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ETSI

650 Route des Lucioles F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

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Foreword

This Technical Specification 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:

Version x.y.z

where:

- x the first digit:
- 1 presented to TSG for information;
- 2 presented to TSG for approval;
- 3 or greater indicates TSG approved document under change control.
 - y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
 - z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document specifies the Radio Resource Control protocol for the radio interface between UE and E-UTRAN as well as for the radio interface between RN and E-UTRAN.

The scope of the present document also includes:

- the radio related information transported in a transparent container between source eNB and target eNB upon inter eNB handover;
- the radio related information transported in a transparent container between a source or target eNB and another system upon inter RAT handover.

2 References

[13]

1).

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

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

Release as th	ne present document.
[1]	3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
[2]	Void.
[3]	3GPP TS 36.302: "Evolved Universal Terrestrial Radio Access (E-UTRA); Services provided by the physical layer ".
[4]	3GPP TS 36.304: "Evolved Universal Terrestrial Radio Access (E-UTRA); UE Procedures in Idle Mode".
[5]	3GPP TS 36.306 "Evolved Universal Terrestrial Radio Access (E-UTRA); UE Radio Access Capabilities".
[6]	3GPP TS 36.321: "Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification".
[7]	3GPP TS 36.322:"Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Link Control (RLC) protocol specification".
[8]	3GPP TS 36.323: "Evolved Universal Terrestrial Radio Access (E-UTRA); Packet Data Convergence Protocol (PDCP) Specification".
[9]	3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access (E-UTRAN); Overall description; Stage 2".
[10]	3GPP TS 22.011: "Service accessibility".
[11]	3GPP TS 23.122: "Non-Access-Stratum (NAS) functions related to Mobile Station (MS) in idle mode".
[12]	3GPP2 C.S0002-F v1.0: "Physical Layer Standard for cdma2000 Spread Spectrum Systems".

ITU-T Recommendation X.680 (07/2002) "Information Technology - Abstract Syntax Notation

One (ASN.1): Specification of basic notation" (Same as the ISO/IEC International Standard 8824-

[14]	ITU-T Recommendation X.681 (07/2002) "Information Technology - Abstract Syntax Notation One (ASN.1): Information object specification" (Same as the ISO/IEC International Standard 8824-2).
[15]	ITU-T Recommendation X.691 (07/2002) "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)" (Same as the ISO/IEC International Standard 8825-2).
[16]	3GPP TS 36.133: "Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management".
[17]	3GPP TS 25.101: "Universal Terrestrial Radio Access (UTRA); User Equipment (UE) radio transmission and reception (FDD)".
[18]	3GPP TS 25.102: "Universal Terrestrial Radio Access (UTRA); User Equipment (UE) radio transmission and reception (TDD)".
[19]	3GPP TS 25.331:"Universal Terrestrial Radio Access (UTRA); Radio Resource Control (RRC); Protocol specification".
[20]	3GPP TS 45.005: "Radio transmission and reception".
[21]	3GPP TS 36.211: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation".
[22]	3GPP TS 36.212: "Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding".
[23]	3GPP TS 36.213: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures".
[24]	3GPP2 C.S0057-E v1.0: "Band Class Specification for cdma2000 Spread Spectrum Systems".
[25]	3GPP2 C.S0005-F v1.0: "Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems".
[26]	3GPP2 C.S0024-C v2.0: "cdma2000 High Rate Packet Data Air Interface Specification".
[27]	3GPP TS 23.003: "Numbering, addressing and identification".
[28]	3GPP TS 45.008: "Radio subsystem link control".
[29]	3GPP TS 25.133: "Requirements for Support of Radio Resource Management (FDD)".
[30]	3GPP TS 25.123: "Requirements for Support of Radio Resource Management (TDD)".
[31]	3GPP TS 36.401: "Evolved Universal Terrestrial Radio Access (E-UTRA); Architecture description".
[32]	3GPP TS 33.401: "3GPP System Architecture Evolution (SAE); Security architecture".
[33]	3GPP2 A.S0008-C v4.0: "Interoperability Specification (IOS) for High Rate Packet Data (HRPD) Radio Access Network Interfaces with Session Control in the Access Network"
[34]	3GPP2 C.S0004-F v1.0: "Signaling Link Access Control (LAC) Standard for cdma2000 Spread Spectrum Systems"
[35]	3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3".
[36]	3GPP TS 44.060: "General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol".
[37]	3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".
[38]	3GPP TS 23.038: "Alphabets and Language".

[39]	3GPP TS 36.413: "Evolved Universal Terrestrial Radio Access (E-UTRAN); S1 Application Protocol (S1 AP)".
[40]	3GPP TS 25.304: "Universal Terrestrial Radio Access (UTRAN); User Equipment (UE) procedures in idle mode and procedures for cell reselection in connected mode".
[41]	3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".
[42]	3GPP TS 36.101: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception".
[43]	3GPP TS 44.005: "Data Link (DL) Layer General Aspects".
[44]	3GPP2 C.S0087-A v2.0: "E-UTRAN - cdma2000 HRPD Connectivity and Interworking Air Interface Specification"
[45]	3GPP TS 44.018: "Mobile radio interface layer 3 specification; Radio Resource Control (RRC) protocol".
[46]	3GPP TS 25.223: "Spreading and modulation (TDD)".
[47]	3GPP TS 36.104: "Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception".
[48]	3GPP TS 36.214: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer - Measurements".
[49]	3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core network protocols; Stage 3".
[50]	3GPP TS 45.010: "Radio subsystem synchronization".
[51]	3GPP TS 23.272: "Circuit Switched Fallback in Evolved Packet System; Stage 2".
[52]	3GPP TS 29.061: "Interworking between the Public Land Mobile Network (PLMN) supporting packet based services and Packet Data Networks (PDN)".
[53]	3GPP2 C.S0097-0 v3.0: "E-UTRAN - cdma2000 1x Connectivity and Interworking Air Interface Specification".
[54]	3GPP TS 36.355: "LTE Positioning Protocol (LPP)".
[55]	3GPP TS 36.216: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer for relaying operation".
[56]	3GPP TS 23.246: "Multimedia Broadcast/Multicast Service (MBMS); Architecture and functional description".
[57]	3GPP TS 26.346: "Multimedia Broadcast/Multicast Service (MBMS); Protocols and codecs".
[58]	3GPP TS 32.422: "Telecommunication management; Subsriber and equipment trace; Trace control and confiuration management".
[59]	3GPP TS 22.368: "Service Requirements for Machine Type Communications; Stage 1".
[60]	3GPP TS 37.320: "Universal Terrestrial Radio Access (UTRA) and Evolved Universal Terrestrial Radio Access (E-UTRA); Radio measurement collection for Minimization of Drive Tests (MDT); Overall description; Stage 2".
[61]	3GPP TS 23.216: "Single Radio Voice Call Continuity (SRVCC); Stage 2".
[62]	3GPP TS 22.146: "Multimedia Broadcast/Multicast Service (MBMS); Stage 1".
[63]	3GPP TR 36.816: "Evolved Universal Terrestrial Radio Access (E-UTRA); Study on signalling and procedure for interference avoidance for in-device coexistence".
[64]	IS-GPS-200F: "Navstar GPS Space Segment/Navigation User Segment Interfaces".

[65] 3GPP TS 25.307: "Requirement on User Equipments (UEs) supporting a release-independent frequency band".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

Commercial Mobile Alert System: Public Warning System that delivers *Warning Notifications* provided by *Warning Notification Providers* to CMAS capable UEs.

CSG member cell: A cell broadcasting the identity of the selected PLMN, registered PLMN or equivalent PLMN and for which the CSG whitelist of the UE includes an entry comprising cell's CSG ID and the respective PLMN identity.

EU-Alert: Public Warning System that delivers Warning Notifications provided by Warning Notification Providers using the same AS mechanisms as defined for CMAS.

Field: The individual contents of an information element are referred as fields.

Floor: Mathematical function used to 'round down' i.e. to the nearest integer having a lower or equal value.

Information element: A structural element containing a single or multiple fields is referred as information element.

Korean Public Alert System (KPAS): Public Warning System that delivers Warning Notifications provided by Warning Notification Providers using the same AS mechanisms as defined for CMAS.

MBMS service: MBMS bearer service as defined in TS 23.246 [56] (i.e. provided via an MRB).

Primary Cell: The cell, operating on the primary frequency, in which the UE either performs the initial connection establishment procedure or initiates the connection re-establishment procedure, or the cell indicated as the primary cell in the handover procedure.

Primary Timing Advance Group: Timing Advance Group containing the PCell.

Secondary Cell: A cell, operating on a secondary frequency, which may be configured once an RRC connection is established and which may be used to provide additional radio resources.

Secondary Timing Advance Group: Timing Advance Group not containing the PCell. A secondary timing advance group contains at least one cell with configured uplink.

Serving Cell: For a UE in RRC_CONNECTED not configured with CA there is only one serving cell comprising of the primary cell. For a UE in RRC_CONNECTED configured with CA the term 'serving cells' is used to denote the set of one or more cells comprising of the primary cell and all secondary cells.

Timing Advance Group: A group of serving cells that is configured by RRC and that, for the cells with an UL configured, use the same timing reference cell and the same Timing Advance value.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

1xRTT CDMA2000 1x Radio Transmission Technology

ACK Acknowledgement
AM Acknowledged Mode
ARQ Automatic Repeat Request

AS Access Stratum

ASN.1 Abstract Syntax Notation One

BCCH Broadcast Control Channel
BCD Binary Coded Decimal
BCH Broadcast Channel
CA Carrier Aggregation
CCCH Common Control Channel
CCO Cell Change Order

CMAS Commercial Mobile Alert Service

CP Control Plane C-RNTI Cell RNTI

CRS Cell-specific Reference Signal

CSFB CS fallback

CSG Closed Subscriber Group
CSI Channel State Information
DCCH Dedicated Control Channel
DCI Downlink Control Information

DL Downlink

DL-SCH Downlink Shared Channel
DRB (user) Data Radio Bearer
DRX Discontinuous Reception
DTCH Dedicated Traffic Channel
EAB Extended Access Barring

EHPLMN Equivalent Home Public Land Mobile Network

ENB Evolved Node B
EPC Evolved Packet Core

EPDCCH Enhanced Physical Downlink Control Channel

EPS Evolved Packet System

ETWS Earthquake and Tsunami Warning System
E-UTRA Evolved Universal Terrestrial Radio Access

E-UTRAN Evolved Universal Terrestrial Radio Access Network

FDD Frequency Division Duplex

FFS For Further Study

GERAN GSM/EDGE Radio Access Network GNSS Global Navigation Satellite System

GSM Global System for Mobile Communications

HARQ Hybrid Automatic Repeat Request HPLMN Home Public Land Mobile Network HRPD CDMA2000 High Rate Packet Data

IDC In-Device Coexistence
IE Information element

IMEI International Mobile Equipment Identity
IMSI International Mobile Subscriber Identity

ISM Industrial, Scientific and Medical kB Kilobyte (1000 bytes)

L1 Layer 1 L2 Layer 2 L3 Layer 3

MAC Medium Access Control

MBMS Multimedia Broadcast Multicast Service

MBSFN Multimedia Broadcast multicast service Single Frequency Network

MDT Minimization of Drive Tests
MIB Master Information Block
MO Mobile Originating

MRB MBMS Point to Multipoint Radio Bearer MRO Mobility Robustness Optimisation MSI MCH Scheduling Information

MT Mobile Terminating N/A Not Applicable

NACC Network Assisted Cell Change

NAS Non Access Stratum
PCCH Paging Control Channel

PCell Primary Cell

PDCCH Physical Downlink Control Channel

PDCP Packet Data Convergence Protocol

PDU Protocol Data Unit

PLMN Public Land Mobile Network
PTAG Primary Timing Advance Group
PUCCH Physical Uplink Control Channel

QoS Quality of Service
RACH Random Access CHannel
RAT Radio Access Technology

RB Radio Bearer RLC Radio Link Control RN Relay Node

RNTI Radio Network Temporary Identifier ROHC RObust Header Compression

RPLMN Registered Public Land Mobile Network

RRC Radio Resource Control
RSCP Received Signal Code Power
RSRP Reference Signal Received Power
RSRQ Reference Signal Received Quality
RSSI Received Signal Strength Indicator
SAE System Architecture Evolution

SAP Service Access Point **SCell** Secondary Cell SFN System Frame Number SI **System Information** SIB System Information Block SI-RNTI System Information RNTI SPS Semi-Persistent Scheduling SR Scheduling Request **SRB** Signalling Radio Bearer

SSAC Service Specific Access Control
STAG Secondary Timing Advance Group
S-TMSI SAE Temporary Mobile Station Identifier

TA Tracking Area

TAG Timing Advance Group
TDD Time Division Duplex
TDM Time Division Multiplexing

TM Transparent Mode

TPC-RNTI Transmit Power Control RNTI

UE User Equipment

UICC Universal Integrated Circuit Card

UL Uplink

UL-SCH Uplink Shared Channel UM Unacknowledged Mode

UP User Plane

UTC Coordinated Universal Time

UTRAN Universal Terrestrial Radio Access Network

VoLTE Voice over Long Term Evolution

In the ASN.1, lower case may be used for some (parts) of the above abbreviations e.g. c-RNTI

4 General

4.1 Introduction

In this specification, (parts of) procedures and messages specified for the UE equally apply to the RN for functionality necessary for the RN. There are also (parts of) procedures and messages which are only applicable to the RN in its communication with the E-UTRAN, in which case the specification denotes the RN instead of the UE. Such RN-specific aspects are not applicable to the UE.

This specification is organised as follows:

- sub-clause 4.2 describes the RRC protocol model;
- sub-clause 4.3 specifies the services provided to upper layers as well as the services expected from lower layers;
- sub-clause 4.4 lists the RRC functions;
- clause 5 specifies RRC procedures, including UE state transitions;
- clause 6 specifies the RRC message in a mixed format (i.e. tabular & ASN.1 together);
- clause 7 specifies the variables (including protocol timers and constants) and counters to be used by the UE;
- clause 8 specifies the encoding of the RRC messages;
- clause 9 specifies the specified and default radio configurations;
- clause 10 specifies the RRC messages transferred across network nodes;
- clause 11 specifies the UE capability related constraints and performance requirements.

4.2 Architecture

4.2.1 UE states and state transitions including inter RAT

A UE is in RRC_CONNECTED when an RRC connection has been established. If this is not the case, i.e. no RRC connection is established, the UE is in RRC_IDLE state. The RRC states can further be characterised as follows:

- RRC IDLE:

- A UE specific DRX may be configured by upper layers.
- UE controlled mobility;
- The UE:
- Monitors a Paging channel to detect incoming calls, system information change, for ETWS capable UEs, ETWS notification, and for CMAS capable UEs, CMAS notification;
- Performs neighbouring cell measurements and cell (re-)selection;
- Acquires system information.
- Performs logging of available measurements together with location and time for logged measurement configured UEs.

- RRC_CONNECTED:

- Transfer of unicast data to/from UE.
- At lower layers, the UE may be configured with a UE specific DRX.
- For UEs supporting CA, use of one or more SCells, aggregated with the PCell, for increased bandwidth;
- Network controlled mobility, i.e. handover and cell change order with optional network assistance (NACC) to GERAN;
- The UE:
- Monitors a Paging channel and/ or System Information Block Type 1 contents to detect system information change, for ETWS capable UEs, ETWS notification, and for CMAS capable UEs, CMAS notification;
- Monitors control channels associated with the shared data channel to determine if data is scheduled for it;
- Provides channel quality and feedback information;

- Performs neighbouring cell measurements and measurement reporting;
- Acquires system information.

The following figure not only provides an overview of the RRC states in E-UTRA, but also illustrates the mobility support between E-UTRAN, UTRAN and GERAN.

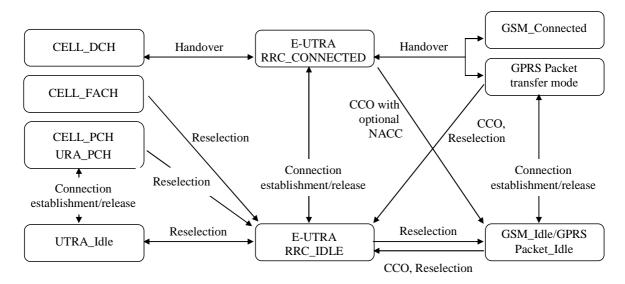


Figure 4.2.1-1: E-UTRA states and inter RAT mobility procedures, 3GPP

The following figure illustrates the mobility support between E-UTRAN, CDMA2000 1xRTT and CDMA2000 HRPD. The details of the CDMA2000 state models are out of the scope of this specification.

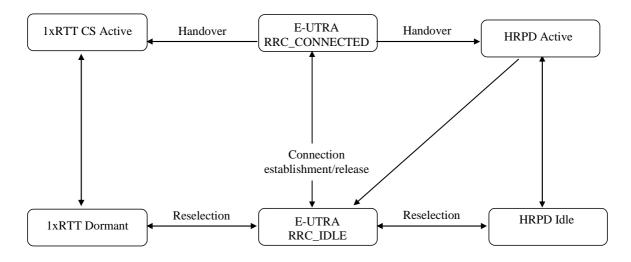


Figure 4.2.1-2: Mobility procedures between E-UTRA and CDMA2000

The inter-RAT handover procedure(s) supports the case of signalling, conversational services, non-conversational services and combinations of these.

In addition to the state transitions shown in Figure 4.2.1-1 and Figure 4.2.1-2, there is support for connection release with redirection information from E-UTRA RRC_CONNECTED to GERAN, UTRAN and CDMA2000 (HRPD Idle/1xRTT Dormant mode).

4.2.2 Signalling radio bearers

"Signalling Radio Bearers" (SRBs) are defined as Radio Bearers (RB) that are used only for the transmission of RRC and NAS messages. More specifically, the following three SRBs are defined:

- SRB0 is for RRC messages using the CCCH logical channel;
- SRB1 is for RRC messages (which may include a piggybacked NAS message) as well as for NAS messages prior to the establishment of SRB2, all using DCCH logical channel;
- SRB2 is for RRC messages which include logged measurement information as well as for NAS messages, all
 using DCCH logical channel. SRB2 has a lower-priority than SRB1 and is always configured by E-UTRAN after
 security activation.

In downlink piggybacking of NAS messages is used only for one dependant (i.e. with joint success/ failure) procedure: bearer establishment/ modification/ release. In uplink NAS message piggybacking is used only for transferring the initial NAS message during connection setup.

NOTE: The NAS messages transferred via SRB2 are also contained in RRC messages, which however do not include any RRC protocol control information.

Once security is activated, all RRC messages on SRB1 and SRB2, including those containing NAS or non-3GPP messages, are integrity protected and ciphered by PDCP. NAS independently applies integrity protection and ciphering to the NAS messages.

4.3 Services

4.3.1 Services provided to upper layers

The RRC protocol offers the following services to upper layers:

- Broadcast of common control information;
- Notification of UEs in RRC_IDLE, e.g. about a terminating call, for ETWS, for CMAS;
- Transfer of dedicated control information, i.e. information for one specific UE.

4.3.2 Services expected from lower layers

In brief, the following are the main services that RRC expects from lower layers:

- PDCP: integrity protection and ciphering;
- RLC: reliable and in-sequence transfer of information, without introducing duplicates and with support for segmentation and concatenation.

Further details about the services provided by Packet Data Convergence Protocol layer (e.g. integrity and ciphering) are provided in TS 36.323 [8]. The services provided by Radio Link Control layer (e.g. the RLC modes) are specified in TS 36.322 [7]. Further details about the services provided by Medium Access Control layer (e.g. the logical channels) are provided in TS 36.321 [6]. The services provided by physical layer (e.g. the transport channels) are specified in TS 36.302 [3].

4.4 Functions

The RRC protocol includes the following main functions:

- Broadcast of system information:
 - Including NAS common information;
 - Information applicable for UEs in RRC_IDLE, e.g. cell (re-)selection parameters, neighbouring cell information and information (also) applicable for UEs in RRC_CONNECTED, e.g. common channel configuration information.
 - Including ETWS notification, CMAS notification;
- RRC connection control:

- Paging;
- Establishment/ modification/ release of RRC connection, including e.g. assignment/ modification of UE identity (C-RNTI), establishment/ modification/ release of SRB1 and SRB2, access class barring;
- Initial security activation, i.e. initial configuration of AS integrity protection (SRBs) and AS ciphering (SRBs, DRBs);
- For RNs, configuration of AS integrity protection for DRBs;
- RRC connection mobility including e.g. intra-frequency and inter-frequency handover, associated security handling, i.e. key/ algorithm change, specification of RRC context information transferred between network nodes;
- Establishment/ modification/ release of RBs carrying user data (DRBs);
- Radio configuration control including e.g. assignment/ modification of ARQ configuration, HARQ configuration;
- For RNs, RN-specific radio configuration control for the radio interface between RN and E-UTRAN;
- In case of CA, cell management including e.g. change of PCell, addition/ modification/ release of SCell(s) and addition/modification/release of STAG(s);
- QoS control including assignment/ modification of semi-persistent scheduling (SPS) configuration information for DL and UL, assignment/ modification of parameters for UL rate control in the UE, i.e. allocation of a priority and a prioritised bit rate (PBR) for each RB;
- Recovery from radio link failure;
- Inter-RAT mobility including e.g. security activation, transfer of RRC context information;
- Measurement configuration and reporting:
 - Establishment/ modification/ release of measurements (e.g. intra-frequency, inter-frequency and inter- RAT measurements);
 - Setup and release of measurement gaps;
 - Measurement reporting;
- Other functions including e.g. transfer of dedicated NAS information and non-3GPP dedicated information, transfer of UE radio access capability information, support for E-UTRAN sharing (multiple PLMN identities);
- Generic protocol error handling;
- Support of self-configuration and self-optimisation;
- Support of measurement logging and reporting for network performance optimisation [60];

NOTE: Random access is specified entirely in the MAC including initial transmission power estimation.

5 Procedures

5.1 General

5.1.1 Introduction

The procedural requirements are structured according to the main functional areas: system information (5.2), connection control (5.3), inter-RAT mobility (5.4) and measurements (5.5). In addition sub-clause 5.6 covers other aspects e.g. NAS dedicated information transfer, UE capability transfer, sub-clause 5.7 specifies the generic error handling, sub-clause 5.8 covers MBMS and sub-clause 5.9 covers RN-specific procedures.

5.1.2 General requirements

The UE shall:

- 1> process the received messages in order of reception by RRC, i.e. the processing of a message shall be completed before starting the processing of a subsequent message;
- NOTE 1: E-UTRAN may initiate a subsequent procedure prior to receiving the UE's response of a previously initiated procedure.
- 1> within a sub-clause execute the steps according to the order specified in the procedural description;
- 1> consider the term 'radio bearer' (RB) to cover SRBs and DRBs but not MRBs unless explicitly stated otherwise;
- 1> set the *rrc-TransactionIdentifier* in the response message, if included, to the same value as included in the message received from E-UTRAN that triggered the response message;
- 1> upon receiving a choice value set to *setup*:
 - 2> apply the corresponding received configuration and start using the associated resources, unless explicitly specified otherwise;
- 1> upon receiving a choice value set to release:
 - 2> clear the corresponding configuration and stop using the associated resources;
- 1> upon handover to E-UTRA; or
- 1> upon receiving an RRCConnectionReconfiguration message including the fullConfig:
 - 2> apply the Conditions in the ASN.1 for inclusion of the fields for the DRB/PDCP/RLC setup during the reconfiguration of the DRBs included in the *drb-ToAddModList*;
- NOTE 2: At each point in time, the UE keeps a single value for each field except for during handover when the UE temporarily stores the previous configuration so it can revert back upon handover failure. In other words: when the UE reconfigures a field, the existing value is released except for during handover.
- NOTE 3: Although not explicitly stated, the UE initially considers all functionality to be deactivated/ released until it is explicitly stated that the functionality is setup/ activated. Correspondingly, the UE initially considers lists to be empty e.g. the list of radio bearers, the list of measurements.

5.2 System information

5.2.1 Introduction

5.2.1.1 General

System information is divided into the *MasterInformationBlock* (MIB) and a number of *SystemInformationBlocks* (SIBs). The MIB includes a limited number of most essential and most frequently transmitted parameters that are needed to acquire other information from the cell, and is transmitted on BCH. SIBs other than *SystemInformationBlockType1* are carried in *SystemInformation* (SI) messages and mapping of SIBs to SI messages is flexibly configurable by *schedulingInfoList* included in *SystemInformationBlockType1*, with restrictions that: each SIB is contained only in a single SI message, and at most once in that message; only SIBs having the same scheduling requirement (periodicity) can be mapped to the same SI message; *SystemInformationBlockType2* is always mapped to the SI message that corresponds to the first entry in the list of SI messages in *schedulingInfoList*. There may be multiple SI messages transmitted with the same periodicity. *SystemInformationBlockType1* and all SI messages are transmitted on DL-SCH.

NOTE 1: The physical layer imposes a limit to the maximum size a SIB can take. When DCI format 1C is used the maximum allowed by the physical layer is 1736 bits (217 bytes) while for format 1A the limit is 2216 bits (277 bytes), see TS 36.212 [22] and TS 36.213 [23].

In addition to broadcasting, E-UTRAN may provide *SystemInformationBlockType1*, including the same parameter values, via dedicated signalling i.e., within an *RRCConnectionReconfiguration* message.

The UE applies the system information acquisition and change monitoring procedures for the PCell. For an SCell, E-UTRAN provides, via dedicated signalling, all system information relevant for operation in RRC_CONNECTED when adding the SCell. Upon change of the relevant system information of a configured SCell, E-UTRAN releases and subsequently adds the concerned SCell, which may be done with a single *RRCConnectionReconfiguration* message. If the UE is receiving or interested to receive an MBMS service in a cell, the UE shall apply the system information acquisition and change monitoring procedure to acquire parameters relevant for MBMS operation and apply the parameters acquired from system information only for MBMS operation for this cell.

NOTE 2: E-UTRAN may configure via dedicated signalling different parameter values than the ones broadcast in the concerned SCell.

An RN configured with an RN subframe configuration does not need to apply the system information acquisition and change monitoring procedures. Upon change of any system information relevant to an RN, E-UTRAN provides the system information blocks containing the relevant system information to an RN configured with an RN subframe configuration via dedicated signalling using the *RNReconfiguration* message. For RNs configured with an RN subframe configuration, the system information contained in this dedicated signalling replaces any corresponding stored system information and takes precedence over any corresponding system information acquired through the system information acquired through the system information acquired until overridden.

NOTE 3: E-UTRAN may configure an RN, via dedicated signalling, with different parameter values than the ones broadcast in the concerned cell.

5.2.1.2 Scheduling

The MIB uses a fixed schedule with a periodicity of 40 ms and repetitions made within 40 ms. The first transmission of the MIB is scheduled in subframe #0 of radio frames for which the SFN mod 4 = 0, and repetitions are scheduled in subframe #0 of all other radio frames.

The SystemInformationBlockType1 uses a fixed schedule with a periodicity of 80 ms and repetitions made within 80 ms. The first transmission of SystemInformationBlockType1 is scheduled in subframe #5 of radio frames for which the SFN mod 8 = 0, and repetitions are scheduled in subframe #5 of all other radio frames for which SFN mod 2 = 0.

The SI messages are transmitted within periodically occurring time domain windows (referred to as SI-windows) using dynamic scheduling. Each SI message is associated with a SI-window and the SI-windows of different SI messages do not overlap. That is, within one SI-window only the corresponding SI is transmitted. The length of the SI-window is common for all SI messages, and is configurable. Within the SI-window, the corresponding SI message can be transmitted a number of times in any subframe other than MBSFN subframes, uplink subframes in TDD, and subframe #5 of radio frames for which SFN mod 2=0. The UE acquires the detailed time-domain scheduling (and other information, e.g. frequency-domain scheduling, used transport format) from decoding SI-RNTI on PDCCH (see TS 36.321 [6]).

A single SI-RNTI is used to address *SystemInformationBlockType1* as well as all SI messages.

SystemInformationBlockType1 configures the SI-window length and the transmission periodicity for the SI messages.

5.2.1.3 System information validity and notification of changes

Change of system information (other than for ETWS, CMAS and EAB parameters) only occurs at specific radio frames, i.e. the concept of a modification period is used. System information may be transmitted a number of times with the same content within a modification period, as defined by its scheduling. The modification period boundaries are defined by SFN values for which SFN mod m=0, where m is the number of radio frames comprising the modification period. The modification period is configured by system information.

When the network changes (some of the) system information, it first notifies the UEs about this change, i.e. this may be done throughout a modification period. In the next modification period, the network transmits the updated system information. These general principles are illustrated in figure 5.2.1.3-1, in which different colours indicate different system information. Upon receiving a change notification, the UE acquires the new system information immediately from the start of the next modification period. The UE applies the previously acquired system information until the UE acquires the new system information.



Figure 5.2.1.3-1: Change of system Information

The *Paging* message is used to inform UEs in RRC_IDLE and UEs in RRC_CONNECTED about a system information change. If the UE receives a *Paging* message including the *systemInfoModification*, it knows that the system information will change at the next modification period boundary. Although the UE may be informed about changes in system information, no further details are provided e.g. regarding which system information will change.

SystemInformationBlockType1 includes a value tag, systemInfoValueTag, that indicates if a change has occurred in the SI messages. UEs may use systemInfoValueTag, e.g. upon return from out of coverage, to verify if the previously stored SI messages are still valid. Additionally, the UE considers stored system information to be invalid after 3 hours from the moment it was successfully confirmed as valid, unless specified otherwise.

E-UTRAN may not update *systemInfoValueTag* upon change of some system information e.g. ETWS information, CMAS information, regularly changing parameters like time information (*SystemInformationBlockType8*, *SystemInformationBlockType16*), EAB parameters. Similarly, E-UTRAN may not include the *systemInfoModification* within the *Paging* message upon change of some system information.

The UE verifies that stored system information remains valid by either checking <code>systemInfoValueTag</code> in <code>SystemInformationBlockType1</code> after the modification period boundary, or attempting to find the <code>systemInfoModification</code> indication at least <code>modificationPeriodCoeff</code> times during the modification period in case no paging is received, in every modification period. If no paging message is received by the UE during a modification period, the UE may assume that no change of system information will occur at the next modification period boundary. If UE in RRC_CONNECTED, during a modification period, receives one paging message, it may deduce from the presence/ absence of <code>systemInfoModification</code> whether a change of system information other than ETWS information, CMAS information and EAB parameters will occur in the next modification period or not.

ETWS and/or CMAS capable UEs in RRC_CONNECTED shall attempt to read paging at least once every *defaultPagingCycle* to check whether ETWS and/or CMAS notification is present or not.

5.2.1.4 Indication of ETWS notification

ETWS primary notification and/ or ETWS secondary notification can occur at any point in time. The *Paging* message is used to inform ETWS capable UEs in RRC_IDLE and UEs in RRC_CONNECTED about presence of an ETWS primary notification and/ or ETWS secondary notification. If the UE receives a *Paging* message including the *etws-Indication*, it shall start receiving the ETWS primary notification and/ or ETWS secondary notification according to *schedulingInfoList* contained in *SystemInformationBlockType1*. If the UE receives *Paging* message including the *etws-Indication* while it is acquiring ETWS notification(s), the UE shall continue acquiring ETWS notification(s) based on the previously acquired *schedulingInfoList* until it re-acquires *schedulingInfoList* in *SystemInformationBlockType1*.

NOTE: The UE is not required to periodically check schedulingInfoList contained in SystemInformationBlockType1, but Paging message including the etws-Indication triggers the UE to reacquire schedulingInfoList contained in SystemInformationBlockType1 for scheduling changes for SystemInformationBlockType10 and SystemInformationBlockType11. The UE may or may not receive a Paging message including the etws-Indication and/or systemInfoModification when ETWS is no longer scheduled.

ETWS primary notification is contained in *SystemInformationBlockType10* and ETWS secondary notification is contained in *SystemInformationBlockType11*. Segmentation can be applied for the delivery of a secondary notification. The segmentation is fixed for transmission of a given secondary notification within a cell (i.e. the same segment size for a given segment with the same *messageIdentifier*, *serialNumber* and *warningMessageSegmentNumber*). An ETWS secondary notification corresponds to a single *CB data* IE as defined according to TS 23.041 [37].

5.2.1.5 Indication of CMAS notification

CMAS notification can occur at any point in time. The *Paging* message is used to inform CMAS capable UEs in RRC_IDLE and UEs in RRC_CONNECTED about presence of one or more CMAS notifications. If the UE receives a *Paging* message including the *cmas-Indication*, it shall start receiving the CMAS notifications according to *schedulingInfoList* contained in *SystemInformationBlockType1*. If the UE receives *Paging* message including the *cmas-Indication* while it is acquiring CMAS notification(s), the UE shall continue acquiring CMAS notification(s) based on the previously acquired *schedulingInfoList* until it re-acquires *schedulingInfoList* in *SystemInformationBlockType1*.

NOTE: The UE is not required to periodically check *schedulingInfoList* contained in *SystemInformationBlockType1*, but *Paging* message including the *cmas-Indication* triggers the UE to reacquire *schedulingInfoList* contained in *SystemInformationBlockType1* for scheduling changes for *SystemInformationBlockType12*. The UE may or may not receive a *Paging* message including the *cmas-Indication* and/or *systemInfoModification* when *SystemInformationBlockType12* is no longer scheduled.

CMAS notification is contained in *SystemInformationBlockType12*. Segmentation can be applied for the delivery of a CMAS notification. The segmentation is fixed for transmission of a given CMAS notification within a cell (i.e. the same segment size for a given segment with the same *messageIdentifier*, *serialNumber* and *warningMessageSegmentNumber*). E-UTRAN does not interleave transmissions of CMAS notifications, i.e. all segments of a given CMAS notification transmission are transmitted prior to those of another CMAS notification. A CMAS notification corresponds to a single *CB data* IE as defined according to TS 23.041 [37].

5.2.1.6 Notification of EAB parameters change

Change of EAB parameters can occur at any point in time. The EAB parameters are contained in *SystemInformationBlockType14*. The *Paging* message is used to inform EAB capable UEs in RRC_IDLE about a change of EAB parameters or that *SystemInformationBlockType14* is no longer scheduled. If the UE receives a *Paging* message including the *eab-ParamModification*, it shall acquire *SystemInformationBlockType14* according to *schedulingInfoList* contained in *SystemInformationBlockType1*. If the UE receives a *Paging* message including the *eab-ParamModification* while it is acquiring *SystemInformationBlockType14*, the UE shall continue acquiring *SystemInformationBlockType14* based on the previously acquired *schedulingInfoList* until it re-acquires *schedulingInfoList* in *SystemInformationBlockType1*.

NOTE: The EAB capable UE is not expected to periodically check *schedulingInfoList* contained in *SystemInformationBlockType1*.

5.2.2 System information acquisition

5.2.2.1 General

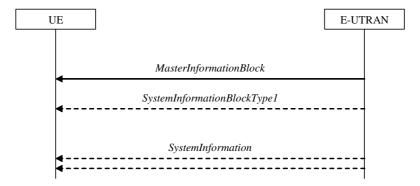


Figure 5.2.2.1-1: System information acquisition, normal

The UE applies the system information acquisition procedure to acquire the AS- and NAS- system information that is broadcasted by the E-UTRAN. The procedure applies to UEs in RRC_IDLE and UEs in RRC_CONNECTED.

5.2.2.2 Initiation

The UE shall apply the system information acquisition procedure upon selecting (e.g. upon power on) and upon reselecting a cell, after handover completion, after entering E-UTRA from another RAT, upon return from out of coverage, upon receiving a notification that the system information has changed, upon receiving an indication about the presence of a ETWS notification, upon receiving an indication about the presence of a CMAS notification, upon receiving a notification that the EAB parameters have changed, upon receiving a request from CDMA2000 upper layers and upon exceeding the maximum validity duration. Unless explicitly stated otherwise in the procedural specification, the system information acquisition procedure overwrites any stored system information, i.e. delta configuration is not applicable for system information and the UE discontinues using a field if it is absent in system information unless explicitly specified otherwise.

5.2.2.3 System information required by the UE

The UE shall:

1> ensure having a valid version, as defined below, of (at least) the following system information, also referred to as the 'required' system information:

2> if in RRC_IDLE:

3> the MasterInformationBlock and SystemInformationBlockType1 as well as SystemInformationBlockType2 through SystemInformationBlockType8, depending on support of the concerned RATs;

2> if in RRC CONNECTED:

3> the *MasterInformationBlock, SystemInformationBlockType1* and *SystemInformationBlockType2* as well as *SystemInformationBlockType8*, depending on support of CDMA2000;

- 1> delete any stored system information after 3 hours from the moment it was confirmed to be valid as defined in 5.2.1.3, unless specified otherwise;
- 1> consider any stored system information except SystemInformationBlockType10, SystemInformationBlockType11, systemInformationBlockType12 and systemInformationBlockType14 to be invalid if systemInfoValueTag included in the SystemInformationBlockType1 is different from the one of the stored system information;

5.2.2.4 System information acquisition by the UE

The UE shall:

- 1> apply the specified BCCH configuration defined in 9.1.1.1;
- 1> if the procedure is triggered by a system information change notification:
 - 2> start acquiring the required system information, as defined in 5.2.2.3, from the beginning of the modification period following the one in which the change notification was received;
- NOTE 1: The UE continues using the previously received system information until the new system information has been acquired.
- 1> if the UE is in RRC_IDLE and enters a cell for which the UE does not have stored a valid version of the system information required in RRC_IDLE, as defined in 5.2.2.3:
 - 2> acquire, using the system information acquisition procedure as defined in 5.2.3, the system information required in RRC_IDLE, as defined in 5.2.2.3;
- 1> following successful handover completion to a PCell for which the UE does not have stored a valid version of the system information required in RRC_CONNECTED, as defined in 5.2.2.3:
 - 2> acquire, using the system information acquisition procedure as defined in 5.2.3, the system information required in RRC_CONNECTED, as defined in 5.2.2.3;
 - 2> upon acquiring the concerned system information:

- 3> discard the corresponding radio resource configuration information included in the *radioResourceConfigCommon* previously received in a dedicated message, if any;
 - 1> following a request from CDMA2000 upper layers:
 - 2> acquire SystemInformationBlockType8, as defined in 5.2.3;
 - 1> neither initiate the RRC connection establishment procedure nor initiate transmission of the RRCConnectionReestablishmentRequest message until the UE has a valid version of the MasterInformationBlock and SystemInformationBlockType1 messages as well as SystemInformationBlockType2;
 - 1> not initiate the RRC connection establishment subject to EAB until the UE has a valid version of SystemInformationBlockType14, if broadcast;
 - 1> if the UE is ETWS capable:
 - 2> upon entering a cell during RRC_IDLE, following successful handover or upon connection re-establishment:
- 3> discard any previously buffered warningMessageSegment;
- 3> clear, if any, the current values of messageIdentifier and serialNumber for SystemInformationBlockType11;
 - 2> when the UE acquires *SystemInformationBlockType1* following ETWS indication, upon entering a cell during RRC_IDLE, following successful handover or upon connection re-establishment:
- 3> if schedulingInfoList indicates that SystemInformationBlockType10 is present:
 - 4> start acquiring SystemInformationBlockType10 immediately;
- 3> if schedulingInfoList indicates that SystemInformationBlockType11 is present:
 - 4> start acquiring SystemInformationBlockType11 immediately;
 - NOTE 2: UEs shall start acquiring *SystemInformationBlockType10* and *SystemInformationBlockType11* as described above even when *systemInfoValueTag* in *SystemInformationBlockType1* has not changed.
 - 1> if the UE is CMAS capable:
 - 2> upon entering a cell during RRC_IDLE, following successful handover or upon connection re-establishment:
- 3> discard any previously buffered warningMessageSegment;
- 3> clear, if any, stored values of *messageIdentifier* and *serialNumber* for *SystemInformationBlockType12* associated with the discarded *warningMessageSegment*;
 - 2> when the UE acquires *SystemInformationBlockType1* following CMAS indication, upon entering a cell during RRC_IDLE, following successful handover and upon connection re-establishment:
- 3> if schedulingInfoList indicates that SystemInformationBlockType12 is present:
 - 4> acquire SystemInformationBlockType12;
 - NOTE 3: UEs shall start acquiring *SystemInformationBlockType12* as described above even when *systemInfoValueTag* in *SystemInformationBlockType1* has not changed.
 - 1> if the UE is interested to receive MBMS services:
 - 2> if *schedulingInfoList* indicates that *SystemInformationBlockType13* is present and the UE does not have stored a valid version of this system information block:
- 3> acquire SystemInformationBlockType13;
 - 2> if the UE is capable of MBMS Service Continuity:
- 3> if *schedulingInfoList* indicates that *SystemInformationBlockType15* is present and the UE does not have stored a valid version of this system information block:
 - 4> acquire SystemInformationBlockType15;

- 1> if the UE is EAB capable:
 - 2> when the UE does not have stored a valid version of *SystemInformationBlockType14* upon entering RRC_IDLE, or when the UE acquires *SystemInformationBlockType1* following EAB parameters change notification or upon entering a cell during RRC_IDLE:
- 3> if schedulingInfoList indicates that SystemInformationBlockType14 is present:
 - 4> start acquiring *SystemInformationBlockType14* immediately;

3> else:

- 4> discard SystemInformationBlockType14, if previously received;
- NOTE 4: EAB capable UEs start acquiring *SystemInformationBlockType14* as described above even when *systemInfoValueTag* in *SystemInformationBlockType1* has not changed.
- NOTE 5: EAB capable UEs maintain an up to date SystemInformationBlockType14 in RRC_IDLE.

