-IEs-ECN-Module
    UTRANMobility-IEs ENCODED BY perUnaligned WITH UTRANMobility-IEs-ECN-Module
    UserEquipment-IEs ENCODED BY perUnaligned WITH UserEquipment-IEs-ECN-Module
    RadioBearer-IEs ENCODED BY perUnaligned WITH RadioBearer-IEs-ECN-Module
    TransportChannel-IEs ENCODED BY perUnaligned WITH TrasportChannel-IEs-ECN-Module
    PhysicalChannel-IEs ENCODED BY perUnaligned WITH PhysicalChannel-IEs-ECN-Module
    Measurement-IEs ENCODED BY perUnaligned WITH Measurement-IEs-ECN-Module
    Other-IEs ENCODED BY perUnaligned WITH Other-IEs-ECN-Module
    ANSI-41-IEs ENCODED BY perUnaligned WITH ANSI-41-IEs-ECN-Module
END
```

12.3 ECN modules for RRC

```
Class-definitions-ECN-Module ENCODING-DEFINITIONS ::=
BEGIN
END

PDU-definitions-ECN-Module ENCODING-DEFINITIONS ::=
BEGIN
END

Corenetwork-IEs-ECN-Module ENCODING-DEFINITIONS ::=
BEGIN
END

UTRANMobility-IEs-ECN-Module ENCODING-DEFINITIONS ::=
BEGIN
END

UserEquipment-IEs-ECN-Module ENCODING-DEFINITIONS ::=
BEGIN
END

RadioBearer-IEs-ECN-Module ENCODING-DEFINITIONS ::=
BEGIN
END

TransportChannel-IEs-ECN-Module ENCODING-DEFINITIONS ::=
BEGIN
END
```

```
PhysicalChannel-IEs-ECN-Module ENCODING-DEFINITIONS ::=
BEGIN
END

Measurement-IEs-ECN-Module ENCODING-DEFINITIONS ::=
BEGIN
END

Other-IEs-ECN-Module ENCODING-DEFINITIONS ::=
BEGIN
END

ANSI-41-IEs-ECN-Module ENCODING-DEFINITIONS ::=
BEGIN
END
```

13 Protocol timers, counters and other parameters

13.1 Timers for UE

Timer	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	See subclause 8.1.5.8.
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.
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	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	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	When the UE detects that it is out of sync. The timer is started only if radio bearer(s) which are associated with T314 exist.	When the RRC Connection Re-establishment procedure has been completed.	See subclause 8.1.5.6
T315	When the UE detects that it is out of sync. The timer is started only if radio bearer(s) which are associated with T315 exist.	When the RRC Connection Re-establishment procedure has been completed.	See subclause 8.1.5.7

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.
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	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	Maximum number of successive "in sync" received from L1.
N313	Maximum number of successive "out of sync" received from L1.
N315	Maximum number of successive "in sync" received from L1 during T313 is activated.

13.4 UE variables

13.4.1 CIPHERING_STATUS

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

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Status	MP		Enumerated(Not started, Started)	

13.4.2 DEFAULT_TFC_SUBSET

This variable contains the TFC subset to go back to when a temporary TFC limitation is released.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
TFC subset	MP		Transport Format Combination Subset 10.3.5.22	

13.4.3 ESTABLISHED_RABS

This variable is used to store information about the established radio access bearers in the UE.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RAB information	OP	1 to <maxRABsetup>		For each RAB established
>RAB info	MP		RAB info 10.3.4.8	
>RB information	MP	1 to <maxRBperRAB>		For each RB belonging to the RAB
>>RB identity	MP		RB identity 10.3.4.13	
>>Subflow	MP		Integer(0..<maxSubflowcount>)	Reference to the RAB subflow implemented by this RB

13.4.4 INTEGRITY_PROTECTION_INFO

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

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Status	MP		Enumerated(Not started, Started)	
Signalling radio bearer specific integrity protection information	MP	1 to <maxSRBsetup>		Status information for RB#0-4 in that order
> Uplink HFN	MP		Hyper frame number 10.3.3.13	
> Downlink HFN	MP		Hyper frame number 10.3.3.13	
> Uplink RRC Message sequence number	MP		Integer (0..15)	
> Downlink RRC Message sequence number	MP		Integer (0..15)	

13.4.5 MEASUREMENT_IDENTITY

This variable stores the measurements configured in the UE. For each configured measurement, the information below shall be stored.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
MEASUREMENT CONTROL	MP		MEASUREMENT CONTROL 10.2.15	Information as contained in this message.

13.4.6 ORDERED_ASU

NOTE: For FDD only.

This variable stores information about an ordered, but not yet executed, update of active set.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
ACTIVE SET UPDATE	MP		ACTIVE SET UPDATE 10.2.1	Information as contained in this message.

13.4.7 ORDERED_CONFIG

This variable stores information about an ordered but not yet executed establishment/release/reconfiguration of radio bearers, and/or transport channels and/or physical channels.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *message*	MP			Information as contained in one of the following messages
>RADIO BEARER SETUP			RADIO BEARER SETUP 10.2.31	
>RADIO BEARER RECONFIGURATION			RADIO BEARER RECONFIGURATION 10.2.25	
>RADIO BEARER RELEASE			RADIO BEARER RELEASE 10.2.28	
>TRANSPORT CHANNEL RECONFIGURATION			TRANSPORT CHANNEL RECONFIGURATION 10.2.54	
>PHYSICAL CHANNEL RECONFIGURATION			PHYSICAL CHANNEL RECONFIGURATION 10.2.20	

13.4.8 PROTOCOL_ERROR_INDICATOR

This variable indicates whether there exist a protcol error that is to be reported to UTRAN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Protocol error indicator	MP		Protocol error indicator 10.3.3.28	

13.4.9 PROTOCOL_ERROR_INFORMATION

This varaible contains diagnostics to be reported to UTRAN for a message that was not completely understood.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Protocol error information	MP		Protocol error information 10.3.8.10	

13.4.10 PROTOCOL_ERROR_REJECT

This variable indicates whether there has occurred a severe protocol error causing the ongoing procedure to fail.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Protocol error reject	MP		Boolean	TRUE: a severe protocol error has occurred

13.4.11 RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO

This variable contains information to be sent to UTRAN about when a new ciphering configuration shall be activated in the uplink for radio bearers using RLC-AM or RLC-UM.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RB uplink ciphering activation time info	MP		RB activation time info 10.3.4.10	

13.4.12 SELECTED_PLMN

This variable contains the type of and identity of the selected PLMN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
PLMN Type	MP		PLMN Type 10.3.1.12	
CHOICE *identity type*	MP			
>PLMN identity			PLMN identity 10.3.1.11	
>SID			SID 10.3.9.11	

CHOICE *identity type*	Condition under which the given *identity type* is chosen
PLMN identity	PLMN Type is "GSM-MAP"
SID	PLMN Type is "ANSI-41"

13.4.13 TGPS_IDENTITY

This variable contains the configuration parameters of a compressed mode transmission gap pattern sequence

Information Element/Group name	Need	Multi	Type and reference	Semantics description
TGPS_IDENTITY	MP		DPCH compressed mode info 10.3.6.27	Information as contained in the IE group "Transmission gap pattern sequence configuration parameters".

13.4.14 UE_CAPABILITY_TRANSFERRED

This variable stores information about which UE capabilities that have been transferred to UTRAN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UE radio access capability	OP		UE radio access capability 10.3.3.40	
UE system specific capability	OP		Inter-system message 10.3.8.6	Includes inter-system classmark

13.4.15 UNACCEPTABLE_CONFIGURATION

This variable contains information on whether the received configuration from the UTRAN resulted in an illegal configuration.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UNACCEPTABLE_CONFIGURATION	MP		Boolean	

13.4.16 VALUE_TAG

This variable contains information about the value tag for the last received system information block of a given type, for all system information blocks using value tags.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
MIB value tag	MP		MIB value tag 10.3.8.7	Value tag for the master information block
SIB 1 value tag	CV-*GSM*		PLMN value tag 10.3.8.8	Value tag for the system information block type 1
SIB 2 value tag	MP		PLMN value tag 10.3.8.8	Value tag for the system information block type 2
SIB 3 value tag	MP		Cell value tag 10.3.8.4	Value tag for the system information block type 3
SIB 4 value tag	MP		Cell value tag 10.3.8.4	Value tag for the system information block type 4
SIB 5 value tag	MP		Cell value tag 10.3.8.4	Value tag for the system information block type 5
SIB 6 value tag	MP		Cell value tag 10.3.8.4	Value tag for the system information block type 6
CHOICE *mode*				
>FDD				
>>SIB 8 value tag	MP		Cell value tag 10.3.8.4	Value tag for the system information block type 8
>TDD				(no data)
SIB 11 value tag	MP		Cell value tag 10.3.8.4	Value tag for the system information block type 11
SIB 12 value tag	MP		Cell value tag 10.3.8.4	Value tag for the system information block type 12
SIB 13 value tag	CV-*ANSI*		Cell value tag 10.3.8.4	Value tag for the system information block type 13
SIB 13.1 value tag	CV-*ANSI*		Cell value tag 10.3.8.4	Value tag for the system information block type 13.1
SIB 13.2 value tag	CV-*ANSI*		Cell value tag 10.3.8.4	Value tag for the system information block type 13.2
SIB 13.3 value tag	CV-*ANSI*		Cell value tag 10.3.8.4	Value tag for the system information block type 13.3
SIB 13.4 value tag	CV-*ANSI*		Cell value tag 10.3.8.4	Value tag for the system information block type 13.4
CHOICE *mode*				
> TDD				
>>SIB 14 value tag	MP		Cell value tag 10.3.8.4	Value tag for the system information block type 14
> FDD				(no data)
SIB 15 value tag	MP		Cell value tag 10.3.8.4	Value tag for the system information block type 15
SIB 16 value tag	MP		PLMN value tag 10.3.8.8	Value tag for the system information block type 16

Condition	Explanation
GSM	This information is only stored when the PLMN Type in the variable SELECTED_PLMN is "GSM-MAP".
ANSI	This information is only stored when the PLMN Type in the variable SELECTED_PLMN is "ANSI-41".

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 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 subclause 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:

For pathloss:

$$10 \cdot LogM_{New} \geq W \cdot 10 \cdot Log\left(\sum_{i=1}^{N_A} M_i\right) + (1-W) \cdot 10 \cdot LogM_{Best} + (R + H_{1a}),$$

For all the other measurement quantity:

$$10 \cdot LogM_{New} \geq W \cdot 10 \cdot Log\left(\sum_{i=1}^{N_A} M_i\right) + (1-W) \cdot 10 \cdot LogM_{Best} - (R + H_{1a}),$$

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.

W is a parameter sent from UTRAN to UE.

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 (***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 subclause 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.

Event 1A may be used for triggering a measurement report, which includes unlisted cells, which the UE has detected.

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:

For pathloss:

$$10 \cdot LogM_{New} \leq W \cdot 10 \cdot Log\left(\sum_{i=1}^{N_A} M_i\right) + (1-W) \cdot 10 \cdot LogM_{Best} + (R + H_{1a}),$$

For all the other measurement quantity:

$$10 \cdot LogM_{Old} \leq W \cdot 10 \cdot Log\left(\sum_{i=1}^{N_A} M_i\right) + (1-W) \cdot 10 \cdot LogM_{Best} - (R + H_{1b}),$$

The variables in the formula are defined as follows:

M_{Old} is the measurement result of the cell leaving the reporting range.