The UE may apply the received SIBs immediately, i.e. the UE does not need to delay using a SIB until all SI messages have been received. The UE may delay applying the received SIBs until completing lower layer procedures associated with a received or a UE originated RRC message, e.g. an ongoing random access procedure.

NOTE 6: While attempting to acquire a particular SIB, if the UE detects from *schedulingInfoList* that it is no longer present, the UE should stop trying to acquire the particular SIB.

5.2.2.5 Essential system information missing

The UE shall:

- 1> if in RRC_IDLE or in RRC_CONNECTED while T311 is running:
 - 2> if the UE is unable to acquire the *MasterInformationBlock* or the *SystemInformationBlockType1*:
- 3> consider the cell as barred in accordance with TS 36.304 [4]; and
- 3> perform barring as if intraFreqReselection is set to allowed, and as if the csg-Indication is set to FALSE;
 - 2> else if the UE is unable to acquire the *SystemInformationBlockType2*:
- 3> treat the cell as barred in accordance with TS 36.304 [4];

5.2.2.6 Actions upon reception of the *MasterInformationBlock* message

Upon receiving the MasterInformationBlock message the UE shall:

- 1> apply the radio resource configuration included in the *phich-Config*;
- 1> if the UE is in RRC IDLE or if the UE is in RRC CONNECTED while T311 is running:
 - 2> if the UE has no valid system information stored according to 5.2.2.3 for the concerned cell:
- 3> apply the received value of dl-Bandwidth to the ul-Bandwidth until SystemInformationBlockType2 is received;

5.2.2.7 Actions upon reception of the *SystemInformationBlockType1* message

Upon receiving the *SystemInformationBlockType1* either via broadcast or via dedicated signalling, the UE shall:

- 1> if in RRC_CONNECTED while T311 is not running, and the UE supports multi-band cells as defined by bit 31 in featureGroupIndicators:
 - 2> disregard the freqBandIndicator and multiBandInfoList, if received, while in RRC_CONNECTED;
 - 2> forward the *cellIdentity* to upper layers;
 - 2> forward the *trackingAreaCode* to upper layers;

- 1> else:
 - 2> if the frequency band indicated in the *freqBandIndicator* is part of the frequency bands supported by the UE; or
 - 2> if the UE supports *multiBandInfoList*, and if one or more of the frequency bands indicated in the *multiBandInfoList* are part of the frequency bands supported by the UE:
- 3> forward the *cellIdentity* to upper layers;
- 3> forward the *trackingAreaCode* to upper layers;
 - 2> else:
- 3> consider the cell as barred in accordance with TS 36.304 [4]; and
- 3> perform barring as if intraFreqReselection is set to notAllowed, and as if the csg-Indication is set to FALSE;

5.2.2.8 Actions upon reception of *SystemInformation* messages

No UE requirements related to the contents of the *SystemInformation* messages apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.9 Actions upon reception of *SystemInformationBlockType2*

Upon receiving *SystemInformationBlockType2*, the UE shall:

- 1> apply the configuration included in the *radioResourceConfigCommon*;
- 1> if upper layers indicate that a (UE specific) paging cycle is configured:
 - 2> apply the shortest of the (UE specific) paging cycle and the *defaultPagingCycle* included in the *radioResourceConfigCommon*;
- 1> if the *mbsfn-SubframeConfigList* is included:
 - 2> consider that DL assignments may occur in the MBSFN subframes indicated in the *mbsfn-SubframeConfigList* under the conditions specified in [23, 7.1];
- 1> apply the specified PCCH configuration defined in 9.1.1.3;
- 1> not apply the *timeAlignmentTimerCommon*;
- 1> if in RRC_CONNECTED and UE is configured with RLF timers and constants values received within *rlf-TimersAndConstants*:
 - 2> not update its values of the timers and constants in *ue-TimersAndConstants* except for the value of timer T300:
- 1> if in RRC_CONNECTED while T311 is not running; and the UE supports multi-band cells as defined by bit 31 in *featureGroupIndicators*:
 - 2> disregard the additional Spectrum Emission and ul-Carrier Freq, if received, while in RRC_CONNECTED;

5.2.2.10 Actions upon reception of SystemInformationBlockType3

No UE requirements related to the contents of this *SystemInformationBlock* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.11 Actions upon reception of SystemInformationBlockType4

No UE requirements related to the contents of this *SystemInformationBlock* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.12 Actions upon reception of SystemInformationBlockType5

No UE requirements related to the contents of this *SystemInformationBlock* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.13 Actions upon reception of SystemInformationBlockType6

No UE requirements related to the contents of this *SystemInformationBlock* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.14 Actions upon reception of *SystemInformationBlockType7*

No UE requirements related to the contents of this *SystemInformationBlock* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.15 Actions upon reception of SystemInformationBlockType8

Upon receiving SystemInformationBlockType8, the UE shall:

- 1> if sib8-PerPLMN-List is included and the UE is capable of network sharing for CDMA2000:
 - 2> apply the CDMA2000 parameters below corresponding to the RPLMN;
- 1> if the systemTimeInfo is included:
 - 2> forward the systemTimeInfo to CDMA2000 upper layers;
- 1> if the UE is in RRC_IDLE and if searchWindowSize is included:
 - 2> forward the searchWindowSize to CDMA2000 upper layers;
- 1> if parametersHRPD is included:
 - 2> forward the *preRegistrationInfoHRPD* to CDMA2000 upper layers only if the UE has not received the *preRegistrationInfoHRPD* within an *RRCConnectionReconfiguration* message after entering this cell;
 - 2> if the *cellReselectionParametersHRPD* is included:
- 3> forward the neighCellList to the CDMA2000 upper layers;
 - 1> if the *parameters1XRTT* is included:
 - 2> if the *csfb-RegistrationParam1XRTT* is included:
- 3> forward the *csfb-RegistrationParam1XRTT* to the CDMA2000 upper layers which will use this information to determine if a CS registration/re-registration towards CDMA2000 1xRTT in the EUTRA cell is required;
 - 2> else:
- 3> indicate to CDMA2000 upper layers that CSFB Registration to CDMA2000 1xRTT is not allowed;
 - 2> if the *longCodeState1XRTT* is included:
- 3> forward the *longCodeState1XRTT* to CDMA2000 upper layers;
 - 2> if the *cellReselectionParameters1XRTT* is included:
- 3> forward the *neighCellList* to the CDMA2000 upper layers;
 - 2> if the csfb-SupportForDualRxUEs is included:
- 3> forward csfb-SupportForDualRxUEs to the CDMA2000 upper layers;
 - 2> else:
- 3> forward csfb-SupportForDualRxUEs, with its value set to FALSE, to the CDMA2000 upper layers;

- 2> if *ac-BarringConfig1XRTT* is included:
- 3> forward ac-BarringConfig1XRTT to the CDMA2000 upper layers;
 - 2> if the *csfb-DualRxTxSupport* is included:
- 3> forward csfb-DualRxTxSupport to the CDMA2000 upper layers;
 - 2> else:
- 3> forward csfb-DualRxTxSupport, with its value set to FALSE, to the CDMA2000 upper layers;

5.2.2.16 Actions upon reception of SystemInformationBlockType9

Upon receiving SystemInformationBlockType9, the UE shall:

1> if *hnb-Name* is included, forward the *hnb-Name* to upper layers;

5.2.2.17 Actions upon reception of SystemInformationBlockType10

Upon receiving *SystemInformationBlockType10*, the UE shall:

1> forward the received warning Type, message Identifier and serial Number to upper layers;

5.2.2.18 Actions upon reception of SystemInformationBlockType11

Upon receiving *SystemInformationBlockType11*, the UE shall:

- 1> if there is no current value for messageIdentifier and serialNumber for SystemInformationBlockType11; or
- 1> if either the received value of *messageIdentifier* or of *serialNumber* or of both are different from the current values of *messageIdentifier* and *serialNumber* for *SystemInformationBlockType11*:
 - 2> use the received values of *messageIdentifier* and *serialNumber* for *SystemInformationBlockType11* as the current values of *messageIdentifier* and *serialNumber* for *SystemInformationBlockType11*;
 - 2> discard any previously buffered warningMessageSegment;
 - 2> if all segments of a warning message have been received:
- 3> assemble the warning message from the received warningMessageSegment;
- 3> forward the received warning message, messageIdentifier, serialNumber and dataCodingScheme to upper layers;
- 3> stop reception of *SystemInformationBlockType11*;
- 3> discard the current values of messageIdentifier and serialNumber for SystemInformationBlockType11;
 - 2> else:
- 3> store the received warningMessageSegment;
- 3> continue reception of SystemInformationBlockType11;
 - 1> else if all segments of a warning message have been received:
 - 2> assemble the warning message from the received warningMessageSegment;
 - 2> forward the received complete warning message, *messageIdentifier*, *serialNumber* and *dataCodingScheme* to upper layers;
 - 2> stop reception of SystemInformationBlockType11;
 - 2> discard the current values of messageIdentifier and serialNumber for SystemInformationBlockType11;
 - 1> else:

- 2> store the received warningMessageSegment;
- 2> continue reception of SystemInformationBlockType11;

The UE should discard any stored *warningMessageSegment* and the current value of *messageIdentifier* and *serialNumber* for *SystemInformationBlockType11* if the complete warning message has not been assembled within a period of 3 hours.

5.2.2.19 Actions upon reception of SystemInformationBlockType12

Upon receiving SystemInformationBlockType12, the UE shall:

- 1> if the SystemInformationBlockType12 contains a complete warning message:
 - 2> forward the received warning message, *messageIdentifier*, *serialNumber* and *dataCodingScheme* to upper layers;
 - 2> continue reception of SystemInformationBlockType12;
- 1> else:
 - 2> if the received values of *messageIdentifier* and *serialNumber* are the same (each value is the same) as a pair for which a warning message is currently being assembled:
- 3> store the received warningMessageSegment;
- 3> if all segments of a warning message have been received:
 - 4> assemble the warning message from the received warningMessageSegment;
 - 4> forward the received warning message, *messageIdentifier*, *serialNumber* and *dataCodingScheme* to upper layers;
 - 4> stop assembling a warning message for this *messageIdentifier* and *serialNumber* and delete all stored information held for it;
- 3> continue reception of SystemInformationBlockType12;
 - 2> else if the received values of *messageIdentifier* and/or *serialNumber* are not the same as any of the pairs for which a warning message is currently being assembled:
- 3> start assembling a warning message for this messageIdentifier and serialNumber pair;
- 3> store the received warningMessageSegment;
- 3> continue reception of SystemInformationBlockType12;

The UE should discard *warningMessageSegment* and the associated values of *messageIdentifier* and *serialNumber* for *SystemInformationBlockType12* if the complete warning message has not been assembled within a period of 3 hours.

NOTE: The number of warning messages that a UE can re-assemble simultaneously is a function of UE implementation.

5.2.2.20 Actions upon reception of SystemInformationBlockType13

No UE requirements related to the contents of this *SystemInformationBlock* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.21 Actions upon reception of SystemInformationBlockType14

No UE requirements related to the contents of this *SystemInformationBlock* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.22 Actions upon reception of SystemInformationBlockType15

No UE requirements related to the contents of this *SystemInformationBlock* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.23 Actions upon reception of SystemInformationBlockType16

No UE requirements related to the contents of this *SystemInformationBlock* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.3 Acquisition of an SI message

When acquiring an SI message, the UE shall:

- 1> determine the start of the SI-window for the concerned SI message as follows:
 - 2> for the concerned SI message, determine the number *n* which corresponds to the order of entry in the list of SI messages configured by *schedulingInfoList* in *SystemInformationBlockType1*;
 - 2> determine the integer value x = (n-1)*w, where w is the si-WindowLength;
 - 2> the SI-window starts at the subframe #a, where $a = x \mod 10$, in the radio frame for which SFN mod T = FLOOR(x/10), where T is the *si-Periodicity* of the concerned SI message;

NOTE: E-UTRAN should configure an SI-window of 1 ms only if all SIs are scheduled before subframe #5 in radio frames for which SFN mod 2 = 0.

- 1> receive DL-SCH using the SI-RNTI from the start of the SI-window and continue until the end of the SI-window whose absolute length in time is given by *si-WindowLength*, or until the SI message was received, excluding the following subframes:
 - 2> subframe #5 in radio frames for which SFN mod 2 = 0;
 - 2> any MBSFN subframes;
 - 2> any uplink subframes in TDD;
- 1> if the SI message was not received by the end of the SI-window, repeat reception at the next SI-window occasion for the concerned SI message;

5.3 Connection control

5.3.1 Introduction

5.3.1.1 RRC connection control

RRC connection establishment involves the establishment of SRB1. E-UTRAN completes RRC connection establishment prior to completing the establishment of the S1 connection, i.e. prior to receiving the UE context information from the EPC. Consequently, AS security is not activated during the initial phase of the RRC connection. During this initial phase of the RRC connection, the E-UTRAN may configure the UE to perform measurement reporting. However, the UE only accepts a handover message when security has been activated.

NOTE: In case the serving frequency broadcasts multiple overlapping bands, E-UTRAN can only configure measurements after having obtained the UE capabilities, as the measurement configuration needs to be set according to the band selected by the UE.

Upon receiving the UE context from the EPC, E-UTRAN activates security (both ciphering and integrity protection) using the initial security activation procedure. The RRC messages to activate security (command and successful response) are integrity protected, while ciphering is started only after completion of the procedure. That is, the response to the message used to activate security is not ciphered, while the subsequent messages (e.g. used to establish SRB2 and DRBs) are both integrity protected and ciphered.

After having initiated the initial security activation procedure, E-UTRAN initiates the establishment of SRB2 and DRBs, i.e. E-UTRAN may do this prior to receiving the confirmation of the initial security activation from the UE. In any case, E-UTRAN will apply both ciphering and integrity protection for the RRC connection reconfiguration messages used to establish SRB2 and DRBs. E-UTRAN should release the RRC connection if the initial security activation and/ or the radio bearer establishment fails (i.e. security activation and DRB establishment are triggered by a joint S1-procedure, which does not support partial success).

For SRB2 and DRBs, security is always activated from the start, i.e. the E-UTRAN does not establish these bearers prior to activating security.

For some radio configuration fields, a critical extension has been defined. A switch from the original version of the field to the critically extended version is allowed using any connection reconfiguration. The UE reverts to the original version of some critically extended fields upon handover and re-establishment as specified elsewhere in this specification. Otherwise, switching a field from the critically extended version to the original version is only possible using the handover or re-establishment procedure with the full configuration option.

After having initiated the initial security activation procedure, E-UTRAN may configure a UE that supports CA, with one or more SCells in addition to the PCell that was initially configured during connection establishment. The PCell is used to provide the security inputs and upper layer system information (i.e. the NAS mobility information e.g. TAI). SCells are used to provide additional downlink and optionally uplink radio resources.

The release of the RRC connection normally is initiated by E-UTRAN. The procedure may be used to re-direct the UE to an E-UTRA frequency or an inter-RAT carrier frequency. Only in exceptional cases, as specified within this specification, TS 36.300 [9], TS 36.304 [4] or TS 24.301 [35], may the UE abort the RRC connection, i.e. move to RRC_IDLE without notifying E-UTRAN.

5.3.1.2 Security

AS security comprises of the integrity protection of RRC signalling (SRBs) as well as the ciphering of RRC signalling (SRBs) and user data (DRBs).

RRC handles the configuration of the security parameters which are part of the AS configuration: the integrity protection algorithm, the ciphering algorithm and two parameters, namely the *keyChangeIndicator* and the *nextHopChainingCount*, which are used by the UE to determine the AS security keys upon handover and/ or connection re-establishment.

The integrity protection algorithm is common for signalling radio bearers SRB1 and SRB2. The ciphering algorithm is common for all radio bearers (i.e. SRB1, SRB2 and DRBs). Neither integrity protection nor ciphering applies for SRB0.

RRC integrity and ciphering are always activated together, i.e. in one message/ procedure. RRC integrity and ciphering are never de-activated. However, it is possible to switch to a 'NULL' ciphering algorithm (eea0).

The 'NULL' integrity protection algorithm (eia0) is used only for the UE in limited service mode [32, TS33.401]. In case the 'NULL' integrity protection algorithm is used, 'NULL' ciphering algorithm is also used.

NOTE 1: Lower layers discard RRC messages for which the integrity check has failed and indicate the integrity verification check failure to RRC.

The AS applies three different security keys: one for the integrity protection of RRC signalling (K_{RRCint}), one for the ciphering of RRC signalling (K_{RRCenc}) and one for the ciphering of user data (K_{UPenc}). All three AS keys are derived from the K_{eNB} key. The K_{eNB} is based on the K_{ASME} key, which is handled by upper layers.

Upon connection establishment new AS keys are derived. No AS-parameters are exchanged to serve as inputs for the derivation of the new AS keys at connection establishment.

The integrity and ciphering of the RRC message used to perform handover is based on the security configuration used prior to the handover and is performed by the source eNB.

The integrity and ciphering algorithms can only be changed upon handover. The four AS keys (K_{eNB} , K_{RRCint} , K_{RRCenc} and K_{UPenc}) change upon every handover and connection re-establishment. The *keyChangeIndicator* is used upon handover and indicates whether the UE should use the keys associated with the K_{ASME} key taken into use with the latest successful NAS SMC procedure. The *nextHopChainingCount* parameter is used upon handover and connection re-establishment by the UE when deriving the new K_{eNB} that is used to generate K_{RRCint} , K_{RRCenc} and K_{UPenc} (see TS 33.401 [32]). An intra cell handover procedure may be used to change the keys in RRC_CONNECTED.

For each radio bearer an independent counter (COUNT, as specified in TS 36.323 [8]) is maintained for each direction. For each DRB, the COUNT is used as input for ciphering. For each SRB, the COUNT is used as input for both ciphering and integrity protection. It is not allowed to use the same COUNT value more than once for a given security key. In order to limit the signalling overhead, individual messages/ packets include a short sequence number (PDCP SN, as specified in TS 36.323 [8]). In addition, an overflow counter mechanism is used: the hyper frame number (TX_HFN and RX_HFN, as specified in TS 36.323 [8]). The HFN needs to be synchronized between the UE and the eNB. The eNB is responsible for avoiding reuse of the COUNT with the same RB identity and with the same K_{eNB} , e.g. due to the transfer of large volumes of data, release and establishment of new RBs. In order to avoid such re-use, the eNB may e.g. use different RB identities for successive RB establishments, trigger an intra cell handover or an RRC_CONNECTED to RRC_IDLE to RRC_CONNECTED transition.

For each SRB, the value provided by RRC to lower layers to derive the 5-bit BEARER parameter used as input for ciphering and for integrity protection is the value of the corresponding *srb-Identity* with the MSBs padded with zeroes.

5.3.1.2a RN security

For RNs, AS security follows the procedures in 5.3.1.2. Furthermore, E-UTRAN may configure per DRB whether or not integrity protection is used. The use of integrity protection may be configured only upon DRB establishment and reconfigured only upon handover or upon the first reconfiguration following RRC connection re-establishment.

To provide integrity protection on DRBs between the RN and the E-UTRAN, the K_{UPint} key is derived from the K_{eNB} key as described in TS33.401 [32]. The same integrity protection algorithm used for SRBs also applies to the DRBs. The K_{UPint} changes at every handover and RRC connection re-establishment and is based on an updated K_{eNB} which is derived by taking into account the *nextHopChainingCount*. The COUNT value maintained for DRB ciphering is also used for integrity protection, if the integrity protection is configured for the DRB.

5.3.1.3 Connected mode mobility

In RRC_CONNECTED, the network controls UE mobility, i.e. the network decides when the UE shall connect to which E-UTRA cell(s), or inter-RAT cell. For network controlled mobility in RRC_CONNECTED, the PCell can be changed using an *RRCConnectionReconfiguration* message including the *mobilityControlInfo* (handover), whereas the SCell(s) can be changed using the *RRCConnectionReconfiguration* message either with or without the *mobilityControlInfo*. The network triggers the handover procedure e.g. based on radio conditions, load. To facilitate this, the network may configure the UE to perform measurement reporting (possibly including the configuration of measurement gaps). The network may also initiate handover blindly, i.e. without having received measurement reports from the UE.

Before sending the handover message to the UE, the source eNB prepares one or more target cells. The source eNB selects the target PCell. The source eNB may also provide the target eNB with a list of best cells on each frequency for which measurement information is available, in order of decreasing RSRP. The source eNB may also include available measurement information for the cells provided in the list. The target eNB decides which SCells are configured for use after handover, which may include cells other than the ones indicated by the source eNB.

The target eNB generates the message used to perform the handover, i.e. the message including the AS-configuration to be used in the target cell(s). The source eNB transparently (i.e. does not alter values/ content) forwards the handover message/ information received from the target to the UE. When appropriate, the source eNB may initiate data forwarding for (a subset of) the DRBs.

After receiving the handover message, the UE attempts to access the target PCell at the first available RACH occasion according to Random Access resource selection defined in TS 36.321 [6], i.e. the handover is asynchronous. Consequently, when allocating a dedicated preamble for the random access in the target PCell, E-UTRA shall ensure it is available from the first RACH occasion the UE may use. Upon successful completion of the handover, the UE sends a message used to confirm the handover.

If the target eNB does not support the release of RRC protocol which the source eNB used to configure the UE, the target eNB may be unable to comprehend the UE configuration provided by the source eNB. In this case, the target eNB should use the full configuration option to reconfigure the UE for Handover and Re-establishment. Full configuration option includes an initialization of the radio configuration, which makes the procedure independent of the configuration used in the source cell(s) with the exception that the security algorithms are continued for the RRC re-establishment.

After the successful completion of handover, PDCP SDUs may be re-transmitted in the target cell(s). This only applies for DRBs using RLC-AM mode and for handovers not involving full configuration option. The further details are specified in TS 36.323 [8]. After the successful completion of handover not involving full configuration option, the SN

and the HFN are reset except for the DRBs using RLC-AM mode (for which both SN and HFN continue). For reconfigurations involving the full configuration option, the PDCP entities are newly established (SN and HFN do not continue) for all DRBs irrespective of the RLC mode. The further details are specified in TS 36.323 [8].

One UE behaviour to be performed upon handover is specified, i.e. this is regardless of the handover procedures used within the network (e.g. whether the handover includes X2 or S1 signalling procedures).

The source eNB should, for some time, maintain a context to enable the UE to return in case of handover failure. After having detected handover failure, the UE attempts to resume the RRC connection either in the source PCell or in another cell using the RRC re-establishment procedure. This connection resumption succeeds only if the accessed cell is prepared, i.e. concerns a cell of the source eNB or of another eNB towards which handover preparation has been performed. The cell in which the re-establishment procedure succeeds becomes the PCell while SCells and STAGs, if configured, are released.

Normal measurement and mobility procedures are used to support handover to cells broadcasting a CSG identity. In addition, E-UTRAN may configure the UE to report that it is entering or leaving the proximity of cell(s) included in its CSG whitelist. Furthermore, E-UTRAN may request the UE to provide additional information broadcast by the handover candidate cell e.g. global cell identity, CSG identity, CSG membership status.

NOTE: E-UTRAN may use the "proximity report" to configure measurements as well as to decide whether or not to request additional information broadcast by the handover candidate cell. The additional information is used to verify whether or not the UE is authorised to access the target PCell and may also be needed to identify handover candidate cell (*PCI confusion* i.e. when the physical layer identity that is included in the measurement report does not uniquely identify the cell).

5.3.2 Paging

5.3.2.1 General



Figure 5.3.2.1-1: Paging

The purpose of this procedure is:

- to transmit paging information to a UE in RRC_IDLE and/or;
- to inform UEs in RRC_IDLE and UEs in RRC_CONNECTED about a system information change and/or;
- to inform about an ETWS primary notification and/ or ETWS secondary notification and/ or;
- to inform about a CMAS notification.

The paging information is provided to upper layers, which in response may initiate RRC connection establishment, e.g. to receive an incoming call.

5.3.2.2 Initiation

E-UTRAN initiates the paging procedure by transmitting the *Paging* message at the UE's paging occasion as specified in TS 36.304 [4]. E-UTRAN may address multiple UEs within a *Paging* message by including one *PagingRecord* for each UE. E-UTRAN may also indicate a change of system information, and/ or provide an ETWS notification or a CMAS notification in the *Paging* message.

5.3.2.3 Reception of the *Paging* message by the UE

Upon receiving the Paging message, the UE shall:

- 1> if in RRC_IDLE, for each of the *PagingRecord*, if any, included in the *Paging* message:
 - 2> if the *ue-Identity* included in the *PagingRecord* matches one of the UE identities allocated by upper layers:
- 3> forward the *ue-Identity* and the *cn-Domain* to the upper layers;
 - 1> if the *systemInfoModification* is included:
 - 2> re-acquire the required system information using the system information acquisition procedure as specified in 5.2.2.
 - 1> if the etws-Indication is included and the UE is ETWS capable:
 - 2> re-acquire *SystemInformationBlockType1* immediately, i.e., without waiting until the next system information modification period boundary;
 - 2> if the *schedulingInfoList* indicates that *SystemInformationBlockType10* is present:
- 3> acquire SystemInformationBlockType10;
 - 2> if the *schedulingInfoList* indicates that *SystemInformationBlockType11* is present:
- 3> acquire *SystemInformationBlockType11*;
 - 1> if the *cmas-Indication* is included and the UE is CMAS capable:
 - 2> re-acquire *SystemInformationBlockType1* immediately, i.e., without waiting until the next system information modification period boundary as specified in 5.2.1.5;
 - 2> if the *schedulingInfoList* indicates that *SystemInformationBlockType12* is present:
- 3> acquire SystemInformationBlockType12;
 - 1> if in RRC_IDLE, the eab-ParamModification is included and the UE is EAB capable:
 - 2> consider previously stored SystemInformationBlockType14 as invalid;
 - 2> re-acquire *SystemInformationBlockType1* immediately, i.e., without waiting until the next system information modification period boundary as specified in 5.2.1.6;
 - 2> re-acquire *SystemInformationBlockType14* using the system information acquisition procedure as specified in 5.2.2.4;

5.3.3 RRC connection establishment

5.3.3.1 General

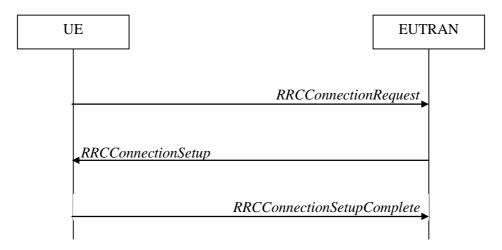


Figure 5.3.3.1-1: RRC connection establishment, successful

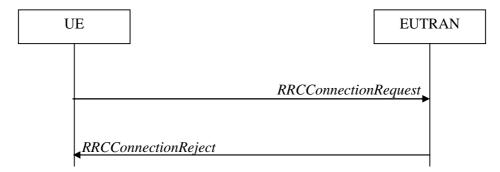


Figure 5.3.3.1-2: RRC connection establishment, network reject

The purpose of this procedure is to establish an RRC connection. RRC connection establishment involves SRB1 establishment. The procedure is also used to transfer the initial NAS dedicated information/ message from the UE to E-UTRAN.

E-UTRAN applies the procedure as follows:

- to establish SRB1 only.

5.3.3.2 Initiation

The UE initiates the procedure when upper layers request establishment of an RRC connection while the UE is in RRC_IDLE.

Upon initiation of the procedure, the UE shall:

- 1> if upper layers indicate that the RRC connection is subject to EAB (see TS 24.301 [35]):
 - 2> if the result of the EAB check, as specified in 5.3.3.12, is that access to the cell is barred:
- 3> inform upper layers about the failure to establish the RRC connection and that EAB is applicable, upon which the procedure ends:
 - 1> if the UE is establishing the RRC connection for mobile terminating calls:
 - 2> if timer T302 is running:

- 3> inform upper layers about the failure to establish the RRC connection and that access barring for mobile terminating calls is applicable, upon which the procedure ends;
 - 1> else if the UE is establishing the RRC connection for emergency calls:
 - 2> if SystemInformationBlockType2 includes the ac-BarringInfo:
- 3> if the *ac-BarringForEmergency* is set to *TRUE*:
 - 4> if the UE has one or more Access Classes, as stored on the USIM, with a value in the range 11..15, which is valid for the UE to use according to TS 22.011 [10] and TS 23.122 [11]:
 - NOTE 1: ACs 12, 13, 14 are only valid for use in the home country and ACs 11, 15 are only valid for use in the HPLMN/ EHPLMN.
- 5> if the *ac-BarringInfo* includes *ac-BarringForMO-Data*, and for all of these valid Access Classes for the UE, the corresponding bit in the *ac-BarringForSpecialAC* contained in *ac-BarringForMO-Data* is set to *one*:
 - 6> consider access to the cell as barred;
 - 4> else:
- 5> consider access to the cell as barred;
 - 2> if access to the cell is barred:
- 3> inform upper layers about the failure to establish the RRC connection, upon which the procedure ends;
 - 1> else if the UE is establishing the RRC connection for mobile originating calls:
 - 2> perform access barring check as specified in 5.3.3.11, using T303 as "Tbarring" and *ac-BarringForMO-Data* as "AC barring parameter";
 - 2> if access to the cell is barred:
- 3> if SystemInformationBlockType2 includes ac-BarringForCSFB or the UE does not support CS fallback:
 - 4> inform upper layers about the failure to establish the RRC connection and that access barring for mobile originating calls is applicable, upon which the procedure ends;
- 3> else (SystemInformationBlockType2 does not include ac-BarringForCSFB and the UE supports CS fallback):
 - 4> if timer T306 is not running, start T306 with the timer value of T303;
 - 4> inform upper layers about the failure to establish the RRC connection and that access barring for mobile originating calls and mobile originating CS fallback is applicable, upon which the procedure ends;
 - 1> else if the UE is establishing the RRC connection for mobile originating signalling:
 - 2> perform access barring check as specified in 5.3.3.11, using T305 as "Tbarring" and *ac-BarringForMO-Signalling* as "AC barring parameter";
 - 2> if access to the cell is barred:
- 3> inform upper layers about the failure to establish the RRC connection and that access barring for mobile originating signalling is applicable, upon which the procedure ends;
 - 1> else (the UE is establishing the RRC connection for mobile originating CS fallback):
 - 2> if SystemInformationBlockType2 includes ac-BarringForCSFB:
- 3> perform access barring check as specified in 5.3.3.11, using T306 as "Tbarring" and *ac-BarringForCSFB* as "AC barring parameter";
- 3> if access to the cell is barred:

4> inform upper layers about the failure to establish the RRC connection and that access barring for mobile originating CS fallback is applicable, due to *ac-BarringForCSFB*, upon which the procedure ends:

2> else:

- 3> perform access barring check as specified in 5.3.3.11, using T306 as "Tbarring" and *ac-BarringForMO-Data* as "AC barring parameter";
- 3> if access to the cell is barred:
 - 4> if timer T303 is not running, start T303 with the timer value of T306;
 - 4> inform upper layers about the failure to establish the RRC connection and that access barring for mobile originating CS fallback and mobile originating calls is applicable, due to *ac-BarringForMO-Data*, upon which the procedure ends;
 - 1> apply the default physical channel configuration as specified in 9.2.4;
 - 1> apply the default semi-persistent scheduling configuration as specified in 9.2.3;
 - 1> apply the default MAC main configuration as specified in 9.2.2;
 - 1> apply the CCCH configuration as specified in 9.1.1.2;
 - 1> apply the timeAlignmentTimerCommon included in SystemInformationBlockType2;
 - 1> start timer T300:
 - 1> initiate transmission of the RRCConnectionRequest message in accordance with 5.3.3.3;
 - NOTE 2: Upon initiating the connection establishment procedure, the UE is not required to ensure it maintains up to date system information applicable only for UEs in RRC_IDLE state. However, the UE needs to perform system information acquisition upon cell re-selection.

5.3.3.3 Actions related to transmission of *RRCConnectionReguest* message

The UE shall set the contents of RRCConnectionRequest message as follows:

- 1> set the *ue-Identity* as follows:
 - 2> if upper layers provide an S-TMSI:
- 3> set the *ue-Identity* to the value received from upper layers;
 - 2> else:
- 3> draw a random value in the range 0 .. 2^{40} -1 and set the *ue-Identity* to this value;
 - NOTE 1: Upper layers provide the S-TMSI if the UE is registered in the TA of the current cell.
 - 1> set the establishmentCause in accordance with the information received from upper layers;

The UE shall submit the RRCConnectionRequest message to lower layers for transmission.

The UE shall continue cell re-selection related measurements as well as cell re-selection evaluation. If the conditions for cell re-selection are fulfilled, the UE shall perform cell re-selection as specified in 5.3.3.5.

5.3.3.4 Reception of the *RRCConnectionSetup* by the UE

NOTE: Prior to this, lower layer signalling is used to allocate a C-RNTI. For further details see TS 36.321 [6];

The UE shall:

1> perform the radio resource configuration procedure in accordance with the received *radioResourceConfigDedicated* and as specified in 5.3.10;

- 1> if stored, discard the cell reselection priority information provided by the *idleModeMobilityControlInfo* or inherited from another RAT;
- 1> stop timer T300;
- 1> stop timer T302, if running;
- 1> stop timer T303, if running;
- 1> stop timer T305, if running;
- 1> stop timer T306, if running;
- 1> perform the actions as specified in 5.3.3.7;
- 1> stop timer T320, if running;
- 1> enter RRC_CONNECTED;
- 1> stop the cell re-selection procedure;
- 1> consider the current cell to be the PCell;
- 1> set the content of *RRCConnectionSetupComplete* message as follows:
 - 2> set the *selectedPLMN-Identity* to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]) from the PLMN(s) included in the *plmn-IdentityList* in *SystemInformationBlockType1*;
 - 2> if upper layers provide the 'Registered MME', include and set the registeredMME as follows:
- 3> if the PLMN identity of the 'Registered MME' is different from the PLMN selected by the upper layers:
 - 4> include the *plmnIdentity* in the *registeredMME* and set it to the value of the PLMN identity in the 'Registered MME' received from upper layers;
- 3> set the *mmegi* and the *mmec* to the value received from upper layers;
 - 2> if upper layers provided the 'Registered MME':
- 3> include and set the *gummei-Type* to the value provided by the upper layers;
 - 2> if connecting as an RN:
- 3> include the *rn-SubframeConfigReq*;
 - 2> set the *dedicatedInfoNAS* to include the information received from upper layers;
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
- 3> include *rlf-InfoAvailable*;
 - 2> if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
- 3> include *logMeasAvailable*;
 - 2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:
- 3> include *connEstFailInfoAvailable*;
 - 2> submit the *RRCConnectionSetupComplete* message to lower layers for transmission, upon which the procedure ends;

5.3.3.5 Cell re-selection while T300, T302, T303, T305 or T306 is running

The UE shall:

- 1> if cell reselection occurs while T300, T302, T303, T305 or T306 is running:
 - 2> if timer T302, T303, T305 and/ or T306 is running:
- 3> stop timer T302, T303, T305 and T306, whichever ones were running;
- 3> perform the actions as specified in 5.3.3.7;
 - 2> if timer T300 is running:
- 3> stop timer T300;
- 3> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established;
- 3> inform upper layers about the failure to establish the RRC connection;

5.3.3.6 T300 expiry

- 1> if timer T300 expires:
 - 2> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established;
 - 2> store the following connection establishment failure information in the *VarConnEstFailReport* by setting its fields as follows:
- 3> clear the information included in VarConnEstFailReport, if any;
- 3> set the *plmn-Identity* to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]) from the PLMN(s) included in the *plmn-IdentityList* in *SystemInformationBlockType1*;
- 3> set the failedCellId to the global cell identity of the cell where connection establishment failure is detected;
- 3> set the *measResultFailedCell* to include the RSRP and RSRQ, if available, of the cell where connection establishment failure is detected and based on measurements collected up to the moment the UE detected the failure;
- 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell re-selection, to include neighbouring cell measurements for at most the following number of neighbouring cells: 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency/ set of frequencies (GERAN) per RAT and according to the following:
 - 4> for each neighbour cell included, include the optional fields that are available;
 - NOTE: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].
- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *numberOfPreamblesSent* to indicate the number of preambles sent by MAC for the failed random access procedure;
- 3> set *contentionDetected* to indicate whether contention resolution was not successful as specified in TS 36.321 [6] for at least one of the transmitted preambles for the failed random access procedure;
- 3> set *maxTxPowerReached* to indicate whether or not the maximum power level was used for the last transmitted preamble, see TS 36.321 [6];
 - 2> inform upper layers about the failure to establish the RRC connection, upon which the procedure ends;

The UE may discard the connection establishment failure information, i.e. release the UE variable *VarConnEstFailReport*, 48 hours after the failure is detected, upon power off or upon detach.

5.3.3.7 T302, T303, T305 or T306 expiry or stop

The UE shall:

- 1> if timer T302 expires or is stopped:
 - 2> inform upper layers about barring alleviation for mobile terminating access;
 - 2> if timer T303 is not running:
- 3> inform upper layers about barring alleviation for mobile originating calls;
 - 2> if timer T305 is not running:
- 3> inform upper layers about barring alleviation for mobile originating signalling;
 - 2> if timer T306 is not running:
- 3> inform upper layers about barring alleviation for mobile originating CS fallback;
 - 1> if timer T303 expires or is stopped:
 - 2> if timer T302 is not running:
- 3> inform upper layers about barring alleviation for mobile originating calls;
 - 1> if timer T305 expires or is stopped:
 - 2> if timer T302 is not running:
- 3> inform upper layers about barring alleviation for mobile originating signalling;
 - 1> if timer T306 expires or is stopped:
 - 2> if timer T302 is not running:
- 3> inform upper layers about barring alleviation for mobile originating CS fallback;

5.3.3.8 Reception of the *RRCConnectionReject* by the UE

- 1> stop timer T300;
- 1> reset MAC and release the MAC configuration;
- 1> start timer T302, with the timer value set to the waitTime;
- 1> if the extendedWaitTime is present and the UE supports delay tolerant access:
 - 2> forward the *extendedWaitTime* to upper layers;
- 1> if deprioritisationReq is included and the UE supports RRC Connection Reject with deprioritisation:
 - 2> start or restart timer T325 with the timer value set to the deprioritisationTimer signalled;
 - 2> store the deprioritisationReq until T325 expiry;
- NOTE: The UE stores the deprioritisation request irrespective of any cell reselection absolute priority assignments (by dedicated or common signalling) and regardless of RRC connections in E-UTRAN or other RATs unless specified otherwise.

1> inform upper layers about the failure to establish the RRC connection and that access barring for mobile originating calls, mobile originating signalling, mobile terminating access and mobile originating CS fallback is applicable, upon which the procedure ends;

5.3.3.9 Abortion of RRC connection establishment

If upper layers abort the RRC connection establishment procedure while the UE has not yet entered RRC_CONNECTED, the UE shall:

- 1> stop timer T300, if running;
- 1> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established;

5.3.3.10 Handling of SSAC related parameters

Upon request from the upper layers, the UE shall:

- 1> set the local variables *BarringFactorForMMTEL-Voice* and *BarringTimeForMMTEL-Voice* as follows:
 - 2> if the UE is in RRC_IDLE and ssac-BarringForMMTEL-Voice is present:
- 3> if the UE has one or more Access Classes, as stored on the USIM, with a value in the range 11..15, which is valid for the UE to use according to TS 22.011 [10] and TS 23.122 [11], and
 - NOTE: ACs 12, 13, 14 are only valid for use in the home country and ACs 11, 15 are only valid for use in the HPLMN/EHPLMN.
- 3> if, for at least one of these Access Classes, the corresponding bit in the *ac-BarringForSpecialAC* contained in *ssac-BarringForMMTEL-Voice* is set to zero:
 - 4> set BarringFactorForMMTEL-Voice to one and BarringTimeForMMTEL-Voice to zero;

3> else:

- 4> set BarringFactorForMMTEL-Voice and BarringTimeForMMTEL-Voice to the value of ac-BarringFactor and ac-BarringTime included in ssac-BarringForMMTEL-Voice, respectively;
- 2> else set BarringFactorForMMTEL-Voice to one and BarringTimeForMMTEL-Voice to zero;
- 1> set the local variables BarringFactorForMMTEL-Video and BarringTimeForMMTEL-Video as follows:
 - 2> if the UE is in RRC_IDLE and ssac-BarringForMMTEL-Video is present:
- 3> if the UE has one or more Access Classes, as stored on the USIM, with a value in the range 11..15, which is valid for the UE to use according to TS 22.011 [10] and TS 23.122 [11], and
- 3> if, for at least one of these Access Classes, the corresponding bit in the *ac-BarringForSpecialAC* contained in *ssac-BarringForMMTEL-Video* is set to zero:
 - 4> set BarringFactorForMMTEL-Video to one and BarringTimeForMMTEL-Video to zero;

3> else:

- 4> set BarringFactorForMMTEL-Video and BarringTimeForMMTEL-Video to the value of ac-BarringFactor and ac-BarringTime included in ssac-BarringForMMTEL-Video, respectively;
- 2> else set BarringFactorForMMTEL-Video to one and BarringTimeForMMTEL-Video to zero;
- 1> forward the variables *BarringFactorForMMTEL-Voice*, *BarringTimeForMMTEL-Voice*, *BarringFactorForMMTEL-Video* and *BarringTimeForMMTEL-Video* to the upper layers;

5.3.3.11 Access barring check

1> if timer T302 or "Tbarring" is running:

- 2> consider access to the cell as barred;
- 1> else if *SystemInformationBlockType2* includes "AC barring parameter":
 - 2> if the UE has one or more Access Classes, as stored on the USIM, with a value in the range 11..15, which is valid for the UE to use according to TS 22.011 [10] and TS 23.122 [11], and
- NOTE: ACs 12, 13, 14 are only valid for use in the home country and ACs 11, 15 are only valid for use in the HPLMN/ EHPLMN.
 - 2> for at least one of these valid Access Classes the corresponding bit in the *ac-BarringForSpecialAC* contained in "AC barring parameter" is set to *zero*:
- 3> consider access to the cell as not barred;

2> else:

- 3> draw a random number 'rand' uniformly distributed in the range: $0 \le rand < 1$;
- 3> if 'rand' is lower than the value indicated by ac-BarringFactor included in "AC barring parameter":
 - 4> consider access to the cell as not barred;

3> else:

4> consider access to the cell as barred;

1> else:

- 2> consider access to the cell as not barred;
- 1> if access to the cell is barred and both timers T302 and "Tbarring" are not running:
 - 2> draw a random number 'rand' that is uniformly distributed in the range $0 \le rand < 1$;
 - 2> start timer "Tbarring" with the timer value calculated as follows, using the *ac-BarringTime* included in "AC barring parameter":

"Tbarring" = (0.7 + 0.6 * rand) * ac-BarringTime.

5.3.3.12 EAB check

The UE shall:

- 1> if SystemInformationBlockType14 is present and includes the eab-Param:
 - 2> if the *eab-Common* is included in the *eab-Param*:
- 3> if the UE belongs to the category of UEs as indicated in the eab-Category contained in eab-Common; and
- 3> if for the Access Class of the UE, as stored on the USIM and with a value in the range 0..9, the corresponding bit in the *eab-BarringBitmap* contained in *eab-Common* is set to *one*:
 - 4> consider access to the cell as barred;

3> else:

- 4> consider access to the cell as not barred due to EAB;
- 2> else (the *eab-PerPLMN-List* is included in the *eab-Param*):
- 3> select the entry in the *eab-PerPLMN-List* corresponding to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]);
- 3> if the eab-Config for that PLMN is included:

- 4> if the UE belongs to the category of UEs as indicated in the *eab-Category* contained in *eab-Config*; and
- 4> if for the Access Class of the UE, as stored on the USIM and with a value in the range 0..9, the corresponding bit in the *eab-BarringBitmap* contained in *eab-Config* is set to *one*:
- 5> consider access to the cell as barred;
 - 4> else:
- 5> consider access to the cell as not barred due to EAB;
- 3> else:
- 4> consider access to the cell as not barred due to EAB;
- 1> else:
 - 2> consider access to the cell as not barred due to EAB;

5.3.4 Initial security activation

5.3.4.1 General

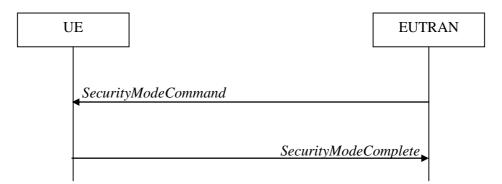


Figure 5.3.4.1-1: Security mode command, successful

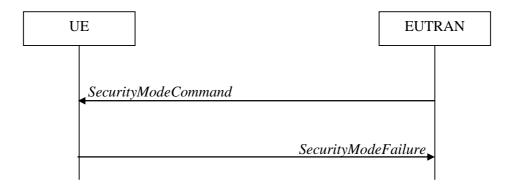


Figure 5.3.4.1-2: Security mode command, failure

The purpose of this procedure is to activate AS security upon RRC connection establishment.

5.3.4.2 Initiation

E-UTRAN initiates the security mode command procedure to a UE in RRC_CONNECTED. Moreover, E-UTRAN applies the procedure as follows:

- when only SRB1 is established, i.e. prior to establishment of SRB2 and/ or DRBs.

5.3.4.3 Reception of the SecurityModeCommand by the UE

The UE shall:

- 1> derive the K_{eNB} key, as specified in TS 33.401 [32];
- 1> derive the K_{RRCint} key associated with the *integrityProtAlgorithm* indicated in the *SecurityModeCommand* message, as specified in TS 33.401 [32];
- 1> request lower layers to verify the integrity protection of the SecurityModeCommand message, using the algorithm indicated by the integrityProtAlgorithm as included in the SecurityModeCommand message and the K_{RRCint} key;
- 1> if the SecurityModeCommand message passes the integrity protection check:
 - 2> derive the K_{RRCenc} key and the K_{UPenc} key associated with the *cipheringAlgorithm* indicated in the *SecurityModeCommand* message, as specified in TS 33.401 [32];
 - 2> if connected as an RN:
- 3> derive the K_{UPint} key associated with the *integrityProtAlgorithm* indicated in the *SecurityModeCommand* message, as specified in TS 33.401 [32];
 - 2> configure lower layers to apply integrity protection using the indicated algorithm and the K_{RRCint} key immediately, i.e. integrity protection shall be applied to all subsequent messages received and sent by the UE, including the SecurityModeComplete message;
 - 2> configure lower layers to apply ciphering using the indicated algorithm, the K_{RRCenc} key and the K_{UPenc} key after completing the procedure, i.e. ciphering shall be applied to all subsequent messages received and sent by the UE, except for the *SecurityModeComplete* message which is sent unciphered;
 - 2> if connected as an RN:
- 3> configure lower layers to apply integrity protection using the indicated algorithm and the K_{UPint} key, for DRBs that are subsequently configured to apply integrity protection, if any;
 - 2> consider AS security to be activated;
 - 2> submit the SecurityModeComplete message to lower layers for transmission, upon which the procedure ends;

1> else:

- 2> continue using the configuration used prior to the reception of the *SecurityModeCommand* message, i.e. neither apply integrity protection nor ciphering.
- 2> submit the SecurityModeFailure message to lower layers for transmission, upon which the procedure ends;

5.3.5 RRC connection reconfiguration

5.3.5.1 General

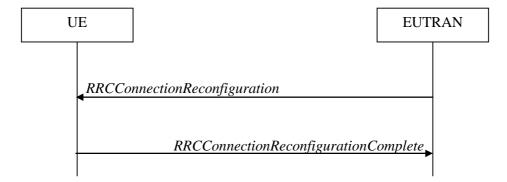


Figure 5.3.5.1-1: RRC connection reconfiguration, successful

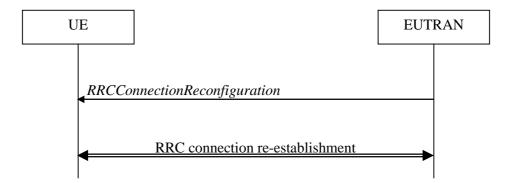


Figure 5.3.5.1-2: RRC connection reconfiguration, failure

The purpose of this procedure is to modify an RRC connection, e.g. to establish/ modify/ release RBs, to perform handover, to setup/ modify/ release measurements, to add/ modify/ release SCells. As part of the procedure, NAS dedicated information may be transferred from E-UTRAN to the UE.

5.3.5.2 Initiation

E-UTRAN may initiate the RRC connection reconfiguration procedure to a UE in RRC_CONNECTED. E-UTRAN applies the procedure as follows:

- the *mobilityControlInfo* is included only when AS-security has been activated, and SRB2 with at least one DRB are setup and not suspended;
- the establishment of RBs (other than SRB1, that is established during RRC connection establishment) is included only when AS security has been activated;
- the addition of SCells is performed only when AS security has been activated;

5.3.5.3 Reception of an *RRCConnectionReconfiguration* not including the *mobilityControlInfo* by the UE

If the *RRCConnectionReconfiguration* message does not include the *mobilityControlInfo* and the UE is able to comply with the configuration included in this message, the UE shall:

- 1> if this is the first *RRCConnectionReconfiguration* message after successful completion of the RRC Connection Re-establishment procedure:
 - 2> re-establish PDCP for SRB2 and for all DRBs that are established, if any;
 - 2> re-establish RLC for SRB2 and for all DRBs that are established, if any;
 - 2> if the RRCConnectionReconfiguration message includes the fullConfig:
- 3> perform the radio configuration procedure as specified in section 5.3.5.8;
 - 2> if the RRCConnectionReconfiguration message includes the radioResourceConfigDedicated:
- 3> perform the radio resource configuration procedure as specified in 5.3.10;
 - 2> resume SRB2 and all DRBs that are suspended, if any;
 - NOTE 1: The handling of the radio bearers after the successful completion of the PDCP re-establishment, e.g. the re-transmission of unacknowledged PDCP SDUs (as well as the associated status reporting), the handling of the SN and the HFN, is specified in TS 36.323 [8].
 - NOTE 2: The UE may discard SRB2 messages and data that it receives prior to completing the reconfiguration used to resume these bearers.

1> else:

2> if the RRCConnectionReconfiguration message includes the radioResourceConfigDedicated:

- 3> perform the radio resource configuration procedure as specified in 5.3.10;
 - NOTE 3: If the *RRCConnectionReconfiguration* message includes the establishment of radio bearers other than SRB1, the UE may start using these radio bearers immediately, i.e. there is no need to wait for an outstanding acknowledgment of the *SecurityModeComplete* message.
 - 1> if the received RRCConnectionReconfiguration includes the sCellToReleaseList:
 - 2> perform SCell release as specified in 5.3.10.3a;
 - 1> if the received RRCConnectionReconfiguration includes the sCellToAddModList:
 - 2> perform SCell addition or modification as specified in 5.3.10.3b;
 - 1> if the received RRCConnectionReconfiguration includes the systemInformationBlockType1Dedicated:
 - 2> perfom the actions upon reception of the SystemInformationBlockType1 message as specified in 5.2.2.7;
 - 1> if the RRCConnectionReconfiguration message includes the dedicatedInfoNASList:
 - 2> forward each element of the *dedicatedInfoNASList* to upper layers in the same order as listed;
 - 1> if the RRCConnectionReconfiguration message includes the measConfig:
 - 2> perform the measurement configuration procedure as specified in 5.5.2;
 - 1> perform the measurement identity autonomous removal as specified in 5.5.2.2a;
 - 1> if the RRCConnectionReconfiguration message includes the otherConfig:
 - 2> perform the other configuration procedure as specified in 5.3.10.9;
 - 1> submit the *RRCConnectionReconfigurationComplete* message to lower layers for transmission using the new configuration, upon which the procedure ends;

5.3.5.4 Reception of an *RRCConnectionReconfiguration* including the *mobilityControlInfo* by the UE (handover)

If the *RRCConnectionReconfiguration* message includes the *mobilityControlInfo* and the UE is able to comply with the configuration included in this message, the UE shall:

- 1> stop timer T310, if running;
- 1> start timer T304 with the timer value set to t304, as included in the mobilityControlInfo;
- 1> if the *carrierFreq* is included:
 - 2> consider the target PCell to be one on the frequency indicated by the *carrierFreq* with a physical cell identity indicated by the *targetPhysCellId*;
- 1> else:
 - 2> consider the target PCell to be one on the frequency of the source PCell with a physical cell identity indicated by the *targetPhysCellId*;
- 1> start synchronising to the DL of the target PCell;
- NOTE 1: The UE should perform the handover as soon as possible following the reception of the RRC message triggering the handover, which could be before confirming successful reception (HARQ and ARQ) of this message.
- 1> reset MAC;
- 1> re-establish PDCP for all RBs that are established:

- NOTE 2: The handling of the radio bearers after the successful completion of the PDCP re-establishment, e.g. the re-transmission of unacknowledged PDCP SDUs (as well as the associated status reporting), the handling of the SN and the HFN, is specified in TS 36.323 [8].
- 1> re-establish RLC for all RBs that are established;
- 1> configure lower layers to consider the SCell(s), if configured, to be in deactivated state;
- 1> apply the value of the *newUE-Identity* as the C-RNTI;
- 1> if the RRCConnectionReconfiguration message includes the fullConfig:
 - 2> perform the radio configuration procedure as specified in section 5.3.5.8;
- 1> configure lower layers in accordance with the received *radioResourceConfigCommon*;
- 1> configure lower layers in accordance with any additional fields, not covered in the previous, if included in the received *mobilityControlInfo*;
- 1> if the RRCConnectionReconfiguration message includes the radioResourceConfigDedicated:
 - 2> perform the radio resource configuration procedure as specified in 5.3.10;
- 1> if the *keyChangeIndicator* received in the *securityConfigHO* is set to *TRUE*:
 - 2> update the K_{eNB} key based on the K_{ASME} key taken into use with the latest successful NAS SMC procedure, as specified in TS 33.401 [32];

1> else:

- 2> update the K_{eNB} key based on the current K_{eNB} or the NH, using the *nextHopChainingCount* value indicated in the *securityConfigHO*, as specified in TS 33.401 [32];
- 1> store the nextHopChainingCount value;
- 1> if the *securityAlgorithmConfig* is included in the *securityConfigHO*:
 - 2> derive the K_{RRCint} key associated with the *integrityProtAlgorithm*, as specified in TS 33.401 [32];
 - 2> if connected as an RN:
- 3> derive the K_{UPint} key associated with the *integrityProtAlgorithm*, as specified in TS 33.401 [32];
 - 2> derive the K_{RRCenc} key and the K_{UPenc} key associated with the *cipheringAlgorithm*, as specified in TS 33.401 [32];
 - 1> else:
 - 2> derive the K_{RRCint} key associated with the current integrity algorithm, as specified in TS 33.401 [32];
 - 2> if connected as an RN:
- 3> derive the K_{UPint} key associated with the current integrity algorithm, as specified in TS 33.401 [32];
 - 2> derive the K_{RRCenc} key and the K_{UPenc} key associated with the current ciphering algorithm, as specified in TS 33.401 [32];
 - 1> configure lower layers to apply the integrity protection algorithm and the K_{RRCint} key, i.e. the integrity protection configuration shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
 - 1> configure lower layers to apply the ciphering algorithm, the K_{RRCenc} key and the K_{UPenc} key, i.e. the ciphering configuration shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
 - 1> if connected as an RN:

- 2> configure lower layers to apply the integrity protection algorithm and the K_{UPint} key, for current or subsequently established DRBs that are configured to apply integrity protection, if any;
- 1> if the received RRCConnectionReconfiguration includes the sCellToReleaseList:
 - 2> perform SCell release as specified in 5.3.10.3a;
- 1> if the received RRCConnectionReconfiguration includes the sCellToAddModList:
 - 2> perform SCell addition or modification as specified in 5.3.10.3b;
- 1> if the received RRCConnectionReconfiguration includes the systemInformationBlockType1Dedicated:
 - 2> perfom the actions upon reception of the SystemInformationBlockType1 message as specified in 5.2.2.7;
- 1> perform the measurement related actions as specified in 5.5.6.1;
- 1> if the *RRCConnectionReconfiguration* message includes the *measConfig*:
 - 2> perform the measurement configuration procedure as specified in 5.5.2;
- 1> perform the measurement identity autonomous removal as specified in 5.5.2.2a;
- 1> release reportProximityConfig and clear any associated proximity status reporting timer;
- 1> if the RRCConnectionReconfiguration message includes the otherConfig:
 - 2> perform the other configuration procedure as specified in 5.3.10.9;
- 1> set the content of *RRCConnectionReconfigurationComplete* message as follows:
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
- 3> include rlf-InfoAvailable;
 - 2> if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
- 3> include the *logMeasAvailable*;
 - 2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:
- 3> include connEstFailInfoAvailable;
 - 1> submit the RRCConnectionReconfigurationComplete message to lower layers for transmission;
 - 1> if MAC successfully completes the random access procedure:
 - 2> stop timer T304;
 - 2> apply the parts of the CQI reporting configuration, the scheduling request configuration and the sounding RS configuration that do not require the UE to know the SFN of the target PCell, if any;
 - 2> apply the parts of the measurement and the radio resource configuration that require the UE to know the SFN of the target PCell (e.g. measurement gaps, periodic CQI reporting, scheduling request configuration, sounding RS configuration), if any, upon acquiring the SFN of the target PCell;
 - NOTE 3: Whenever the UE shall setup or reconfigure a configuration in accordance with a field that is received it applies the new configuration, except for the cases addressed by the above statements.
 - 2> if the UE is configured to provide IDC indications:
- 3> if the UE has transmitted an *InDeviceCoexIndication* message during the last 1 second preceding reception of the *RRCConnectionReconfiguration* message including *mobilityControlInfo*:
 - 4> initiate transmission of the InDeviceCoexIndication message in accordance with 5.6.9.3;

- 2> if the UE is configured to provide power preference indications:
- 3> if the UE has transmitted a *UEAssistanceInformation* message during the last 1 second preceding reception of the *RRCConnectionReconfiguration* message including *mobilityControlInfo*:
 - 4> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.6.10.3;
 - 2> if *SystemInformationBlockType15* is broadcast by the PCell:
- 3> if the UE has transmitted a *MBMSInterestIndication* message during the last 1 second preceding reception of the *RRCConnectionReconfiguration* message including *mobilityControlInfo*:
 - 4> ensure having a valid version of *SystemInformationBlockType15* for the PCell;
 - 4> determine the set of MBMS frequencies of interest in accordance with 5.8.5.3;
 - 4> initiate transmission of the MBMSInterestIndication message in accordance with 5.8.5.4;
 - 2> the procedure ends;
 - NOTE 4: The UE is not required to determine the SFN of the target PCell by acquiring system information from that cell before performing RACH access in the target PCell.

5.3.5.5 Reconfiguration failure

The UE shall:

- 1> if the UE is unable to comply with (part of) the configuration included in the *RRCConnectionReconfiguration* message:
 - 2> continue using the configuration used prior to the reception of RRCConnectionReconfiguration message;
 - 2> if security has not been activated:
- 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause other;
 - 2> else:
- 3> initiate the connection re-establishment procedure as specified in 5.3.7, upon which the connection reconfiguration procedure ends;
 - NOTE 1: The UE may apply above failure handling also in case the *RRCConnectionReconfiguration* message causes a protocol error for which the generic error handling as defined in 5.7 specifies that the UE shall ignore the message.
 - NOTE 2: If the UE is unable to comply with part of the configuration, it does not apply any part of the configuration, i.e. there is no partial success/ failure.

5.3.5.6 T304 expiry (handover failure)

- 1> if T304 expires (handover failure):
- NOTE 1: Following T304 expiry any dedicated preamble, if provided within the *rach-ConfigDedicated*, is not available for use by the UE anymore.
 - 2> revert back to the configuration used in the source PCell, excluding the configuration configured by the *physicalConfigDedicated*, the *mac-MainConfig* and the *sps-Config*;
 - 2> store the following handover failure information in VarRLF-Report by setting its fields as follows:
- 3> clear the information included in *VarRLF-Report*, if any;
- 3> set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e. includes the RPLMN);

3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the source PCell based on measurements collected up to the moment the UE detected handover failure;

3> set the *measResultNeighCells* to include the best measured cells, other than the source PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected handover failure, and set its fields as follows;

- 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
- 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
- 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
- 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;
- 4> for each neighbour cell included, include the optional fields that are available;
- NOTE 2: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.
- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell of the failed handover;
- 3> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;
- 3> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
- 3> set the *connectionFailureType* to 'hof;
- 3> set the *c-RNTI* to the C-RNTI used in the source PCell;
 - 2> initiate the connection re-establishment procedure as specified in 5.3.7, upon which the RRC connection reconfiguration procedure ends;

The UE may discard the handover failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the failure is detected, upon power off or upon detach.

NOTE 3: E-UTRAN may retrieve the handover failure information using the UE information procedure with *rlf-ReportReq* set to *true*, as specified in 5.6.5.3.

5.3.5.7 Void

5.3.5.8 Radio Configuration involving full configuration option

- 1> release/ clear all current dedicated radio configurations except the C-RNTI, the security configuration and the PDCP, RLC, logical channel configurations for the RBs and the logged measurement configuration;
- NOTE 1: Radio configuration is not just the resource configuration but includes other configurations like *MeasConfig* and *OtherConfig*.

- 1> if the RRCConnectionReconfiguration message includes the mobilityControlInfo:
 - 2> release/ clear all current common radio configurations;
 - 2> use the default values specified in 9.2.5 for timer T310, T311 and constant N310, N311;
- 1> else:
 - 2> use values for timers T301, T310, T311 and constants N310, N311, as included in *ue-TimersAndConstants* received in *SystemInformationBlockType2*;
- 1> apply the default physical channel configuration as specified in 9.2.4;
- 1> apply the default semi-persistent scheduling configuration as specified in 9.2.3;
- 1> apply the default MAC main configuration as specified in 9.2.2;
- 1> for each *srb-Identity* value included in the *srb-ToAddModList* (SRB reconfiguration):
 - 2> apply the specified configuration defined in 9.1.2 for the corresponding SRB;
 - 2> apply the corresponding default RLC configuration for the SRB specified in 9.2.1.1 for SRB1 or in 9.2.1.2 for SRB2;
 - 2> apply the corresponding default logical channel configuration for the SRB as specified in 9.2.1.1 for SRB1 or in 9.2.1.2 for SRB2;
- NOTE 2: This is to get the SRBs (SRB1 and SRB2 for handover and SRB2 for reconfiguration after reestablishment) to a known state from which the reconfiguration message can do further configuration.
- 1> for each eps-BearerIdentity value included in the drb-ToAddModList that is part of the current UE configuration:
 - 2> release the PDCP entity;
 - 2> release the RLC entity or entities;
 - 2> release the DTCH logical channel;
 - 2> release the *drb-identity*;
- NOTE 3: This will retain the *eps-bearerIdentity* but remove the DRBs including *drb-identity* of these bearers from the current UE configuration and trigger the setup of the DRBs within the AS in Section 5.3.10.3 using the new configuration. The *eps-bearerIdentity* acts as the anchor for associating the released and re-setup DRB.
- 1> for each *eps-BearerIdentity* value that is part of the current UE configuration but not part of the *drb-ToAddModList*:
 - 2> perform DRB release as specified in 5.3.10.2;

5.3.6 Counter check

5.3.6.1 General

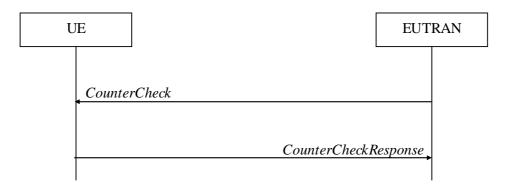


Figure 5.3.6.1-1: Counter check procedure

The counter check procedure is used by E-UTRAN to request the UE to verify the amount of data sent/ received on each DRB. More specifically, the UE is requested to check if, for each DRB, the most significant bits of the COUNT match with the values indicated by E-UTRAN.

NOTE: The procedure enables E-UTRAN to detect packet insertion by an intruder (a 'man in the middle').

5.3.6.2 Initiation

E-UTRAN initiates the procedure by sending a *CounterCheck* message.

NOTE: E-UTRAN may initiate the procedure when any of the COUNT values reaches a specific value.

5.3.6.3 Reception of the *CounterCheck* message by the UE

Upon receiving the *CounterCheck* message, the UE shall:

- 1> for each DRB that is established:
 - 2> if no COUNT exists for a given direction (uplink or downlink) because it is a uni-directional bearer configured only for the other direction:
- 3> assume the COUNT value to be 0 for the unused direction;
 - 2> if the *drb-Identity* is not included in the *drb-CountMSB-InfoList*:
- 3> include the DRB in the *drb-CountInfoList* in the *CounterCheckResponse* message by including the *drb-Identity*, the *count-Uplink* and the *count-Downlink* set to the value of the corresponding COUNT;
 - 2> else if, for at least one direction, the most significant bits of the COUNT are different from the value indicated in the *drb-CountMSB-InfoList*:
- 3> include the DRB in the *drb-CountInfoList* in the *CounterCheckResponse* message by including the *drb-Identity*, the *count-Uplink* and the *count-Downlink* set to the value of the corresponding COUNT;
 - 1> for each DRB that is included in the *drb-CountMSB-InfoList* in the *CounterCheck* message that is not established:
 - 2> include the DRB in the *drb-CountInfoList* in the *CounterCheckResponse* message by including the *drb-Identity*, the *count-Uplink* and the *count-Downlink* with the most significant bits set identical to the corresponding values in the *drb-CountMSB-InfoList* and the least significant bits set to zero;
 - 1> submit the CounterCheckResponse message to lower layers for transmission upon which the procedure ends;

5.3.7 RRC connection re-establishment

5.3.7.1 General

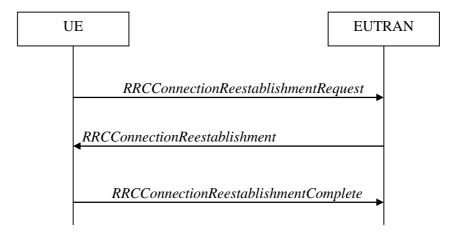


Figure 5.3.7.1-1: RRC connection re-establishment, successful

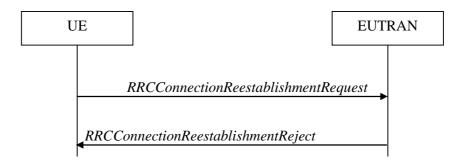


Figure 5.3.7.1-2: RRC connection re-establishment, failure

The purpose of this procedure is to re-establish the RRC connection, which involves the resumption of SRB1 operation, the re-activation of security and the configuration of only the PCell.

A UE in RRC_CONNECTED, for which security has been activated, may initiate the procedure in order to continue the RRC connection. The connection re-establishment succeeds only if the concerned cell is prepared i.e. has a valid UE context. In case E-UTRAN accepts the re-establishment, SRB1 operation resumes while the operation of other radio bearers remains suspended. If AS security has not been activated, the UE does not initiate the procedure but instead moves to RRC_IDLE directly.

E-UTRAN applies the procedure as follows:

- to reconfigure SRB1 and to resume data transfer only for this RB;
- to re-activate AS security without changing algorithms.

5.3.7.2 Initiation

The UE shall only initiate the procedure when AS security has been activated. The UE initiates the procedure when one of the following conditions is met:

- 1> upon detecting radio link failure, in accordance with 5.3.11; or
- 1> upon handover failure, in accordance with 5.3.5.6; or
- 1> upon mobility from E-UTRA failure, in accordance with 5.4.3.5; or
- 1> upon integrity check failure indication from lower layers; or

1> upon an RRC connection reconfiguration failure, in accordance with 5.3.5.5;

Upon initiation of the procedure, the UE shall:

- 1> stop timer T310, if running;
- 1> start timer T311;
- 1> suspend all RBs except SRB0;
- 1> reset MAC;
- 1> release the SCell(s), if configured, in accordance with 5.3.10.3a;
- 1> apply the default physical channel configuration as specified in 9.2.4;
- 1> apply the default semi-persistent scheduling configuration as specified in 9.2.3;
- 1> apply the default MAC main configuration as specified in 9.2.2;
- 1> release powerPrefIndicationConfig, if configured and stop timer T340, if running;
- 1> release reportProximityConfig and clear any associated proximity status reporting timer;
- 1> release *obtainLocationConfig*, if configured;
- 1> release idc-Config, if configured;
- 1> release *measSubframePatternPCell*, if configured;
- 1> if connected as an RN and configured with an RN subframe configuration:
 - 2> release the RN subframe configuration;
- 1> perform cell selection in accordance with the cell selection process as specified in TS 36.304 [4];

5.3.7.3 Actions following cell selection while T311 is running

Upon selecting a suitable E-UTRA cell, the UE shall:

- 1> stop timer T311;
- 1> start timer T301;
- 1> apply the *timeAlignmentTimerCommon* included in *SystemInformationBlockType2*;
- 1> initiate transmission of the RRCConnectionReestablishmentRequest message in accordance with 5.3.7.4;
- NOTE: This procedure applies also if the UE returns to the source PCell.

Upon selecting an inter-RAT cell, the UE shall:

- 1> if the selected cell is a UTRA cell, and if the UE supports Radio Link Failure Report for Inter-RAT MRO, include *selectedUTRA-CellId* in the *VarRLF-Report* and set it to the physical cell identity and carrier frequency of the selected UTRA cell;
- 1> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';

5.3.7.4 Actions related to transmission of *RRCConnectionReestablishmentRequest* message

If the procedure was initiated due to radio link failure or handover failure, the UE shall:

1> set the reestablishmentCellId in the VarRLF-Report to the global cell identity of the selected cell;

The UE shall set the contents of RRCConnectionReestablishmentRequest message as follows:

- 1> set the *ue-Identity* as follows:
 - 2> set the *c-RNTI* to the C-RNTI used in the source PCell (handover and mobility from E-UTRA failure) or used in the PCell in which the trigger for the re-establishment occurred (other cases);
 - 2> set the *physCellId* to the physical cell identity of the source PCell (handover and mobility from E-UTRA failure) or of the PCell in which the trigger for the re-establishment occurred (other cases);
 - 2> set the *shortMAC-I* to the 16 least significant bits of the MAC-I calculated:
- 3> over the ASN.1 encoded as per section 8 (i.e., a multiple of 8 bits) VarShortMAC-Input;
- 3> with the K_{RRCint} key and integrity protection algorithm that was used in the source PCell (handover and mobility from E-UTRA failure) or of the PCell in which the trigger for the re-establishment occurred (other cases); and
- 3> with all input bits for COUNT, BEARER and DIRECTION set to binary ones;
 - 1> set the reestablishmentCause as follows:
 - 2> if the re-establishment procedure was initiated due to reconfiguration failure as specified in 5.3.5.5 (the UE is unable to comply with the reconfiguration):
- 3> set the reestablishmentCause to the value reconfigurationFailure;
 - 2> else if the re-establishment procedure was initiated due to handover failure as specified in 5.3.5.6 (intra-LTE handover failure) or 5.4.3.5 (inter-RAT mobility from EUTRA failure):
- 3> set the reestablishmentCause to the value handoverFailure;
 - 2> else:
- 3> set the reestablishmentCause to the value otherFailure;

The UE shall submit the RRCConnectionReestablishmentRequest message to lower layers for transmission.

5.3.7.5 Reception of the RRCConnectionReestablishment by the UE

NOTE 1: Prior to this, lower layer signalling is used to allocate a C-RNTI. For further details see TS 36.321 [6];

- 1> stop timer T301;
- 1> consider the current cell to be the PCell;
- 1> re-establish PDCP for SRB1;
- 1> re-establish RLC for SRB1;
- 1> perform the radio resource configuration procedure in accordance with the received *radioResourceConfigDedicated* and as specified in 5.3.10;
- 1> resume SRB1;
- NOTE 2: E-UTRAN should not transmit any message on SRB1 prior to receiving the *RRCConnectionReestablishmentComplete* message.
- 1> update the K_{eNB} key based on the K_{ASME} key to which the current K_{eNB} is associated, using the nextHopChainingCount value indicated in the RRCConnectionReestablishment message, as specified in TS 33.401 [32];
- 1> store the *nextHopChainingCount* value;
- 1> derive the K_{RRCint} key associated with the previously configured integrity algorithm, as specified in TS 33.401 [32];

- 1> derive the K_{RRCenc} key and the K_{UPenc} key associated with the previously configured ciphering algorithm, as specified in TS 33.401 [32];
- 1> if connected as an RN:
 - 2> derive the K_{UPint} key associated with the previously configured integrity algorithm, as specified in TS 33.401 [32];
- 1> configure lower layers to activate integrity protection using the previously configured algorithm and the K_{RRCint} key immediately, i.e., integrity protection shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
- 1> if connected as an RN:
 - 2> configure lower layers to apply integrity protection using the previously configured algorithm and the K_{UPint} key, for subsequently resumed or subsequently established DRBs that are configured to apply integrity protection, if any;
- 1> configure lower layers to apply ciphering using the previously configured algorithm, the K_{RRCenc} key and the K_{UPenc} key immediately, i.e., ciphering shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
- 1> set the content of RRCConnectionReestablishmentComplete message as follows:
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
- 3> include the *rlf-InfoAvailable*;
 - 2> if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
- 3> include the *logMeasAvailable*;
 - 2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:
- 3> include the *connEstFailInfoAvailable*;
 - 1> perform the measurement related actions as specified in 5.5.6.1;
 - 1> perform the measurement identity autonomous removal as specified in 5.5.2.2a;
 - 1> submit the RRCConnectionReestablishmentComplete message to lower layers for transmission;
 - 1> if *SystemInformationBlockType15* is broadcast by the PCell:
 - 2> if the UE has transmitted an *MBMSInterestIndication* message during the last 1 second preceding detection of radio link failure:
- 3> ensure having a valid version of *SystemInformationBlockType15* for the PCell;
- 3> determine the set of MBMS frequencies of interest in accordance with 5.8.5.3;
- 3> initiate transmission of the MBMSInterestIndication message in accordance with 5.8.5.4;
 - 1> the procedure ends;

5.3.7.6 T311 expiry

Upon T311 expiry, the UE shall:

1> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';

5.3.7.7 T301 expiry or selected cell no longer suitable

The UE shall:

- 1> if timer T301 expires; or
- 1> if the selected cell becomes no longer suitable according to the cell selection criteria as specified in TS 36.304 [4]:
 - 2> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';

5.3.7.8 Reception of RRCConnectionReestablishmentReject by the UE

Upon receiving the RRCConnectionReestablishmentReject message, the UE shall:

1> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';

5.3.8 RRC connection release

5.3.8.1 General



Figure 5.3.8.1-1: RRC connection release, successful

The purpose of this procedure is to release the RRC connection, which includes the release of the established radio bearers as well as all radio resources.

5.3.8.2 Initiation

E-UTRAN initiates the RRC connection release procedure to a UE in RRC_CONNECTED.

5.3.8.3 Reception of the RRCConnectionRelease by the UE

- 1> delay the following actions defined in this sub-clause 60 ms from the moment the *RRCConnectionRelease* message was received or optionally when lower layers indicate that the receipt of the *RRCConnectionRelease* message has been successfully acknowledged, whichever is earlier;
- 1> if the RRCConnectionRelease message includes the idleModeMobilityControlInfo:
 - 2> store the cell reselection priority information provided by the *idleModeMobilityControlInfo*;
 - 2> if the t320 is included:
- 3> start timer T320, with the timer value set according to the value of t320;
 - 1> else:
 - 2> apply the cell reselection priority information broadcast in the system information;
 - 1> if the release Cause received in the RRCConnectionRelease message indicates loadBalancingTAURequired:

- 2> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'load balancing TAU required';
- 1> else if the release Cause received in the RRCConnectionRelease message indicates cs-FallbackHighPriority:
 - 2> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'CS Fallback High Priority';

1> else:

- 2> if the extendedWaitTime is present and the UE supports delay tolerant access:
- 3> forward the extendedWaitTime to upper layers;
 - 2> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';

5.3.8.4 T320 expiry

The UE shall:

- 1> if T320 expires:
 - 2> if stored, discard the cell reselection priority information provided by the *idleModeMobilityControlInfo* or inherited from another RAT;
 - 2> apply the cell reselection priority information broadcast in the system information;

5.3.9 RRC connection release requested by upper layers

5.3.9.1 General

The purpose of this procedure is to release the RRC connection. Access to the current PCell may be barred as a result of this procedure.

NOTE: Upper layers invoke the procedure, e.g. upon determining that the network has failed an authentication check, see TS 24.301 [35].