M_i is a measurement result of a cell in the active set.

N_A is the number of cells in the current active set.

M_{Best} is the measurement result of the strongest cell in the active set.

W is a parameter sent from UTRAN to UE.

R is the reporting range

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 (***R***) common to many reporting events and an optional **hysteresis** parameter (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

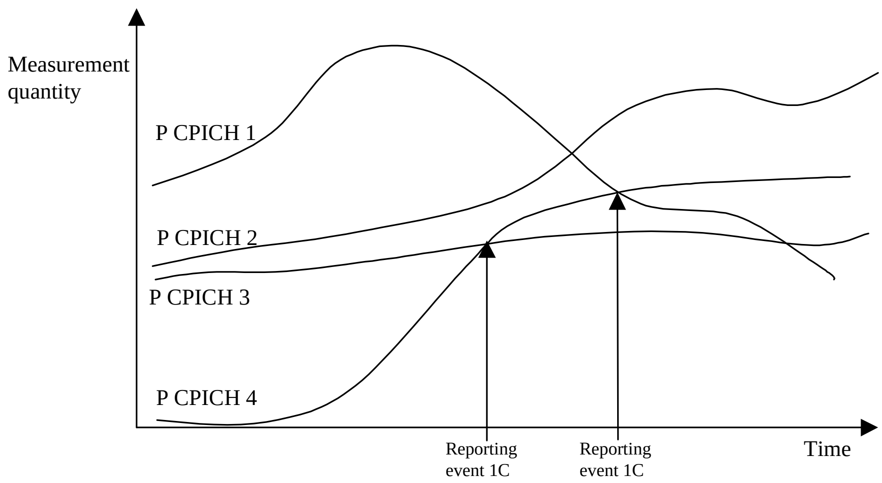

Figure 57: A primary CPICH that is not included in the active set becomes better than a primary CPICH that is in the active set

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

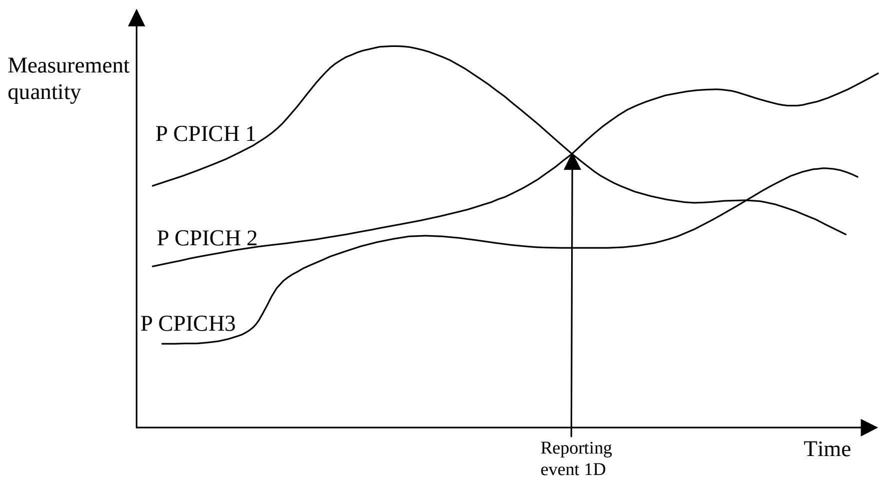

Figure 58: A primary CPICH becomes better than the previously best primary CPICH

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

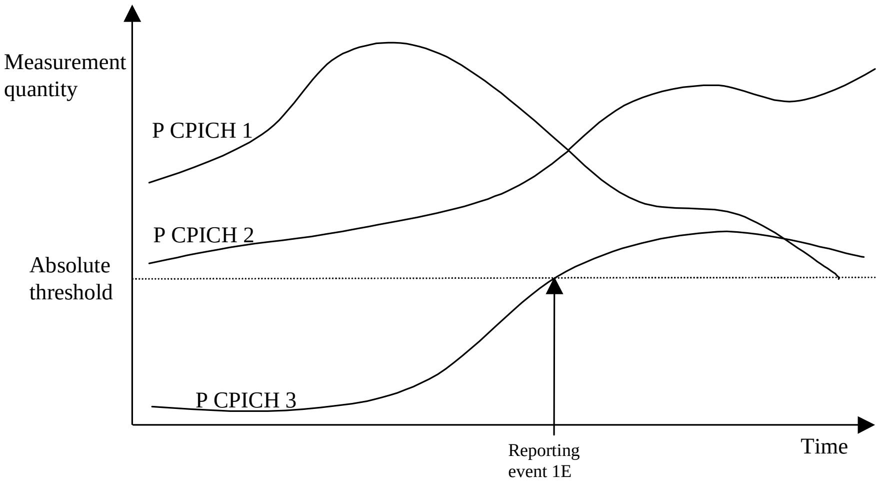

Figure 59: Event-triggered report when a Primary CPICH becomes better than an absolute threshold

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.

Event 1E may be used for triggering a measurement report, which includes unlisted cells, which the UE has detected.

14.1.2.6 Reporting event 1F: A Primary CPICH becomes worse than an absolute threshold

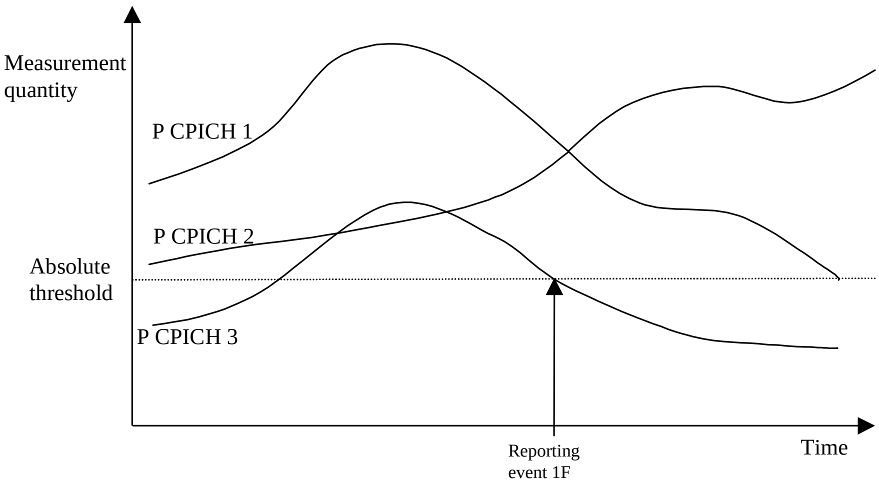

Figure 60: Event-triggered report when a Primary CPICH becomes worse than an absolute threshold

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 Reporting event 1G: Change of best cell (TDD)

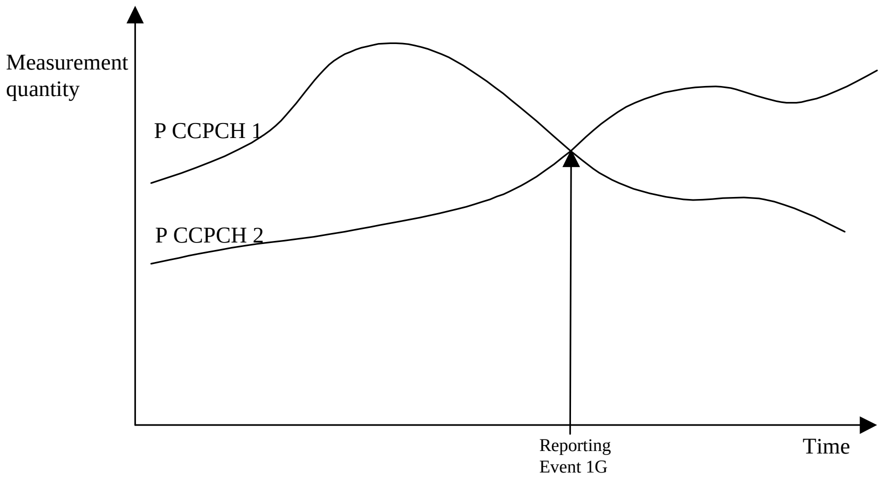

Figure 61: A primary CCPCH becomes better than the previous best primary CCPCH

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 Reporting event 1H: Timeslot ISCP below a certain threshold (TDD)

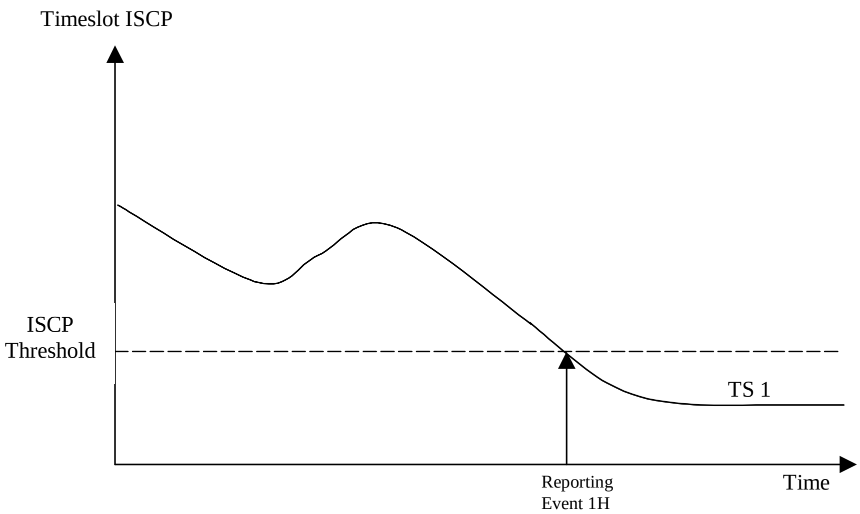

Figure 62: An ISCP value of a timeslot becomes worse than an absolute threshold

14.1.3.3 Reporting event 1I: Timeslot ISCP above a certain threshold (TDD)

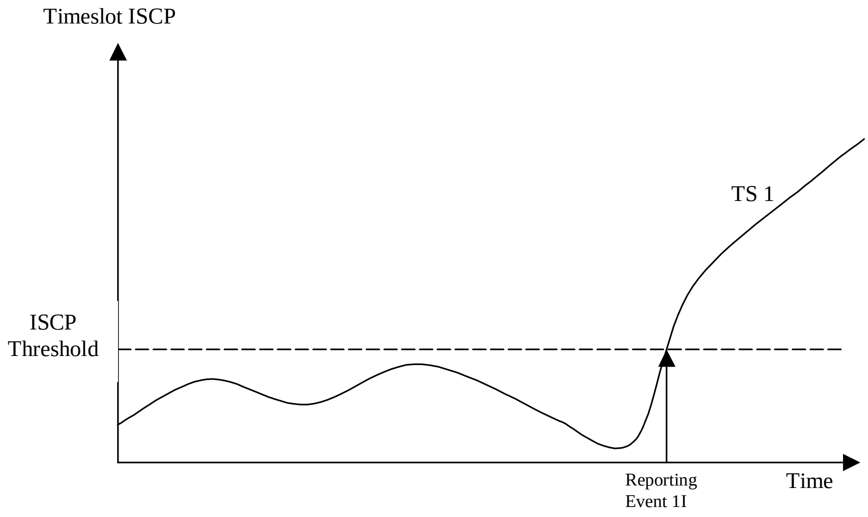

Figure 63: An ISCP value of a timeslot becomes better than a certain threshold

14.1.4 Event-triggered periodic intra-frequency measurement reports

14.1.4.1 Cell addition failure (FDD only)

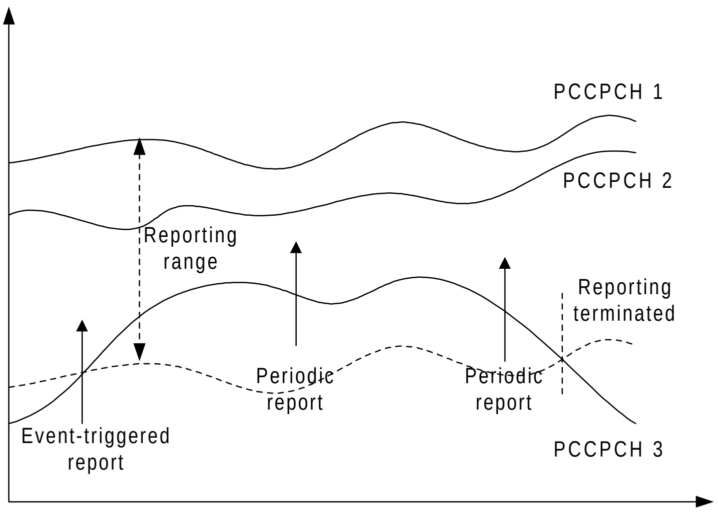

Figure 64: Periodic reporting triggered by event 1A

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 64. 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)

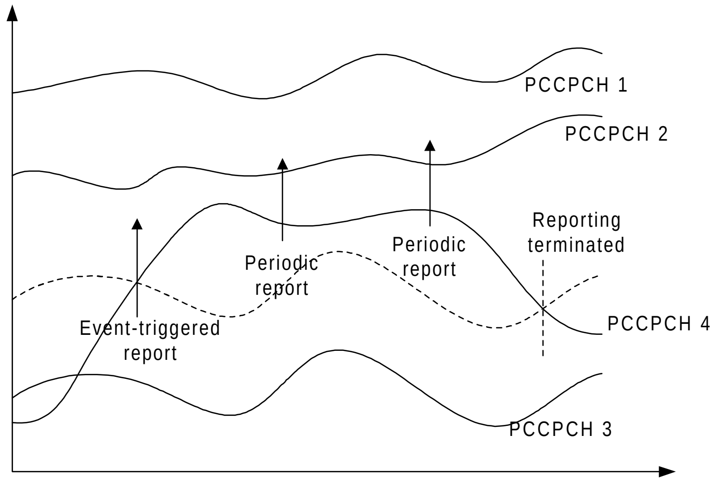

Figure 65: Periodic reporting triggered by event 1C

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 65. 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.