5.3.9.2 Initiation

The UE initiates the procedure when upper layers request the release of the RRC connection. The UE shall not initiate the procedure for power saving purposes.

The UE shall:

- 1> if the upper layers indicate barring of the PCell:
 - 2> treat the PCell used prior to entering RRC_IDLE as barred according to TS 36.304 [4];
- 1> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';

5.3.10 Radio resource configuration

5.3.10.0 General

- 1> if the received *radioResourceConfigDedicated* includes the *srb-ToAddModList*:
 - 2> perform the SRB addition or reconfiguration as specified in 5.3.10.1;
- 1> if the received radioResourceConfigDedicated includes the drb-ToReleaseList:
 - 2> perform DRB release as specified in 5.3.10.2;

- 1> if the received radioResourceConfigDedicated includes the drb-ToAddModList:
 - 2> perform DRB addition or reconfiguration as specified in 5.3.10.3;
- 1> if the received radioResourceConfigDedicated includes the mac-MainConfig:
 - 2> perform MAC main reconfiguration as specified in 5.3.10.4;
- 1> if the received *radioResourceConfigDedicated* includes *sps-Config*:
 - 2> perform SPS reconfiguration according to 5.3.10.5;
- 1> if the received radioResourceConfigDedicated includes the physicalConfigDedicated:
 - 2> reconfigure the physical channel configuration as specified in 5.3.10.6.
- 1> if the received *radioResourceConfigDedicated* includes the *rlf-TimersAndConstants*:
 - 2> reconfigure the values of timers and constants as specified in 5.3.10.7;
- 1> if the received radioResourceConfigDedicated includes the measSubframePatternPCell:
 - 2> reconfigure the time domain measurement resource restriction for the serving cell as specified in 5.3.10.8;

5.3.10.1 SRB addition/ modification

The UE shall:

- 1> for each *srb-Identity* value included in the *srb-ToAddModList* that is not part of the current UE configuration (SRB establishment):
 - 2> apply the specified configuration defined in 9.1.2 for the corresponding SRB;
 - 2> establish a PDCP entity and configure it with the current security configuration, if applicable;
 - 2> establish an RLC entity in accordance with the received *rlc-Config*;
 - 2> establish a DCCH logical channel in accordance with the received *logicalChannelConfig* and with the logical channel identity set in accordance with 9.1.2;
- 1> for each *srb-Identity* value included in the *srb-ToAddModList* that is part of the current UE configuration (SRB reconfiguration):
 - 2> reconfigure the RLC entity in accordance with the received *rlc-Config*;
 - 2> reconfigure the DCCH logical channel in accordance with the received logicalChannelConfig;

5.3.10.2 DRB release

- 1> for each *drb-Identity* value included in the *drb-ToReleaseList* that is part of the current UE configuration (DRB release); or
- 1> for each *drb-identity* value that is to be released as the result of full configuration option according to 5.3.5.8:
 - 2> release the PDCP entity;
 - 2> release the RLC entity or entities;
 - 2> release the DTCH logical channel;
- 1> if the procedure was triggered due to handover:
 - 2> indicate the release of the DRB(s) and the *eps-BearerIdentity* of the released DRB(s) to upper layers after successful handover;

1> else:

- 2> indicate the release of the DRB(s) and the *eps-BearerIdentity* of the released DRB(s) to upper layers immediately.
- NOTE: The UE does not consider the message as erroneous if the *drb-ToReleaseList* includes any *drb-Identity* value that is not part of the current UE configuration.

5.3.10.3 DRB addition/ modification

The UE shall:

- 1> for each *drb-Identity* value included in the *drb-ToAddModList* that is not part of the current UE configuration (DRB establishment including the case when full configuration option is used):
 - 2> establish a PDCP entity and configure it with the current security configuration and in accordance with the received *pdcp-Config*;
 - 2> establish an RLC entity or entities in accordance with the received *rlc-Config*;
 - 2> establish a DTCH logical channel in accordance with the received *logicalChannelIdentity* and the received *logicalChannelConfig*;
 - 2> if the RRCConnectionReconfiguration message includes the fullConfig IE:
- 3> associate the established DRB with corresponding included *eps-BearerIdentity*;
 - 2> else:
- 3> indicate the establishment of the DRB and the eps-BearerIdentity of the established DRB(s) to upper layers;
 - 1> for each *drb-Identity* value included in the *drb-ToAddModList* that is part of the current UE configuration (DRB reconfiguration):
 - 2> if the *pdcp-Config* is included:
- 3> reconfigure the PDCP entity in accordance with the received *pdcp-Config*;
 - 2> if the *rlc-Config* is included:
- 3> reconfigure the RLC entity or entities in accordance with the received *rlc-Config*;
 - 2> if the *logicalChannelConfig* is included:
- 3> reconfigure the DTCH logical channel in accordance with the received logicalChannelConfig;
 - NOTE: Removal and addition of the same *drb-Identity* in single *radioResourceConfiguration* is not supported.

5.3.10.3a SCell release

- 1> if the release is triggered by reception of the *sCellToReleaseList*:
 - 2> for each sCellIndex value included in the sCellToReleaseList:
- 3> if the current UE configuration includes an SCell with value sCellIndex:
 - 4> release the SCell;
 - 1> if the release is triggered by RRC connection re-establishment:
 - 2> release all SCells that are part of the current UE configuration;

5.3.10.3b SCell addition/ modification

The UE shall:

- 1> for each *sCellIndex* value included in the *sCellToAddModList* that is not part of the current UE configuration (SCell addition):
 - 2> add the SCell, corresponding to the *cellIdentification*, in accordance with the received *radioResourceConfigCommonSCell* and *radioResourceConfigDedicatedSCell*;
 - 2> configure lower layers to consider the SCell to be in deactivated state;
- 1> for each *sCellIndex* value included in the *sCellToAddModList* that is part of the current UE configuration (SCell modification):
 - 2> modify the SCell configuration in accordance with the received radioResourceConfigDedicatedSCell;

5.3.10.4 MAC main reconfiguration

The UE shall:

- 1> reconfigure the MAC main configuration in accordance with the received *mac-MainConfig* other than *stag-ToReleaseList* and *stag-ToAddModList*;
- 1> if the received *mac-MainConfig* includes the *stag-ToReleaseList*:
 - 2> for each STAG-Id value included in the stag-ToReleaseList that is part of the current UE configuration:
- 3> release the STAG indicated by STAG-Id;
 - 1> if the received mac-MainConfig includes the stag-ToAddModList:
 - 2> for each *stag-Id* value included in *stag-ToAddModList* that is not part of the current UE configuration (STAG addition):
- 3> add the STAG, corresponding to the *stag-Id*, in accordance with the received *timeAlignmentTimerSTAG*;
 - 2> for each *stag-Id* value included in *stag-ToAddModList* that is part of the current UE configuration (STAG modification):
- 3> reconfigure the STAG, corresponding to the stag-Id, in accordance with the received timeAlignmentTimerSTAG;

5.3.10.5 Semi-persistent scheduling reconfiguration

The UE shall:

1> reconfigure the semi-persistent scheduling in accordance with the received *sps-Config*;

5.3.10.6 Physical channel reconfiguration

- 1> if the *antennaInfo-r10* is included in the received *physicalConfigDedicated* and the previous version of this field that was received by the UE was *antennaInfo* (without suffix i.e. the version defined in REL-8):
 - 2> apply the default antenna configuration as specified in section 9.2.4;
- 1> if the *cqi-ReportConfig-r10* is included in the received *physicalConfigDedicated* and the previous version of this field that was received by the UE was *cqi-ReportConfig* (without suffix i.e. the version defined in REL-8):
 - 2> apply the default CQI reporting configuration as specified in 9.2.4;
- NOTE: Application of the default configuration involves release of all extensions introduced in REL-9 and later.
- 1> reconfigure the physical channel configuration in accordance with the received physicalConfigDedicated;

- 1> if the antennalnfo is included and set to explicitValue:
 - 2> if the configured transmissionMode is tm1, tm2, tm5, tm6 or tm7; or
 - 2> if the configured transmissionMode is tm8 and pmi-RI-Report is not present; or
 - 2> if the configured transmissionMode is tm9 and pmi-RI-Report is not present; or
 - 2> if the configured *transmissionMode* is *tm9* and *pmi-RI-Report* is present and *antennaPortsCount* within *csi-RS* is set to *an1*:
- 3> release ri-ConfigIndex in cqi-ReportPeriodic, if previously configured;
 - 1> else if the *antennaInfo* is included and set to *defaultValue*:
 - 2> release *ri-ConfigIndex* in *cqi-ReportPeriodic*, if previously configured;

5.3.10.7 Radio Link Failure Timers and Constants reconfiguration

The UE shall:

- 1> if the received *rlf-TimersAndConstants* is set to release:
 - 2> use values for timers T301, T310, T311 and constants N310, N311, as included in *ue-TimersAndConstants* received in *SystemInformationBlockType2*;
- 1> else:
 - 2> reconfigure the value of timers and constants in accordance with received rlf-TimersAndConstants;

5.3.10.8 Time domain measurement resource restriction for serving cell

The UE shall:

- 1> if the received *measSubframePatternPCell* is set to *release*:
 - 2> release the time domain measurement resource restriction for the PCell, if previously configured
- 1> else:
 - 2> apply the time domain measurement resource restriction for the PCell in accordance with the received *measSubframePatternPCell*;

5.3.10.9 Other configuration

- 1> if the received *otherConfig* includes the *reportProximityConfig*:
 - 2> if *proximityIndicationEUTRA* is set to *enabled*:
- 3> consider itself to be configured to provide proximity indications for E-UTRA frequencies in accordance with 5.3.14;
 - 2> else:
- 3> consider itself not to be configured to provide proximity indications for E-UTRA frequencies;
 - 2> if *proximityIndicationUTRA* is set to *enabled*:
- 3> consider itself to be configured to provide proximity indications for UTRA frequencies in accordance with 5.3.14;
 - 2> else:
- 3> consider itself not to be configured to provide proximity indications for UTRA frequencies;
 - 1> if the received *otherConfig* includes the *obtainLocation*:

2> attempt to have detailed location information available for any subsequent measurement report;

NOTE: The UE is requested to attempt to have valid detailed location information available whenever sending a measurement report for which it is configured to include available detailed location information. The UE may not succeed e.g. because the user manually disabled the GPS hardware, due to no/poor satellite coverage. Further details, e.g. regarding when to activate GNSS, are up to UE implementation.

- 1> if the received *otherConfig* includes the *idc-Config*:
 - 2> if *idc-Indication* is included (i.e. set to *setup*):
- 3> consider itself to be configured to provide IDC indications in accordance with 5.6.9;

2> else

- 3> consider itself not to be configured to provide IDC indications;
 - 2> if autonomousDenialParameters is included:

3> consider itself to be allowed to deny any transmission in a particular UL subframe if during the number of subframes indicated by *autonomousDenialValidity*, preceding and including this particular subframe, it autonomously denied fewer UL subframes than indicated by *autonomousDenialSubframes*;

2> else:

- 3> consider itself not to be allowed to deny any UL transmission;
 - 1> if the received *otherConfig* includes the *powerPrefIndicationConfig*:
 - 2> if powerPrefIndicationConfig is set to setup:
- 3> consider itself to be configured to provide power preference indications in accordance with 5.6.10;

2> else:

3> consider itself not to be configured to provide power preference indications;

5.3.11 Radio link failure related actions

5.3.11.1 Detection of physical layer problems in RRC CONNECTED

The UE shall:

1> upon receiving N310 consecutive "out-of-sync" indications for the PCell from lower layers while neither T300, T301, T304 nor T311 is running:

2> start timer T310;

NOTE: Physical layer monitoring and related autonomous actions do not apply to SCells.

5.3.11.2 Recovery of physical layer problems

Upon receiving N311 consecutive "in-sync" indications for the PCell from lower layers while T310 is running, the UE shall:

1> stop timer T310;

- NOTE 1: In this case, the UE maintains the RRC connection without explicit signalling, i.e. the UE maintains the entire radio resource configuration.
- NOTE 2: Periods in time where neither "in-sync" nor "out-of-sync" is reported by layer 1 do not affect the evaluation of the number of consecutive "in-sync" or "out-of-sync" indications.

5.3.11.3 Detection of radio link failure

- 1> upon T310 expiry; or
- 1> upon random access problem indication from MAC while neither T300, T301, T304 nor T311 is running; or
- 1> upon indication from RLC that the maximum number of retransmissions has been reached:
 - 2> consider radio link failure to be detected;
 - 2> store the following radio link failure information in the VarRLF-Report by setting its fields as follows:
- 3> clear the information included in *VarRLF-Report*, if any;
- 3> set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e. includes the RPLMN);
- 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected radio link failure;
- 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected radio link failure, and set its fields as follows:
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the *measResultListEUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;
 - 4> for each neighbour cell included, include the optional fields that are available;
 - NOTE: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.
- 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
- 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;
- 3> if an RRCConnectionReconfiguration message including the mobilityControlInfo was received before the connection failure:
 - 4> if the last RRCConnectionReconfiguration message including the mobilityControlInfo concerned an intra E-UTRA handover:
- 5> include the *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;
- 5> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
 - 4> if the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo* concerned a handover to E-UTRA from UTRA and if the UE supports Radio Link Failure Report for Inter-RAT MRO:

5> include the *previousUTRA-CellId* and set it to the physical cell identity, the carrier frequency and the global cell identity, if available, of the UTRA Cell in which the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;

5> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;

- 3> set the *connectionFailureType* to *rlf*;
- 3> set the *c-RNTI* to the C-RNTI used in the PCell;
- 3> set the *rlf-Cause* to the trigger for detecting radio link failure;
 - 2> if AS security has not been activated:
- 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
 - 2> else:
- 3> initiate the connection re-establishment procedure as specified in 5.3.7;

The UE may discard the radio link failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the radio link failure is detected, upon power off or upon detach.

5.3.12 UE actions upon leaving RRC_CONNECTED

Upon leaving RRC_CONNECTED, the UE shall:

- 1> reset MAC:
- 1> stop all timers that are running except T320, T325 and T330;
- 1> release all radio resources, including release of the RLC entity, the MAC configuration and the associated PDCP entity for all established RBs;
- 1> indicate the release of the RRC connection to upper layers together with the release cause;
- 1> if leaving RRC_CONNECTED was triggered neither by reception of the *MobilityFromEUTRACommand* message nor by selecting an inter-RAT cell while T311 was running:
 - 2> enter RRC_IDLE and perform procedures as specified in TS 36.304 [4, 5.2.7];

5.3.13 UE actions upon PUCCH/ SRS release request

Upon receiving a PUCCH/ SRS release request from lower layers, the UE shall:

- 1> apply the default physical channel configuration for *cqi-ReportConfig* as specified in 9.2.4 and release *cqi-ReportConfigSCell*, for each SCell that is configured, if any;
- 1> apply the default physical channel configuration for *soundingRS-UL-ConfigDedicated* as specified in 9.2.4, for all serving cells;
- 1> apply the default physical channel configuration for schedulingRequestConfig as specified in 9.2.4;

Upon receiving an SRS release request from lower layers, the UE shall:

1> apply the default physical channel configuration for *soundingRS-UL-ConfigDedicated*, as specified in 9.2.4, for the cells of the concerned TAG;

NOTE: Upon PUCCH/ SRS release request, the UE does not modify the *soundingRS-UL-ConfigDedicatedAperiodic* i.e. it does not apply the default for this field (release).

5.3.14 Proximity indication

5.3.14.1 General

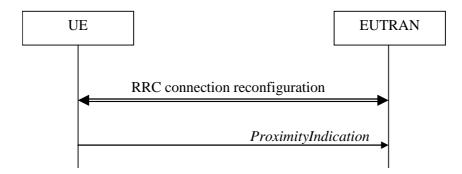


Figure 5.3.14.1-1: Proximity indication

The purpose of this procedure is to indicate that the UE is entering or leaving the proximity of one or more CSG member cells. The detection of proximity is based on an autonomous search function as defined in TS 36.304 [4].

5.3.14.2 Initiation

A UE in RRC_CONNECTED shall:

- 1> if the UE enters the proximity of one or more CSG member cell(s) on an E-UTRA frequency while proximity indication is enabled for such E-UTRA cells; or
- 1> if the UE enters the proximity of one or more CSG member cell(s) on an UTRA frequency while proximity indication is enabled for such UTRA cells; or
- 1> if the UE leaves the proximity of all CSG member cell(s) on an E-UTRA frequency while proximity indication is enabled for such E-UTRA cells; or
- 1> if the UE leaves the proximity of all CSG member cell(s) on an UTRA frequency while proximity indication is enabled for such UTRA cells:
 - 2> if the UE has previously not transmitted a *ProximityIndication* for the RAT and frequency during the current RRC connection, or if more than 5 s has elapsed since the UE has last transmitted a *ProximityIndication* (either entering or leaving) for the RAT and frequency:
- 3> initiate transmission of the *ProximityIndication* message in accordance with 5.3.14.3;

NOTE: In the conditions above, "if the UE enters the proximity of one or more CSG member cell(s)" includes the case of already being in the proximity of such cell(s) at the time proximity indication for the corresponding RAT is enabled.

5.3.14.3 Actions related to transmission of *ProximityIndication* message

The UE shall set the contents of *ProximityIndication* message as follows:

- 1> if the UE applies the procedure to report entering the proximity of CSG member cell(s):
 - 2> set type to entering;
- 1> else if the UE applies the procedure to report leaving the proximity of CSG member cell(s):
 - 2> set type to leaving;
- 1> if the proximity indication was triggered for one or more CSG member cell(s) on an E-UTRA frequency:
 - 2> set the *carrierFreq* to *eutra* with the value set to the E-ARFCN value of the E-UTRA cell(s) for which proximity indication was triggered;

- 1> else if the proximity indication was triggered for one or more CSG member cell(s) on a UTRA frequency:
 - 2> set the *carrierFreq* to *utra* with the value set to the ARFCN value of the UTRA cell(s) for which proximity indication was triggered;

The UE shall submit the *ProximityIndication* message to lower layers for transmission.

5.3.15 Void

5.4 Inter-RAT mobility

5.4.1 Introduction

The general principles of connected mode mobility are described in 5.3.1.3. The general principles of the security handling upon connected mode mobility are described in 5.3.1.2.

For the (network controlled) inter RAT mobility from E-UTRA for a UE in RRC_CONNECTED, a single procedure is defined that supports both handover, cell change order with optional network assistance (NACC) and enhanced CS fallback to CDMA2000 1xRTT. In case of mobility to CDMA2000, the eNB decides when to move to the other RAT while the target RAT determines to which cell the UE shall move.

5.4.2 Handover to E-UTRA

5.4.2.1 General

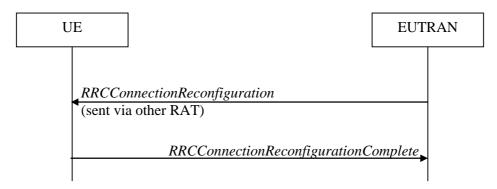


Figure 5.4.2.1-1: Handover to E-UTRA, successful

The purpose of this procedure is to, under the control of the network, transfer a connection between the UE and another Radio Access Network (e.g. GERAN or UTRAN) to E-UTRAN.

The handover to E-UTRA procedure applies when SRBs, possibly in combination with DRBs, are established in another RAT. Handover from UTRAN to E-UTRAN applies only after integrity has been activated in UTRAN.

5.4.2.2 Initiation

The RAN using another RAT initiates the Handover to E-UTRA procedure, in accordance with the specifications applicable for the other RAT, by sending the *RRCConnectionReconfiguration* message via the radio access technology from which the inter-RAT handover is performed.

E-UTRAN applies the procedure as follows:

- to activate ciphering, possibly using NULL algorithm, if not yet activated in the other RAT;
- to establish SRB1, SRB2 and one or more DRBs, i.e. at least the DRB associated with the default EPS bearer is established;

5.4.2.3 Reception of the RRCConnectionReconfiguration by the UE

If the UE is able to comply with the configuration included in the *RRCConnectionReconfiguration* message, the UE shall:

- 1> apply the default physical channel configuration as specified in 9.2.4;
- 1> apply the default semi-persistent scheduling configuration as specified in 9.2.3;
- 1> apply the default MAC main configuration as specified in 9.2.2;
- 1> start timer T304 with the timer value set to t304, as included in the mobilityControlInfo;
- 1> consider the target PCell to be one on the frequency indicated by the *carrierFreq* with a physical cell identity indicated by the *targetPhysCellId*;
- 1> start synchronising to the DL of the target PCell;
- 1> set the C-RNTI to the value of the *newUE-Identity*;
- 1> for the target PCell, apply the downlink bandwidth indicated by the *dl-Bandwidth*;
- 1> for the target PCell, apply the uplink bandwidth indicated by (the absence or presence of) the *ul-Bandwidth*;
- 1> configure lower layers in accordance with the received radioResourceConfigCommon;
- 1> configure lower layers in accordance with any additional fields, not covered in the previous, if included in the received *mobilityControlInfo*;
- 1> perform the radio resource configuration procedure as specified in 5.3.10;
- 1> forward the *nas-SecurityParamToEUTRA* to the upper layers;
- 1> derive the K_{eNB} key, as specified in TS 33.401 [32];
- 1> derive the K_{RRCint} key associated with the *integrityProtAlgorithm*, as specified in TS 33.401 [32];
- 1> derive the K_{RRCenc} key and the K_{UPenc} key associated with the *cipheringAlgorithm*, as specified in TS 33.401 [32];
- 1> configure lower layers to apply the indicated integrity protection algorithm and the K_{RRCint} key immediately, i.e. the indicated integrity protection configuration shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
- 1> configure lower layers to apply the indicated ciphering algorithm, the K_{RRCenc} key and the K_{UPenc} key immediately, i.e. the indicated ciphering configuration shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
- 1> if the received RRCConnectionReconfiguration includes the sCellToAddModList:
 - 2> perform SCell addition as specified in 5.3.10.3b;
- 1> if the *RRCConnectionReconfiguration* message includes the *measConfig*:
 - 2> perform the measurement configuration procedure as specified in 5.5.2;
- 1> perform the measurement identity autonomous removal as specified in 5.5.2.2a;
- 1> if the RRCConnectionReconfiguration message includes the otherConfig:
 - 2> perform the other configuration procedure as specified in 5.3.10.9;
- 1> set the content of RRCConnectionReconfigurationComplete message as follows:
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
- 3> include *rlf-InfoAvailable*;

- 2> if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
- 3> include the *logMeasAvailable*;
 - 2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:
- 3> include connEstFailInfoAvailable;
 - 1> submit the RRCConnectionReconfigurationComplete message to lower layers for transmission using the new configuration;
 - 1> if the RRCConnectionReconfiguration message does not include rlf-TimersAndConstants set to setup:
 - 2> use the default values specified in 9.2.5 for timer T310, T311 and constant N310, N311;
 - 1> if MAC successfully completes the random access procedure:
 - 2> stop timer T304;
 - 2> apply the parts of the CQI reporting configuration, the scheduling request configuration and the sounding RS configuration that do not require the UE to know the SFN of the target PCell, if any;
 - 2> apply the parts of the measurement and the radio resource configuration that require the UE to know the SFN of the target PCell (e.g. measurement gaps, periodic CQI reporting, scheduling request configuration, sounding RS configuration), if any, upon acquiring the SFN of the target PCell;
 - NOTE 1: Whenever the UE shall setup or reconfigure a configuration in accordance with a field that is received it applies the new configuration, except for the cases addressed by the above statements.
 - 2> enter E-UTRA RRC CONNECTED, upon which the procedure ends;
 - NOTE 2: The UE is not required to determine the SFN of the target PCell by acquiring system information from that cell before performing RACH access in the target PCell.

5.4.2.4 Reconfiguration failure

The UE shall:

- 1> if the UE is unable to comply with (part of) the configuration included in the *RRCConnectionReconfiguration* message:
 - 2> perform the actions defined for this failure case as defined in the specifications applicable for the other RAT;
- NOTE 1: The UE may apply above failure handling also in case the *RRCConnectionReconfiguration* message causes a protocol error for which the generic error handling as defined in 5.7 specifies that the UE shall ignore the message.
- NOTE 2: If the UE is unable to comply with part of the configuration, it does not apply any part of the configuration, i.e. there is no partial success/ failure.

5.4.2.5 T304 expiry (handover to E-UTRA failure)

- 1> upon T304 expiry (handover to E-UTRA failure):
 - 2> reset MAC;
 - 2> perform the actions defined for this failure case as defined in the specifications applicable for the other RAT;

5.4.3 Mobility from E-UTRA

5.4.3.1 General

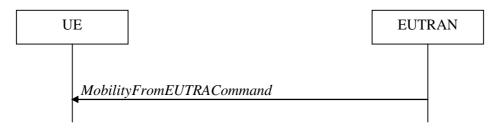


Figure 5.4.3.1-1: Mobility from E-UTRA, successful

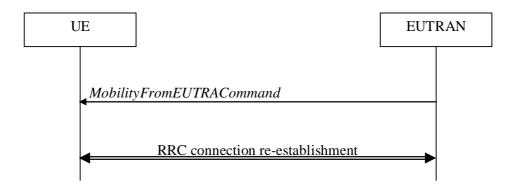


Figure 5.4.3.1-2: Mobility from E-UTRA, failure

The purpose of this procedure is to move a UE in RRC_CONNECTED to a cell using another Radio Access Technology (RAT), e.g. GERAN, UTRA or CDMA2000 systems. The mobility from E-UTRA procedure covers the following type of mobility:

- handover, i.e. the *MobilityFromEUTRACommand* message includes radio resources that have been allocated for the UE in the target cell;
- cell change order, i.e. the MobilityFromEUTRACommand message may include information facilitating access
 of and/ or connection establishment in the target cell, e.g. system information. Cell change order is applicable
 only to GERAN; and
- enhanced CS fallback to CDMA2000 1xRTT, i.e. the *MobilityFromEUTRACommand* message includes radio
 resources that have been allocated for the UE in the target cell. The enhanced CS fallback to CDMA2000 1xRTT
 may be combined with concurrent handover or redirection to CDMA2000 HRPD.

NOTE: For the case of dual receiver/transmitter enhanced CS fallback to CDMA2000 1xRTT, the *DLInformationTransfer* message is used instead of the *MobilityFromEUTRACommand* message (see TS 36.300 [9]).

5.4.3.2 Initiation

E-UTRAN initiates the mobility from E-UTRA procedure to a UE in RRC_CONNECTED, possibly in response to a *MeasurementReport* message or in response to reception of CS fallback indication for the UE from MME, by sending a *MobilityFromEUTRACommand* message. E-UTRAN applies the procedure as follows:

- the procedure is initiated only when AS-security has been activated, and SRB2 with at least one DRB are setup and not suspended;

5.4.3.3 Reception of the *MobilityFromEUTRACommand* by the UE

The UE shall be able to receive a *MobilityFromEUTRACommand* message and perform a cell change order to GERAN, even if no prior UE measurements have been performed on the target cell.

- 1> stop timer T310, if running;
- 1> if the *MobilityFromEUTRACommand* message includes the *purpose* set to *handover*:
 - 2> if the *targetRAT-Type* is set to *utra* or *geran*:
- 3> consider inter-RAT mobility as initiated towards the RAT indicated by the *targetRAT-Type* included in the *MobilityFromEUTRACommand* message;
- 3> forward the *nas-SecurityParamFromEUTRA* to the upper layers;
- 3> access the target cell indicated in the inter-RAT message in accordance with the specifications of the target RAT;
 - 3> if the *targetRAT-Type* is set to *geran*:
 - 4> use the contents of *systemInformation*, if provided for PS Handover, as the system information to begin access on the target GERAN cell;
 - NOTE 1: If there are DRBs for which no radio bearers are established in the target RAT as indicated in the targetRAT-MessageContainer in the message, the E-UTRA RRC part of the UE does not indicate the release of the concerned DRBs to the upper layers. Upper layers may derive which bearers are not established from information received from the AS of the target RAT.
 - NOTE 2: In case of SR-VCC, the DRB to be replaced is specified in [61].
 - 2> else if the *targetRAT-Type* is set to *cdma2000-1XRTT* or *cdma2000-HRPD*:
- 3> forward the *targetRAT-Type* and the *targetRAT-MessageContainer* to the CDMA2000 upper layers for the UE to access the cell(s) indicated in the inter-RAT message in accordance with the specifications of the CDMA2000 target-RAT;
 - 1> else if the MobilityFromEUTRACommand message includes the purpose set to cellChangeOrder:
 - 2> start timer T304 with the timer value set to t304, as included in the MobilityFromEUTRACommand message;
 - 2> if the *targetRAT-Type* is set to *geran*:
- 3> if networkControlOrder is included in the MobilityFromEUTRACommand message:
 - 4> apply the value as specified in TS 44.060 [36];
- 3> else:
- 4> acquire networkControlOrder and apply the value as specified in TS 44.060 [36];
- 3> use the contents of *systemInformation*, if provided, as the system information to begin access on the target GERAN cell:
 - 2> establish the connection to the target cell indicated in the *CellChangeOrder*;
 - NOTE 3: The criteria for success or failure of the cell change order to GERAN are specified in TS 44.060[36].
 - 1> if the *MobilityFromEUTRACommand* message includes the *purpose* set to *e-CSFB*:
 - 2> if *messageContCDMA2000-1XRTT* is present:
- 3> forward the *messageContCDMA2000-1XRTT* to the CDMA2000 upper layers for the UE to access the cell(s) indicated in the inter-RAT message in accordance with the specification of the target RAT;
 - 2> if mobilityCDMA2000-HRPD is present and is set to handover:
- 3> forward the *messageContCDMA2000-HRPD* to the CDMA2000 upper layers for the UE to access the cell(s) indicated in the inter-RAT message in accordance with the specification of the target RAT;
 - 2> if *mobilityCDMA2000-HRPD* is present and is set to *redirection*:

- 3> forward the redirectCarrierCDMA2000-HRPD to the CDMA2000 upper layers;
 - NOTE 4: When the CDMA2000 upper layers in the UE receive both the *messageContCDMA2000-1XRTT* and *messageContCDMA2000-HRPD* the UE performs concurrent access to both CDMA2000 1xRTT and CDMA2000 HRPD RAT.
 - NOTE 5: The UE should perform the handover, the cell change order or enhanced 1xRTT CS fallback as soon as possible following the reception of the RRC message *MobilityFromEUTRACommand*, which could be before confirming successful reception (HARQ and ARQ) of this message.

5.4.3.4 Successful completion of the mobility from E-UTRA

Upon successfully completing the handover, the cell change order or enhanced 1xRTT CS fallback, the UE shall:

1> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';

NOTE: If the UE performs enhanced 1xRTT CS fallback along with concurrent mobility to CDMA2000 HRPD and the connection to either CDMA2000 1xRTT or CDMA2000 HRPD succeeds, then the mobility from E-UTRA is considered successful.

5.4.3.5 Mobility from E-UTRA failure

- 1> if T304 expires (mobility from E-UTRA failure); or
- 1> if the UE does not succeed in establishing the connection to the target radio access technology; or
- 1> if the UE is unable to comply with (part of) the configuration included in the *MobilityFromEUTRACommand* message; or
- 1> if there is a protocol error in the inter RAT information included in the *MobilityFromEUTRACommand* message, causing the UE to fail the procedure according to the specifications applicable for the target RAT:
 - 2> stop T304, if running;
 - 2> if the *cs-FallbackIndicator* in the *MobilityFromEUTRACommand* message was set to *TRUE* or *e-CSFB* was present:
- 3> indicate to upper layers that the CS Fallback procedure has failed;
 - 2> revert back to the configuration used in the source PCell, excluding the configuration configured by the *physicalConfigDedicated*, *mac-MainConfig* and *sps-Config*;
 - 2> initiate the connection re-establishment procedure as specified in 5.3.7;
 - NOTE: For enhanced CS fallback to CDMA2000 1xRTT, the above UE behavior applies only when the UE is attempting the enhanced 1xRTT CS fallback and connection to the target radio access technology fails or if the UE is attempting enhanced 1xRTT CS fallback along with concurrent mobility to CDMA2000 HRPD and connection to both the target radio access technologies fails.

5.4.4 Handover from E-UTRA preparation request (CDMA2000)

5.4.4.1 General

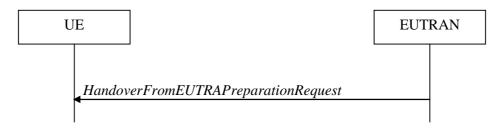


Figure 5.4.4.1-1: Handover from E-UTRA preparation request

The purpose of this procedure is to trigger the UE to prepare for handover or enhanced 1xRTT CS fallback to CDMA2000 by requesting a connection with this network. The UE may use this procedure to concurrently prepare for handover to CDMA2000 HRPD along with preparation for enhanced CS fallback to CDMA2000 1xRTT. This procedure applies to CDMA2000 capable UEs only.

This procedure is also used to trigger the UE which supports dual Rx/Tx enhanced 1xCSFB to redirect its second radio to CDMA2000 1xRTT.

The handover from E-UTRA preparation request procedure applies when signalling radio bearers are established.

5.4.4.2 Initiation

E-UTRAN initiates the handover from E-UTRA preparation request procedure to a UE in RRC_CONNECTED, possibly in response to a *MeasurementReport* message or CS fallback indication for the UE, by sending a *HandoverFromEUTRAPreparationRequest* message. E-UTRA initiates the procedure only when AS security has been activated.

5.4.4.3 Reception of the HandoverFromEUTRAPreparationRequest by the UE

Upon reception of the HandoverFromEUTRAPreparationRequest message, the UE shall:

- 1> if dualRxTxRedirectIndicator is present in the received message:
 - 2> forward dualRxTxRedirectIndicator to the CDMA2000 upper layers;
 - 2> forward redirectCarrierCDMA2000-1XRTT to the CDMA2000 upper layers, if included;

1> else:

- 2> indicate the request to prepare handover or enhanced 1xRTT CS fallback and forward the *cdma2000-Type* to the CDMA2000 upper layers;
- 2> if *cdma2000-Type* is set to *type1XRTT*:
- 3> forward the *rand* and the *mobilityParameters* to the CDMA2000 upper layers;
 - 2> if concurrPrepCDMA2000-HRPD is present in the received message:
- 3> forward concurrPrepCDMA2000-HRPD to the CDMA2000 upper layers;
 - 2> else:
- 3> forward concurrPrepCDMA2000-HRPD, with its value set to FALSE, to the CDMA2000 upper layers;

5.4.5 UL handover preparation transfer (CDMA2000)

5.4.5.1 General



Figure 5.4.5.1-1: UL handover preparation transfer

The purpose of this procedure is to tunnel the handover related CDMA2000 dedicated information or enhanced 1xRTT CS fallback related CDMA2000 dedicated information from UE to E-UTRAN when requested by the higher layers. The procedure is triggered by the higher layers on receipt of *HandoverFromEUTRAPreparationRequest* message. If preparing for enhanced CS fallback to CDMA2000 1xRTT and handover to CDMA2000 HRPD, the UE sends two consecutive *ULHandoverPreparationTransfer* messages to E-UTRAN, one per addressed CDMA2000 RAT Type. This procedure applies to CDMA2000 capable UEs only.

5.4.5.2 Initiation

A UE in RRC_CONNECTED initiates the UL Handover Preparation Transfer procedure whenever there is a need to transfer handover or enhanced 1xRTT CS fallback related non-3GPP dedicated information. The UE initiates the UL handover preparation transfer procedure by sending the *ULHandoverPreparationTransfer* message.

5.4.5.3 Actions related to transmission of the *ULHandoverPreparationTransfer* message

The UE shall set the contents of the *ULHandoverPreparationTransfer* message as follows:

- 1> include the *cdma2000-Type* and the *dedicatedInfo*;
- 1> if the *cdma2000-Type* is set to *type1XRTT*:
 - 2> include the *meid* and set it to the value received from the CDMA2000 upper layers;
- 1> submit the *ULHandoverPreparationTransfer* message to lower layers for transmission, upon which the procedure ends;

5.4.5.4 Failure to deliver the *ULHandoverPreparationTransfer* message

The UE shall:

- 1> if the UE is unable to guarantee successful delivery of *ULHandoverPreparationTransfer* messages:
 - 2> inform upper layers about the possible failure to deliver the information contained in the concerned *ULHandoverPreparationTransfer* message;

5.4.6 Inter-RAT cell change order to E-UTRAN

5.4.6.1 General

The purpose of the inter-RAT cell change order to E-UTRAN procedure is to transfer, under the control of the source radio access technology, a connection between the UE and another radio access technology (e.g. GSM/ GPRS) to E-UTRAN.

5.4.6.2 Initiation

The procedure is initiated when a radio access technology other than E-UTRAN, e.g. GSM/GPRS, using procedures specific for that RAT, orders the UE to change to an E-UTRAN cell. In response, upper layers request the establishment of an RRC connection as specified in subclause 5.3.3.

NOTE: Within the message used to order the UE to change to an E-UTRAN cell, the source RAT should specify the identity of the target E-UTRAN cell as specified in the specifications for that RAT.

The UE shall:

- 1> upon receiving an RRCConnectionSetup message:
 - 2> consider the inter-RAT cell change order procedure to have completed successfully;

5.4.6.3 UE fails to complete an inter-RAT cell change order

If the inter-RAT cell change order fails the UE shall return to the other radio access technology and proceed as specified in the appropriate specifications for that RAT.

The UE shall:

- 1> upon failure to establish the RRC connection as specified in subclause 5.3.3:
 - 2> consider the inter-RAT cell change order procedure to have failed;

NOTE: The cell change was network ordered. Therefore, failure to change to the target PCell should not cause the UE to move to UE-controlled cell selection.

5.5 Measurements

5.5.1 Introduction

The UE reports measurement information in accordance with the measurement configuration as provided by E-UTRAN. E-UTRAN provides the measurement configuration applicable for a UE in RRC_CONNECTED by means of dedicated signalling, i.e. using the *RRCConnectionReconfiguration* message.

The UE can be requested to perform the following types of measurements:

- Intra-frequency measurements: measurements at the downlink carrier frequency(ies) of the serving cell(s).
- Inter-frequency measurements: measurements at frequencies that differ from any of the downlink carrier frequency(ies) of the serving cell(s).
- Inter-RAT measurements of UTRA frequencies.
- Inter-RAT measurements of GERAN frequencies.
- Inter-RAT measurements of CDMA2000 HRPD or CDMA2000 1xRTT frequencies.

The measurement configuration includes the following parameters:

- 1. **Measurement objects:** The objects on which the UE shall perform the measurements.
 - For intra-frequency and inter-frequency measurements a measurement object is a single E-UTRA carrier frequency. Associated with this carrier frequency, E-UTRAN can configure a list of cell specific offsets and a list of 'blacklisted' cells. Blacklisted cells are not considered in event evaluation or measurement reporting.
 - For inter-RAT UTRA measurements a measurement object is a set of cells on a single UTRA carrier frequency.
 - For inter-RAT GERAN measurements a measurement object is a set of GERAN carrier frequencies.

- For inter-RAT CDMA2000 measurements a measurement object is a set of cells on a single (HRPD or 1xRTT) carrier frequency.

NOTE 1: Some measurements using the above mentioned measurement objects, only concern a single cell, e.g. measurements used to report neighbouring cell system information, PCell UE Rx-Tx time difference.