14.1.5 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 66, 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.

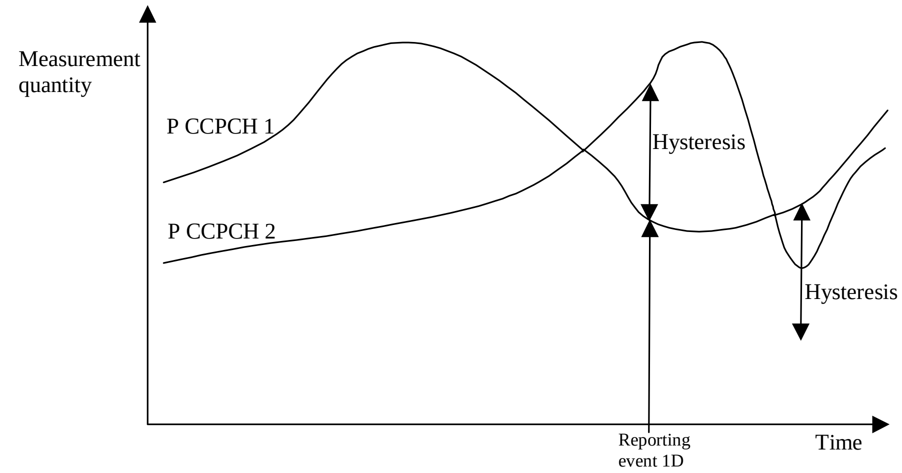

Figure 66: Hysteresis limits the amount of measurement reports

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 67, 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.

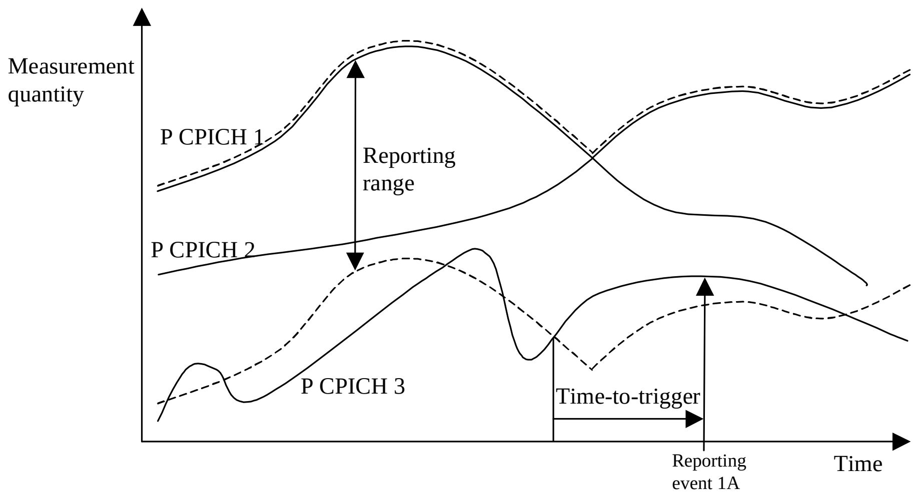

Figure 67: Time-to-trigger limits the amount of measurement reports

In the following TDD example in Figure 68, 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.

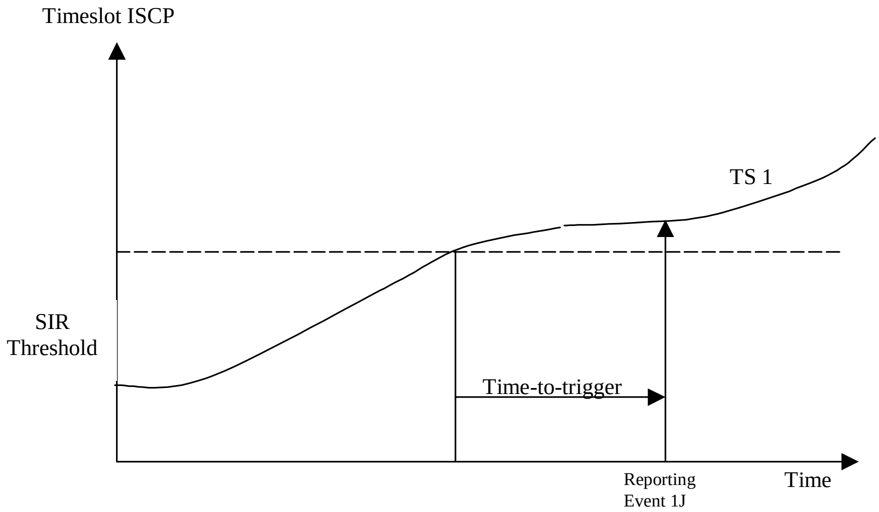

Figure 68: Time-to-trigger limits the amount of measurement reports

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 69, 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 69, 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 69, 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.

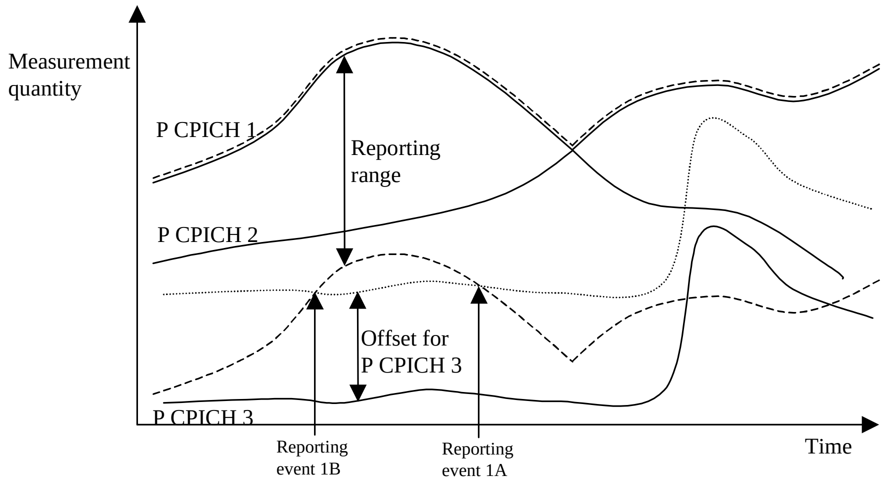

Figure 69: A positive offset is applied to primary CPICH 3 before event evaluation in the UE

For the TDD example, in Figure 70, 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).

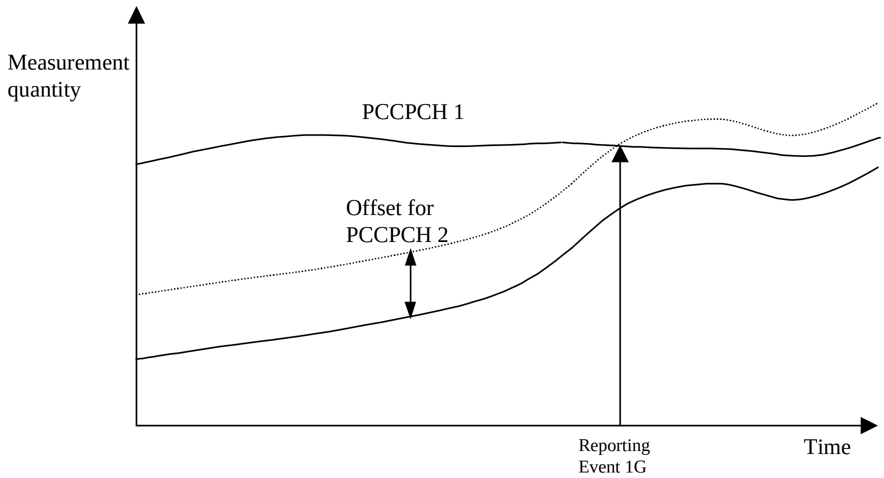

Figure 70: A positive offset is applied to primary CCPCH 2

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 71 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.