- 2. **Reporting configurations**: A list of reporting configurations where each reporting configuration consists of the following:
 - Reporting criterion: The criterion that triggers the UE to send a measurement report. This can either be periodical or a single event description.
 - Reporting format: The quantities that the UE includes in the measurement report and associated information (e.g. number of cells to report).
- 3. **Measurement identities**: A list of measurement identities where each measurement identity links one measurement object with one reporting configuration. By configuring multiple measurement identities it is possible to link more than one measurement object to the same reporting configuration, as well as to link more than one reporting configuration to the same measurement object. The measurement identity is used as a reference number in the measurement report.
- 4. **Quantity configurations:** One quantity configuration is configured per RAT type. The quantity configuration defines the measurement quantities and associated filtering used for all event evaluation and related reporting of that measurement type. One filter can be configured per measurement quantity.
- 5. **Measurement gaps:** Periods that the UE may use to perform measurements, i.e. no (UL, DL) transmissions are scheduled.

E-UTRAN only configures a single measurement object for a given frequency, i.e. it is not possible to configure two or more measurement objects for the same frequency with different associated parameters, e.g. different offsets and/ or blacklists. E-UTRAN may configure multiple instances of the same event e.g. by configuring two reporting configurations with different thresholds.

The UE maintains a single measurement object list, a single reporting configuration list, and a single measurement identities list. The measurement object list includes measurement objects, that are specified per RAT type, possibly including intra-frequency object(s) (i.e. the object(s) corresponding to the serving frequency(ies)), inter-frequency object(s) and inter-RAT objects. Similarly, the reporting configuration list includes E-UTRA and inter-RAT reporting configurations. Any measurement object can be linked to any reporting configuration of the same RAT type. Some reporting configurations may not be linked to a measurement object. Likewise, some measurement objects may not be linked to a reporting configuration.

The measurement procedures distinguish the following types of cells:

- 1. The serving cell(s)- these are the PCell and one or more SCells, if configured for a UE supporting CA.
- 2. Listed cells these are cells listed within the measurement object(s).
- 3. Detected cells these are cells that are not listed within the measurement object(s) but are detected by the UE on the carrier frequency(ies) indicated by the measurement object(s).

For E-UTRA, the UE measures and reports on the serving cell(s), listed cells and detected cells. For inter-RAT UTRA, the UE measures and reports on listed cells and optionally on cells that are within a range for which reporting is allowed by E-UTRAN. For inter-RAT GERAN, the UE measures and reports on detected cells. For inter-RAT CDMA2000, the UE measures and reports on listed cells.

- NOTE 2: For inter-RAT UTRA and CDMA2000, the UE measures and reports also on detected cells for the purpose of SON.
- NOTE 3: This specification is based on the assumption that typically CSG cells of home deployment type are not indicated within the neighbour list. Furthermore, the assumption is that for non-home deployments, the physical cell identity is unique within the area of a large macro cell (i.e. as for UTRAN).

Whenever the procedural specification, other than contained in sub-clause 5.5.2, refers to a field it concerns a field included in the *VarMeasConfig* unless explicitly stated otherwise i.e. only the measurement configuration procedure covers the direct UE action related to the received *measConfig*.

5.5.2 Measurement configuration

5.5.2.1 General

E-UTRAN applies the procedure as follows:

- to ensure that, whenever the UE has a measConfig, it includes a measObject for each serving frequency;
- to configure at most one measurement identity using a reporting configuration with the *purpose* set to *reportCGI*;
- for serving frequencies, set the EARFCN within the corresponding *measObject* according to the band as used for reception/ transmission;

- 1> if the received *measConfig* includes the *measObjectToRemoveList*:
 - 2> perform the measurement object removal procedure as specified in 5.5.2.4;
- 1> if the received *measConfig* includes the *measObjectToAddModList*:
 - 2> perform the measurement object addition/ modification procedure as specified in 5.5.2.5;
- 1> if the received *measConfig* includes the *reportConfigToRemoveList*:
 - 2> perform the reporting configuration removal procedure as specified in 5.5.2.6;
- 1> if the received measConfig includes the reportConfigToAddModList:
 - 2> perform the reporting configuration addition/ modification procedure as specified in 5.5.2.7;
- 1> if the received *measConfig* includes the *quantityConfig*:
 - 2> perform the quantity configuration procedure as specified in 5.5.2.8;
- 1> if the received *measConfig* includes the *measIdToRemoveList*:
 - 2> perform the measurement identity removal procedure as specified in 5.5.2.2;
- 1> if the received *measConfig* includes the *measIdToAddModList*:
 - 2> perform the measurement identity addition/ modification procedure as specified in 5.5.2.3;
- 1> if the received *measConfig* includes the *measGapConfig*:
 - 2> perform the measurement gap configuration procedure as specified in 5.5.2.9;
- 1> if the received *measConfig* includes the *s-Measure*:
 - 2> set the parameter *s-Measure* within *VarMeasConfig* to the lowest value of the RSRP ranges indicated by the received value of *s-Measure*;
- 1> if the received *measConfig* includes the *preRegistrationInfoHRPD*:
 - 2> forward the *preRegistrationInfoHRPD* to CDMA2000 upper layers;
- 1> if the received *measConfig* includes the *speedStatePars*:
 - 2> set the parameter *speedStatePars* within *VarMeasConfig* to the received value of *speedStatePars*;
- 1> if the received *measConfig* includes the *allowInterruptions*:
 - 2> set the parameter *allowInterruptions* within *VarMeasConfig* to the received value of *allowInterruptions*;

5.5.2.2 Measurement identity removal

The UE shall:

- 1> for each *measId* included in the received *measIdToRemoveList* that is part of the current UE configuration in *VarMeasConfig*:
 - 2> remove the entry with the matching measId from the measIdList within the VarMeasConfig;
 - 2> remove the measurement reporting entry for this measId from the VarMeasReportList, if included;
 - 2> stop the periodical reporting timer or timer T321, whichever one is running, and reset the associated information (e.g. *timeToTrigger*) for this *measId*;

NOTE: The UE does not consider the message as erroneous if the *measIdToRemoveList* includes any *measId* value that is not part of the current UE configuration.

5.5.2.2a Measurement identity autonomous removal

The UE shall:

- 1> for each *measId* included in the *measIdList* within *VarMeasConfig*:
 - 2> if the associated *reportConfig* concerns an event involving a serving cell while the concerned serving cell is not configured:
- 3> remove the *measId* from the *measIdList* within the *VarMeasConfig*;
- 3> remove the measurement reporting entry for this measId from the VarMeasReportList, if included;
- 3> stop the periodical reporting timer if running, and reset the associated information (e.g. *timeToTrigger*) for this *measId*;
 - NOTE 1: The above UE autonomous removal of measId's applies only for measurement events A1, A2 and A6.
 - NOTE 2: When performed during re-establishment, the UE is only configured with a primary frequency (i.e. the SCell(s) are released, if configured).

5.5.2.3 Measurement identity addition/ modification

E-UTRAN applies the procedure as follows:

- configure a *measId* only if the corresponding measurement object, the corresponding reporting configuration and the corresponding quantity configuration, are configured;

- 1> for each measId included in the received measIdToAddModList:
 - 2> if an entry with the matching measId exists in the measIdList within the VarMeasConfig:
- 3> replace the entry with the value received for this *measId*;
 - 2> else:
- 3> add a new entry for this *measId* within the *VarMeasConfig*;
 - 2> remove the measurement reporting entry for this measId from the VarMeasReportList, if included;
 - 2> stop the periodical reporting timer or timer T321, whichever one is running, and reset the associated information (e.g. *timeToTrigger*) for this *measId*;
 - 2> if the *triggerType* is set to *periodical* and the *purpose* is set to *reportCGI* in the *reportConfig* associated with this *measId*:
- 3> if the *measObject* associated with this *measId* concerns E-UTRA:

- 4> if the *si-RequestForHO* is included in the *reportConfig* associated with this *measId*:
 - 5> start timer T321 with the timer value set to 150 ms for this *measId*;
- 4> else:
- 5> start timer T321 with the timer value set to 1 second for this *measId*;
- 3> else if the *measObject* associated with this *measId* concerns UTRA:
 - 4> if the si-RequestForHO is included in the reportConfig associated with this measId:
- 5> for UTRA FDD, start timer T321 with the timer value set to 2 seconds for this measld;
- 5> for UTRA TDD, start timer T321 with the timer value set to [1 second] for this measId;
 - 4> else:
- 5> start timer T321 with the timer value set to 8 seconds for this *measId*;
- 3> else:
- 4> start timer T321 with the timer value set to 8 seconds for this *measId*;

5.5.2.4 Measurement object removal

The UE shall:

- 1> for each *measObjectId* included in the received *measObjectToRemoveList* that is part of the current UE configuration in *VarMeasConfig*:
 - 2> remove the entry with the matching measObjectId from the measObjectList within the VarMeasConfig;
 - 2> remove all measId associated with this measObjectId from the measIdList within the VarMeasConfig, if any;
 - 2> if a *measId* is removed from the *measIdList*:
- 3> remove the measurement reporting entry for this *measId* from the *VarMeasReportList*, if included;
- 3> stop the periodical reporting timer or timer T321, whichever one is running, and reset the associated information (e.g. *timeToTrigger*) for this *measId*;
 - NOTE: The UE does not consider the message as erroneous if the *measObjectToRemoveList* includes any *measObjectId* value that is not part of the current UE configuration.

5.5.2.5 Measurement object addition/ modification

- 1> for each measObjectId included in the received measObjectToAddModList:
 - 2> if an entry with the matching *measObjectId* exists in the *measObjectList* within the *VarMeasConfig*, for this entry:
- 3> reconfigure the entry with the value received for this *measObject*, except for the fields *cellsToAddModList*, *blackCellsToAddModList*, *cellsToRemoveList*, *blackCellsToRemoveList* and *measSubframePatternConfigNeigh*;
- 3> if the received *measObject* includes the *cellsToRemoveList*:
 - 4> for each *cellIndex* included in the *cellsToRemoveList*:
- 5> remove the entry with the matching *cellIndex* from the *cellsToAddModList*;
- 3> if the received *measObject* includes the *cellsToAddModList*:
 - 4> for each *cellIndex* value included in the *cellsToAddModList*:

- 5> if an entry with the matching *cellIndex* exists in the *cellsToAddModList*:
 - 6> replace the entry with the value received for this *cellIndex*;
- 5> else:
- 6> add a new entry for the received cellIndex to the cellsToAddModList;
- 3> if the received *measObject* includes the *blackCellsToRemoveList*:
 - 4> for each *cellIndex* included in the *blackCellsToRemoveList*:
- 5> remove the entry with the matching *cellIndex* from the *blackCellsToAddModList*;
 - NOTE 1: For each *cellIndex* included in the *blackCellsToRemoveList* that concerns overlapping ranges of cells, a cell is removed from the black list of cells only if all cell indexes containing it are removed.
- 3> if the received *measObject* includes the *blackCellsToAddModList*:
 - 4> for each cellIndex included in the blackCellsToAddModList:
- 5> if an entry with the matching *cellIndex* is included in the *blackCellsToAddModList*:
 - 6> replace the entry with the value received for this *cellIndex*;
- 5> else:
- 6> add a new entry for the received *cellIndex* to the *blackCellsToAddModList*;
- 3> if the received *measObject* includes *measSubframePatternConfigNeigh*:
 - 4> set measSubframePatternConfigNeigh within the VarMeasConfig to the value of the received field
- 3> for each measId associated with this measObjectId in the measIdList within the VarMeasConfig, if any:
 - 4> remove the measurement reporting entry for this measId from the VarMeasReportList, if included;
 - 4> stop the periodical reporting timer or timer T321, whichever one is running, and reset the associated information (e.g. *timeToTrigger*) for this *measId*;
 - 2> else:
- 3> add a new entry for the received measObject to the measObjectList within VarMeasConfig;
 - NOTE 2: The UE does not need to retain the cellForWhichToReportCGI in the measObject after reporting cgi-Info.

5.5.2.6 Reporting configuration removal

- 1> for each *reportConfigId* included in the received *reportConfigToRemoveList* that is part of the current UE configuration in *VarMeasConfig*:
 - 2> remove the entry with the matching reportConfigId from the reportConfigList within the VarMeasConfig;
 - 2> remove all measId associated with the reportConfigId from the measIdList within the VarMeasConfig, if any;
 - 2> if a *measId* is removed from the *measIdList*:
- 3> remove the measurement reporting entry for this measId from the VarMeasReportList, if included;
- 3> stop the periodical reporting timer or timer T321, whichever one is running, and reset the associated information (e.g. *timeToTrigger*) for this *measId*;
 - NOTE: The UE does not consider the message as erroneous if the *reportConfigToRemoveList* includes any *reportConfigId* value that is not part of the current UE configuration.

5.5.2.7 Reporting configuration addition/ modification

The UE shall:

- 1> for each reportConfigId included in the received reportConfigToAddModList:
 - 2> if an entry with the matching reportConfigId exists in the reportConfigList within the VarMeasConfig, for this entry:
- 3> reconfigure the entry with the value received for this *reportConfig*;
- 3> for each measId associated with this reportConfigId included in the measIdList within the VarMeasConfig, if any:
 - 4> remove the measurement reporting entry for this measId from in VarMeasReportList, if included;
 - 4> stop the periodical reporting timer or timer T321, whichever one is running, and reset the associated information (e.g. *timeToTrigger*) for this *measId*;

2> else:

3> add a new entry for the received reportConfig to the reportConfigList within the VarMeasConfig;

5.5.2.8 Quantity configuration

The UE shall:

- 1> for each RAT for which the received *quantityConfig* includes parameter(s):
 - 2> set the corresponding parameter(s) in *quantityConfig* within *VarMeasConfig* to the value of the received *quantityConfig* parameter(s);
- 1> for each *measId* included in the *measIdList* within *VarMeasConfig*:
 - 2> remove the measurement reporting entry for this measId from the VarMeasReportList, if included;
 - 2> stop the periodical reporting timer or timer T321, whichever one is running, and reset the associated information (e.g. *timeToTrigger*) for this *measId*;

5.5.2.9 Measurement gap configuration

The UE shall:

- 1> if measGapConfig is set to setup:
 - 2> if a measurement gap configuration is already setup, release the measurement gap configuration;
 - 2> setup the measurement gap configuration indicated by the measGapConfig in accordance with the received gapOffset, i.e., the first subframe of each gap occurs at an SFN and subframe meeting the following condition:

```
SFN mod T = FLOOR(gapOffset/10);
```

 $subframe = gapOffset \mod 10;$

with T = MGRP/10 as defined in TS 36.133 [16];

1> else:

2> release the measurement gap configuration;

5.5.3 Performing measurements

5.5.3.1 General

For all measurements the UE applies the layer 3 filtering as specified in 5.5.3.2, before using the measured results for evaluation of reporting criteria or for measurement reporting.

The UE shall:

- 1> whenever the UE has a *measConfig*, perform RSRP and RSRQ measurements for each serving cell, applying for the PCell the time domain measurement resource restriction in accordance with *measSubframePatternPCell*, if configured;
- 1> for each *measId* included in the *measIdList* within *VarMeasConfig*:
 - 2> if the *purpose* for the associated *reportConfig* is set to *reportCGI*:
- 3> if *si-RequestForHO* is configured for the associated *reportConfig*:
 - 4> perform the corresponding measurements on the frequency and RAT indicated in the associated *measObject* using autonomous gaps as necessary;

3> else:

- 4> perform the corresponding measurements on the frequency and RAT indicated in the associated *measObject* using available idle periods or using autonomous gaps as necessary;
- NOTE 1: If autonomous gaps are used to perform measurements, the UE is allowed to temporarily abort communication with all serving cell(s), i.e. create autonomous gaps to perform the corresponding measurements within the limits specified in TS 36.133 [16]. Otherwise, the UE only supports the measurements with the purpose set to *reportCGI* only if E-UTRAN has provided sufficient idle periods.
- 3> try to acquire the global cell identity of the cell indicated by the *cellForWhichToReportCGI* in the associated *measObject* by acquiring the relevant system information from the concerned cell;
- 3> if the cell indicated by the *cellForWhichToReportCGI* included in the associated *measObject* is an E-UTRAN cell:
 - 4> try to acquire the CSG identity, if the CSG identity is broadcast in the concerned cell;
 - 4> try to acquire the *trackingAreaCode* in the concerned cell;
 - 4> try to acquire the list of additional PLMN Identities, as included in the *plmn-IdentityList*, if multiple PLMN identities are broadcast in the concerned cell;
 - NOTE 2: The 'primary' PLMN is part of the global cell identity.
- 3> if the cell indicated by the cellForWhichToReportCGI included in the associated measObject is a UTRAN cell:
 - 4> try to acquire the LAC, the RAC and the list of additional PLMN Identities, if multiple PLMN identities are broadcast in the concerned cell;
 - 4> try to acquire the CSG identity, if the CSG identity is broadcast in the concerned cell;
- 3> if the cell indicated by the *cellForWhichToReportCGI* included in the associated *measObject* is a GERAN cell:
 - 4> try to acquire the RAC in the concerned cell;
- 3> if the cell indicated by the *cellForWhichToReportCGI* included in the associated *measObject* is a CDMA2000 cell and the *cdma2000-Type* included in the *measObject* is *typeHRPD*:
 - 4> try to acquire the Sector ID in the concerned cell;
- 3> if the cell indicated by the *cellForWhichToReportCGI* included in the associated *measObject* is a CDMA2000 cell and the *cdma2000-Type* included in the *measObject* is *type1XRTT*:
 - 4> try to acquire the BASE ID, SID and NID in the concerned cell;

2> else:

3> if a measurement gap configuration is setup; or

3> if the UE does not require measurement gaps to perform the concerned measurements:

4> if s-Measure is not configured; or

4> if s-Measure is configured and the PCell RSRP, after layer 3 filtering, is lower than this value:

5> perform the corresponding measurements of neighbouring cells on the frequencies and RATs indicated in the concerned *measObject*, applying for neighbouring cells on the primary frequency the time domain measurement resource restriction in accordance with *measSubframePatternConfigNeigh*, if configured in the concerned *measObject*;

4> if the *ue-RxTxTimeDiffPeriodical* is configured in the associated *reportConfig*:

5> perform the UE Rx-Tx time difference measurements on the PCell;

2> perform the evaluation of reporting criteria as specified in 5.5.4;

NOTE 3: The *s-Measure* defines when the UE is required to perform measurements. The UE is however allowed to perform measurements also when the PCell RSRP exceeds *s-Measure*, e.g., to measure cells broadcasting a CSG identity following use of the autonomous search function as defined in TS 36.304 [4].

5.5.3.2 Layer 3 filtering

The UE shall:

1> for each measurement quantity that the UE performs measurements according to 5.5.3.1:

NOTE 1: This does not include quantities configured solely for UE Rx-Tx time difference measurements i.e. for those type of measurements the UE ignores the *triggerQuantity* and *reportQuantity*.

2> filter the measured result, before using for evaluation of reporting criteria or for measurement reporting, by the following formula:

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

where

 M_n is the latest received measurement result from the physical layer;

 F_n is the updated filtered measurement result, that is used for evaluation of reporting criteria or for measurement reporting;

 F_{n-1} is the old filtered measurement result, where F_{θ} is set to M_{I} when the first measurement result from the physical layer is received; and

 $a = 1/2^{(k/4)}$, where k is the *filterCoefficient* for the corresponding measurement quantity received by the *quantityConfig*;

2> adapt the filter such that the time characteristics of the filter are preserved at different input rates, observing that the *filterCoefficient* k assumes a sample rate equal to 200 ms;

NOTE 2: If *k* is set to 0, no layer 3 filtering is applicable.

NOTE 3: The filtering is performed in the same domain as used for evaluation of reporting criteria or for measurement reporting, i.e., logarithmic filtering for logarithmic measurements.

NOTE 4: The filter input rate is implementation dependent, to fulfil the performance requirements set in [16]. For further details about the physical layer measurements, see TS 36.133 [16].

5.5.4 Measurement report triggering

5.5.4.1 General

- 1> for each *measId* included in the *measIdList* within *VarMeasConfig*:
 - 2> if the corresponding reportConfig includes a purpose set to reportStrongestCellsForSON:
- 3> consider any neighbouring cell detected on the associated frequency to be applicable;
 - 2> else if the corresponding reportConfig includes a purpose set to reportCGI:
- 3> consider any neighbouring cell detected on the associated frequency/ set of frequencies (GERAN) which has a physical cell identity matching the value of the *cellForWhichToReportCGI* included in the corresponding *measObject* within the *VarMeasConfig* to be applicable;
 - 2> else:
- 3> if the corresponding *measObject* concerns E-UTRA:
 - 4> if the *ue-RxTxTimeDiffPeriodical* is configured in the corresponding *reportConfig*:
- 5> consider only the PCell to be applicable;
 - 4> else if the *eventA1* or *eventA2* is configured in the corresponding *reportConfig*:
- 5> consider only the serving cell to be applicable;
 - 4> else:
- 5> consider any neighbouring cell detected on the associated frequency to be applicable when the concerned cell is not included in the *blackCellsToAddModList* defined within the *VarMeasConfig* for this *measId*;
- 5> for events involving a serving cell on one frequency and neighbours on another frequency, consider the serving cell on the other frequency as a neighbouring cell;
- 3> else if the corresponding measObject concerns UTRA or CDMA2000:
 - 4> consider a neighbouring cell on the associated frequency to be applicable when the concerned cell is included in the *cellsToAddModList* defined within the *VarMeasConfig* for this *measId* (i.e. the cell is included in the white-list);
 - NOTE 0: The UE may also consider a neighbouring cell on the associated UTRA frequency to be applicable when the concerned cell is included in the *csg-allowedReportingCells* within the *VarMeasConfig* for this *measId*, if configured in the corresponding *measObjectUTRA* (i.e. the cell is included in the range of physical cell identities for which reporting is allowed).
- 3> else if the corresponding *measObject* concerns GERAN:
 - 4> consider a neighbouring cell on the associated set of frequencies to be applicable when the concerned cell matches the *ncc-Permitted* defined within the *VarMeasConfig* for this *measId*;
 - 2> if the *triggerType* is set to *event* and if the entry condition applicable for this event, i.e. the event corresponding with the *eventId* of the corresponding *reportConfig* within *VarMeasConfig*, is fulfilled for one or more applicable cells for all measurements after layer 3 filtering taken during *timeToTrigger* defined for this event within the *VarMeasConfig*, while the *VarMeasReportList* does not include an measurement reporting entry for this *measId* (a first cell triggers the event):
- 3> include a measurement reporting entry within the VarMeasReportList for this measId;
- 3> set the numberOfReportsSent defined within the VarMeasReportList for this measId to 0;
- 3> include the concerned cell(s) in the *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId*;

- 3> initiate the measurement reporting procedure, as specified in 5.5.5;
 - 2> if the *triggerType* is set to *event* and if the entry condition applicable for this event, i.e. the event corresponding with the *eventId* of the corresponding *reportConfig* within *VarMeasConfig*, is fulfilled for one or more applicable cells not included in the *cellsTriggeredList* for all measurements after layer 3 filtering taken during *timeToTrigger* defined for this event within the *VarMeasConfig* (a subsequent cell triggers the event):
- 3> set the numberOfReportsSent defined within the VarMeasReportList for this measId to 0;
- 3> include the concerned cell(s) in the *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId*;
- 3> initiate the measurement reporting procedure, as specified in 5.5.5;
 - 2> if the *triggerType* is set to *event* and if the leaving condition applicable for this event is fulfilled for one or more of the cells included in the *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId* for all measurements after layer 3 filtering taken during *timeToTrigger* defined within the *VarMeasConfig* for this event:
- 3> remove the concerned cell(s) in the *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId*;
- 3> if *reportOnLeave* is set to *TRUE* for the corresponding reporting configuration or if *a6-ReportOnLeave* is set to *TRUE* for the corresponding reporting configuration:
 - 4> initiate the measurement reporting procedure, as specified in 5.5.5;
- 3> if the cellsTriggeredList defined within the VarMeasReportList for this measId is empty:
 - 4> remove the measurement reporting entry within the VarMeasReportList for this measId;
 - 4> stop the periodical reporting timer for this *measId*, if running;
 - 2> if the *purpose* is included and set to *reportStrongestCells* or to *reportStrongestCellsForSON* and if a (first) measurement result is available:
- 3> include a measurement reporting entry within the VarMeasReportList for this measId;
- 3> set the numberOfReportsSent defined within the VarMeasReportList for this measId to 0;
- 3> initiate the measurement reporting procedure, as specified in 5.5.5;
 - NOTE 1: If the *purpose* is set to *reportStrongestCells* and *reportAmount* > 1, the UE initiates a first measurement report immediately after the quantity to be reported becomes available for the PCell. If the *purpose* is set to *reportStrongestCells* and *reportAmount* = 1, the UE initiates a first measurement report immediately after the quantity to be reported becomes available for the PCell and for the strongest cell among the applicable cells. If the purpose is set to *reportStrongestCellsForSON*, the UE initiates a first measurement report when it has determined the strongest cells on the associated frequency.
 - 2> upon expiry of the periodical reporting timer for this *measId*:
- 3> initiate the measurement reporting procedure, as specified in 5.5.5;
 - 2> if the *purpose is* included and set to *reportCGI* and if the UE acquired the information needed to set all fields of *cgi-Info* for the requested cell:
- 3> include a measurement reporting entry within the *VarMeasReportList* for this *measId*;
- 3> set the numberOfReportsSent defined within the VarMeasReportList for this measId to 0;
- 3> stop timer T321;
- 3> initiate the measurement reporting procedure, as specified in 5.5.5;
 - 2> upon expiry of the T321 for this *measId*:
- 3> include a measurement reporting entry within the VarMeasReportList for this measId;

- 3> set the numberOfReportsSent defined within the VarMeasReportList for this measId to 0;
- 3> initiate the measurement reporting procedure, as specified in 5.5.5;
 - NOTE 2: The UE does not stop the periodical reporting with *triggerType* set to *event* or to *periodical* while the corresponding measurement is not performed due to the PCell RSRP being equal to or better than *s-Measure* or due to the measurement gap not being setup.
 - NOTE 3: If the UE is configured with DRX, the UE may delay the measurement reporting for event triggered and periodical triggered measurements until the Active Time, which is defined in TS 36.321 [6].

5.5.4.2 Event A1 (Serving becomes better than threshold)

The UE shall:

- 1> consider the entering condition for this event to be satisfied when condition A1-1, as specified below, is fulfilled;
- 1> consider the leaving condition for this event to be satisfied when condition A1-2, as specified below, is fulfilled;
- 1> for this measurement, consider the primary or secondary cell that is configured on the frequency indicated in the associated *measObjectEUTRA* to be the serving cell;

Inequality A1-1 (Entering condition)

Ms - Hys > Thresh

Inequality A1-2 (Leaving condition)

Ms + Hys < Thresh

The variables in the formula are defined as follows:

Ms is the measurement result of the serving cell, not taking into account any offsets.

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigEUTRA for this event).

Thresh is the threshold parameter for this event (i.e. *a1-Threshold* as defined within *reportConfigEUTRA* for this event).

Ms is expressed in dBm in case of RSRP, or in dB in case of RSRQ.

Hys is expressed in dB.

Thresh is expressed in the same unit as *Ms*.

5.5.4.3 Event A2 (Serving becomes worse than threshold)

The UE shall:

- 1> consider the entering condition for this event to be satisfied when condition A2-1, as specified below, is fulfilled;
- 1> consider the leaving condition for this event to be satisfied when condition A2-2, as specified below, is fulfilled;
- 1> for this measurement, consider the primary or secondary cell that is configured on the frequency indicated in the associated *measObjectEUTRA* to be the serving cell;

Inequality A2-1 (Entering condition)

Ms + Hys < Thresh

Inequality A2-2 (Leaving condition)

Ms-Hys>Thresh

The variables in the formula are defined as follows:

Ms is the measurement result of the serving cell, not taking into account any offsets.

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigEUTRA for this event).

Thresh is the threshold parameter for this event (i.e. a2-Threshold as defined within reportConfigEUTRA for this event).

Ms is expressed in dBm in case of RSRP, or in dB in case of RSRQ.

Hys is expressed in dB.

Thresh is expressed in the same unit as *Ms*.

5.5.4.4 Event A3 (Neighbour becomes offset better than PCell)

The UE shall:

1> consider the entering condition for this event to be satisfied when condition A3-1, as specified below, is fulfilled;

1> consider the leaving condition for this event to be satisfied when condition A3-2, as specified below, is fulfilled;

NOTE The cell(s) that triggers the event is on the frequency indicated in the associated *measObject* which may be different from the (primary) frequency used by the PCell.

Inequality A3-1 (Entering condition)

$$Mn + Ofn + Ocn - Hys > Mp + Ofp + Ocp + Off$$

Inequality A3-2 (Leaving condition)

$$Mn + Ofn + Ocn + Hys < Mp + Ofp + Ocp + Off$$

The variables in the formula are defined as follows:

Mn is the measurement result of the neighbouring cell, not taking into account any offsets.

Ofn is the frequency specific offset of the frequency of the neighbour cell (i.e. *offsetFreq* as defined within *measObjectEUTRA* corresponding to the frequency of the neighbour cell).

Ocn is the cell specific offset of the neighbour cell (i.e. *cellIndividualOffset* as defined within *measObjectEUTRA* corresponding to the frequency of the neighbour cell), and set to zero if not configured for the neighbour cell.

Mp is the measurement result of the PCell, not taking into account any offsets.

Ofp is the frequency specific offset of the primary frequency (i.e. *offsetFreq* as defined within *measObjectEUTRA* corresponding to the primary frequency).

Ocp is the cell specific offset of the PCell (i.e. *cellIndividualOffset* as defined within *measObjectEUTRA* corresponding to the primary frequency), and is set to zero if not configured for the PCell.

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigEUTRA for this event).

Off is the offset parameter for this event (i.e. a3-Offset as defined within reportConfigEUTRA for this event).

Mn, **Mp** are expressed in dBm in case of RSRP, or in dB in case of RSRQ.

Ofn, Ocn, Ofp, Ocp, Hys, Off are expressed in dB.

5.5.4.5 Event A4 (Neighbour becomes better than threshold)

The UE shall:

1> consider the entering condition for this event to be satisfied when condition A4-1, as specified below, is fulfilled;

1> consider the leaving condition for this event to be satisfied when condition A4-2, as specified below, is fulfilled;

Inequality A4-1 (Entering condition)

Mn + Ofn + Ocn - Hys > Thresh

Inequality A4-2 (Leaving condition)

Mn + Ofn + Ocn + Hys < Thresh

The variables in the formula are defined as follows:

Mn is the measurement result of the neighbouring cell, not taking into account any offsets.

Ofn is the frequency specific offset of the frequency of the neighbour cell (i.e. *offsetFreq* as defined within *measObjectEUTRA* corresponding to the frequency of the neighbour cell).

Ocn is the cell specific offset of the neighbour cell (i.e. *cellIndividualOffset* as defined within *measObjectEUTRA* corresponding to the frequency of the neighbour cell), and set to zero if not configured for the neighbour cell.

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigEUTRA for this event).

Thresh is the threshold parameter for this event (i.e. a4-Threshold as defined within reportConfigEUTRA for this event).

Mn is expressed in dBm in case of RSRP, or in dB in case of RSRQ.

Ofn, Ocn, Hys are expressed in dB.

Thresh is expressed in the same unit as *Mn*.

5.5.4.6 Event A5 (PCell becomes worse than threshold1 and neighbour becomes better than threshold2)

The UE shall:

1> consider the entering condition for this event to be satisfied when both condition A5-1 and condition A5-2, as specified below, are fulfilled;

1> consider the leaving condition for this event to be satisfied when condition A5-3 or condition A5-4, i.e. at least one of the two, as specified below, is fulfilled;

NOTE: The cell(s) that triggers the event is on the frequency indicated in the associated *measObject* which may be different from the (primary) frequency used by the PCell.

Inequality A5-1 (Entering condition 1)

Mp + Hys < Thresh

Inequality A5-2 (Entering condition 2)

Mn + Ofn + Ocn - Hys > Thresh2

Inequality A5-3 (Leaving condition 1)

Mp-Hys>Thresh

Inequality A5-4 (Leaving condition 2)

Mn + Ofn + Ocn + Hys < Thresh2

The variables in the formula are defined as follows:

Mp is the measurement result of the PCell, not taking into account any offsets.

Mn is the measurement result of the neighbouring cell, not taking into account any offsets.

Ofn is the frequency specific offset of the frequency of the neighbour cell (i.e. *offsetFreq* as defined within *measObjectEUTRA* corresponding to the frequency of the neighbour cell).

Ocn is the cell specific offset of the neighbour cell (i.e. *cellIndividualOffset* as defined within *measObjectEUTRA* corresponding to the frequency of the neighbour cell), and set to zero if not configured for the neighbour cell.

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigEUTRA for this event).

Thresh1 is the threshold parameter for this event (i.e. *a5-Threshold1* as defined within *reportConfigEUTRA* for this event).

Thresh2 is the threshold parameter for this event (i.e. *a5-Threshold2* as defined within *reportConfigEUTRA* for this event).

Mn, Mp are expressed in dBm in case of RSRP, or in dB in case of RSRQ.

Ofn, Ocn, Hys are expressed in dB.

Thresh1 is expressed in the same unit as *Mp*.

Thresh2 is expressed in the same unit as *Mn*.

5.5.4.6a Event A6 (Neighbour becomes offset better than SCell)

The UE shall:

1> consider the entering condition for this event to be satisfied when condition A6-1, as specified below, is fulfilled;

1> consider the leaving condition for this event to be satisfied when condition A6-2, as specified below, is fulfilled;

1> for this measurement, consider the (secondary) cell that is configured on the frequency indicated in the associated *measObjectEUTRA* to be the serving cell;

NOTE: The neighbour(s) is on the same frequency as the SCell i.e. both are on the frequency indicated in the associated *measObject*.

Inequality A6-1 (Entering condition)

Mn + Ocn - Hys > Ms + Ocs + Off

Inequality A6-2 (Leaving condition)

Mn + Ocn + Hys < Ms + Ocs + Off

The variables in the formula are defined as follows:

Mn is the measurement result of the neighbouring cell, not taking into account any offsets.

Ocn is the cell specific offset of the neighbour cell (i.e. *cellIndividualOffset* as defined within *measObjectEUTRA* corresponding to the frequency of the neighbour cell), and set to zero if not configured for the neighbour cell.

Ms is the measurement result of the serving cell, not taking into account any offsets.

Ocs is the cell specific offset of the serving cell (i.e. *cellIndividualOffset* as defined within *measObjectEUTRA* corresponding to the serving frequency), and is set to zero if not configured for the serving cell.

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigEUTRA for this event).

Off is the offset parameter for this event (i.e. a6-Offset as defined within reportConfigEUTRA for this event).

Mn, Ms are expressed in dBm in case of RSRP, or in dB in case of RSRQ.

Ocn, Ocs, Hys, Off are expressed in dB.

5.5.4.7 Event B1 (Inter RAT neighbour becomes better than threshold)

The UE shall:

1> for UTRA and CDMA2000, only trigger the event for cells included in the corresponding measurement object;

1> consider the entering condition for this event to be satisfied when condition B1-1, as specified below, is fulfilled;

1> consider the leaving condition for this event to be satisfied when condition B1-2, as specified below, is fulfilled;

Inequality B1-1 (Entering condition)

Mn + Ofn - Hys > Thresh

Inequality B1-2 (Leaving condition)

Mn + Ofn + Hys < Thresh

The variables in the formula are defined as follows:

Mn is the measurement result of the inter-RAT neighbour cell, not taking into account any offsets. For CDMA 2000 measurement result, *pilotStrength* is divided by -2.

Ofn is the frequency specific offset of the frequency of the inter-RAT neighbour cell (i.e. *offsetFreq* as defined within the *measObject* corresponding to the frequency of the neighbour inter-RAT cell).

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigInterRAT for this event).

Thresh is the threshold parameter for this event (i.e. b1-Threshold as defined within reportConfigInterRAT for this event). For CDMA2000, b1-Threshold is divided by -2.

Mn is expressed in dBm or in dB, depending on the measurement quantity of the inter-RAT neighbour cell.

Ofn, Hys are expressed in dB.

Thresh is expressed in the same unit as Mn.

5.5.4.8 Event B2 (PCell becomes worse than threshold1 and inter RAT neighbour becomes better than threshold2)

The UE shall:

- 1> for UTRA and CDMA2000, only trigger the event for cells included in the corresponding measurement object;
- 1> consider the entering condition for this event to be satisfied when both condition B2-1 and condition B2-2, as specified below, are fulfilled;
- 1> consider the leaving condition for this event to be satisfied when condition B2-3 or condition B2-4, i.e. at least one of the two, as specified below, is fulfilled;

Inequality B2-1 (Entering condition 1)

Mp + Hys < Thresh

Inequality B2-2 (Entering condition 2)

Mn + Ofn - Hys > Thresh2

Inequality B2-3 (Leaving condition 1)

Mp-Hys>Thresh

Inequality B2-4 (Leaving condition 2)

Mn + Ofn + Hys < Thresh2

The variables in the formula are defined as follows:

Mp is the measurement result of the PCell, not taking into account any offsets.

Mn is the measurement result of the inter-RAT neighbour cell, not taking into account any offsets. For CDMA2000 measurement result, *pilotStrength* is divided by -2.

Ofn is the frequency specific offset of the frequency of the inter-RAT neighbour cell (i.e. *offsetFreq* as defined within the *measObject* corresponding to the frequency of the inter-RAT neighbour cell).

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigInterRAT for this event).

Thresh1 is the threshold parameter for this event (i.e. b2-*Threshold1* as defined within *reportConfigInterRAT* for this event).

Thresh2 is the threshold parameter for this event (i.e. *b2-Threshold2* as defined within *reportConfigInterRAT* for this event). For CDMA2000, *b2-Threshold2* is divided by -2.

Mp is expressed in dBm in case of RSRP, or in dB in case of RSRQ.

Mn is expressed in dBm or dB, depending on the measurement quantity of the inter-RAT neighbour cell.

Ofn, Hys are expressed in dB.

Thresh1 is expressed in the same unit as *Mp*.

Thresh2 is expressed in the same unit as *Mn*.

5.5.5 Measurement reporting

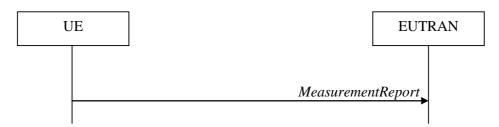


Figure 5.5.5-1: Measurement reporting

The purpose of this procedure is to transfer measurement results from the UE to E-UTRAN.