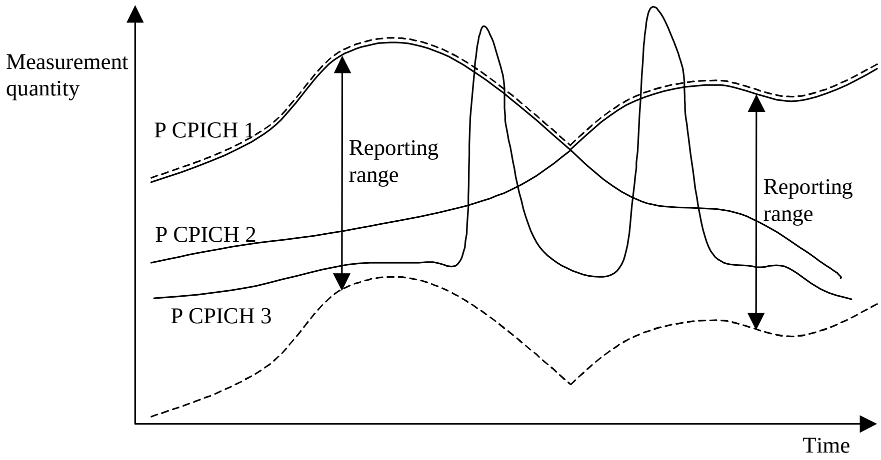

Figure 71: Primary CPICH 3 is forbidden to affect the reporting range

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 clause 7)].
- UE transmit power.
- UE position (FFS).
- Downlink SIR (RSCP/ISCP) on the traffic channels after RAKE combining (FFS).

14.2 Inter-frequency measurements

The frequency quality estimate used in events 2a, 2b 2c, 2d and 2e is defined as:

$$Q_{carrier\ j} = 10 \cdot Log M_{carrier\ j} = W_j \cdot 10 \cdot Log\left(\sum_{i=1}^{N_{A\ j}} M_{i\ j}\right) + (1 - W_j) \cdot 10 \cdot Log M_{Best\ j} - H,$$

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

H is the hysteresis parameter

14.2.1 Inter-frequency reporting events

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 subclause 14.x.x. The measurement objects are the monitored primary common pilot channels (CPICH) in FDD mode and the monitored primary common control channels (PCCPCH) in TDD mode. 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 (FDD) or primary CCPCH (TDD) 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 (FDD) or primary CCPCH (TDD) 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 (FDD) or primary CCPCH (TDD) 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 (FDD) or primary CCPCH (TDD) 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 (FDD) or primary CCPCH (TDD) 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 (FDD) or primary CCPCH (TDD) on the used frequency.

14.3 Inter-system measurements

The estimated quality of the active set in UTRAN in events 3a is defined as:

$$Q_{UTRAN} = 10 \cdot Log M_{UTRAN} = W \cdot 10 \cdot Log\left(\sum_{i=1}^{N_A} M_i\right) + (1-W) \cdot 10 \cdot Log M_{Best},$$

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

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 subclause 14.x.x The measurement objects are the monitored primary common pilot channels (CPICH) in FDD mode and the monitored primary common control channels (PCCPCH) in TDD mode 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 (FDD) or primary CCPCH (TDD) 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 (FDD) or primary CCPCH (TDD) 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 (FDD) or primary CCPCH (TDD) 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

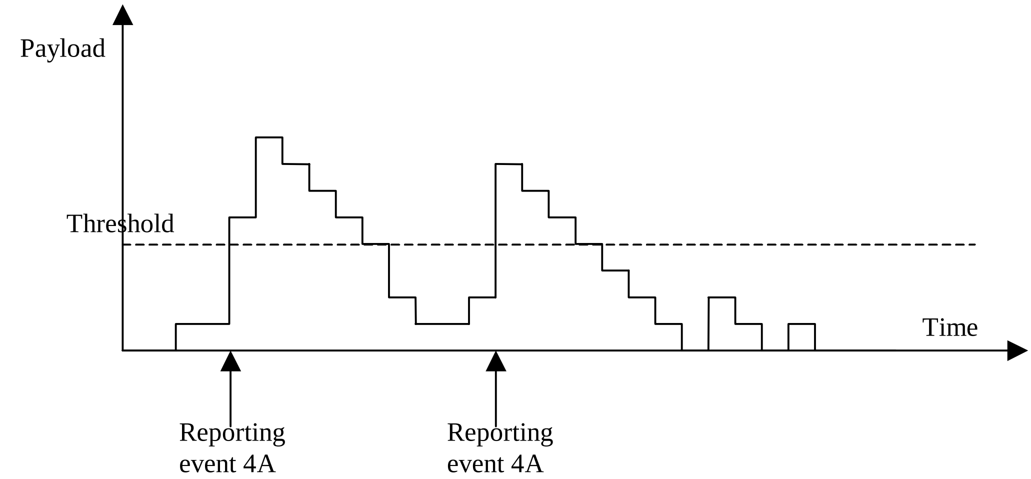

Figure 72: Event triggered report when RLC buffer payload exceeds a certain threshold

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.

14.4.2.2 Reporting event 4 B: RLC buffer payload becomes smaller than an absolute threshold

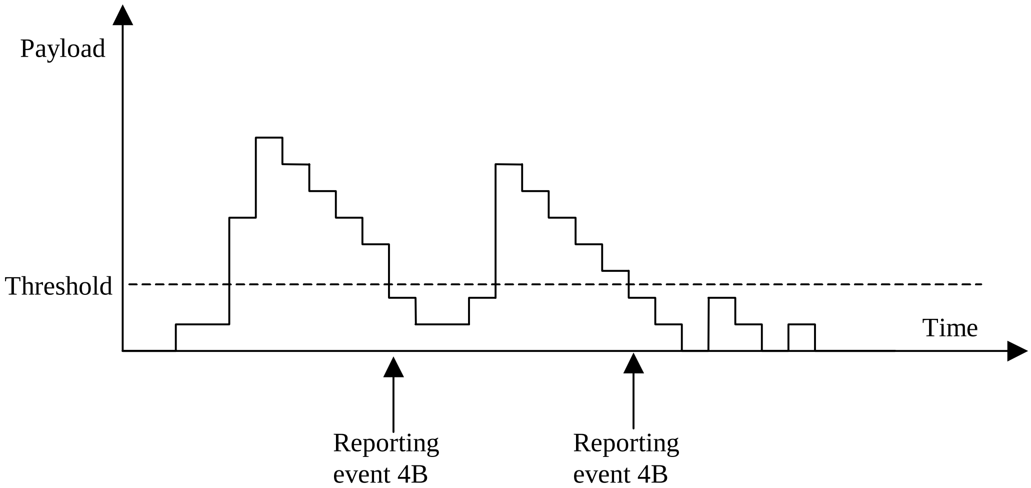

Figure 73: Event triggered report when RLC buffer payload becomes smaller than certain threshold

If the monitored payload becomes smaller than 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.

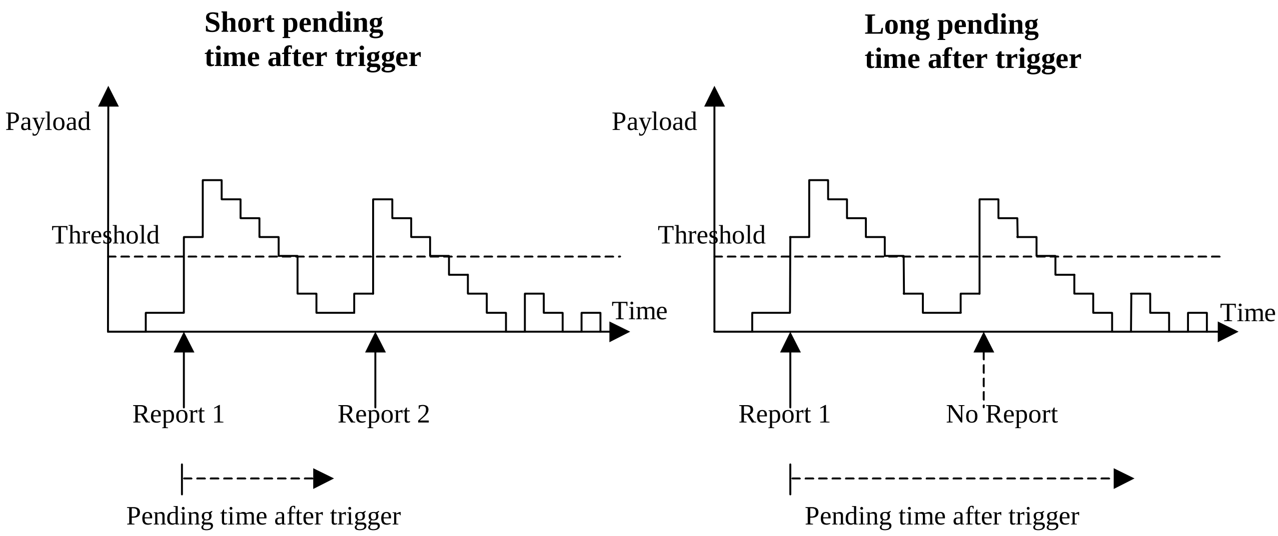

Figure 74: Pending time after trigger limits the amount of consecutive measurement reports

Figure 74 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).
3. UE Rx-Tx time difference.

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.

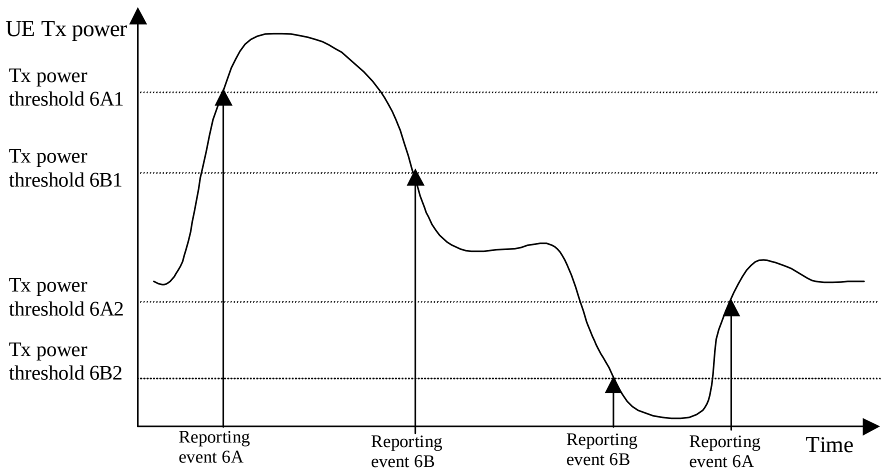

Figure 75: Event-triggered measurement reports when the UE Tx power becomes larger or less than absolute thresholds

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.

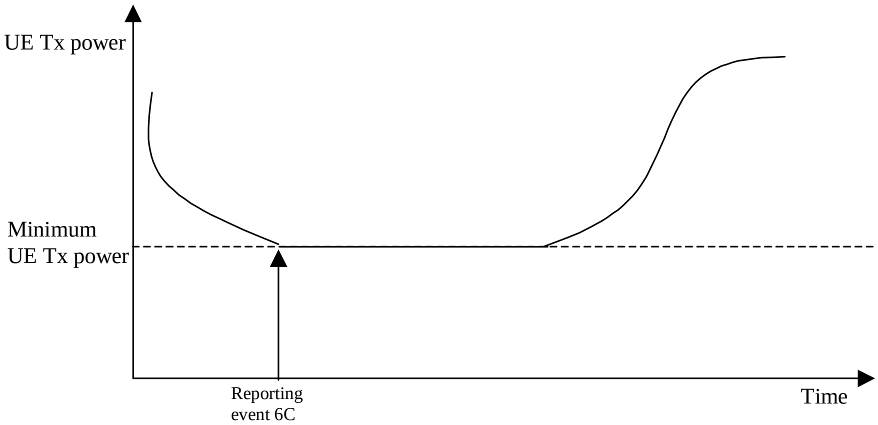

Figure 76: Event-triggered measurement report when the UE Tx power reaches its minimum value

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.