For the *measId* for which the measurement reporting procedure was triggered, the UE shall set the *measResults* within the *MeasurementReport* message as follows:

- 1> set the *measId* to the measurement identity that triggered the measurement reporting;
- 1> set the *measResultPCell* to include the quantities of the PCell;
- 1> set the *measResultServFreqList* to include for each SCell that is configured, if any, within *measResultSCell* the quantities of the concerned SCell, if available according to performance requirements in [16];
- 1> if the *reportConfig* associated with the *measId* that triggered the measurement reporting includes *reportAddNeighMeas*:
 - 2> for each serving frequency for which *measObjectId* is referenced in the *measIdList*, other than the frequency corresponding with the *measId* that triggered the measurement reporting:

3> set the *measResultServFreqList* to include within *measResultBestNeighCell* the *physCellId* and the quantities of the best non-serving cell, based on RSRP, on the concerned serving frequency;

- 1> if there is at least one applicable neighbouring cell to report:
 - 2> set the *measResultNeighCells* to include the best neighbouring cells up to *maxReportCells* in accordance with the following:
- 3> if the *triggerType* is set to *event*:
 - 4> include the cells included in the *cellsTriggeredList* as defined within the *VarMeasReportList* for this *measId*:

3> else:

- 4> include the applicable cells for which the new measurement results became available since the last periodical reporting or since the measurement was initiated or reset;
- NOTE: The reliability of the report (i.e. the certainty it contains the strongest cells on the concerned frequency) depends on the measurement configuration i.e. the *reportInterval*. The related performance requirements are specified in TS 36.133 [16].
- 3> for each cell that is included in the *measResultNeighCells*, include the *physCellId*;
- 3> if the triggerType is set to event; or the purpose is set to reportStrongestCells or to reportStrongestCellsForSON:
 - 4> for each included cell, include the layer 3 filtered measured results in accordance with the *reportConfig* for this *measId*, ordered as follows:
- 5> if the *measObject* associated with this *measId* concerns E-UTRA:
 - 6> set the *measResult* to include the quantity(ies) indicated in the *reportQuantity* within the concerned *reportConfig* in order of decreasing *triggerQuantity*, i.e. the best cell is included first:
- 5> if the *measObject* associated with this *measId* concerns UTRA FDD and if *ReportConfigInterRAT* includes the *reportQuantityUTRA-FDD*:
 - 6> set the *measResult* to include the quantities indicated by the *reportQuantityUTRA-FDD* in order of decreasing *measQuantityUTRA-FDD* within the *quantityConfig*, i.e. the best cell is included first;
- 5> if the *measObject* associated with this *measId* concerns UTRA FDD and if *ReportConfigInterRAT* does not include the *reportQuantityUTRA-FDD*; or
- 5> if the measObject associated with this measId concerns UTRA TDD, GERAN or CDMA2000:
 - 6> set the *measResult* to the quantity as configured for the concerned RAT within the *quantityConfig* in order of either decreasing quantity for UTRA and GERAN or increasing quantity for CDMA2000 *pilotStrength*, i.e. the best cell is included first;
- 3> else if the *purpose* is set to *reportCGI*:
 - 4> if the mandatory present fields of the *cgi-Info* for the cell indicated by the *cellForWhichToReportCGI* in the associated *measObject* have been obtained:
- 5> if the cell broadcasts a CSG identity:
 - 6> include the *csg-Identity*;
 - 6> include the *csg-MemberStatus* and set it to *member* if the cell is a CSG member cell;
- 5> if the si-RequestForHO is configured within the reportConfig associated with this measId:
 - 6> include the *cgi-Info* containing all the fields that have been successfully acquired, except for the *plmn-IdentityList*;
- 5> else:
- 6> include the *cgi-Info* containing all the fields that have been successfully acquired;
- 1> if the ue-RxTxTimeDiffPeriodical is configured within the corresponding reportConfig for this measId;
 - 2> set the *ue-RxTxTimeDiffResult* to the measurement result provided by lower layers;
 - 2> set the *currentSFN*;
- 1> if the *includeLocationInfo* is configured in the corresponding *reportConfig* for this *measId* and detailed location information that has not been reported is available, set the content of the *locationInfo* as follows:
 - 2> include the *locationCoordinates*:

- 2> if available, include the gnss-TOD-msec;
- 1> increment the *numberOfReportsSent* as defined within the *VarMeasReportList* for this *measId* by 1;
- 1> stop the periodical reporting timer, if running;
- 1> if the *numberOfReportsSent* as defined within the *VarMeasReportList* for this *measId* is less than the *reportAmount* as defined within the corresponding *reportConfig* for this *measId*:
 - 2> start the periodical reporting timer with the value of *reportInterval* as defined within the corresponding *reportConfig* for this *measId*;
- 1> else:
 - 2> if the *triggerType* is set to *periodical*:
- 3> remove the entry within the *VarMeasReportList* for this *measId*;
- 3> remove this *measId* from the *measIdList* within *VarMeasConfig*;
 - 1> if the measured results are for CDMA2000 HRPD:
 - 2> set the preRegistrationStatusHRPD to the UE's CDMA2000 upper layer's HRPD preRegistrationStatus;
 - 1> if the measured results are for CDMA2000 1xRTT:
 - 2> set the *preRegistrationStatusHRPD* to *FALSE*;
 - 1> submit the *MeasurementReport* message to lower layers for transmission, upon which the procedure ends;

5.5.6 Measurement related actions

5.5.6.1 Actions upon handover and re-establishment

E-UTRAN applies the handover procedure as follows:

- when performing the handover procedure, as specified in 5.3.5.4, ensure that a *measObjectId* corresponding to each handover target serving frequency is configured as a result of the procedures described in this sub-clause and in 5.3.5.4;
- when changing the band while the physical frequency remains unchanged, E-UTRAN releases the *measObject* corresponding to the source frequency and adds a *measObject* corresponding to the target frequency (i.e. it does not reconfigure the *measObject*);

E-UTRAN applies the re-establishment procedure as follows:

- when performing the connection re-establishment procedure, as specified in 5.3.7, ensure that a measObjectId
 corresponding each target serving frequency is configured as a result of the procedure described in this subclause and the subsequent connection reconfiguration procedure immediately following the re-establishment
 procedure;
- in the first reconfiguration following the re-establishment when changing the band while the physical frequency remains unchanged, E-UTRAN releases the *measObject* corresponding to the source frequency and adds a *measObject* corresponding to the target frequency (i.e. it does not reconfigure the *measObject*);

- 1> for each *measId* included in the *measIdList* within *VarMeasConfig*:
 - 2> if the *triggerType* is set to *periodical*:
- 3> remove this *measId* from the *measIdList* within *VarMeasConfig*:
 - 1> if the procedure was triggered due to a handover or successful re-establishment and the procedure involves a change of primary frequency, update the *measId* values in the *measIdList* within *VarMeasConfig* as follows:

- 2> if a *measObjectId* value corresponding to the target primary frequency exists in the *measObjectList* within *VarMeasConfig*:
- 3> for each *measId* value in the *measIdList*:
 - 4> if the *measId* value is linked to the *measObjectId* value corresponding to the source primary frequency:
- 5> link this measId value to the measObjectId value corresponding to the target primary frequency;
 - 4> else if the *measId* value is linked to the *measObjectId* value corresponding to the target primary frequency:
- 5> link this *measId* value to the *measObjectId* value corresponding to the source primary frequency;
 - 2> else:
- 3> remove all *measId* values that are linked to the *measObjectId* value corresponding to the source primary frequency;
 - 1> remove all measurement reporting entries within VarMeasReportList;
 - 1> stop the periodical reporting timer or timer T321, whichever one is running, as well as associated information (e.g. *timeToTrigger*) for all *measId*;
 - 1> release the measurement gaps, if activated;
 - NOTE: If the UE requires measurement gaps to perform inter-frequency or inter-RAT measurements, the UE resumes the inter-frequency and inter-RAT measurements after the E-UTRAN has setup the measurement gaps.

5.5.6.2 Speed dependant scaling of measurement related parameters

The UE shall adjust the value of the following parameter configured by the E-UTRAN depending on the UE speed: *timeToTrigger*. The UE shall apply 3 different levels, which are selected as follows:

The UE shall:

- 1> perform mobility state detection using the mobility state detection as specified in TS 36.304 [4] with the following modifications:
 - 2> counting handovers instead of cell reselections;
 - 2> applying the parameter applicable for RRC_CONNECTED as included in *speedStatePars* within *VarMeasConfig*;
- 1> if high mobility state is detected:
 - 2> use the timeToTrigger value multiplied by sf-High within VarMeasConfig;
- 1> else if medium mobility state is detected:
 - $2> use the {\it timeToTrigger} \ value \ multiplied \ by {\it sf-Medium} \ within {\it VarMeasConfig};$
- 1> else:
 - 2> no scaling is applied;

5.5.7 Inter-frequency RSTD measurement indication

5.5.7.1 General

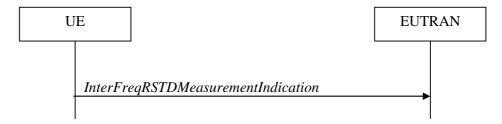


Figure 5.5.7.1-1: Inter-frequency RSTD measurement indication

The purpose of this procedure is to indicate to the network that the UE is going to start/stop OTDOA inter-frequency RSTD measurements which require measurement gaps as specified in [16, 8.1.2.6].

NOTE: It is a network decision to configure the measurement gap.

5.5.7.2 Initiation

The UE shall:

- 1> if and only if upper layers indicate to start performing inter-frequency RSTD measurements and the UE requires measurement gaps for these measurements while measurement gaps are either not configured or not sufficient:
 - 2> initiate the procedure to indicate start;
- NOTE 1: The UE verifies the measurement gap situation only upon receiving the indication from upper layers. If at this point in time sufficient gaps are available, the UE does not initiate the procedure. Unless it receives a new indication from upper layers, the UE is only allowed to further repeat the procedure in the same PCell once per frequency if the provided measurement gaps are insufficient.
- 1> if and only if upper layers indicate to stop performing inter-frequency RSTD measurements:
 - 2> initiate the procedure to indicate stop;
- NOTE 2: The UE may initiate the procedure to indicate stop even if it did not previously initiate the procedure to indicate start.

5.5.7.3 Actions related to transmission of *InterFreqRSTDMeasurementIndication* message

The UE shall set the contents of InterFreqRSTDMeasurementIndication message as follows:

- 1> set the *rstd-InterFreqIndication* as follows:
 - 2> if the procedure is initiated to indicate start of inter-frequency RSTD measurements:
- 3> set the rstd-InterFreqInfoList according to the information received from upper layers;
 - 2> else if the procedure is initiated to indicate stop of inter-frequency RSTD measurements:
- 3> set the *rstd-InterFreqIndication* to the value *stop*;
 - 1> submit the *InterFreqRSTDMeasurementIndication* message to lower layers for transmission, upon which the procedure ends;

5.6 Other

5.6.1 DL information transfer

5.6.1.1 General

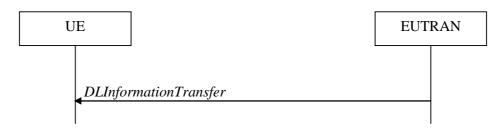


Figure 5.6.1.1-1: DL information transfer

The purpose of this procedure is to transfer NAS or (tunnelled) non-3GPP dedicated information from E-UTRAN to a UE in RRC_CONNECTED.

5.6.1.2 Initiation

E-UTRAN initiates the DL information transfer procedure whenever there is a need to transfer NAS or non-3GPP dedicated information. E-UTRAN initiates the DL information transfer procedure by sending the *DLInformationTransfer* message.

5.6.1.3 Reception of the *DLInformationTransfer* by the UE

Upon receiving *DLInformationTransfer* message, the UE shall:

- 1> if the *dedicatedInfoType* is set to *dedicatedInfoNAS*:
 - 2> forward the *dedicatedInfoNAS* to the NAS upper layers.
- 1> if the dedicatedInfoType is set to dedicatedInfoCDMA2000-1XRTT or to dedicatedInfoCDMA2000-HRPD:
 - 2> forward the *dedicatedInfoCDMA2000* to the CDMA2000 upper layers;

5.6.2 UL information transfer

5.6.2.1 General

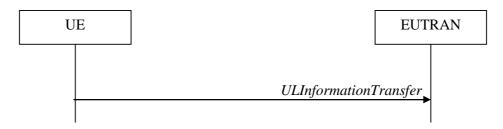


Figure 5.6.2.1-1: UL information transfer

The purpose of this procedure is to transfer NAS or (tunnelled) non-3GPP dedicated information from the UE to E-UTRAN.

5.6.2.2 Initiation

A UE in RRC_CONNECTED initiates the UL information transfer procedure whenever there is a need to transfer NAS or non-3GPP dedicated information, except at RRC connection establishment in which case the NAS information is

piggybacked to the *RRCConnectionSetupComplete* message. The UE initiates the UL information transfer procedure by sending the *ULInformationTransfer* message. When CDMA2000 information has to be transferred, the UE shall initiate the procedure only if SRB2 is established.

5.6.2.3 Actions related to transmission of *ULInformationTransfer* message

The UE shall set the contents of the ULInformationTransfer message as follows:

- 1> if there is a need to transfer NAS information:
 - 2> set the *dedicatedInfoType* to include the *dedicatedInfoNAS*;
- 1> if there is a need to transfer CDMA2000 1XRTT information:
 - 2> set the *dedicatedInfoType* to include the *dedicatedInfoCDMA2000-1XRTT*;
- 1> if there is a need to transfer CDMA2000 HRPD information:
 - 2> set the *dedicatedInfoType* to include the *dedicatedInfoCDMA2000-HRPD*;
- 1> submit the ULInformationTransfer message to lower layers for transmission, upon which the procedure ends;

5.6.2.4 Failure to deliver *ULInformationTransfer* message

The UE shall:

- 1> if mobility (i.e. handover, RRC connection re-establishment) occurs before the successful delivery of *ULInformationTransfer* messages has been confirmed by lower layers:
 - 2> inform upper layers about the possible failure to deliver the information contained in the concerned *ULInformationTransfer* messages;

5.6.3 UE capability transfer

5.6.3.1 General

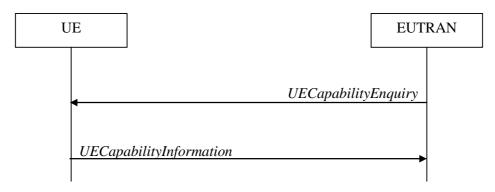


Figure 5.6.3.1-1: UE capability transfer

The purpose of this procedure is to transfer UE radio access capability information from the UE to E-UTRAN.

If the UE has changed its E-UTRAN radio access capabilities, the UE shall request higher layers to initiate the necessary NAS procedures (see TS 23.401 [41]) that would result in the update of UE radio access capabilities using a new RRC connection.

NOTE: Change of the UE's GERAN UE radio capabilities in RRC_IDLE is supported by use of Tracking Area Update.

5.6.3.2 Initiation

E-UTRAN initiates the procedure to a UE in RRC_CONNECTED when it needs (additional) UE radio access capability information.

5.6.3.3 Reception of the *UECapabilityEnquiry* by the UE

The UE shall:

- 1> set the contents of *UECapabilityInformation* message as follows:
 - 2> if the *ue-CapabilityRequest* includes *eutra*:
- 3> include the UE-EUTRA-Capability within a ue-CapabilityRAT-Container and with the rat-Type set to eutra;
- 3> if the UE supports FDD and TDD:
 - 4> set all fields of *UECapabilityInformation*, except field *fdd-Add-UE-EUTRA-Capabilities* and *tdd-Add-UE-EUTRA-Capabilities* (including their sub-fields), to include the values applicable for both FDD and TDD (i.e. functionality supported by both modes);
 - 4> if (some of) the UE capability fields have a different value for FDD and TDD:
- 5> if for FDD, the UE supports additional functionality compared to what is indicated by the previous fields of *UECapabilityInformation*:
 - 6> include field *fdd-Add-UE-EUTRA-Capabilities* and set it to include fields reflecting the additional functionality applicable for FDD;
- 5> if for TDD, the UE supports additional functionality compared to what is indicated by the previous fields of *UECapabilityInformation*:
 - 6> include field *tdd-Add-UE-EUTRA-Capabilities* and set it to include fields reflecting the additional functionality applicable for TDD;

NOTE: The UE includes fields of XDD-Add-UE-EUTRA-Capabilities in accordance with the following:

- The field is included only if one or more of its sub-fields has a value that is different compared to the value signalled elsewhere within *UE-EUTRA-Capability*;

(this value signalled elsewhere is also referred to as the Common value, that is supported for both XDD modes)

- For the fields that are included in *XDD-Add-UE-EUTRA-Capabilities*, the UE sets:
- the sub-fields that are not allowed to be different the same as the Common value;
- the sub-fields that are allowed to be different to a value indicating at least the same functionality as indicated by the *Common value*;
- 3> else (UE supports single xDD mode):
 - 4> set all fields of *UECapabilityInformation*, except field *fdd-Add-UE-EUTRA-Capabilities* and *tdd-Add-UE-EUTRA-Capabilities* (including their sub-fields), to include the values applicable for the xDD mode supported by the UE;
- 3> if the *UECapabilityEnquiry* message includes *requestedFrequencyBands* and UE supports *requestedFrequencyBands*:
 - 4> create a set of band combinations supported by the UE, including non-CA combinations, target for being included in *supportedBandCombination* while observing the following order (i.e. listed in order of decreasing priority):
- include all non-CA bands, regardless of whether UE supports carrier aggregation, only:
 - if the UE includes ue-Category-v1020 (i.e. indicating category 6 to 8); or
 - if for at least one of the non-CA bands, the UE supports more MIMO layers with TM9 and TM10 than implied by the UE category; or

- the UE supports TM10 with one or more CSI processes;
- include all 2DL+1UL CA band combinations, only consisting of bands included in requestedFrequencyBands;
- include all other 2DL+1UL CA band combinations;
- include all other CA band combinations, only consisting of bands included in *requestedFrequencyBands*, and prioritized in the order of *requestedFrequencyBands*, (i.e. first include remaining band combinations containing the first-listed band, then include remaining band combinations containing the second-listed band, and so on);
 - 4> include in *supportedBandCombination* as many of the target band combinations as possible, determined according to the above, while observing the priority order;
 - 4> include in *supportedBandCombinationAdd* as many of the remaining target band combinations as possible, i.e. the target band combinations the UE was not able to include in *supportedBandCombination*, and limited to those consisting of bands included in *requestedFrequencyBands*, while observing the priority order;
 - 4> indicate in *requestedBands* the same bands and in the same order as included in the received *requestedFrequencyBands*;

3> else

- 4> create a set of band combinations supported by the UE, including non-CA combinations, target for being included in *supportedBandCombination*:
- include all non-CA bands, regardless of whether UE supports carrier aggregation, only:
 - if the UE includes ue-Category-v1020 (i.e. indicating category 6 to 8); or
 - if for at least one of the non-CA bands, the UE supports more MIMO layers with TM9 and TM10 than implied by the UE category; or
 - the UE supports TM10 with one or more CSI processes;
- include all 2DL+1UL CA band combinations:
- include all other CA band combinations;
 - 4> include in *supportedBandCombination* as many of the target band combinations as possible, determined according to the above;
 - 4> if the number of non-CA and CA band combinations supported by UE exceeds the maximum number of band combinations of *supportedBandCombination*, the selection of subset of band combinations is up to UE implementation;
 - NOTE: If the *UECapabilityEnquiry* message does not include *requestedFrequencyBands*, UE does not include *supportedBandCombinationAdd*.
 - 2> if the ue-CapabilityRequest includes geran-cs and if the UE supports GERAN CS domain:
- 3> include the UE radio access capabilities for GERAN CS within a *ue-CapabilityRAT-Container* and with the *rat-Type* set to *geran-cs*;
 - 2> if the ue-CapabilityRequest includes geran-ps and if the UE supports GERAN PS domain:
- 3> include the UE radio access capabilities for GERAN PS within a *ue-CapabilityRAT-Container* and with the *rat-Type* set to *geran-ps*;
 - 2> if the *ue-CapabilityRequest* includes *utra* and if the UE supports UTRA:
- 3> include the UE radio access capabilities for UTRA within a *ue-CapabilityRAT-Container* and with the *rat-Type* set to *utra*;
 - 2> if the ue-CapabilityRequest includes cdma2000-1XRTT and if the UE supports CDMA2000 1xRTT:
- 3> include the UE radio access capabilities for CDMA2000 within a *ue-CapabilityRAT-Container* and with the *rat-Type* set to *cdma2000-1XRTT*;

1> submit the UECapabilityInformation message to lower layers for transmission, upon which the procedure ends;

5.6.4 CSFB to 1x Parameter transfer

5.6.4.1 General

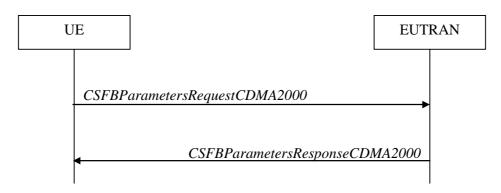


Figure 5.6.4.1-1: CSFB to 1x Parameter transfer

The purpose of this procedure is to transfer the CDMA2000 1xRTT parameters required to register the UE in the CDMA2000 1xRTT network for CSFB support.

5.6.4.2 Initiation

A UE in RRC_CONNECTED initiates the CSFB to 1x Parameter transfer procedure upon request from the CDMA2000 upper layers. The UE initiates the CSFB to 1x Parameter transfer procedure by sending the *CSFBParametersRequestCDMA2000* message.

5.6.4.3 Actions related to transmission of *CSFBParametersRequestCDMA2000* message

The UE shall:

1> submit the *CSFBParametersRequestCDMA2000* message to lower layers for transmission using the current configuration;

5.6.4.4 Reception of the CSFBParametersResponseCDMA2000 message

Upon reception of the CSFBParametersResponseCDMA2000 message, the UE shall:

1> forward the *rand* and the *mobilityParameters* to the CDMA2000 1xRTT upper layers;

5.6.5 UE Information

5.6.5.1 General

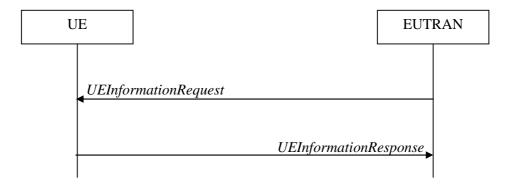


Figure 5.6.5.1-1: UE information procedure

The UE information procedure is used by E-UTRAN to request the UE to report information.

5.6.5.2 Initiation

E-UTRAN initiates the procedure by sending the *UEInformationRequest* message.

5.6.5.3 Reception of the *UEInformationRequest* message

Upon receiving the *UEInformationRequest* message, the UE shall:

- 1> if rach-ReportReq is set to true, set the contents of the rach-Report in the UEInformationResponse message as follows:
 - 2> set the *numberOfPreamblesSent* to indicate the number of preambles sent by MAC for the last successfully completed random access procedure;
 - 2> if contention resolution was not successful as specified in TS 36.321 [6] for at least one of the transmitted preambles for the last successfully completed random access procedure:
- 3> set the *contentionDetected* to *true*;
 - 2> else:
- 3> set the *contentionDetected* to *false*;
 - 1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
 - 2> set *timeSinceFailure* in *VarRLF-Report* to the time that elapsed since the last radio link or handover failure in E-UTRA;
 - 2> set the rlf-Report in the UEInformationResponse message to the value of rlf-Report in VarRLF-Report;
 - 2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
 - 1> if *connEstFailReportReq* is set to *true* and the UE has connection establishment failure information in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:
 - 2> set *timeSinceFailure* in *VarConnEstFailReport* to the time that elapsed since the last connection establishment failure in E-UTRA;
 - 2> set the *connEstFailReport* in the *UEInformationResponse* message to the value of *connEstFailReport* in *VarConnEstFailReport*;

- 2> discard the *connEstFailReport* from *VarConnEstFailReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
- 1> if the *logMeasReportReq* is present and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
 - 2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:
- 3> include the absoluteTimeStamp and set it to the value of absoluteTimeInfo in the VarLogMeasReport;
 - 3> include the traceReference and set it to the value of traceReference in the VarLogMeasReport;
- 3> include the *traceRecordingSessionRef* and set it to the value of *traceRecordingSessionRef* in the *VarLogMeasReport*;
- 3> include the tce-Id and set it to the value of tce-Id in the VarLogMeasReport;
- 3> include the *logMeasInfoList* and set it to include one or more entries from *VarLogMeasReport* starting from the entries logged first;
- 3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:
 - 4> include the *logMeasAvailable*;
 - 1> if the *logMeasReport* is included in the *UEInformationResponse*:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;
 - 2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
 - 1> else:
 - 2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1;

5.6.6 Logged Measurement Configuration

5.6.6.1 General



Figure 5.6.6.1-1: Logged measurement configuration

The purpose of this procedure is to configure the UE to perform logging of measurement results while in RRC_IDLE. The procedure applies to logged measurements capable UEs that are in RRC_CONNECTED.

NOTE E-UTRAN may retrieve stored logged measurement information by means of the UE Information procedure.

5.6.6.2 Initiation

E-UTRAN initiates the logged measurement configuration procedure to UE in RRC_CONNECTED by sending the *LoggedMeasurementConfiguration* message.

5.6.6.3 Reception of the LoggedMeasurementConfiguration by the UE

Upon receiving the *LoggedMeasurementConfiguration* message the UE shall:

- 1> discard the logged measurement configuration as well as the logged measurement information as specified in 5.6.7;
- 1> store the received logging Duration, logging Interval and area Configuration, if included, in VarLogMeas Config;
- 1> if the *LoggedMeasurementConfiguration* message includes *plmn-IdentityList*:
 - 2> set *plmn-IdentityList* in *VarLogMeasReport* to include the RPLMN as well as the PLMNs included in *plmn-IdentityList*;

1> else:

- 2> set *plmn-IdentityList* in *VarLogMeasReport* to include the RPLMN;
- 1> store the received absoluteTimeInfo, traceReference, traceRecordingSessionRef and tce-Id in VarLogMeasReport;
- 1> start timer T330 with the timer value set to the *loggingDuration*;

5.6.6.4 T330 expiry

Upon expiry of T330 the UE shall:

1> release VarLogMeasConfig;

The UE is allowed to discard stored logged measurements, i.e. to release *VarLogMeasReport*, 48 hours after T330 expiry.

5.6.7 Release of Logged Measurement Configuration

5.6.7.1 General

The purpose of this procedure is to release the logged measurement configuration as well as the logged measurement information.

5.6.7.2 Initiation

The UE shall initiate the procedure upon receiving a logged measurement configuration in another RAT. The UE shall also initiate the procedure upon power off or detach.

The UE shall:

- 1> stop timer T330, if running;
- 1> if stored, discard the logged measurement configuration as well as the logged measurement information, i.e. release the UE variables *VarLogMeasConfig* and *VarLogMeasReport*;

5.6.8 Measurements logging

5.6.8.1 General

This procedure specifies the logging of available measurements by a UE in RRC_IDLE that has a logged measurement configuration.

5.6.8.2 Initiation

While T330 is running, the UE shall:

- 1> perform the logging in accordance with the following:
 - 2> if the UE is camping normally on an E-UTRA cell and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport* and, if the cell is part of the area indicated by *areaConfiguration* if configured in *VarLogMeasConfig*:
- 3> perform the logging at regular time intervals, as defined by the loggingInterval in VarLogMeasConfig;
 - 2> when adding a logged measurement entry in *VarLogMeasReport*, include the fields in accordance with the following:
- 3> set the *relativeTimeStamp* to indicate the elapsed time since the moment at which the logged measurement configuration was received;
- 3> if detailed location information became available during the last logging interval, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
- 3> set the servCellIdentity to indicate global cell identity of the cell the UE is camping on;
- 3> set the measResultServCell to include the quantities of the cell the UE is camping on;
- 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell re-selection, to include neighbouring cell measurements that became available during the last logging interval for at most the following number of neighbouring cells: 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency/ set of frequencies (GERAN) per RAT and according to the following:
 - 4> for each neighbour cell included, include the optional fields that are available;
 - NOTE: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].
 - 2> when the memory reserved for the logged measurement information becomes full, stop timer T330 and perform the same actions as performed upon expiry of T330, as specified in 5.6.6.4;

5.6.9 In-device coexistence indication

5.6.9.1 General

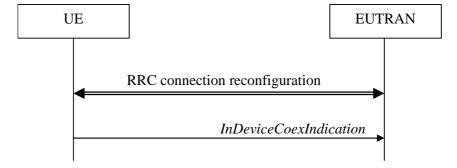


Figure 5.6.9.1-1: In-device coexistence indication

The purpose of this procedure is to inform E-UTRAN about (a change of) the In-Device Coexistence (IDC) problems experienced by the UE in RRC_CONNECTED, as described in TS 36.300 [9], and to provide the E-UTRAN with information in order to resolve them.

5.6.9.2 Initiation

A UE capable of providing IDC indications may initiate the procedure when it is configured to provide IDC indications and upon change of IDC problem information.

Upon initiating the procedure, the UE shall:

- 1> if configured to provide IDC indications:
 - 2> if the UE did not transmit an InDeviceCoexIndication message since it was configured to provide IDC indications:
- 3> if on one or more frequencies for which a *measObjectEUTRA* is configured, the UE is experiencing IDC problems that it cannot solve by itself:
 - 4> initiate transmission of the InDeviceCoexIndication message in accordance with 5.6.9.3;
 - 2> else:
- 3> if the set of frequencies, for which a *measObjectEUTRA* is configured and on which the UE is experiencing IDC problems that it cannot solve by itself, is different from the set indicated in the last transmitted *InDeviceCoexIndication* message; or
- 3> if for one or more of the frequencies in the previously reported set of frequencies, the *interferenceDirection* is different from the value indicated in the last transmitted *InDeviceCoexIndication* message; or
- 3> if the TDM assistance information is different from the assistance information included in the last transmitted *InDeviceCoexIndication* message:
 - 4> initiate transmission of the InDeviceCoexIndication message in accordance with 5.6.9.3;

5.6.9.3 Actions related to transmission of InDeviceCoexIndication message

The UE shall set the contents of the InDeviceCoexIndication message as follows:

- 1> if there is at least one E-UTRA carrier frequency, for which a measurement object is configured, that is affected by IDC problems:
 - 2> include the IE *affectedCarrierFreqList* with an entry for each affected E-UTRA carrier frequency for which a measurement object is configured;
 - 2> for each E-UTRA carrier frequency included in the IE *affectedCarrierFreqList*, include *interferenceDirection* and set it accordingly;
 - 2> include Time Domain Multiplexing (TDM) based assistance information:
- 3> if the UE has DRX related assistance information that could be used to resolve the IDC problems:
 - 4> include *drx-CycleLength*, *drx-Offset* and *drx-ActiveTime*;
- 3> else (the UE has desired subframe reservation patterns related assistance information that could be used to resolve the IDC problems):
 - 4> include *idc-SubframePatternList*;
 - NOTE 1: When sending an *InDeviceCoexIndication* message to inform E-UTRAN the IDC problems, the UE includes all assistance information (rather than providing e.g. the changed part(s) of the assistance information).

The UE shall submit the InDeviceCoexIndication message to lower layers for transmission.

5.6.10 UE Assistance Information

5.6.10.1 General

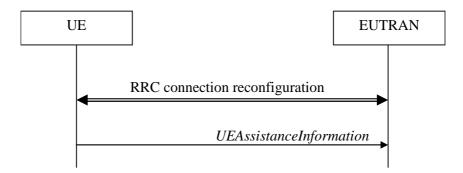


Figure 5.6.10.1-1: UE Assistance Information

The purpose of this procedure is to inform E-UTRAN of the UE"s power saving preference. Upon configuring the UE to provide power preference indications E-UTRAN may consider that the UE does not prefer a configuration primarily optimised for power saving until the UE explicitly indicates otherwise.

5.6.10.2 Initiation

A UE capable of providing power preference indications in RRC_CONNECTED may initiate the procedure in several cases including upon being configured to provide power preference indications and upon change of power preference.

Upon initiating the procedure, the UE shall:

- 1> if configured to provide power preference indications:
 - 2> if the UE did not transmit a *UEAssistanceInformation* message since it was configured to provide power preference indications; or
 - 2> if the current power preference is different from the one indicated in the last transmission of the *UEAssistanceInformation* message and timer T340 is not running:
- 3> initiate transmission of the UEAssistanceInformation message in accordance with 5.6.10.3;

5.6.10.3 Actions related to transmission of *UEAssistanceInformation* message

The UE shall set the contents of the UEAssistanceInformation message:

- 1> if the UE prefers a configuration primarily optimised for power saving:
 - 2> set powerPrefIndication to lowPowerConsumption;

1> else:

- 2> start or restart timer T340 with the timer value set to the *powerPrefIndicationTimer*;
- 2> set powerPrefIndication to normal;

The UE shall submit the UEAssistanceInformation message to lower layers for transmission.

5.7 Generic error handling

5.7.1 General

The generic error handling defined in the subsequent sub-clauses applies unless explicitly specified otherwise e.g. within the procedure specific error handling.

The UE shall consider a value as not comprehended when it is set:

- to an extended value that is not defined in the version of the transfer syntax supported by the UE.
- to a spare or reserved value unless the specification defines specific behaviour that the UE shall apply upon receiving the concerned spare/ reserved value.

The UE shall consider a field as not comprehended when it is defined:

- as spare or reserved unless the specification defines specific behaviour that the UE shall apply upon receiving the concerned spare/reserved field.

5.7.2 ASN.1 violation or encoding error

The UE shall:

- 1> when receiving an RRC message on the BCCH, PCCH, CCCH, or MCCH for which the abstract syntax is invalid [13]:
 - 2> ignore the message;

NOTE This section applies in case one or more fields is set to a value, other than a spare, reserved or extended value, not defined in this version of the transfer syntax. E.g. in the case the UE receives value 12 for a field defined as INTEGER (1..11). In cases like this, it may not be possible to reliably detect which field is in the error hence the error handling is at the message level.

5.7.3 Field set to a not comprehended value

The UE shall, when receiving an RRC message on any logical channel:

- 1> if the message includes a field that has a value that the UE does not comprehend:
 - 2> if a default value is defined for this field:
- 3> treat the message while using the default value defined for this field;
 - 2> else if the concerned field is optional:
- 3> treat the message as if the field were absent and in accordance with the need code for absence of the concerned field;
 - 2> else:
- 3> treat the message as if the field were absent and in accordance with sub-clause 5.7.4;

5.7.4 Mandatory field missing

The UE shall:

- 1> if the message includes a field that is mandatory to include in the message (e.g. because conditions for mandatory presence are fulfilled) and that field is absent or treated as absent:
 - 2> if the RRC message was received on DCCH or CCCH:
- 3> ignore the message;
 - 2> else:
- 3> if the field concerns a (sub-field of) an entry of a list (i.e. a SEQUENCE OF):
 - 4> treat the list as if the entry including the missing or not comprehended field was not present;
- 3> else if the field concerns a sub-field of another field, referred to as the 'parent' field i.e. the field that is one nesting level up compared to the erroneous field:
 - 4> consider the 'parent' field to be set to a not comprehended value;

4> apply the generic error handling to the subsequent 'parent' field(s), until reaching the top nesting level i.e. the message level;

3> else (field at message level):

- 4> ignore the message;
- NOTE 1: The error handling defined in these sub-clauses implies that the UE ignores a message with the message type or version set to a not comprehended value.
- NOTE 2: The nested error handling for messages received on logical channels other than DCCH and CCCH applies for errors in extensions also, even for errors that can be regarded as invalid E-UTRAN operation e.g. E-UTRAN not observing conditional presence.

The following ASN.1 further clarifies the levels applicable in case of nested error handling for errors in extension fields.

```
-- /example/ ASN1START
-- Example with extension addition group
ItemInfoList ::=
                             SEQUENCE (SIZE (1..max)) OF ItemInfo
ItemInfo ::=
                             SEQUENCE {
   itemIdentity
                                INTEGER (1..max),
   field1
                                Field1,
   field2
                                Field2
                                                   OPTIONAL,
                                                                       -- Need ON
   [[ field3-r9
                                Field3-r9
                                                   OPTIONAL,
                                                                       -- Cond Cond1
                                                   OPTIONAL
      field4-r9
                                Field4-r9
                                                                       -- Need ON
   ]]
-- Example with traditional non-critical extension (empty sequence)
BroadcastInfoBlock1 ::=
                                SEQUENCE {
   itemIdentity
                                INTEGER (1..max),
   field1
                                Field1,
   field2
                                Field2
                                                   OPTIONAL,
                                                                       -- Need ON
   nonCriticalExtension
                                BroadcastInfoBlock1-v940-IEs OPTIONAL
BroadcastInfoBlock1-v940-IEs::= SEQUENCE {
```

```
field3-r9 Field3-r9 OPTIONAL, -- Cond Cond1
field4-r9 Field4-r9 OPTIONAL, -- Need ON
nonCriticalExtension SEQUENCE {} OPTIONAL -- Need OP
}
-- ASN1STOP
```

The UE shall, apply the following principles regarding the levels applicable in case of nested error handling:

- an extension addition group is not regarded as a level on its own. E.g. in the ASN.1 extract in the previous, a error regarding the conditionality of *field3* would result in the entire itemInfo entry to be ignored (rather than just the extension addition group containing *field3* and *field4*)
- a traditional *nonCriticalExtension* is not regarded as a level on its own. E.g. in the ASN.1 extract in the previous, a error regarding the conditionality of *field3* would result in the entire *BroadcastInfoBlock1* to be ignored (rather than just the non critical extension containing *field3* and *field4*).

5.7.5 Not comprehended field

The UE shall, when receiving an RRC message on any logical channel:

- 1> if the message includes a field that the UE does not comprehend:
 - 2> treat the rest of the message as if the field was absent;

NOTE: This section does not apply to the case of an extension to the value range of a field. Such cases are addressed instead by the requirements in section 5.7.3.

5.8 MBMS

5.8.1 Introduction

5.8.1.1 General

In general the control information relevant only for UEs supporting MBMS is separated as much as possible from unicast control information. Most of the MBMS control information is provided on a logical channel specific for MBMS common control information: the MCCH. E-UTRA employs one MCCH logical channel per MBSFN area. In case the network configures multiple MBSFN areas, the UE acquires the MBMS control information from the MCCHs that are configured to identify if services it is interested to receive are ongoing. The action applicable when the UE is unable to simultaneously receive MBMS and unicast services is up to UE implementation. In this release of the specification, an MBMS capable UE is only required to support reception of a single MBMS service at a time, and reception of more than one MBMS service (also possibly on more than one MBSFN area) in parallel is left for UE implementation. The MCCH carries the MBSFNAreaConfiguration message, which indicates the MBMS sessions that are ongoing as well as the (corresponding) radio resource configuration. The MCCH may also carry the MBMSCountingRequest message, when E-UTRAN wishes to count the number of UEs in RRC_CONNECTED that are receiving or interested to receive one or more specific MBMS services.

A limited amount of MBMS control information is provided on the BCCH. This primarily concerns the information needed to acquire the MCCH(s). This information is carried by means of a single MBMS specific *SystemInformationBlock: SystemInformationBlockType13*. An MBSFN area is identified solely by the *mbsfn-AreaId* in *SystemInformationBlockType13*. At mobility, the UE considers that the MBSFN area is continuous when the source cell and the target cell broadcast the same value in the *mbsfn-AreaId*.

5.8.1.2 Scheduling

The MCCH information is transmitted periodically, using a configurable repetition period. Scheduling information is not provided for MCCH i.e. both the time domain scheduling as well as the lower layer configuration are semi-statically configured, as defined within *SystemInformationBlockType13*.

For MBMS user data, which is carried by the MTCH logical channel, E-UTRAN periodically provides MCH scheduling information (MSI) at lower layers (MAC). This MCH information only concerns the time domain scheduling i.e. the frequency domain scheduling and the lower layer configuration are semi-statically configured. The periodicity of the MSI is configurable and defined by the MCH scheduling period.

5.8.1.3 MCCH information validity and notification of changes

Change of MCCH information only occurs at specific radio frames, i.e. the concept of a modification period is used. Within a modification period, the same MCCH information may be transmitted a number of times, as defined by its scheduling (which is based on a repetition period). The modification period boundaries are defined by SFN values for which SFN mod m=0, where m is the number of radio frames comprising the modification period. The modification period is configured by means of SystemInformationBlockType13.