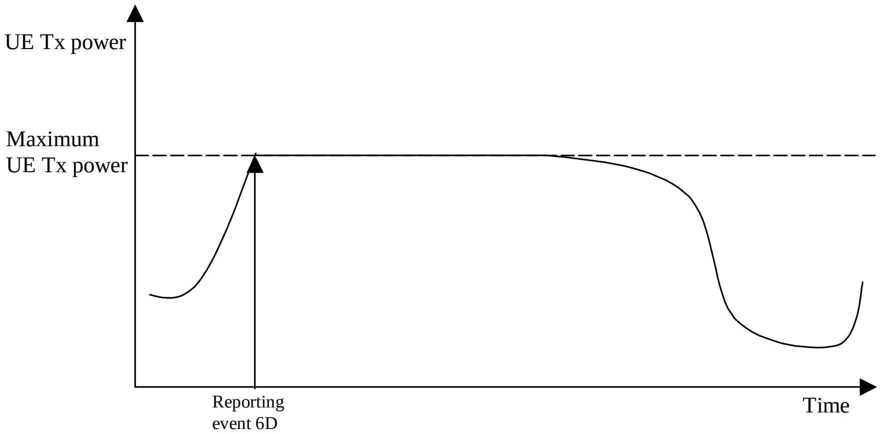

Figure 77: Event-triggered report when the UE Tx power reaches its maximum value

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.

14.5.2.6 Reporting event 6F: The UE Rx-Tx time difference for a RL included in the active set 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 message when the UE Rx-Tx time difference becomes larger than the threshold defined by the IE "UE Rx-Tx time difference threshold".

14.5.2.7 Reporting event 6G: The UE Rx-Tx time difference for a RL included in the active set 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 Rx-Tx time difference becomes less than the threshold defined by the IE "UE Rx-Tx time difference threshold".

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 procedure shall be activated in the UE when it has been allocated an uplink DCH with DRAC static information elements. Such uplink DCHs can be established through RB establishment procedure, RB reconfiguration procedure, RB release procedure or Transport Channel Reconfiguration procedure by setting the DRAC static information elements to indicate that the DCH is controlled by the DRAC procedure.

The UE shall periodically listen to the SIB 10 of each cell in its Active Set. The scheduling information of SIB10 and the SCCPCH info on which the SIB10 is transmitted are provided to the UE when the DCH is set up and when a cell is added in its active set. In case several SIB10 messages from different cells are scheduled at the same time, the UE shall only listen to the SIB10 broadcast in the cell of its Active Set having the best CPICH measurements.

Upon reception of a SYSTEM INFORMATION message comprising a SIB10,the UE shall:

1. Determine and store the most stringent DRAC parameters from the last received values from each cell of its active set (i.e. select the lowest product p_{tr}*maximum bit rate corresponding to its DRAC class identity)

2. Determine the allowed subset of TFCS according to the selected maximum bit rate value, and store it for later usage.
   The allowed subset of TFCS are the ones of the TFCS for which the sum of bit rates of the DCH controlled by DRAC is lower than Maximum Bit Rate IE, i.e.

$$\sum_{\text{DCHi controlled by DRAC}} TBSsize_i / TTI_i < MaximumBitRate$$

After the first SIB10 has been received, the UE shall start the following process:

1. At the start of the next TTI, the UE shall randomly select p ? [0,1].

2. If p < ptr, the UE shall transmit on the DCH controlled by DRAC during $T_{validity}$ frames using the last stored allowed subset of TFCS and comes back to step 1, otherwise the UE shall stop transmission on these DCH during T_{retry} frames and then comes back to step 1.

Transmission time validity ($T_{validity}$) and Time duration before retry (T_{retry}) are indicated to the UE at the establishment of a DCH controlled by this procedure and may be changed through RB or transport channel reconfiguration. The UE shall always use the latest received DRAC static parameters.

A UE which supports the simultaneous reception of one SCCPCH and one DPCH shall support the DRAC procedure.

14.7 Downlink power control

14.7.1 Generalities

This function is implemented in the UE in order to set the SIR target value on each CCTrCH used for the downlink power control. This SIR value shall be adjusted according to an autonomous function in the UE in order to achieve the same measured quality as the quality target set by UTRAN. The quality target is set as the transport channel BLER value for each transport channel as signalled by UTRAN. For CPCH the quality target is set as the BER of the DL DPCCH as signalled by UTRAN.

When transport channel BLER is used the UE shall run a quality target control loop such that the quality requirement is met for each transport channel, which has been assigned a BLER target.

When DL DPCCH BER is used the UE shall run a quality target control loop such that the quality requirement is met for each CPCH transport channel, which has been assigned a DL DPCCH BER target.

The UE shall set the SIR target when the physical channel has been set up or reconfigured. It shall not increase the SIR target value before the power control has converged on the current value. The UE may estimate whether the power control has converged on the current value, by comparing the averaged measured SIR to the SIR target value.

If the UE has received a DL outer loop control message from UTRAN indicating that the SIR target value shall not be increased above the current value, it shall record the current value as the maximum allowed value for the power control function, until it receives a new DL outer loop control message from UTRAN indicating that the restriction is removed.

14.7.2 Downlink power control in compressed mode

In compressed mode, the target SIR needs to be changed during compressed frames and one frame after compressed frames (recovery frame), compared to normal mode. For this purpose, four values DeltaSIR1, DeltaSIRafter1, DeltaSIR2 and DeltaSIRafter2 are signalled by the UTRAN to the UE (see section 10.2.9).

For each frame, the target SIR offset during compressed mode, compared to normal mode is:

$$\Delta SIR = \max(\Delta SIR1\_compression, \ldots, \Delta SIRn\_compression) + \Delta SIR\_coding$$

where n is the number of TTI lengths for all TrChs of the CCTrCh, F_i is the length in number of frames of the i-th TTI and where ΔSIR_coding fulfils:

- ΔSIR_coding= DeltaSIR1 for compressed frames corresponding to the first transmission gap in the transmission gap pattern.
- ΔSIR_coding= DeltaSIRafter1 for recovery frames corresponding to the first transmission gap in the transmission gap pattern.
- ΔSIR_coding= DeltaSIR2 for compressed frames corresponding to the second transmission gap in the transmission gap pattern.
- ΔSIR_coding= DeltaSIRafter2 for recovery frames corresponding to the second transmission gap in the transmission gap pattern.
- ΔSIR_coding= 0 otherwise.

and ΔSIRi_compression is defined by :

- If the frames are compressed by reducing the spreading factor by 2 ("Compressed mode method" IE is equal to "SF/2"):
  - ΔSIRi_compression= 3 dB for each compressed frame, where TGL is the gap length in number of slots (either from one gap or a sum of gaps) in the frame.
  - ΔSIRi_compression= 0 otherwise.
- If the frames are compressed by puncturing ("Compressed mode method" IE is equal to "puncturing"):
  - ΔSIRi_compression= $10 \log (15*F_i / (15*F_i - TGL_i))$ if there is a transmission gap within the current TTI of length F_i frames, where TGL_i is the gap length in number of slots (either from one gap or a sum of gaps) in the current TTI of length F_i frames.
  - ΔSIRi_compression= 0 otherwise.
- If the frames are compressed by upper layer scheduling ("Compressed mode method" IE is equal to "upper layer scheduling"):
  - ΔSIRi_compression= 0 for all frames.

In the particular case where a transmission gap overlaps two frames (double-frame method), the second compressed frame (with the second part of the transmission gap) must be considered as the recovery frame (ΔSIR_coding = DeltaSIRafter1 or ΔSIR_coding = DeltaSIRafter2). Thus, in this case, the first frame following the two consecutive compressed frames is not considered as a recovery frame (ΔSIR_coding=0).

Several compressed mode patterns applying to the same frames should be avoided as much as possible.

In particular; several simultaneous patterns by puncturing applying to the same frames shall be considered as a protocol error by the UE. The handling of this error is described in the procedure descriptions in clause 8

In case a frame or TTI is simultaneously compressed by puncturing and by reduction of the spreading factor, or in case a frame is simultaneously a compressed frame in one pattern and a recovery frame in another pattern, all offsets must be added and the total target SIR offset is applied to the frame.

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 $TrCH_i$, $i = 1, 2, \ldots, I$, 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* $i = 1, 2, \ldots, I$*, 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 downlink common CH, "TrCHi" is numbered with ascending integer numbers starting from 1 in the order listed in a SYSTEM INFORMATION message.

In all other cases, for each separate TFCI field, "TrCHi" is numbered with ascending integer numbers starting from 1 in the ascending order of transport channel identities of the channels mapped to that TFCI field.

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 information between network nodes

14.10.1 RRC Initialisation Information, source RNC to target RNC

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 including the radio bearer and transport channel configuration. This "RRC initialisation information, source RNC to target RNC" 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, source RNC to target RNC" and update its state parameters accordingly to facilitate a transparent relocation of SRNS for the UE.