When the network changes (some of) the MCCH information, it notifies the UEs about the change during a first modification period. In the next modification period, the network transmits the updated MCCH information. These general principles are illustrated in figure 5.8.1.3-1, in which different colours indicate different MCCH information. Upon receiving a change notification, a UE interested to receive MBMS services acquires the new MCCH information immediately from the start of the next modification period. The UE applies the previously acquired MCCH information until the UE acquires the new MCCH information.

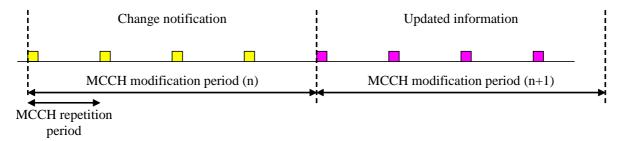


Figure 5.8.1.3-1: Change of MCCH Information

Indication of an MBMS specific RNTI, the M-RNTI (see TS 36.321 [6]), on PDCCH is used to inform UEs in RRC_IDLE and UEs in RRC_CONNECTED about an MCCH information change. When receiving an MCCH information change notification, the UE knows that the MCCH information will change at the next modification period boundary. The notification on PDCCH indicates which of the MCCHs will change, which is done by means of an 8-bit bitmap. Within this bitmap, the bit at the position indicated by the field *notificationIndicator* is used to indicate changes for that MBSFN area: if the bit is set to "1", the corresponding MCCH will change. No further details are provided e.g. regarding which MCCH information will change. The MCCH information change notification is used to inform the UE about a change of MCCH information upon session start or about the start of MBMS counting.

The MCCH information change notifications on PDCCH are transmitted periodically and are carried on MBSFN subframes only. These MCCH information change notification occasions are common for all MCCHs that are configured, and configurable by parameters included in <code>SystemInformationBlockType13</code>: a repetition coefficient, a radio frame offset and a subframe index. These common notification occasions are based on the MCCH with the shortest modification period.

NOTE 1: E-UTRAN may modify the MBMS configuration information provided on MCCH at the same time as updating the MBMS configuration information carried on BCCH i.e. at a coinciding BCCH and MCCH modification period. Upon detecting that a new MCCH is configured on BCCH, a UE interested to receive one or more MBMS services should acquire the MCCH, unless it knows that the services it is interested in are not provided by the corresponding MBSFN area.

A UE that is receiving an MBMS service shall acquire the MCCH information from the start of each modification period. A UE that is not receiving an MBMS service, as well as UEs that are receiving an MBMS service but potentially interested to receive other services not started yet in another MBSFN area, shall verify that the stored MCCH information remains valid by attempting to find the MCCH information change notification at least

notificationRepetitionCoeff times during the modification period of the applicable MCCH(s), if no MCCH information change notification is received.

NOTE 2: In case the UE is aware which MCCH(s) E-UTRAN uses for the service(s) it is interested to receive, the UE may only need to monitor change notifications for a subset of the MCCHs that are configured, referred to as the 'applicable MCCH(s)' in the above.

5.8.2 MCCH information acquisition

5.8.2.1 General

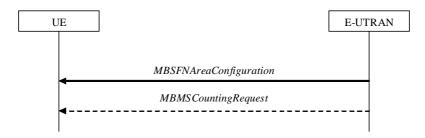


Figure 5.8.2.1-1: MCCH information acquisition

The UE applies the MCCH information acquisition procedure to acquire the MBMS control information that is broadcasted by the E-UTRAN. The procedure applies to MBMS capable UEs that are in RRC_IDLE or in RRC_CONNECTED.

5.8.2.2 Initiation

A UE interested to receive MBMS services shall apply the MCCH information acquisition procedure upon entering the corresponding MBSFN area (e.g. upon power on, following UE mobility) and upon receiving a notification that the MCCH information has changed. A UE that is receiving an MBMS service shall apply the MCCH information acquisition procedure to acquire the MCCH, that corresponds with the service that is being received, at the start of each modification period.

Unless explicitly stated otherwise in the procedural specification, the MCCH information acquisition procedure overwrites any stored MCCH information, i.e. delta configuration is not applicable for MCCH information and the UE discontinues using a field if it is absent in MCCH information unless explicitly specified otherwise.

5.8.2.3 MCCH information acquisition by the UE

An MBMS capable UE shall:

- 1> if the procedure is triggered by an MCCH information change notification:
 - 2> start acquiring the MBSFNAreaConfiguration message and the MBMSCountingRequest message if present, from the beginning of the modification period following the one in which the change notification was received:
- NOTE 1: The UE continues using the previously received MCCH information until the new MCCH information has been acquired.
- 1> if the UE enters an MBSFN area:
 - 2> acquire the *MBSFNAreaConfiguration* message and the *MBMSCountingRequest* message if present, at the next repetition period;
- 1> if the UE is receiving an MBMS service:
 - 2> start acquiring the *MBSFNAreaConfiguration* message and the *MBMSCountingRequest* message if present, that both concern the MBSFN area of the service that is being received, from the beginning of each modification period;

5.8.2.4 Actions upon reception of the MBSFNAreaConfiguration message

No UE requirements related to the contents of this MBSFNAreaConfiguration apply other than those specified elsewhere e.g. within procedures using the concerned system information, the corresponding field descriptions.

5.8.2.5 Actions upon reception of the MBMSCountingRequest message

Upon receiving *MBMSCountingRequest* message, the UE shall perform the MBMS Counting procedure as specified in section 5.8.4.

5.8.3 MBMS PTM radio bearer configuration

5.8.3.1 General

The MBMS PTM radio bearer configuration procedure is used by the UE to configure RLC, MAC and the physical layer upon starting and/or stopping to receive an MRB. The procedure applies to UEs interested to receive one or more MBMS services.

NOTE: In case the UE is unable to receive an MBMS service due to capability limitations, upper layers may take appropriate action e.g. terminate a lower priority unicast service.

5.8.3.2 Initiation

The UE applies the MRB establishment procedure to start receiving a session of a service it has an interest in. The procedure may be initiated e.g. upon start of the MBMS session, upon (re-)entry of the corresponding MBSFN service area, upon becoming interested in the MBMS service, upon removal of UE capability limitations inhibiting reception of the concerned service.

The UE applies the MRB release procedure to stop receiving a session. The procedure may be initiated e.g. upon stop of the MBMS session, upon leaving the corresponding MBSFN service area, upon losing interest in the MBMS service, when capability limitations start inhibiting reception of the concerned service.

5.8.3.3 MRB establishment

Upon MRB establishment, the UE shall:

- 1> establish an RLC entity in accordance with the configuration specified in 9.1.1.4;
- 1> configure an MTCH logical channel in accordance with the received *locgicalChannelIdentity*, applicable for the MRB, as included in the *MBSFNAreaConfiguration* message;
- 1> configure the physical layer in accordance with the *pmch-Config*, applicable for the MRB, as included in the *MBSFNAreaConfiguration* message;
- 1> inform upper layers about the establishment of the MRB by indicating the corresponding tmgi and session1d;

5.8.3.4 MRB release

Upon MRB release, the UE shall:

- 1> release the RLC entity as well as the related MAC and physical layer configuration;
- 1> inform upper layers about the release of the MRB by indicating the corresponding tmgi and sessionId;

5.8.4 MBMS Counting Procedure

5.8.4.1 General

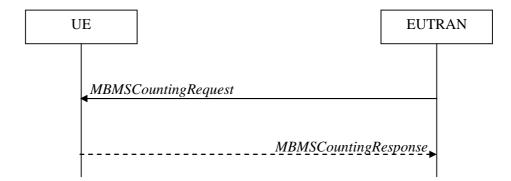


Figure 5.8.4.1-1: MBMS Counting procedure

The MBMS Counting procedure is used by the E-UTRAN to count the number of RRC_CONNECTED mode UEs which are receiving via an MRB or interested to receive via an MRB the specified MBMS services.

The UE determines interest in an MBMS service, that is identified by the TMGI, by interaction with upper layers.

5.8.4.2 Initiation

E-UTRAN initiates the procedure by sending an MBMSCountingRequest message.

5.8.4.3 Reception of the MBMSCountingRequest message by the UE

Upon receiving the MBMSCountingRequest message, the UE in RRC_CONNECTED mode shall:

- 1> if the *SystemInformationBlockType1*, that provided the scheduling information for the *systemInformationBlockType13* that included the configuration of the MCCH via which the *MBMSCountingRequest* message was received, contained the identity of the Registered PLMN; and
- 1> if the UE is receiving via an MRB or interested to receive via an MRB at least one of the services in the received *countingRequestList:*
 - 2> if more than one entry is included in the *mbsfn-AreaInfoList* received in the *SystemInformationBlockType13* that included the configuration of the MCCH via which the *MBMSCountingRequest* message was received:
- 3> include the *mbsfn-AreaIndex* in the *MBMSCountingResponse* message and set it to the index of the entry in the *mbsfn-AreaInfoList* within the received *SystemInformationBlockType13* that corresponds with the MBSFN area used to transfer the received *MBMSCountingRequest* message;
 - 2> for each MBMS service included in the received *countingRequestList*:
- 3> if the UE is receiving via an MRB or interested to receive via an MRB this MBMS service:
 - 4> include an entry in the *countingResponseList* within the *MBMSCountingResponse* message with *countingResponseService* set it to the index of the entry in the *countingRequestList* within the received *MBMSCountingRequest* that corresponds with the MBMS service the UE is receiving or interested to receive;
 - 2> submit the *MBMSCountingResponse* message to lower layers for transmission upon which the procedure ends:
 - NOTE 1: UEs that are receiving an MBMS User Service [56] by means of a Unicast Bearer Service [57] (i.e. via a DRB), but are interested to receive the concerned MBMS User Service [56] via an MBMS Bearer Service (i.e. via an MRB), respond to the counting request.
 - NOTE 2: If ciphering is used at upper layers, the UE does not respond to the counting request if it can not decipher the MBMS service for which counting is performed (see TS 22.146 [62, 5.3]).

NOTE 3: The UE treats the *MBMSCountingRequest* messages received in each modification period independently. In the unlikely case E-UTRAN would repeat an *MBMSCountingRequest* (i.e. including the same services) in a subsequent modification period, the UE responds again. The UE provides at most one *MBMSCountingResponse* message to multiple transmission attempts of an *MBMSCountingRequest* messages in a given modification period.

5.8.5 MBMS interest indication

5.8.5.1 General

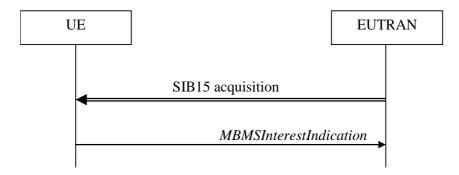


Figure 5.8.5.1-1: MBMS interest indication

The purpose of this procedure is to inform E-UTRAN that the UE is receiving or is interested to receive MBMS via an MRB, and if so, to inform E-UTRAN about the priority of MBMS versus unicast reception.

5.8.5.2 Initiation

An MBMS capable UE in RRC_CONNECTED may initiate the procedure in several cases including upon successful connection establishment, upon entering or leaving the service area, upon session start or stop, upon change of interest, upon change of priority between MBMS reception and unicast reception or upon change to a PCell broadcasting *SystemInformationBlockType15*.

Upon initiating the procedure, the UE shall:

- 1> if SystemInformationBlockType15 is broadcast by the PCell:
 - 2> ensure having a valid version of SystemInformationBlockType15 for the PCell;
 - 2> if the UE did not transmit an MBMSInterestIndication message since last entering RRC_CONNECTED state; or
 - 2> if since the last time the UE transmitted an *MBMSInterestIndication* message, the UE connected to a PCell not broadcasting *SystemInformationBlockType15*:
- 3> if the set of MBMS frequencies of interest, determined in accordance with 5.8.5.3, is not empty:
 - 4> initiate transmission of the MBMSInterestIndication message in accordance with 5.8.5.4;
 - 2> else:
- 3> if the set of MBMS frequencies of interest, determined in accordance with 5.8.5.3, has changed since the last transmission of the *MBMSInterestIndication* message; or
- 3> if the prioritisation of reception of all indicated MBMS frequencies compared to reception of any of the established unicast bearers has changed since the last transmission of the *MBMSInterestIndication* message:
 - 4> initiate transmission of the MBMSInterestIndication message in accordance with 5.8.5.4;
 - NOTE: The UE may send an *MBMSInterestIndication* even when it is able to receive the MBMS services it is interested in i.e. to avoid that the network allocates a configuration inhibiting MBMS reception.

5.8.5.3 Determine MBMS frequencies of interest

The UE shall:

- 1> consider a frequency to be part of the MBMS frequencies of interest if the following conditions are met:
 - 2> at least one MBMS session the UE is receiving or interested to receive via an MRB is ongoing or about to start; and
- NOTE 1: The UE may determine whether the session is ongoing from the start and stop time indicated in the User Service Description (USD), see 3GPP TS 36.300 [9] or 3GPP TS 26.346 [57].
 - 2> for at least one of these MBMS sessions *SystemInformationBlockType15* acquired from the PCell includes for the concerned frequency one or more MBMS SAIs as indicated in the USD for this session; and
- NOTE 2: The UE considers a frequency to be part of the MBMS frequencies of interest even though E-UTRAN may (temporarily) not employ an MRB for the concerned session. I.e. the UE does not verify if the session is indicated on MCCH
- NOTE 3: The UE considers the frequencies of interest independently of any synchronization state, e.g. [9, Annex J.1].
 - 2> the UE is capable of simultaneously receiving the set of MBMS frequencies of interest, regardless of whether a serving cell is configured on each of these frequencies or not; and
 - 2> the *supportedBandCombination* the UE included in *UE-EUTRA-Capability* contains at least one band combination including the set of MBMS frequencies of interest;
- NOTE 4: Indicating a frequency implies that the UE supports *SystemInformationBlockType13* acquisition for the concerned frequency i.e. the indication should be independent of whether a serving cell is configured on that frequency.
- NOTE 5: When evaluating which frequencies it can receive simultaneously, the UE does not take into account the serving frequencies that are currently configured i.e. it only considers MBMS frequencies it is interested to receive.
- NOTE 6: The set of MBMS frequencies of interest includes at most one frequency for a given physical frequency. The UE only considers a physical frequency to be part of the MBMS frequencies of interest if it supports at least one of the bands indicated for this physical frequency in <code>SystemInformationBlockType1</code> (for serving frequency) or <code>SystemInformationBlockType15</code> (for neighbouring frequencies). In this case, E-UTRAN may assume the UE supports MBMS reception on any of the bands supported by the UE (i.e. according to <code>supportedBandCombination</code>).

5.8.5.4 Actions related to transmission of MBMSInterestIndication message

The UE shall set the contents of the MBMSInterestIndication message as follows:

- 1> if the set of MBMS frequencies of interest, determined in accordance with 5.8.5.3, is not empty:
 - 2> include *mbms-FreqList* and set it to include the MBMS frequencies of interest, using the EARFCN corresponding with *freqBandIndicator* included in *SystemInformationBlockType1* (for serving frequency), if applicable, and the EARFCN(s) as included in *SystemInformationBlockType15* (for neighbouring frequencies);
- NOTE 1: The EARFCN included in *mbms-FreqList* is merely used to indicate a physical frequency the UE is interested to receive i.e. the UE may not support the band corresponding to the included EARFCN (but it does support at least one of the bands indicated in system information for the concerned physical frequency).
 - 2> include *mbms-Priority* if the UE prioritises reception of all indicated MBMS frequencies above reception of any of the unicast bearers;

NOTE 2: If the UE prioritises MBMS reception and unicast data cannot be supported because of congestion on the MBMS carrier(s), E-UTRAN may initiate release of unicast bearers. It is up to E-UTRAN implementation whether all bearers or only GBR bearers are released. E-UTRAN does not initiate reestablishment of the released unicast bearers upon alleviation of the congestion.

The UE shall submit the MBMSInterestIndication message to lower layers for transmission.

5.9 RN procedures

5.9.1 RN reconfiguration

5.9.1.1 General

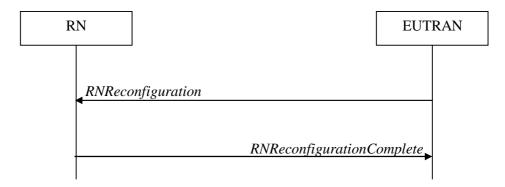


Figure 5.9.1.1-1: RN reconfiguration

The purpose of this procedure is to configure/reconfigure the RN subframe configuration and/or to update the system information relevant for the RN in RRC_CONNECTED.

5.9.1.2 Initiation

E-UTRAN may initiate the RN reconfiguration procedure to an RN in RRC_CONNECTED when AS security has been activated.

5.9.1.3 Reception of the RNReconfiguration by the RN

The RN shall:

- 1> if the *rn-SystemInfo* is included:
 - 2> if the *systemInformationBlockType1* is included:
- 3> act upon the received SystemInformationBlockType1 as specified in 5.2.2.7;
 - 2> if the *SystemInformationBlockType2* is included:
- 3> act upon the received SystemInformationBlockType2 as specified in 5.2.2.9;
 - 1> if the *rn-SubframeConfig* is included:
 - 2> reconfigure lower layers in accordance with the received *subframeConfigPatternFDD* or *subframeConfigPatternTDD*;
 - 2> if the *rpdcch-Config* is included:
 - 3> reconfigure lower layers in accordance with the received *rpdcch-Config*;
 - 1> submit the *RNReconfigurationComplete* message to lower layers for transmission, upon which the procedure ends;

6 Protocol data units, formats and parameters (tabular & ASN.1)

6.1 General

The contents of each RRC message is specified in sub-clause 6.2 using ASN.1 to specify the message syntax and using tables when needed to provide further detailed information about the information elements specified in the message syntax. The syntax of the information elements that are defined as stand-alone abstract types is further specified in a similar manner in sub-clause 6.3.

The need for information elements to be present in a message or an abstract type, i.e., the ASN.1 fields that are specified as OPTIONAL in the abstract notation (ASN.1), is specified by means of comment text tags attached to the OPTIONAL statement in the abstract syntax. All comment text tags are available for use in the downlink direction only. The meaning of each tag is specified in table 6.1-1.

Table 6.1-1: Meaning of abbreviations used to specify the need for information elements to be present

Abbreviation	Meaning
Cond <i>conditionTag</i> (Used in downlink only)	Conditionally present An information element for which the need is specified by means of conditions. For each conditionTag, the need is specified in a tabular form following the ASN.1 segment. In case, according to the conditions, a field is not present, the UE takes no action and where applicable shall continue to use the existing value (and/ or the associated functionality) unless explicitly stated otherwise (e.g. in the conditional presence table or in the description of the field itself).
Need OP (Used in downlink only)	Optionally present An information element that is optional to signal. For downlink messages, the UE is not required to take any special action on absence of the IE beyond what is specified in the procedural text or the field description table following the ASN.1 segment. The UE behaviour on absence should be captured either in the procedural text or in the field description.
Need ON (Used in downlink only)	Optionally present, No action An information element that is optional to signal. If the message is received by the UE, and in case the information element is absent, the UE takes no action and where applicable shall continue to use the existing value (and/ or the associated functionality).
Need OR (Used in downlink only)	Optionally present, Release An information element that is optional to signal. If the message is received by the UE, and in case the information element is absent, the UE shall discontinue/ stop using/ delete any existing value (and/ or the associated functionality).

Any IE with Need ON in system information shall be interpreted as Need OR.

Need codes may not be specified for a parent extension field/ extension group, used in downlink, which includes one or more child extension fields. Upon absence of such a parent extension field/ extension group, the UE shall:

- For each individual child extension field, including extensions that are mandatory to include in the optional group, act in accordance with the need code that is defined for the extension;
- Apply this behaviour not only for child extension fields included directly within the optional parent extension field/ extension group, but also for extension fields defined at further nesting levels as long as for none of the fields in-between the concerned extension field and the parent extension field a need code is specified;

NOTE 1: The above applies for groups of non critical extensions using double brackets (referred to as extension groups), as well as non-critical extensions at the end of a message or at the end of a structure contained in a BIT STRING or OCTET STRING (referred to as parent extension fields).

Need codes, conditions and ASN.1 defaults specified for a particular (child) field only apply in case the (parent) field including the particular field is present. This rule does not apply for optional parent extension fields/ extension groups without need codes,

NOTE 2: The previous rule implies that E-UTRAN has to include such a parent extension field to release a child field that is either:

- Optional with need OR, or
- Conditional while the UE releases the child field when absent.

The handling of need codes as specified in the previous is illustrated by means of an example, as shown in the following ASN.1.

```
-- /example/ ASN1START
RRCMessage-r8-IEs ::=
                                    SEQUENCE {
   field1
                                 InformationElement1,
   field2
                                 InformationElement2
                                                                OPTIONAL, -- Need ON
   nonCriticalExtension
                                 RRCMessage-v8a0-IEs
                                                                OPTIONAL
RRCMessage-v8a0-IEs ::=
                                    SEQUENCE {
  field3
                                 InformationElement3
                                                                OPTIONAL, -- Need ON
   nonCriticalExtension
                                 RRCMessage-v940-IEs
                                                                OPTIONAL
RRCMessage-v940-IEs ::=
                                    SEQUENCE {
                                                                OPTIONAL, -- Need OR
  field4
                                 InformationElement4
   nonCriticalExtension
                                 SEQUENCE {}
                                                                OPTIONAL
}
InformationElement1 ::=
                              SEQUENCE {
   field11
                              InformationElement11
                                                            OPTIONAL, -- Need ON
                              InformationElement12
   field12
                                                            OPTIONAL, -- Need OR
                                 InformationElement13
   [[ field13
                                                            OPTIONAL, -- Need OR
      field14
                                 InformationElement14
                                                            OPTIONAL -- Need ON
  ]]
InformationElement2 ::=
                              SEQUENCE {
```

```
field21 InformationElement11 OPTIONAL, -- Need OR
...
}
-- ASN1STOP
```

The handling of need codes as specified in the previous implies that:

- if *field2* in *RRCMessage-r8-IEs* is absent, the UE does not modify *field21*; if *field2* in *RRCMessage-r8-IEs* is present but does not include *field21*, the UE releases *field21*;
- if the extension group containing *field13* is absent, the UE releases *field13* and does not modify *field14*;
- if *nonCriticalExtension* defined by IE *RRCMessage-v8a0-IEs* is absent, the UE does not modify *field3* and releases *field4*;

6.2 RRC messages

NOTE: The messages included in this section reflect the current status of the discussions. Additional messages may be included at a later stage.

6.2.1 General message structure

EUTRA-RRC-Definitions

This ASN.1 segment is the start of the E-UTRA RRC PDU definitions.

```
-- ASN1START

EUTRA-RRC-Definitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- ASN1STOP
```

BCCH-BCH-Message

The *BCCH-BCH-Message* class is the set of RRC messages that may be sent from the E-UTRAN to the UE via BCH on the BCCH logical channel.

```
BCCH-BCH-MessageType ::= MasterInformationBlock
-- ASN1STOP
```

BCCH-DL-SCH-Message

The *BCCH-DL-SCH-Message* class is the set of RRC messages that may be sent from the E-UTRAN to the UE via DL-SCH on the BCCH logical channel.

MCCH-Message

The MCCH-Message class is the set of RRC messages that may be sent from the E-UTRAN to the UE on the MCCH logical channel.

```
mbsfnAreaConfiguration-r9 MBSFNAreaConfiguration-r9
},
later CHOICE {
    c2 CHOICE {
        mbmsCountingRequest-r10 MBMSCountingRequest-r10
    },
    messageClassExtension SEQUENCE {}
}
-- ASN1STOP
```

PCCH-Message

The *PCCH-Message* class is the set of RRC messages that may be sent from the E-UTRAN to the UE on the PCCH logical channel.

DL-CCCH-Message

The *DL-CCCH-Message* class is the set of RRC messages that may be sent from the E-UTRAN to the UE on the downlink CCCH logical channel.

```
-- ASN1START
```

```
DL-CCCH-Message ::= SEQUENCE {
                        DL-CCCH-MessageType
   message
DL-CCCH-MessageType ::= CHOICE {
                     CHOICE {
      rrcConnectionReestablishment
                                       RRCConnectionReestablishment,
      rrcConnectionReestablishmentReject
                                          RRCConnectionReestablishmentReject,
      rrcConnectionReject
                                       RRCConnectionReject,
      rrcConnectionSetup
                                       RRCConnectionSetup
   },
   messageClassExtension SEQUENCE {}
-- ASN1STOP
```

DL-DCCH-Message

The *DL-DCCH-Message* class is the set of RRC messages that may be sent from the E-UTRAN to the UE or from the E-UTRAN to the RN on the downlink DCCH logical channel.

```
-- ASN1START
DL-DCCH-Message ::= SEQUENCE {
   message
                       DL-DCCH-MessageType
DL-DCCH-MessageType ::= CHOICE {
   c1
                     CHOICE {
      csfb Parameters Response CDMA 2000\\
                                             CSFBParametersResponseCDMA2000,
      dlInformationTransfer
                                      DLInformationTransfer,
      handoverFromEUTRAPreparationRequest
                                                HandoverFromEUTRAPreparationRequest,
      mobilityFromEUTRACommand
                                             MobilityFromEUTRACommand,
      rrcConnectionReconfiguration
                                       RRCConnectionReconfiguration,
      rrcConnectionRelease
                                       RRCConnectionRelease,
      securityModeCommand
                                          SecurityModeCommand,
      ueCapabilityEnquiry
                                       UECapabilityEnquiry,
```

```
counterCheck

ueInformationRequest-r9

loggedMeasurementConfiguration-r10

LoggedMeasurementConfiguration-r10,

rnReconfiguration-r10

RNReconfiguration-r10,

spare4 NULL,

spare3 NULL, spare2 NULL, spare1 NULL

},

messageClassExtension SEQUENCE {}

-- ASN1STOP
```

UL-CCCH-Message

The *UL-CCCH-Message* class is the set of RRC messages that may be sent from the UE to the E-UTRAN on the uplink CCCH logical channel.

UL-DCCH-Message

The *UL-DCCH-Message* class is the set of RRC messages that may be sent from the UE to the E-UTRAN or from the RN to the E-UTRAN on the uplink DCCH logical channel.

```
-- ASN1START
```

```
UL-DCCH-Message ::= SEQUENCE {
                         UL-DCCH-MessageType
   message
}
UL-DCCH-MessageType ::= CHOICE {
                      CHOICE {
   c1
      csfbParametersRequestCDMA2000
                                               CSFBParametersRequestCDMA2000,
      measurementReport
                                         MeasurementReport,
      rrcConnectionReconfigurationComplete RRCConnectionReconfigurationComplete,
      rrc Connection Reestablish ment Complete \\ RRC Connection Reestablish ment Complete, \\
      rrcConnectionSetupComplete
                                            RRCConnectionSetupComplete,
      securityModeComplete
                                         SecurityModeComplete,
      securityModeFailure
                                         SecurityModeFailure,
      ueCapabilityInformation
                                         UECapabilityInformation,
                                         ULHandoverPreparationTransfer,
      ul Hand over Preparation Transfer \\
      ulInformationTransfer
                                         ULInformationTransfer,
      counterCheckResponse
                                         CounterCheckResponse,
      ueInformationResponse-r9
                                         UEInformationResponse-r9,
      proximityIndication-r9
                                         ProximityIndication-r9,
      rnReconfigurationComplete-r10
                                            RNReconfigurationComplete-r10,
      mbmsCountingResponse-r10
                                            MBMSCountingResponse-r10,
      interFreqRSTDMeasurementIndication-r10 InterFreqRSTDMeasurementIndication-r10
   },
   messageClassExtension CHOICE {
      c2
                            CHOICE {
         ueAssistanceInformation-r11
                                            UEAssistanceInformation-r11,
         inDeviceCoexIndication-r11
                                            InDeviceCoexIndication-r11,
         mbmsInterestIndication-r11
                                         MBMSInterestIndication-r11,
         spare13 NULL,
         spare12 NULL, spare11 NULL, spare10 NULL,
         spare9 NULL, spare8 NULL, spare7 NULL,
         spare6 NULL, spare5 NULL, spare4 NULL,
         spare3 NULL, spare2 NULL, spare1 NULL
```

```
messageClassExtensionFuture-r11 SEQUENCE {}
}
-- ASN1STOP
```

6.2.2 Message definitions

CounterCheck

The *CounterCheck* message is used by the E-UTRAN to indicate the current COUNT MSB values associated to each DRB and to request the UE to compare these to its COUNT MSB values and to report the comparison results to E-UTRAN.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

CounterCheck message

```
-- ASN1START
CounterCheck ::=
                        SEQUENCE {
   rrc-TransactionIdentifier
                              RRC-TransactionIdentifier,
  criticalExtensions
                                  CHOICE {
                                  CHOICE {
         counterCheck-r8
                                        CounterCheck-r8-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                 SEQUENCE {}
   }
CounterCheck-r8-IEs ::= SEQUENCE {
   drb-CountMSB-InfoList
                                  DRB-CountMSB-InfoList,
  nonCriticalExtension
                              CounterCheck-v8a0-IEs
                                                             OPTIONAL
CounterCheck-v8a0-IEs ::= SEQUENCE {
```

```
lateNonCriticalExtension
                               OCTET STRING
                                                            OPTIONAL,
  nonCriticalExtension
                             SEQUENCE {}
                                                            OPTIONAL
DRB-CountMSB-InfoList ::=
                            SEQUENCE (SIZE (1..maxDRB)) OF DRB-CountMSB-Info
DRB-CountMSB-Info ::= SEQUENCE {
                                                                                  drb-Identity
                                                                                      DRB-
Identity,
  countMSB-Uplink
                               INTEGER(0..33554431),
  countMSB-Downlink
                               INTEGER(0..33554431)
-- ASN1STOP
```

CounterCheck field descriptions count-MSB-Downlink Indicates the value of 25 MSBs from downlink COUNT associated to this DRB. count-MSB-Uplink Indicates the value of 25 MSBs from uplink COUNT associated to this DRB. drb-CountMSB-InfoList Indicates the MSBs of the COUNT values of the DRBs.

CounterCheckResponse

The CounterCheckResponse message is used by the UE to respond to a CounterCheck message.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

CounterCheckResponse message

-- ASN1START CounterCheckResponse ::= SEQUENCE { rrc-TransactionIdentifier RRC-TransactionIdentifier, criticalExtensions CHOICE { counterCheckResponse-r8 CounterCheckResponse-r8-IEs, criticalExtensionsFuture SEQUENCE {}

```
CounterCheckResponse-r8-IEs ::= SEQUENCE {
   drb-CountInfoList
                                 DRB-CountInfoList,
   nonCriticalExtension
                              CounterCheckResponse-v8a0-IEs
                                                               OPTIONAL
}
CounterCheckResponse-v8a0-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                                 OCTET STRING
                                                               OPTIONAL,
   nonCriticalExtension
                              SEQUENCE {}
                                                               OPTIONAL
DRB-CountInfoList ::=
                           SEQUENCE (SIZE (0..maxDRB)) OF DRB-CountInfo
DRB-CountInfo ::= SEQUENCE {
                                                                                         drb-Identity
                                                                                         DRB-Identity,
                                            count-Uplink
                                                                     INTEGER(0..4294967295),
                                            count-Downlink
                                                                        INTEGER(0..4294967295)
-- ASN1STOP
```

CounterCheckResponse field descriptions		
count-Downlink		
Indicates the value of downlink COUNT associated to this DRB.		
count-Uplink		
Indicates the value of uplink COUNT associated to this DRB.		
drb-CountInfoList		
Indicates the COUNT values of the DRBs.		

CSFBParametersRequestCDMA2000

The *CSFBParametersRequestCDMA2000* message is used by the UE to obtain the CDMA2000 1xRTT Parameters from the network. The UE needs these parameters to generate the CDMA2000 1xRTT Registration message used to register with the CDMA2000 1xRTT Network which is required to support CSFB to CDMA2000 1xRTT.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

CSFBParametersRequestCDMA2000 message

```
-- ASN1START
CSFBParametersRequestCDMA2000 ::= SEQUENCE {
  criticalExtensions
                              CHOICE {
     csfb Parameters Request CDMA 2000-r8-IEs, \\
     criticalExtensionsFuture
                              SEQUENCE {}
  }
CSFBParametersRequestCDMA2000-r8-IEs ::= SEQUENCE {
  nonCriticalExtension
                           CSFBParametersRequestCDMA2000-v8a0-IEs OPTIONAL
}
CSFBParametersRequestCDMA2000-v8a0-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                              OCTET STRING
                                                          OPTIONAL,
                                                          OPTIONAL
  nonCriticalExtension
                           SEQUENCE {}
-- ASN1STOP
```

CSFBParametersResponseCDMA2000

The *CSFBParametersResponseCDMA2000* message is used to provide the CDMA2000 1xRTT Parameters to the UE so the UE can register with the CDMA2000 1xRTT Network to support CSFB to CDMA2000 1xRTT.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

CSFBParametersResponseCDMA2000 message

-- ASN1START

```
CSFBParametersResponseCDMA2000 ::= SEQUENCE {
   rrc-TransactionIdentifier
                              RRC-TransactionIdentifier,
   criticalExtensions
                                    CHOICE {
      csfb Parameters Response CDMA 2000-r8\\
                                            CSFBParametersResponseCDMA2000-r8-IEs,
      criticalExtensionsFuture
                                    SEQUENCE {}
   }
CSFBParametersResponseCDMA2000-r8-IEs ::= SEQUENCE {
                              RAND-CDMA2000,
   rand
  mobilityParameters
                                 MobilityParametersCDMA2000,
  nonCriticalExtension
                              CSFBParametersResponseCDMA2000-v8a0-IEs OPTIONAL
CSFBParametersResponseCDMA2000-v8a0-IEs ::= SEQUENCE {
   lateNonCriticalExtension
                                OCTET STRING
                                                               OPTIONAL,
   nonCriticalExtension
                              SEQUENCE {}
                                                               OPTIONAL
-- ASN1STOP
```

DLInformationTransfer

The DLInformationTransfer message is used for the downlink transfer of NAS or non-3GPP dedicated information.

Signalling radio bearer: SRB2 or SRB1 (only if SRB2 not established yet. If SRB2 is suspended, E-UTRAN does not send this message until SRB2 is resumed.)

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

DLInformationTransfer message

```
-- ASN1START

DLInformationTransfer ::= SEQUENCE {
    rrc-TransactionIdentifier RRC-TransactionIdentifier,
    criticalExtensions CHOICE {
        c1 CHOICE {
```

```
dlInformationTransfer-r8
                                       DLInformationTransfer-r8-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                 SEQUENCE {}
   }
DLInformationTransfer-r8-IEs ::= SEQUENCE {
   dedicatedInfoType
      dedicatedInfoNAS
                                    DedicatedInfoNAS,
      dedicatedInfoCDMA2000-1XRTT
                                          DedicatedInfoCDMA2000,
      dedicatedInfoCDMA2000-HRPD
                                          DedicatedInfoCDMA2000
   },
   nonCriticalExtension
                              DLInformationTransfer-v8a0-IEs
                                                               OPTIONAL
DLInformationTransfer-v8a0-IEs ::= SEQUENCE {
   lateNonCriticalExtension
                                 OCTET STRING
                                                               OPTIONAL,
   nonCriticalExtension
                              SEQUENCE {}
                                                               OPTIONAL
-- ASN1STOP
```

HandoverFromEUTRAPreparationRequest (CDMA2000)

The *HandoverFromEUTRAPreparationRequest* message is used to trigger the handover preparation procedure with a CDMA2000 RAT. This message is also used to trigger a tunneled preparation procedure with a CDMA2000 1xRTT RAT to obtain traffic channel resources for the enhanced CS fallback to CDMA2000 1xRTT, which may also involve a concurrent preparation for handover to CDMA2000 HRPD. Also, this message is used to trigger the dual Rx/Tx redirection procedure with a CDMA2000 1xRTT RAT.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

HandoverFromEUTRAPreparationRequest message

```
-- ASNISTART
```

```
HandoverFromEUTRAPreparationRequest ::= SEQUENCE {
  rrc-TransactionIdentifier
                          RRC-TransactionIdentifier,
  criticalExtensions
                                CHOICE {
     c1
                                CHOICE {
         handoverFromEUTRAPreparationRequest-r8
                                   HandoverFromEUTRAPreparationRequest-r8-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                SEQUENCE {}
   }
HandoverFromEUTRAPreparationRequest-r8-IEs ::= SEQUENCE {
  cdma2000-Type
                             CDMA2000-Type,
                          RAND-CDMA2000
  rand
                                                    OPTIONAL, -- Cond cdma2000-Type
  mobilityParameters
                             MobilityParametersCDMA2000 OPTIONAL, -- Cond cdma2000-Type
  nonCriticalExtension
                          HandoverFromEUTRAPreparationRequest-v890-IEsOPTIONAL
HandoverFromEUTRAPreparationRequest-v890-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                             OCTET STRING
                                                    OPTIONAL,
  nonCriticalExtension
                          HandoverFromEUTRAPreparationRequest-v920-IEsOPTIONAL
HandoverFromEUTRAPreparationRequest-v920-IEs ::= SEQUENCE {
  concurrPrepCDMA2000-HRPD-r9
                                                          OPTIONAL, -- Cond cdma2000-Type
  nonCriticalExtension
                          HandoverFromEUTRAPreparationRequest-v1020-IEs OPTIONAL
HandoverFromEUTRAPreparationRequest-v1020-IEs ::= SEQUENCE {
  dualRxTxRedirectIndicator-r10 ENUMERATED {true}
                                                       OPTIONAL, -- Cond cdma2000-1XRTT
  redirectCarrierCDMA2000-1XRTT-r10 CarrierFreqCDMA2000
                                                             OPTIONAL, -- Cond dualRxTxRedirect
  nonCriticalExtension
                             SEQUENCE {}
                                                    OPTIONAL
```

-- ASN1STOP

HandoverFromEUTRAPreparationRequest field descriptions

concurrPrepCDMA2000-HRPD

Value TRUE indicates that upper layers should initiate concurrent preparation for handover to CDMA2000 HRPD in addition to preparation for enhanced CS fallback to CDMA2000 1xRTT.

dualRxTxRedirectIndicator

Value TRUE indicates that the second radio of the dual Rx/Tx UE is being redirected to CDMA2000 1xRTT [51].

redirectCarrierCDMA2000-1XRTT

Used to indicate the CDMA2000 1xRTT carrier frequency where the UE is being redirected to.

Conditional presence	Explanation
cdma2000-1XRTT	The field is optionally present, need ON, if the <i>cdma2000-Type</i> = <i>type1XRTT</i> ; otherwise it
	is not present.
cdma2000-Type	The field is mandatory present if the <i>cdma2000-Type</i> = <i>type1XRTT</i> ; otherwise it is not
	present.
dualRxTxRedirect	The field is optionally present, need ON, if dualRxTxRedirectIndicator is present;
	otherwise it is not present.