Information Element/Group Name	Need	Multi	Type and reference	Semantics description
Non RRC IEs				
State of RRC	MP		Enumerated (CELL_DCH, CELL_FACH,CELL_PCH, URA_PCH)	
State of RRC procedure	MP		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)	
Ciphering related information				
Ciphering status	MP		Enumerated(Not started, Started)	
Calculation time for ciphering related information	CV *Ciphering*			Time when the ciphering information of the message were calculated, relative to a cell of the target RNC
>Cell Identity	MP		Cell Identity 10.3.2.2	Identity of one of the cells under the target RNC and included in the active set of the current call
>SFN	MP		Integer(0..4095)	
Ciphering info per radio bearer	OP	1 to <maxRB>		
>RB identity	MP		RB identity 10.3.4.13	
>Downlink HFN	MP		Hyperframe number 10.3.3.13	
>Uplink HFN	MP		Hyperframe number 10.3.3.13	
Integrity protection related information				
Integrity protection status	MP		Enumerated(Not started, Started)	
Integrity protection failure count	MP		Integer(0..N316)	
Signalling radio bearer specific integrity protection information	CV *IP*	4 to <maxSRBsetup>		Status information for RB#0-4 in that order
> Uplink HFN	MP		Hyper frame number 10.3.3.13	
> Downlink HFN	MP		Hyper frame number 10.3.3.13	
> Uplink RRC Message sequence number	MP		Integer (0.. 15)	
> Downlink RRC Message sequence number	MP		Integer (0.. 15)	

Implementation specific parameters	OP		Bitstring (1..512)	
RRC IEs				
UE Information elements				
U-RNTI	MP		U-RNTI 10.3.3.45	
C-RNTI	OP		C-RNTI 10.3.3.8	
UE radio access Capability	MP		UE radio access capability 10.3.3.40	
Other Information elements				
Inter System message (inter system classmark)	OP		Inter-system message 10.8.6	
UTRAN Mobility Information elements				
URA Identifier	OP		URA identity 10.3.2.6	
CN Information Elements				
CN common GSM-MAP NAS system information	MP		NAS system information (GSM-MAP) 10.3.1.9	
CN domain related information	OP	1 to <MaxCN domains >		CN related information to be provided for each CN domain
>CN domain identity	MP			
>CN domain specific GSM-MAP NAS system info	MP		NAS system information (GSM-MAP) 10.3.1.9	
Measurement Related Information elements				
For each ongoing measurement reporting	OP	1 to <MaxNo OfMeas>		
>Measurement Identity Number	MP		Measurement identity number 10.3.7.73	
>Measurement Command	MP		Measurement command 10.3.7.71	
>Measurement Type	CV Setup		Measurement type 10.3.7.75	
>Measurement Reporting Mode	OP		Measurement reporting mode 10.3.7.74	
>Additional Measurements list	OP		Additional measurements list 10.3.7.1	
>CHOICE Measurement	OP			
>>Intra-frequency				
>>>Intra-frequency cell info	OP		Intra-frequency cell info list 10.3.7.33	
>>>Intra-frequency measurement quantity	OP		Intra-frequency measurement quantity 10.3.7.38	
>>>Intra-frequency reporting quantity	OP		Intra-frequency reporting quantity 10.3.7.41	
>>>Reporting cell status	OP		Reporting cell status 10.3.7.86	
>>>Measurement validity	OP		Measurement validity 10.3.7.76	

>>>CHOICE report criteria	OP			
>>>>Intra-frequency measurement reporting criteria			Intra-frequency measurement reporting criteria 10.3.7.39	
>>>>Periodical reporting			Periodical reporting criteria 10.3.7.78	
>>>>No reporting			NULL	
>>Inter-frequency				
>>>Inter-frequency cell info	OP		Inter-frequency cell info list 10.3.7.13	
>>>Inter-frequency measurement quantity	OP		Inter-frequency measurement quantity 10.3.7.18	
>>>Inter-frequency reporting quantity	OP		Inter-frequency reporting quantity 10.3.7.21	
>>>Reporting cell status	OP		Reporting cell status 10.3.7.86	
>>>Measurement validity	OP		Measurement validity 10.3.7.76	
>>>CHOICE report criteria	OP			
>>>>Inter-frequency measurement reporting criteria			Inter-frequency measurement reporting criteria 10.3.7.19	
>>>>Periodical reporting			Periodical reporting criteria 10.3.7.78	
>>>>No reporting			NULL	
>>Inter-system				
>>>Inter-system cell info	OP		Inter-system cell info list 10.3.7.23	
>>>Inter-system measurement quantity	OP		Inter-system measurement quantity 10.3.7.29	
>>>Inter-system reporting quantity	OP		Inter-system reporting quantity 10.3.7.32	
>>>Reporting cell status	OP		Reporting cell status 10.3.7.86	
>>>Measurement validity	OP		Measurement validity 10.3.7.76	
>>>CHOICE report criteria	OP			
>>>>Inter-system measurement reporting criteria			Inter-system measurement reporting criteria 10.3.7.30	
>>>>Periodical reporting			Periodical reporting criteria 10.3.7.78	
>>>>No reporting			NULL	
>>Traffic Volume				
>>>Traffic volume measurement Object	OP		Traffic volume measurement object 10.3.7.95	
>>>Traffic volume measurement quantity	OP		Traffic volume measurement quantity 10.3.7.96	
>>>Traffic volume reporting quantity	OP		Traffic volume reporting quantity 10.3.7.99	
>>>CHOICE report criteria	OP			

>>>>Traffic volume measurement reporting criteria			Traffic volume measurement reporting criteria 10.3.7.97	
>>>>Periodical reporting			Periodical reporting criteria 10.3.7.78	
>>>>No reporting			NULL	
>>Quality				
>>>Quality measurement Object	OP		Quality measurement object	
>>>Quality measurement quantity	OP		Quality measurement quantity	
>>>Quality reporting quantity	OP		Quality reporting quantity 10.3.7.84	
>>>CHOICE report criteria	OP			
>>>>Quality measurement reporting criteria			Quality measurement reporting criteria 10.3.7.83	
>>>>Periodical reporting			Periodical reporting criteria 10.3.7.78	
>>>>No reporting			NULL	
>>UE internal				
>>>UE internal measurement quantity	OP		UE internal measurement quantity 10.3.7.104	
>>>UE internal reporting quantity	OP		UE internal reporting quantity 10.3.7.107	
>>>CHOICE report criteria	OP			
>>>>UE internal measurement reporting criteria			UE internal measurement reporting criteria 10.3.7.105	
>>>>Periodical reporting			Periodical reporting criteria 10.3.7.78	
>>>>No reporting			NULL	
Radio Bearer Information Elements				
Signalling radio bearer information	MP	4 to <maxSRBsetup>		For each signalling radio bearer
>RB identity	MP		RB identity 10.3.4.13	
>RLC info	MP		RLC info 10.3.4.20	
>RB mapping info	MP		RB mapping info 10.3.4.18	
RAB information	OP	1 to <maxRABsetup>		Information for each RAB
>RAB info	MP		RAB info 10.3.4.8	
>For each Radio Bearer	OP	1 to <maxRB>		Information for each radio bearer belonging to this RAB
>>RB Identity	MP		RB identity 10.3.4.13	
>>RLC Info	MP		RLC info 10.3.4.20	

>>PDCP Info	OP		PDCP info 10.3.4.2	Absent if PDCP is not configured for RB
>>PDCP SN Info	CV PDCP		PDCP SN info 10.3.4.3	
>>RB mapping info	MP		RB mapping info 10.3.4.18	
Transport Channel Information Elements				
TFCS (UL DCHs)	OP		Transport format combination set 10.3.5.20	
TFCS (DL DCHs)	OP		Transport format combination set 10.3.5.20	
TFC subset (UL DCHs)	OP		Transport format combination subset 10.3.5.22	
TFCS (USCHs)	OP		Transport format combination set 10.3.5.20	
TFCS (DSCHs)	OP		Transport format combination set 10.3.5.20	
TFC subset (USCHs)	OP		Transport format combination subset 10.3.5.22	
Uplink transport channels				
For each uplink transport channel	OP	1 to <MaxTrCH>		
>Transport channel identity	MP		Transport channel identity 10.3.5.18	
>TFS	MP		Transport format set 10.3.5.23	
Downlink transport channels				
For each downlink transport channel	OP	1 to <MaxTrCH>		
>Transport channel identity	MP		Transport channel identity 10.3.5.18	
>TFS	MP		Transport format set 10.3.5.23	
Measurement report	OP		MEASUREMENT REPORT 10.2.17	

Multi Bound	Explanation
MaxNoOfMeas	Maximum number of active measurements, upper limit 16

Condition	Explanation
Setup	The IE is mandatory when the IE Measurement command has the value "Setup", otherwise the IE is not needed.
Ciphering	The IE is mandatory when the IE Ciphering Status has the value "started" and the ciphering counters need not be reinitialised, otherwise the IE is not needed.
IP	The IE is mandatory when the IE Integrity protection status has the value "started" and the ciphering counters need not be reinitialised, otherwise the IE is not needed.
PDCP	The IE is mandatory when the PDCP Info IE is present, otherwise the IE is not needed.

14.10.2 RRC initialisation information, source system to target RNC

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *RRC message*	MP			
>UE CAPABILITY INFORMATION			UE CAPABILITY INFORMATION 10.2.60	NOTE: is assumed to contain HFNs as well. At least one spare value with criticality:reject is needed.

NOTE: Other information, such as a list of predefined configurations in the source system, is FFS.

14.10.3 RRC information, target RNC to source system

There are 2 possible cases for RNC relocation:

1. The UE is already under control of target RNC; and
2. The SRNC Relocation with Hard Handover (UE still under control of SRNC), but UE is moving to a location controlled by the target RNC (based on measurement information).

In case 1 the relocation is transparent to the UE and there is no "reverse" direction container. The SRNC just assigns the 'serving' function to the target RNC which then becomes the Serving RNC.

In case 2 the relocation is initiated by SRNC which also provides the RRC Initialization Information to the target RNC. Base on this information, the target RNC prepares the Hard Handover Message ("Physical channel reconfiguration" (subclause 8.2.6), "radio bearer establishment" (subclause 8.2.1), "Radio bearer reconfiguration" (subclause 8.2.2), "Radio bearer release" (subclause 8.2.3) or "Transport channel reconfiguration" (subclause 8.2.4). In addition to this it may be "Handover To Utran Command" fromanother system e.g. GSM. One of these messages is transmitted using a transparent target RNC to source system direction RANAP container to the SRNC. This message is labeled as XXX.

The source RNC then transmits the Handover Message to the UE which then performs the handover.

In the successful case, the UE transmits an XXX COMPLETE message, using the new configuration, to the target RNC.

In case of failure, the UE transmits an XXX FAILURE, using the old configuration, to the source RNC and the RRC context remains unchanged (has to be confirmed and checked with the SRNS relocation procedure).

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *RRC message*	MP			
> RADIO BEARER SETUP			RADIO BEARER SETUP 10.2.31	
> RADIO BEARER RECONFIGURATION			RADIO BEARER RECONFIGURATION 10.2.25	
>RADIO BEARER RELEASE			RADIO BEARER RELEASE 10.2.28	
> TRANSPORT CHANNEL RECONFIGURATION			TRANSPORT CHANNEL RECONFIGURATION 10.2.54	
> PHYSICAL CHANNEL RECONFIGURATION			PHYSICAL CHANNEL RECONFIGURATION 10.2.20	
> HANDOVER TO UTRAN COMMAND			HANDOVER TO UTRAN COMMAND 10.2.10	

14.11 Versatile Channel Assignment Mode (VCAM) mapping rule (FDD only)

When Versatile Channel Assignment Method (VCAM) is used in the CPCH procedure, the following mapping rules shall be used to specify one PCPCH.

If the number of PCPCHs is less than or equal to 16, there is a one to one mapping between the CA index and the PCPCH index. Thus a suitable AP signature (and/or AP sub-channel) number is transmitted for the required spreading factor based on the broadcast system information, and the assigned PCPCH index (having the requested spreading factor) corresponds to the received CA index.

When the number of PCPCHs is greater than 16, a combination of an AP signature (and/or AP sub-channel) number and a CA signature number specifies one PCPCH as follows:

In VCAM mapping rule, a combination of an AP signature (and/or AP sub-channel) number and a CA signature number specifies one PCPCH. In a CPCH set, there are K available PCPCHs which are numbered k=0,1,…, K-1, and there are R available Minimum Spreading Factor A_r, r=0,1,…,R-1, that a UE can request and use. The maximum available number of PCPCHs and the number of available AP signatures (and/or AP sub-channels) for A_r are denoted as $P0_r$ and S_r, respectively, for r=0,1,…,R-1. Let P_r be equal to 16 if $P0_r$ is less than 16 and to $P0_r$ otherwise. T_r represents the number of CA signatures for A_r which are needed for specifying PCPCH. The default value of T_r is 16.

S_r always satisfies $S_r \geq \min\{s : s \times T_r \geq P_r\}$. :

The list of available AP signatures (and/or AP sub-channels) for each A_r is renumbered from signature index 0 to signature index S_r -1, starting with the lowest AP signature (and/or AP sub-channel) number, and continuing in sequence, in the order of increasing signature numbers.

Then for given AP signature (and/or AP sub-channel) number and CA signature number, the number k that signifies the assigned PCPCH is obtained as:

$$k = \{[(i+n) \bmod S_r] + j\, S_r\} \bmod P_r ,$$

where i (i=0,1,…,S_r-1) is the AP signature (and/or AP sub-channel) index for A_r, j (j=0,1,…,min(P_r,T_r)-1) is the CA signature number for A_r and n is a nonnegative integer which satisfies

$$n\, M_r\, S_r \leq i + j\, S_r < (n+1)\, M_r\, S_r \text{ where } M_r = \min\{m : (m\, S_r) \bmod P_r = 0\}.$$

An example of the above mapping rule is shown in subclause 18.1.

14.12 LCS measurements

14.13 RRC information transferred between UE and other systems

This subclause specifies RRC information that is exchanged between other systems and the UE. This information is transferred via another RAT in accordance with the specifications applicable for those systems. This subclause specifies the UTRAN RRC information applicable for the different information flows.

14.13.1 RRC information, another RAT to UE

14.13.1.1 Pre-defined configuration information

Another system may provide the UE with one or more pre- defined UTRAN configurations, comprising of radio bearer, transport channel and physical channel parameters. The UE shall store the information, and use it upon handover to UTRAN if requested to do so within the HANDOVER TO UTRAN COMMAND message. The pre- defined configuration information includes the following RRC information.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RB information elements				
Predefined radio configurations		1 to <maxPredefConfigCount>		
>Predefined configuration identity	MP		Predefined configuration identity 10.3.4.5	
>Predefined configuration value tag	OP		Predefined configuration value tag 10.3.4.6	
UE information elements				
Re-establishment timer	MP		Re-establishment timer 10.3.3.30	
RB information elements				
>Predefined RB configuration	MP		Predefined RB configuration 10.3.4.7	
TrCH Information Elements				
>Predefined TrCH configuration	MP		Predefined TrCH configuration 10.3.5.9	
PhyCH Information Elements				
>Predefined PhCH configuration	MP		Predefined PhyCH configuration 10.3.6.48	

Multi Bound	Explanation
MaxPredefConfigCount	Maximum number of predefined configurations

14.13.2 RRC information, UE to another RAT

14.13.2.1 UE capability information

Upon receiving a UE information request from another system, the UE shall indicate the requested capabilities. The UE capability information includes the following RRC information.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UE information elements				
UE radio access capability	OP		UE radio access capability 10.3.3.40	

14.13.2.2 UE security information

Upon receiving a UE information request from another system, the UE shall indicate the requested security information. The UE security information includes the following RRC information.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
UE information elements				
START list	MP	1 to <MaxCNdomains>		START [TS 33.102] values for all CN domains
>CN domain identity	MP		CN domain identity 10.3.1.1	
>START	MP		Hyper frame number 10.3.3.13	START values to be used in this CN domain.

14.13.2.3 Pre-defined configuration status information

Another system may provide the UE with one or more pre- defined UTRAN configurations, comprising of radio bearer, transport channel and physical channel parameters. If requested, the UE shall indicate the configurations it has stored. The pre-defined configuration status information should include the following RRC information.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RB information elements				
Predefined configurations		1 to <maxPredefConfigCount>		The list is in order of preconfiguration identity
>Predefined configuration value tag	OP		Predefined configuration value tag 10.3.4.6	The UE shall include the value tag if it has stored the concerned configuration

Multi Bound	Explanation
MaxPredefConfigCount	Maximum number of predefined configurations

15 Primitives between RRC and upper layers

Void.

16 Handling of unknown, unforeseen and erroneous protocol data

16.1 General

This subclause specifies procedures for the handling of unknown, unforeseen, and erroneous protocol data by the receiving entity. These procedures are called "error handling procedures", but in addition to provide recovery mechanisms for error situations they define a compatibility mechanism for future extensions of the protocol.

The error handling procedures specified in this subclause shall apply to all RRC messages. When there is a specific handling for messages received on different logical channels this is specified.

When the UE receives an RRC message, it shall set the variable PROTOCOL_ERROR_REJECT to FALSE and then perform the checks in the order as defined below.

The procedures specified in clause 8 are applied only for the messages passing the checks as defined below, except when procedure specific handling is used to recover from the error.

16.2 ASN.1 violation or encoding error

If the UE receives a message on the DCCH for which the encoded message does not result in a valid abstract syntax value, it shall perform the following:

- Set the variable PROTOCOL_ERROR_REJECT to TRUE.
- Transmit an RRC STATUS message on the uplink DCCH. The IE "Protocol error information" shall contain an IE "Protocol error cause" set to "ASN.1 violation or encoding error".
- When the transmission of the RRC STATUS message has been confirmed by RLC, the UE shall resume normal operation as if the invalid message has not been received.

If the UE receives a message on the BCCH, PCCH or CCCH for which the encoded message does not result in a valid abstract syntax value, it shall ignore the message.

16.3 Unknown or unforeseen message type

If a UE receives an RRC message on the DCCH with a message type reserved for future extension it shall:

- Set the variable PROTOCOL_ERROR_REJECT to TRUE.
- Transmit an RRC STATUS message on the uplink DCCH. The IE "Protocol error information" shall contain an IE "Protocol error cause" set to "Message type non-existent or not implemented".
- When the transmission of the RRC STATUS message has been confirmed by RLC, the UE shall resume normal operation as if the invalid message has not been received.

If the UE receives a message on the BCCH, PCCH or CCCH with a message type reserved for future extension it shall ignore the message.

16.4 Unknown or unforeseen information element value, mandatory information element

If the UE receives an RRC message on the DCCH, or addressed to the UE on the CCCH, with a mandatory IE having a value, including choice, reserved for future extension the UE shall

- If criticality of the IE is defined as "Ignore" and if a default value of the IE is defined, treat the rest of the message using the default value of the IE.

- If criticality of the IE is defined as "Reject" or no default value of the IE is defined:
  - Set the variable PROTOCOL_ERROR_REJECT to TRUE.
  - Set the IE "Protocol error cause" in the variable PROTOCOL_ERROR_INFORMATION to "Information element value not comprehended".
  - Perform procedure specific error handling according to clause 8.

If the UE receives an RRC message on the BCCH or PCCH with a mandatory IE having a value reserved for future extension it shall

- If criticality of the IE is defined as "Ignore" and if a default value of the IE is defined, treat the rest of the message using the default value of the IE.
- If criticality of the IE is defined as "Reject" or no default value of the IE is defined, ignore the message.

16.5 Conditional information element error

If the UE receives an RRC message on the DCCH, BCCH, PCCH, or addressed to the UE on the CCCH, for which the specified conditions for absence of a conditional IE are met and that IE is present, the UE shall:

- Ignore the IE.
- Treat the rest of the message as if the IE was not present.

If the UE receives an RRC message on the DCCH, or addressed to the UE on the CCCH, for which the specified conditions for presence of a conditional IE are met and that IE is absent, the UE shall:

- Set the variable PROTOCOL_ERROR_REJECT to TRUE.
- Set the IE "Protocol error cause" in the variable PROTOCOL_ERROR_INFORMATION to "Conditional information element error".
- Perform procedure specific error handling according to clause 8.

If the UE receives an RRC message on the BCCH or PCCH for which the specified conditions for presence of a conditional IE are met and that IE is absent, the UE shall ignore the message.

16.6 Unknown or unforeseen information element value, conditional information element

If the UE receives an RRC message on the DCCH, or addressed to the UE on the CCCH, for which the specified conditions for presence of a conditional IE are met, that IE is present, and that IE has a value, including choice, reserved for future extension, the UE shall

- If criticality of the IE is defined as "Ignore" and if a default value of the IE is defined, treat the rest of the message using the default value of the IE.
- If criticality of the IE is defined as "Reject" or no default value of the IE is defined:
  - Set the variable PROTOCOL_ERROR_REJECT to TRUE.
  - Set the IE "Protocol error cause" in the variable PROTOCOL_ERROR_INFORMATION to "Information element value not comprehended".
  - Perform procedure specific error handling according to clause 8.

If the UE receives an RRC message on the BCCH or PCCH for which the specified conditions for presence of a conditional IE are met, that IE is present, and that IE has a value, including choice, reserved for future extension, the UE shall

- If criticality of the IE is defined as "Ignore" and if a default value of the IE is defined, treat the rest of the message using the default value of the IE.

- If criticality of the IE is defined as "Reject" or no default value of the IE is defined, ignore the message.

16.7 Unknown or unforeseen information element value, optional information element

If the UE receives an RRC message on the DCCH, or addressed to the UE on the CCCH, with an optional IE having a value, including choice, reserved for future extension and the criticality for that IE is specified as "ignore", it shall:

- Ignore the value of the IE.

- Treat the rest of the message as if the IE was not present.

If the UE receives an RRC message on the DCCH, or addressed to the UE on the CCCH, with an optional IE having a value, including choice, reserved for future extension and the criticality for that IE is specified as "reject", it shall:

- Set the variable PROTOCOL_ERROR_REJECT to TRUE.

- Set the IE "Protocol error cause" in the variable PROTOCOL_ERROR_INFORMATION to "Information element value not comprehended".

- Perform procedure specific error handling according to clause 8.

If the UE receives an RRC message on the BCCH or PCCH with an optional IE having a value, including choice, reserved for future extension it shall:

- Ignore the value of the IE.

- Treat the rest of the message as if the IE was not present.

16.8 Unexpected message extension

If the UE receives a message on the DCCH, or addressed to the UE on the CCCH, containing at least one information element in an extension for which a content is not defined, and therefore not expected, the UE shall check the criticality of that extension, if defined.

- If the criticality for the extension is defined and is set to "Ignore", the UE shall ignore the content of the extension and the message contents after the extension, but treat the parts of the message up to the extension normally.

- If the criticality for the extension is defined and is set to "Reject", or if the criticality is not defined, the UE shall:

  - Set the variable PROTOCOL_ERROR_REJECT to TRUE.

  - Set the IE "Protocol error cause" in the variable PROTOCOL_ERROR_INFORMATION to "Message extension not comprehended".

  - Perform procedure specific error handling according to clause 8.

If the UE receives a message on the BCCH or PCCH, containing at least one information element in an extension for which a content is not defined, and therefore not expected, the UE shall check the criticality of that extension, if defined.

- If the criticality for the extension is defined and is set to "Ignore", the UE shall ignore the content of the extension and the message contents after the extension, but treat the parts of the message up to the extension normally.

- If the criticality for the extension is defined and is set to "Reject", or if the criticality is not defined, the UE shall ignore the message.

17 SDL

This subclause describes the functionality of the protocol in descriptive SDL.

18 Appendices: Examples of operation

18.1 Example of VCAM mapping rule

Table 18.1.1: Example of Mapping Rule for PCPCH ≥ 16

PCPCH (k)	SF = 128			SF = 256			
0	AP_0(AP0), CA_0	AP_2(AP1), CA_7	AP_1(AP2), CA_{14}	AP_0(AP3), CA_0	AP_1(AP4), CA_5	AP_2 (AP5), CA_{10}	AP_3(AP6), CA_{15}
1	AP_1(AP1), CA_0	AP_0(AP2), CA_7	AP_2(AP0), CA_{14}	AP_1(AP4), CA_0	AP_2(AP5), CA_5	AP_3(AP6), CA_{10}	
2	AP_2(AP2), CA_0	AP_1(AP0), CA_7	AP_0(AP1), CA_{14}	AP_2(AP5), CA_0	AP_3(AP6), CA_5	AP_0(AP3), CA_{11}	
3	AP_0(AP0), CA_1	AP_2(AP1), CA_8	AP_1(AP2), CA_{15}	AP_3(AP6), CA_0	AP_0(AP3), CA_6	AP_1(AP4), CA_{11}	
4	AP_1(AP1), CA_1	AP_0(AP2), CA_8	AP_2(AP0), CA_{15}	AP_0(AP3), CA_1	AP_1 (AP4), CA_6	AP_2(AP5), CA_{11}	
5	AP_2(AP2), CA_1	AP_1(AP0), CA_8	AP_0(AP1), CA_{15}	AP_1(AP4), CA_1	AP_2(AP5), CA_6	AP_3(AP6), CA_{11}	
6	AP_0(AP0), CA_2	AP_2(AP1), CA_9		AP_2(AP5), CA_1	AP_3(AP6), CA_6	AP_0(AP3), CA_{12}	
7	AP_1(AP1), CA_2	AP_0(AP2), CA_9		AP_3(AP6), CA_1	AP_0(AP3), CA_7	AP_1(AP4), CA_{12}	
8	AP_2(AP2), CA_2	AP_1(AP0), CA_9		AP_0(AP3), CA_2	AP_1(AP4), CA_7	AP_2(AP5), CA_{12}	
9	AP_0(AP0), CA_3	AP_2(AP1), CA_{10}		AP_1(AP4), CA_2	AP_2(AP5), CA_7	AP_3(AP6), CA_{12}	
10	AP_1(AP1), CA_3	AP_0(AP2), CA_{10}		AP_2(AP5), CA_2	AP_3(AP6), CA_7	AP_0(AP3), CA_{13}	
11	AP_2(AP2), CA_3	AP_1(AP0), CA_{10}		AP_3(AP6), CA_2	AP_0(AP3), CA_8	AP_1(AP4), CA_{13}	
12	AP_0(AP0), CA_4	AP_2(AP1), CA_{11}		AP_0(AP3), CA_3	AP_1(AP4), CA_8	AP_2(AP5), CA_{13}	
13	AP_1(AP1), CA_4	AP_0(AP2), CA_{11}		AP_1(AP4), CA_3	AP_2(AP5), CA_8	AP_3(AP6), CA_{13}	
14	AP_2(AP2), CA_4	AP_1(AP0), CA_{11}		AP_2(AP5), CA_3	AP_3(AP6), CA_8	AP_0(AP3), CA_{14}	
15	AP_0(AP0), CA_5	AP_2(AP1), CA_{12}		AP_3(AP6), CA_3	AP_0(AP3), CA_9	AP_1(AP4), CA_{14}	
16	AP_1(AP1), CA_5	AP_0(AP2), CA_{12}		AP_0(AP3), CA_4	AP_1(AP4), CA_9	AP_2(AP5), CA_{14}	
17	AP_2(AP2), CA_5	AP_1(AP0), CA_{12}		AP_1(AP4), CA_4	AP_2(AP5), CA_9	AP_3(AP6), CA_{14}	
18	AP_0(AP0), CA_6	AP_2(AP1), CA_{13}		AP_2(AP5), CA_4	AP_3(AP6), CA_9	AP_0(AP3), CA_{15}	
19	AP_1(AP1), CA_6	AP_0(AP2), CA_{13}		AP_3(AP6), CA_4	AP_0(AP3), CA_{10}	AP_1(AP4), CA_{15}	
20	AP_2(AP2), CA_6	AP_1(AP0), CA_{13}		AP_0(AP3), CA_5	AP_1(AP4), CA_{10}	AP_2(AP5), CA_{15}	

NOTE:

- SF (A_0) = 128, Number of AP (S_0) = 3: Re-numbered AP0 = AP_0, AP1 = AP_1, AP2 = AP_2
- SF (A_1) = 256, Number of AP (S_1) = 4: Re-numbered AP3 = AP_0, AP4 = AP_1, AP5 = AP_2, AP6 = AP_3
- P_0=P_1=21
- T_0=T_1=16.
- In this example, M_0=7, M_1=21

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

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
RAN_07	3.1.0	122	RP-000043	3.2.0	(03/00) TDD Mode BCH Reception in Cell DCH State
RAN_07	3.1.0	123	RP-000043	3.2.0	Uplink Outer Loop Power Control in TDD Mode
RAN_07	3.1.0	124	RP-000043	3.2.0	TFS TB Size Calculation with Bit Aligned TDD MAC Headers
RAN_07	3.1.0	125	RP-000043	3.2.0	Grouping of DRAC IEs, and detailed definitions of these Ies
RAN_07	3.1.0	126	RP-000043	3.2.0	Correction of specifications for the 'Dynamic Resource Allocation Control of Uplink DCH' Procedure
RAN_07	3.1.0	131	RP-000043	3.2.0	Clarification of PDCP info and PDCP capability Ies
RAN_07	3.1.0	132	RP-000043	3.2.0	Editorial change to "Specification of system information block characteristics"
RAN_07	3.1.0	133	RP-000043	3.2.0	Additions of CBS related Information Elements
RAN_07	3.1.0	134	RP-000043	3.2.0	Signalling for computed gain factors
RAN_07	3.1.0	137	RP-000043	3.2.0	General error handling procedures
RAN_07	3.1.0	138	RP-000043	3.2.0	RRC message extensions
RAN_07	3.1.0	139	RP-000043	3.2.0	Padding of RRC messages using RLC transparent mode
RAN_07	3.1.0	140	RP-000043	3.2.0	UE information elements
RAN_07	3.1.0	141	RP-000043	3.2.0	Other information elements
RAN_07	3.1.0	142	RP-000043	3.2.0	Integrity protection function
RAN_07	3.1.0	143	RP-000043	3.2.0	RAB-RB relations
RAN_07	3.1.0	144	RP-000043	3.2.0	Inter-system handover from UTRAN
RAN_07	3.1.0	145	RP-000043	3.2.0	Handover to UTRAN including procedure for pre- configuration
RAN_07	3.1.0	146	RP-000043	3.2.0	RRC measurement filtering parameters
RAN_07	3.1.0	147	RP-000043	3.2.0	New event "RL out of UE Rx window"
RAN_07	3.1.0	148	RP-000044	3.2.0	Access control on RACH
RAN_07	3.1.0	149	RP-000044	3.2.0	cdma2000 Hard Handover
RAN_07	3.1.0	150	RP-000044	3.2.0	CPCH parameters with corrections
RAN_07	3.1.0	152	RP-000044	3.2.0	U-plane AM RLC reconfiguration by cell update procedure
RAN_07	3.1.0	154	RP-000044	3.2.0	CPCH
RAN_07	3.1.0	155	RP-000044	3.2.0	Information elements for ASC in TDD
RAN_07	3.1.0	156	RP-000044	3.2.0	Addition of timing advance value in handover related messages
RAN_07	3.1.0	157	RP-000044	3.2.0	Physical channel description for TDD
RAN_07	3.1.0	159	RP-000044	3.2.0	Message contents for the intersystem command message to UTRAN operating in TDD mode
RAN_07	3.1.0	160	RP-000044	3.2.0	Corrections on use of PUSCH power control info and minor corrections
RAN_07	3.1.0	162	RP-000044	3.2.0	UE individual DRX cycles in CELL_PCH and URA_PCH states
RAN_07	3.1.0	163	RP-000044	3.2.0	Correction to Transport Format Combination Control procedure
RAN_07	3.1.0	164	RP-000044	3.2.0	Downlink outer loop power control
RAN_07	3.1.0	165	RP-000044	3.2.0	Redirection of RRC connection setup
RAN_07	3.1.0	166	RP-000044	3.2.0	Inter-frequency measurements in CELL_FACH state
RAN_07	3.1.0	167	RP-000044	3.2.0	List of found editorial mistakes in the Dec99 version of 25.331 (V3.1.0)
RAN_07	3.1.0	168	RP-000044	3.2.0	Transport block size
RAN_07	3.1.0	169	RP-000044	3.2.0	Cell Access Restriction
RAN_07	3.1.0	170	RP-000044	3.2.0	Editorial modification
RAN_07	3.1.0	171	RP-000044	3.2.0	Modification of DPCH info

RAN_07	3.1.0	172	RP-000045	3.2.0	Measurement control message
RAN_07	3.1.0	173	RP-000045	3.2.0	Reporting cell status
RAN_07	3.1.0	174	RP-000045	3.2.0	Additional IE for RB release
RAN_07	3.1.0	175	RP-000045	3.2.0	Available SF in PRACH info
RAN_07	3.1.0	176	RP-000045	3.2.0	Traffic volume measurement event
RAN_07	3.1.0	177	RP-000045	3.2.0	Report of multiple cells on an event result
RAN_07	3.1.0	178	RP-000045	3.2.0	Editorial modification on Direct Transfer
RAN_07	3.1.0	179	RP-000045	3.2.0	Correction of the Security Mode Control procedure
RAN_07	3.1.0	180	RP-000045	3.2.0	Maximum calculated Transport Format Combination
RAN_07	3.1.0	183	RP-000045	3.2.0	Additional DPCH IEs to align 25.331 with 25.214
RAN_07	3.1.0	184	RP-000045	3.2.0	RB – DCH mapping
RAN_07	3.1.0	188	RP-000045	3.2.0	Modifications related to FDD mode DSCH
RAN_07	3.1.0	189	RP-000045	3.2.0	Identification of Shared Channel Physical Configuration in TDD Mode
RAN_07	3.1.0	192	RP-000045	3.2.0	Uplink Outer Loop Power Control During Hard Handover
RAN_07	3.1.0	193	RP-000045	3.2.0	Support of Multiple CCTrCH's in TDD Mode
RAN_07	3.1.0	194	RP-000045	3.2.0	Uplink Physical Channel Control in TDD Mode
RAN_07	3.1.0	201	RP-000045	3.2.0	Transfer of initial information from UE to target RNC prior to handover to UTRAN
RAN_07	3.1.0	202	RP-000045	3.2.0	CN information elements
RAN_07	3.1.0	203	RP-000045	3.2.0	UTRAN mobility information elements
RAN_07	3.1.0	204	RP-000045	3.2.0	RB information elements
RAN_07	3.1.0	205	RP-000046	3.2.0	Physical channel information elements
RAN_07	3.1.0	206	RP-000046	3.2.0	UE capability information elements
RAN_07	3.1.0	207	RP-000046	3.2.0	UE variables
RAN_07	3.1.0	208	RP-000046	3.2.0	Actions when entering idle mode
RAN_07	3.1.0	209	RP-000046	3.2.0	Usage of pilot bits
RAN_07	3.1.0	210	RP-000046	3.2.0	System information procedure corrections
RAN_07	3.1.0	212	RP-000046	3.2.0	Reconfiguration of ciphering
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History

Document history		
V3.1.0	January 2000	Publication
V3.2.0	March 2000	Publication
V3.3.0	June 2000	Publication