InDeviceCoexIndication

The *InDeviceCoexIndication* message is used to inform E-UTRAN about IDC problems which can not be solved by the UE itself, as well as to provide information that may assist E-UTRAN when resolving these problems.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

InDeviceCoexIndication message

```
-- ASN1START
InDeviceCoexIndication-r11 ::=
                                  SEQUENCE {
   criticalExtensions
                                  CHOICE {
      c1
                                  CHOICE {
         inDeviceCoexIndication-r11
                                               InDeviceCoexIndication-r11-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                  SEQUENCE {}
InDeviceCoexIndication-r11-IEs ::=
                                  SEQUENCE {
   affectedCarrierFreqList-r11
                                  AffectedCarrierFreqList-r11
                                                                            OPTIONAL,
   tdm-AssistanceInfo-r11
                                  TDM-AssistanceInfo-r11
                                                                            OPTIONAL,
```

```
lateNonCriticalExtension
                                  OCTET STRING
                                                                        OPTIONAL,
  nonCriticalExtension
                               SEQUENCE {}
                                                                        OPTIONAL
AffectedCarrierFreqList-r11 ::=SEQUENCE (SIZE (1..maxFreqIDC-r11)) OF AffectedCarrierFreq-r11
AffectedCarrierFreq-r11 ::= SEQUENCE {
   carrierFreq-r11
                            MeasObjectId,
  interferenceDirection-r11 ENUMERATED {eutra, other, both, spare}
}
TDM-AssistanceInfo-r11 ::= CHOICE {
   drx-AssistanceInfo-r11
                                  SEQUENCE {
      drx-CycleLength-r11
                                     ENUMERATED {sf40, sf64, sf80, sf128, sf160,
                                      sf256, spare2, spare1},
      drx-Offset-r11
                                     INTEGER (0..255) OPTIONAL,
      drx-ActiveTime-r11
                                     ENUMERATED { sf20, sf30, sf40, sf60, sf80,
                                      sf100, spare2, spare1}
   },
   idc-SubframePatternList-r11
                                     IDC-SubframePatternList-r11,
IDC-SubframePatternList-r11 ::= SEQUENCE (SIZE (1..maxSubframePatternIDC-r11)) OF IDC-SubframePattern
r11
IDC-SubframePattern-r11 ::= CHOICE {
   subframePatternFDD-r11
                                     BIT STRING (SIZE (4)),
   subframePatternTDD-r11
                                     CHOICE {
      subframeConfig0-r11
                                         BIT STRING (SIZE (70)),
      subframeConfig1-5-r11
                                     BIT STRING (SIZE (10)),
      subframeConfig6-r11
                                        BIT STRING (SIZE (60))
   },
```

-- ASN1STOP

InDeviceCoexIndication field descriptions

affectedCarrierFreqList

List of E-UTRA carrier frequencies affected by IDC problems.

drx-ActiveTime

Indicates the desired active time that the E-UTRAN is recommended to configure. Value in number of subframes. Value sf20 corresponds to 20 subframes, sf30 corresponds to 30 subframes and so on.

drx-CycleLength

Indicates the desired DRX cycle length that the E-UTRAN is recommended to configure. Value in number of subframes. Value sf40 corresponds to 40 subframes, sf64 corresponds to 64 subframes and so on.

drx-Offset

Indicates the desired DRX starting offset that the E-UTRAN is recommended to configure. The UE shall set the value of drx-Offset smaller than the value of drx-CycleLength. The starting frame and subframe satisfy the relation: [(SFN * 10) + subframe number] modulo (drx-CycleLength) = drx-Offset.

idc-SubframePatternList

A list of one or more subframe patterns indicating which HARQ process E-UTRAN is requested to abstain from using. Value 0 indicates that E-UTRAN is requested to abstain from using the subframe. For FDD, the radio frame in which the pattern starts (i.e. the radio frame in which the first/leftmost bit of the *subframePatternFDD* corresponds to subframe #0) occurs when SFN mod 2 = 0. For TDD, the first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string divided by 10. The UE shall indicate a subframe pattern that follows HARQ time line, as specified in TS 36.213 [23], i.e, if a subframe is set to 1 in the subframe pattern, also the corresponding subframes carrying the potential UL grant [23, 8.0], the UL HARQ retransmission [23, 8.0] and the DL/UL HARQ feedback [23, 7.3, 8.3 and 9.1.2] shall be set to 1.

interferenceDirection

Indicates the direction of IDC interference. Value *eutra* indicates that only E-UTRA is victim of IDC interference, value *other* indicates that only another radio is victim of IDC interference and value *both* indicates that both E-UTRA and another radio are victims of IDC interference. The other radio refers to either the ISM radio or GNSS (see 3GPP TR 36.816 [63]).

InterFreqRSTDMeasurementIndication

The *InterFreqRSTDMeasurementIndication* message is used to indicate that the UE is going to either start or stop OTDOA inter-frequency RSTD measurement which requires measurement gaps as specified in TS 36.133 [16, 8.1.2.6].

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

InterFreqRSTDMeasurementIndication message

-- ASN1START InterFreqRSTDMeasurementIndication-r10 ::= SEQUENCE { criticalExtensions CHOICE { c1 CHOICE { interFreqRSTDMeasurementIndication-r10 InterFreqRSTDMeasurementIndication-r10-IEs, spare3 NULL, spare2 NULL, spare1 NULL }, criticalExtensionsFuture SEQUENCE {}

```
}
InterFreqRSTDMeasurementIndication-r10-IEs ::=
                                                  SEQUENCE {
   rstd-InterFreqIndication-r10
                               CHOICE {
      start
                                  SEQUENCE {
         rstd\hbox{-}InterFreqInfoList\hbox{-}r10
                                            RSTD\text{-}InterFreqInfoList\text{-}r10
      },
                                  NULL
      stop
   },
   lateNonCriticalExtension
                                  OCTET STRING
                                                                  OPTIONAL,
   nonCriticalExtension
                               SEQUENCE {}
                                                                  OPTIONAL
}
RSTD-InterFreqInfoList-r10 ::= \quad SEQUENCE \ (SIZE (1..maxRSTD-Freq-r10)) \ OF \ RSTD-InterFreqInfo-r10
RSTD-InterFreqInfo-r10 ::= SEQUENCE {
                               ARFCN-ValueEUTRA,
   carrierFreq-r10
   measPRS-Offset-r10
                               INTEGER (0..39),
                                                                     OPTIONAL
   [[ carrierFreq-v1090
                          ARFCN-ValueEUTRA-v9e0
   ]]
-- ASN1STOP
```

InterFreqRSTDMeasurementIndication field descriptions

carrierFreq

The EARFCN value of the carrier received from upper layers for which the UE needs to perform the inter-frequency RSTD measurements. If the UE includes *carrierFreq-v1090*, it shall set *carrierFreq-r10* to *maxEARFCN*.

measPRS-Offset

Indicates the requested gap offset for performing inter-frequency RSTD measurements. It is the smallest subframe offset from the beginning of subframe 0 of SFN=0 of the serving cell of the requested gap for measuring PRS positioning occasions in the carrier frequency *carrierFreq* for which the UE needs to perform the inter-frequency RSTD measurements. The PRS positioning occasion information is received from upper layers. The value of *measPRS-Offset* is obtained by mapping the starting subframe of the PRS positioning occasion in the measured cell onto the corresponding subframe in the serving cell and is calculated as the serving cell"s number of subframes from SFN=0 mod 40.

The UE shall take into account any additional time required by the UE to start PRS measurements on the other carrier when it does this mapping for determining the *measPRS-Offset*.

NOTE: Figure 6.2.2-1 illustrates the measPRS-Offset field.

rstd-InterFreqIndication

Indicates the inter-frequency RSTD measurement action, i.e. the UE is going to start or stop inter-frequency RSTD measurement.

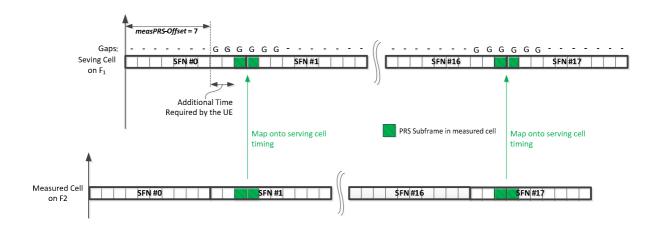


Figure 6.2.2-1 (informative): Exemplary calculation of measPRS-Offset field.

LoggedMeasurementConfiguration

The *LoggedMeasurementConfiguration* message is used by E-UTRAN to configure the UE to perform logging of measurement results while in RRC_IDLE. It is used to transfer the logged measurement configuration for network performance optimisation, see TS 37.320 [60].

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

LoggedMeasurementConfiguration message

-- ASN1START LoggedMeasurementConfiguration-r10 ::= SEQUENCE { criticalExtensions CHOICE {

```
CHOICE {
      c1
         loggedMeasurementConfiguration-r10
                                              LoggedMeasurementConfiguration-r10-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                     SEQUENCE {}
LoggedMeasurementConfiguration-r10-IEs ::= SEQUENCE {
   traceReference-r10
                              TraceReference-r10,
   traceRecordingSessionRef-r10 OCTET STRING (SIZE (2)),
   tce-Id-r10
                            OCTET STRING (SIZE (1)),
   absoluteTimeInfo-r10
                               AbsoluteTimeInfo-r10,
   areaConfiguration-r10
                               AreaConfiguration-r10
                                                       OPTIONAL, -- Need OR
  loggingDuration-r10
                               LoggingDuration-r10,
  loggingInterval-r10
                               LoggingInterval-r10,
   non Critical Extension \\
                            LoggedMeasurementConfiguration-v1080-IEs OPTIONAL
LoggedMeasurementConfiguration-v1080-IEs ::= SEQUENCE {
   lateNonCriticalExtension-r10 OCTET STRING
                                                              OPTIONAL,
                           LoggedMeasurementConfiguration-v1130-IEs OPTIONAL
   nonCriticalExtension
}
LoggedMeasurementConfiguration-v1130-IEs ::= SEQUENCE {
                               PLMN-IdentityList3-r11
   plmn-IdentityList-r11
                                                           OPTIONAL, -- Need OR
   areaConfiguration-v1130
                                  AreaConfiguration-v1130
                                                              OPTIONAL, -- Need OR
  non Critical Extension \\
                            SEQUENCE {}
                                                       OPTIONAL
-- ASN1STOP
```

LoggedMeasurementConfiguration field descriptions

absoluteTimeInfo

Indicates the absolute time in the current cell.

areaConfiguration

Used to restrict the area in which the UE performs measurement logging to cells broadcasting either one of the included cell identities or one of the included tracking area codes/ identities.

plmn-IdentityList

Indicates a set of PLMNs defining when the UE performs measurement logging as well as the associated status indication and information retrieval i.e. the UE performs these actions when the RPLMN is part of this set of PLMNs.

tce-ld

Parameter Trace Collection Entity Id: See TS 32.422 [58].

traceRecordingSessionRef

Parameter Trace Recording Session Reference: See TS 32.422 [58]

MasterInformationBlock

The MasterInformationBlock includes the system information transmitted on BCH.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: BCCH

Direction: E-UTRAN to UE

MasterInformationBlock

-- ASN1START MasterInformationBlock ::= SEQUENCE { dl-Bandwidth ENUMERATED { n6, n15, n25, n50, n75, n100}, phich-Config PHICH-Config, systemFrameNumber BIT STRING (SIZE (8)), spare BIT STRING (SIZE (10)) }

MasterInformationBlock field descriptions

dl-Bandwidth

Parameter: transmission bandwidth configuration, N_{RB} in downlink, see TS 36.101 [42, table 5.6-1]. n6 corresponds to 6 resource blocks, n15 to 15 resource blocks and so on.

systemFrameNumber

Defines the 8 most significant bits of the SFN. As indicated in TS 36.211 [21, 6.6.1], the 2 least significant bits of the SFN are acquired implicitly in the P-BCH decoding, i.e. timing of 40ms P-BCH TTI indicates 2 least significant bits (within 40ms P-BCH TTI, the first radio frame: 00, the second radio frame: 01, the third radio frame: 10, the last radio frame: 11). One value applies for all serving cells (the associated functionality is common i.e. not performed independently for each cell).

MBMSCountingRequest

The *MBMSCountingRequest* message is used by E-UTRAN to count the UEs that are receiving or interested to receive specific MBMS services.

Signalling radio bearer: N/A

RLC-SAP: UM

Logical channel: MCCH
Direction: E-UTRAN to UE

MBMSCountingRequest message

```
-- ASN1START
MBMSCountingRequest-r10 ::=
                                 SEQUENCE {
  countingRequestList-r10
                                 CountingRequestList-r10,
  lateNonCriticalExtension
                              OCTET STRING
                                                            OPTIONAL,
  nonCriticalExtension
                           SEQUENCE {}
                                                            OPTIONAL
CountingRequestList-r10 ::= SEQUENCE (SIZE (1..maxServiceCount)) OF CountingRequestInfo-r10
CountingRequestInfo-r10 ::=
                              SEQUENCE {
   tmgi-r10
                              TMGI-r9,
-- ASN1STOP
```

MBMSCountingResponse

The MBMSCountingResponse message is used by the UE to respond to an MBMSCountingRequest message.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

MBMSCountingResponse message

-- ASN1START

```
MBMSCountingResponse-r10 ::=
                                    SEQUENCE {
   criticalExtensions
                                 CHOICE {
      c1
                                 CHOICE {
         countingResponse-r10
                                       MBMSCountingResponse-r10-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                 SEQUENCE {}
MBMSCountingResponse-r10-IEs ::= SEQUENCE {
   mbsfn-AreaIndex-r10
                                 INTEGER (0..maxMBSFN-Area-1)
                                                                                 OPTIONAL,
  countingResponseList-r10
                              CountingResponseList-r10
                                                            OPTIONAL,
   lateNonCriticalExtension
                              OCTET STRING
                                                            OPTIONAL,
   nonCriticalExtension
                           SEQUENCE {}
                                                            OPTIONAL
CountingResponseList-r10 ::=
                              SEQUENCE (SIZE (1..maxServiceCount)) OF CountingResponseInfo-r10
CountingResponseInfo-r10 ::=
                              SEQUENCE {
   countingResponseService-r10 INTEGER (0..maxServiceCount-1),
-- ASN1STOP
```

${\it MBMSCountingResponse}\ field\ descriptions$

countingResponseList

List of MBMS services which the UE is receiving or interested to receive. Value 0 for field *countingResponseService* corresponds to the first entry in *countingRequestList* within *MBMSCountingRequest*, value 1 corresponds to the second entry in this list and so on.

mbsfn-AreaIndex

Index of the entry in field *mbsfn-AreaInfoList* within *SystemInformationBlockType13*. Value 0 corresponds to the first entry in *mbsfn-AreaInfoList* within *SystemInformationBlockType13*, value 1 corresponds to the second entry in this list and so on.

MBMSInterestIndication

The *MBMSInterestIndication* message is used to inform E-UTRAN that the UE is receiving/interested to receive or no longer receiving/ interested to receive MBMS via an MRB.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

MBMSInterestIndication message

```
-- ASN1START
MBMSInterestIndication-r11 ::=
                                 SEQUENCE {
   criticalExtensions
                                 CHOICE {
      c1
                                 CHOICE {
         interestIndication-r11
                                       MBMSInterestIndication-r11-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                 SEQUENCE {}
MBMSInterestIndication-r11-IEs ::= SEQUENCE {
                                 CarrierFreqListMBMS-r11
  mbms-FreqList-r11
                                                               OPTIONAL,
  mbms-Priority-r11
                                 ENUMERATED {true}
                                                               OPTIONAL,
   lateNonCriticalExtension
                                 OCTET STRING
                                                            OPTIONAL,
   nonCriticalExtension
                              SEQUENCE {}
                                                            OPTIONAL
-- ASN1STOP
```

MBMSInterestIndication field descriptions

mbms-FreqList

List of MBMS frequencies on which the UE is receiving or interested to receive MBMS via an MRB.

mbms-Priority

Indicates whether the UE prioritises MBMS reception above unicast reception. The field is present (i.e. value *true*), if the UE prioritises reception of all listed MBMS frequencies above reception of any of the unicast bearers. Otherwise the field is absent.

MBSFNAreaConfiguration

The *MBSFNAreaConfiguration* message contains the MBMS control information applicable for an MBSFN area. E-UTRAN configures an MCCH for each MBSFN area i.e. the MCCH identifies the MBSFN area.

Signalling radio bearer: N/A

RLC-SAP: UM

Logical channel: MCCH
Direction: E-UTRAN to UE

MBSFNAreaConfiguration message

```
-- ASN1START
MBSFNAreaConfiguration-r9 ::=
                                 SEQUENCE {
   commonSF-Alloc-r9
                                 CommonSF-AllocPatternList-r9,
   commonSF-AllocPeriod-r9
                                    ENUMERATED {
                                    rf4, rf8, rf16, rf32, rf64, rf128, rf256},
  pmch-InfoList-r9
                              PMCH-InfoList-r9,
   nonCriticalExtension
                              MBSFNAreaConfiguration-v930-IEs OPTIONAL
MBSFNAreaConfiguration-v930-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                                 OCTET STRING
                                                               OPTIONAL,
   nonCriticalExtension
                              SEQUENCE {}
                                                               OPTIONAL
CommonSF-AllocPatternList-r9 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig
-- ASN1STOP
```

MBSFNAreaConfiguration field descriptions

commonSF-Alloc

Indicates the subframes allocated to the MBSFN area

commonSF-AllocPeriod

Indicates the period during which resources corresponding with field *commonSF-Alloc* are divided between the (P)MCH that are configured for this MBSFN area. The subframe allocation patterns, as defined by *commonSF-Alloc*, repeat continously during this period. Value rf4 corresponds to 4 radio frames, rf8 corresponds to 8 radio frames and so on. The *commonSF-AllocPeriod* starts in the radio frames for which: SFN mod *commonSF-AllocPeriod* = 0.

MeasurementReport

The MeasurementReport message is used for the indication of measurement results.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

MeasurementReport message

```
-- ASN1START
MeasurementReport ::=
                              SEQUENCE {
  criticalExtensions
                                 CHOICE {
                                 CHOICE{
         measurementReport-r8
                                       MeasurementReport-r8-IEs,
         spare7 NULL,
         spare6 NULL, spare5 NULL, spare4 NULL,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                 SEQUENCE {}
   }
MeasurementReport-r8-IEs ::=
                              SEQUENCE {
  measResults
                                 MeasResults,
   non Critical Extension \\
                              MeasurementReport-v8a0-IEs
                                                                            OPTIONAL
}
MeasurementReport-v8a0-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                                 OCTET STRING
                                                                OPTIONAL,
  nonCriticalExtension
                                                                OPTIONAL
                              SEQUENCE {}
-- ASN1STOP
```

MobilityFromEUTRACommand

The *MobilityFromEUTRACommand* message is used to command handover or a cell change from E-UTRA to another RAT (3GPP or non-3GPP), or enhanced CS fallback to CDMA2000 1xRTT.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

MobilityFromEUTRACommand message

```
-- ASN1START
MobilityFromEUTRACommand ::=
                                  SEQUENCE {
  rrc-TransactionIdentifier
                            RRC-TransactionIdentifier,
  criticalExtensions
                               CHOICE {
     c1
                               CHOICE{
        mobilityFromEUTRACommand-r8
                                           MobilityFromEUTRACommand-r8-IEs,
        mobilityFromEUTRACommand-r9
                                           MobilityFromEUTRACommand-r9-IEs,
        spare2 NULL, spare1 NULL
     },
     criticalExtensionsFuture
                               SEQUENCE {}
   }
MobilityFromEUTRACommand-r8-IEs ::= SEQUENCE {
  cs-FallbackIndicator
                            BOOLEAN,
                               CHOICE{
  purpose
     handover
                               Handover,
     cell Change Order\\
                                  CellChangeOrder
   },
  nonCriticalExtension
                            MobilityFromEUTRACommand-v8a0-IEs OPTIONAL
MobilityFromEUTRACommand-v8a0-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                               OCTET STRING
                                                            OPTIONAL,
  nonCriticalExtension
                            MobilityFromEUTRACommand-v8d0-IEs OPTIONAL
}
MobilityFromEUTRACommand-v8d0-IEs ::= SEQUENCE {
  bandIndicator
                            BandIndicatorGERAN
                                                      OPTIONAL, -- Cond GERAN
```

```
nonCriticalExtension
                                                     OPTIONAL
                           SEQUENCE {}
}
MobilityFromEUTRACommand-r9-IEs ::= SEQUENCE {
  cs-FallbackIndicator
                           BOOLEAN,
  purpose
                              CHOICE{
     handover
                              Handover,
     cellChangeOrder
                                 CellChangeOrder,
     e-CSFB-r9
                                 E-CSFB-r9,
  },
  nonCriticalExtension
                           MobilityFromEUTRACommand-v930-IEs OPTIONAL
MobilityFromEUTRACommand-v930-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                              OCTET STRING
                                                          OPTIONAL,
  nonCriticalExtension
                           MobilityFromEUTRACommand-v960-IEs OPTIONAL
MobilityFromEUTRACommand-v960-IEs ::= SEQUENCE {
  bandIndicator
                           BandIndicatorGERAN
                                                     OPTIONAL, -- Cond GERAN
  nonCriticalExtension
                           SEQUENCE {}
                                                     OPTIONAL
Handover ::=
                        SEQUENCE {
  targetRAT-Type
                              ENUMERATED {
                              utra, geran, cdma2000-1XRTT, cdma2000-HRPD,
                              spare4, spare3, spare2, spare1, ...},
  targetRAT-MessageContainer
                                 OCTET STRING,
  nas-SecurityParamFromEUTRA
                                    OCTET STRING (SIZE (1)) OPTIONAL, -- Cond UTRAGERAN
                                                       OPTIONAL -- Cond PSHO
  systemInformation
                              SI-OrPSI-GERAN
CellChangeOrder ::=
                        SEQUENCE {
  t304
                            ENUMERATED {
```

```
ms100, ms200, ms500, ms1000,
                               ms2000, ms4000, ms8000, spare1},
  targetRAT-Type
                               CHOICE {
                               SEQUENCE {
        geran
           physCellId
                                    PhysCellIdGERAN,
           carrierFreq
                                    CarrierFreqGERAN,
           networkControlOrder
                                       BIT STRING (SIZE (2))
                                                                 OPTIONAL, -- Need OP
                                                              OPTIONAL -- Need OP
           systemInformation
                                    SI-OrPSI-GERAN
  }
SI-OrPSI-GERAN ::=
                               CHOICE {
                            SystemInfoListGERAN,
  si
                            SystemInfoListGERAN
  psi
E-CSFB-r9 ::=
                            SEQUENCE {
                                    OCTET STRING OPTIONAL, -- Need ON
  messageContCDMA2000-1XRTT-r9
  mobilityCDMA2000-HRPD-r9
                                 ENUMERATED {
                               handover, redirection
                            }
                                          OPTIONAL, -- Need OP
  messageContCDMA2000-HRPD-r9
                                    OCTET STRING OPTIONAL, -- Cond concHO
  redirectCarrierCDMA2000-HRPD-r9 CarrierFreqCDMA2000 OPTIONAL -- Cond concRedir
-- ASN1STOP
```

MobilityFromEUTRACommand field descriptions

bandIndicator

Indicates how to interpret the ARFCN of the BCCH carrier.

carrierFreq

contains the carrier frequency of the target GERAN cell.

cs-FallbackIndicator

Value true indicates that the CS Fallback procedure to UTRAN or GERAN is triggered.

messageContCDMA2000-1XRTT

This field contains a message specified in CDMA2000 1xRTT standard that either tells the UE to move to specific 1xRTT target cell(s) or indicates a failure to allocate resources for the enhanced CS fallback to CDMA2000 1xRTT.

messageContCDMA2000-HRPD

This field contains a message specified in CDMA2000 HRPD standard that either tells the UE to move to specific HRPD target cell(s) or indicates a failure to allocate resources for the handover to CDMA2000 HRPD.

mobilityCDMA2000-HRPD

This field indicates whether or not mobility to CDMA2000 HRPD is to be performed by the UE and it also indicates the type of mobility to CDMA2000 HRPD that is to be performed; If this field is not present the UE shall perform only the enhanced CS fallback to CDMA2000 1xRTT.

nas-SecurityParamFromEUTRA

Used to deliver the key synchronisation and Key freshness for the E-UTRAN to UTRAN handovers as specified in TS 33.401. The content of the parameter is defined in TS24.301.

networkControlOrder

Parameter NETWORK_CONTROL_ORDER in TS 44.060 [36].

purpose

Indicates which type of mobility procedure the UE is requested to perform. EUTRAN always applies value *e-CSFB* in case of enhanced CS fallback to CDMA2000 (e.g. also when that procedure results in handover to CDMA2000 1XRTT only, in handover to CDMA2000 HRPD only or in redirection to CDMA2000 HRPD only),

redirectCarrierCDMA2000-HRPD

The *redirectCarrierCDMA2000-HRPD* indicates a CDMA2000 carrier frequency and is used to redirect the UE to a HRPD carrier frequency.

SvstemInfoListGERAN

If purpose = CellChangeOrder and if the field is not present, the UE has to acquire SI/PSI from the GERAN cell.

t304

Timer T304 as described in section 7.3. Value ms100 corresponds with 100 ms, ms200 corresponds with 200 ms and so on.

targetRAT-Type

Indicates the target RAT type.

targetRAT-MessageContainer

The field contains a message specified in another standard, as indicated by the *targetRAT-Type*, and carries information about the target cell identifier(s) and radio parameters relevant for the target radio access technology. NOTE 1.

A complete message is included, as specified in the other standard.

Conditional presence	Explanation
concHO	The field is mandatory present if the <i>mobilityCDMA2000-HRPD</i> is set to 'handover';
	otherwise the field is optional present, need ON.
concRedir	The field is mandatory present if the mobilityCDMA2000-HRPD is set to 'redirection';
	otherwise the field is not present.
GERAN	The field should be present if the <i>purpose</i> is set to 'handover' and the targetRAT-Type is
	set to 'geran'; otherwise the field is not present
PSH0	The field is mandatory present in case of PS handover toward GERAN; otherwise the
	field is optionally present, but not used by the UE
UTRAGERAN	The field is mandatory present if the <i>targetRAT-Type</i> is set to ' <i>utra</i> ' or ' <i>geran</i> '; otherwise
	the field is not present

NOTE 1: The correspondence between the value of the *targetRAT-Type*, the standard to apply and the message contained within the *targetRAT-MessageContainer* is shown in the table below:

targetRAT-Type	Standard to apply	targetRAT-MessageContainer
cdma2000-1XRTT	C.S0001 or later, C.S0007 or later, C.S0008 or later	
cdma2000-HRPD	C.S0024 or later	
geran	GSM TS 04.18, version 8.5.0 or later, or 3GPP TS 44.018 (clause 9.1.15)	HANDOVER COMMAND
	3GPP TS 44.060, version 6.13.0 or later (clause 11.2.43)	PS HANDOVER COMMAND
	3GPP TS 44.060, version 7.6.0 or later (clause 11.2.46)	DTM HANDOVER COMMAND
utra	3GPP TS 25.331 (clause 10.2.16a)	HANDOVER TO UTRAN COMMAND

Paging

The Paging message is used for the notification of one or more UEs.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: PCCH

Direction: E-UTRAN to UE

Paging message

```
-- ASN1START
Paging ::=
                    SEQUENCE {
  pagingRecordList
                             PagingRecordList
                                                           OPTIONAL, -- Need ON
  system Info Modification\\
                             ENUMERATED {true}
                                                              OPTIONAL, -- Need ON
                                                              OPTIONAL, -- Need ON
  etws-Indication
                             ENUMERATED {true}
  nonCriticalExtension
                          Paging-v890-IEs
                                                        OPTIONAL
Paging-v890-IEs ::=
                       SEQUENCE {
  lateNonCriticalExtension
                             OCTET STRING
                                                              OPTIONAL,
  nonCriticalExtension
                                                           OPTIONAL
                          Paging-v920-IEs
}
Paging-v920-IEs ::=
                       SEQUENCE {
  cmas-Indication-r9
                             ENUMERATED {true}
                                                              OPTIONAL, -- Need ON
  nonCriticalExtension
                             Paging-v1130-IEs
                                                        OPTIONAL
Paging-v1130-IEs ::=
                          SEQUENCE {
```

```
eab-ParamModification-r11
                                                                OPTIONAL, -- Need ON
                              ENUMERATED {true}
  nonCriticalExtension
                           SEQUENCE {}
                                                             OPTIONAL
PagingRecordList ::=
                              SEQUENCE (SIZE (1..maxPageRec)) OF PagingRecord
PagingRecord ::=
                           SEQUENCE {
   ue-Identity
                                 PagingUE-Identity,
   cn-Domain
                                 ENUMERATED {ps, cs},
PagingUE-Identity ::=
                              CHOICE {
   s-TMSI
                                 S-TMSI.
                              IMSI,
  imsi
   ...
IMSI ::=
                           SEQUENCE (SIZE (6..21)) OF IMSI-Digit
IMSI-Digit ::=
                              INTEGER (0..9)
-- ASN1STOP
```

Paging field descriptions

cmas-Indication

If present: indication of a CMAS notification.

cn-Domain

Indicates the origin of paging.

eab-ParamModification

If present: indication of an EAB parameters (SIB14) modification.

etws-Indication

If present: indication of an ETWS primary notification and/ or ETWS secondary notification.

imsi

The International Mobile Subscriber Identity, a globally unique permanent subscriber identity, see TS 23.003 [27]. The first element contains the first IMSI digit, the second element contains the second IMSI digit and so on.

system Info Modification

If present: indication of a BCCH modification other than SIB10, SIB11, SIB12 and SIB14.

ue-Identity

Provides the NAS identity of the UE that is being paged.

ProximityIndication

The *ProximityIndication* message is used to indicate that the UE is entering or leaving the proximity of one or more CSG member cell(s).

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH
Direction: UE to E-UTRAN

ProximityIndication message

```
-- ASN1START
ProximityIndication-r9 ::= SEQUENCE {
  criticalExtensions
                                 CHOICE {
      c1
                                 CHOICE {
         proximityIndication-r9
                                        ProximityIndication-r9-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
         },
      criticalExtensionsFuture
                                 SEQUENCE {}
ProximityIndication-r9-IEs ::= SEQUENCE {
                                 ENUMERATED {entering, leaving},
   type-r9
  carrierFreq-r9
                              CHOICE {
      eutra-r9
                                 ARFCN-ValueEUTRA,
                                 ARFCN-ValueUTRA,
      utra-r9
      eutra2-v9e0
                                     ARFCN-ValueEUTRA-v9e0
   },
  nonCriticalExtension
                              ProximityIndication-v930-IEs
                                                                             OPTIONAL
ProximityIndication-v930-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                                 OCTET STRING
                                                                OPTIONAL,
   nonCriticalExtension
                              SEQUENCE {}
                                                                OPTIONAL
```

-- ASN1STOP

ProximityIndication field descriptions

carrierFreq

Indicates the RAT and frequency of the CSG member cell(s), for which the proximity indication is sent. For E-UTRA and UTRA frequencies, the UE shall set the ARFCN according to a band it previously considered suitable for accessing (one of) the CSG member cell(s), for which the proximity indication is sent.

type

Used to indicate whether the UE is entering or leaving the proximity of CSG member cell(s).

RNReconfiguration

The RNReconfiguration is a command to modify the RN subframe configuration and/or to convey changed system information.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to RN

RNReconfiguration message

```
-- ASN1START
RNReconfiguration-r10 ::=
                           SEQUENCE {
   rrc-TransactionIdentifier
                           RRC-TransactionIdentifier,
   criticalExtensions
                              CHOICE {
      c1
                               CHOICE {
         rnReconfiguration-r10
                                 RNReconfiguration-r10-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                              SEQUENCE {}
RNReconfiguration-r10-IEs ::=
                              SEQUENCE {
   rn-SystemInfo-r10
                                  RN-SystemInfo-r10
                                                          OPTIONAL, -- Need ON
                                                                OPTIONAL, -- Need ON
   rn-SubframeConfig-r10
                                  RN-SubframeConfig-r10
  lateNonCriticalExtension
                                  OCTET STRING
                                                             OPTIONAL,
   nonCriticalExtension
                               SEQUENCE {}
                                                             OPTIONAL
```

```
RN-SystemInfo-r10 ::= SEQUENCE {

systemInformationBlockType1-r10 OCTET STRING (CONTAINING SystemInformationBlockType1)
OPTIONAL, -- Need ON

systemInformationBlockType2-r10 SystemInformationBlockType2 OPTIONAL, -- Need ON

...

-- ASN1STOP
```

RNReconfigurationComplete

The RNReconfigurationComplete message is used to confirm the successful completion of an RN reconfiguration.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: RN to E-UTRAN

RNReconfigurationComplete message

```
-- ASN1START
RNReconfigurationComplete-r10 ::=
                                     SEQUENCE {
   rrc-TransactionIdentifier
                                  RRC-TransactionIdentifier,
  criticalExtensions
                                     CHOICE {
      c1
                                     CHOICE{
         rnReconfigurationComplete-r10
                                              RNReconfigurationComplete-r10-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                     SEQUENCE {}
   }
RNReconfigurationComplete-r10-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                                     OCTET STRING
                                                             OPTIONAL,
   nonCriticalExtension
                                 SEQUENCE {}
                                                             OPTIONAL
```

-- ASN1STOP

RRCConnectionReconfiguration

The RRCConnectionReconfiguration message is the command to modify an RRC connection. It may convey information for measurement configuration, mobility control, radio resource configuration (including RBs, MAC main configuration and physical channel configuration) including any associated dedicated NAS information and security configuration.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

RRCConnectionReconfiguration message

```
-- ASN1START
RRCConnectionReconfiguration ::= SEQUENCE {
   rrc-TransactionIdentifier
                               RRC-TransactionIdentifier,
   criticalExtensions
                                 CHOICE {
      c1
                                 CHOICE{
         rrcConnectionReconfiguration-r8
                                           RRCConnectionReconfiguration-r8-IEs,
         spare7 NULL,
         spare6 NULL, spare5 NULL, spare4 NULL,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                 SEQUENCE {}
   }
RRCConnectionReconfiguration-r8-IEs ::= SEQUENCE {
                                                             OPTIONAL, -- Need ON
   measConfig
                                 MeasConfig
   mobilityControlInfo
                                 MobilityControlInfo
                                                             OPTIONAL, -- Cond HO
   dedicatedInfoNASList
                                 SEQUENCE (SIZE(1..maxDRB)) OF
                                 DedicatedInfoNAS
                                                          OPTIONAL. -- Cond nonHO
   radio Resource Config Dedicated \\
                                 RadioResourceConfigDedicated
                                                                OPTIONAL, -- Cond HO-toEUTRA
   securityConfigHO
                                 SecurityConfigHO
                                                             OPTIONAL, -- Cond HO
   nonCriticalExtension
                              RRCConnectionReconfiguration-v890-IEs OPTIONAL
```

```
RRCConnectionReconfiguration-v890-IEs ::= SEQUENCE {
   lateNonCriticalExtension
                                 OCTET STRING
                                                            OPTIONAL,
   nonCriticalExtension
                              RRCConnectionReconfiguration-v920-IEs OPTIONAL
RRCConnectionReconfiguration-v920-IEs ::= SEQUENCE {
                                                            OPTIONAL, -- Need ON
   otherConfig-r9
                                 OtherConfig-r9
   fullConfig-r9
                              ENUMERATED {true}
                                                            OPTIONAL, -- Cond HO-Reestab
   nonCriticalExtension
                              RRCConnectionReconfiguration-v1020-IEs OPTIONAL
}
RRCConnectionReconfiguration-v1020-IEs ::= SEQUENCE {
                                                            OPTIONAL, -- Need ON
   sCellToReleaseList-r10
                                 SCellToReleaseList-r10
                                    SCellToAddModList-r10
                                                                  OPTIONAL, -- Need ON
   sCellToAddModList-r10
   nonCriticalExtension
                              RRCConnectionReconfiguration-v1130-IEs OPTIONAL
RRCConnectionReconfiguration-v1130-IEs ::= SEQUENCE {
   systemInfomationBlockType1Dedicated-r11 OCTET STRING (CONTAINING SystemInformationBlockType1)
                                                         OPTIONAL, -- Need ON
   non Critical Extension \\
                              SEQUENCE {}
                                                            OPTIONAL
SCellToAddModList-r10 ::=
                              SEQUENCE (SIZE (1..maxSCell-r10)) OF SCellToAddMod-r10
SCellToAddMod-r10 ::=
                              SEQUENCE {
   sCellIndex-r10
                                 SCellIndex-r10,
   cellIdentification-r10
                              SEQUENCE {
      physCellId-r10
                                    PhysCellId,
      dl-CarrierFreq-r10
                                    ARFCN-ValueEUTRA
                                                   OPTIONAL, -- Cond SCellAdd
   }
   radioResourceConfigCommonSCell-r10
                                          RadioResourceConfigCommonSCell-r10 OPTIONAL, -- Cond
SCellAdd
   radioResourceConfigDedicatedSCell-r10 RadioResourceConfigDedicatedSCell-r10 OPTIONAL, -- Cond
SCellAdd2
```

```
...,
                                    ARFCN-ValueEUTRA-v9e0 OPTIONAL -- Cond EARFCN-max
   [[ dl-CarrierFreq-v1090
   11
SCellToReleaseList-r10 ::=
                              SEQUENCE (SIZE (1..maxSCell-r10)) OF SCellIndex-r10
SecurityConfigHO ::=
                              SEQUENCE {
   handoverType
                                 CHOICE {
      intraLTE
                                 SEQUENCE {
         securityAlgorithmConfig
                                          SecurityAlgorithmConfig
                                                                     OPTIONAL, -- Cond fullConfig
         keyChangeIndicator
                                       BOOLEAN,
         nextHopChainingCount
                                       NextHopChainingCount
      },
      interRAT
                                 SEQUENCE {
         securityAlgorithmConfig
                                          SecurityAlgorithmConfig,
         nas-SecurityParamToEUTRA
                                          OCTET STRING (SIZE(6))
   },
-- ASN1STOP
```

RRCConnectionReconfiguration field descriptions

dedicatedInfoNASList

This field is used to transfer UE specific NAS layer information between the network and the UE. The RRC layer is transparent for each PDU in the list.

fullConfig

Indicates the full configuration option is applicable for the RRC Connection Reconfiguration message.

keyChangeIndicator

true is used only in an intra-cell handover when a K_{eNB} key is derived from a K_{ASME} key taken into use through the latest successful NAS SMC procedure, as described in TS 33.401 [32] for K_{eNB} re-keying. false is used in an intra-LTE handover when the new K_{eNB} key is obtained from the current K_{eNB} key or from the NH as described in TS 33.401 [32].

nas-securityParamToEUTRA

This field is used to transfer UE specific NAS layer information between the network and the UE. The RRC layer is transparent for this field, although it affects activation of AS- security after inter-RAT handover to E-UTRA. The content is defined in TS 24.301.

nextHopChainingCount

Parameter NCC: See TS 33.401 [32]

Conditional presence	Explanation
EARFCN-max	The field is mandatory present if <i>dl-CarrierFreq-r10</i> is included and set to <i>maxEARFCN</i> .
	Otherwise the field is not present.
fullConfig	This field is mandatory present for handover within E-UTRA when the fullConfig is
	included; otherwise it is optionally present, Need OP.
НО	The field is mandatory present in case of handover within E-UTRA or to E-UTRA;
	otherwise the field is not present.
HO-Reestab	This field is optionally present, need ON, in case of handover within E-UTRA or upon the
	first reconfiguration after RRC connection re-establishment; otherwise the field is not
	present.
HO-toEUTRA	The field is mandatory present in case of handover to E-UTRA or for reconfigurations
	when fullConfig is included; otherwise the field is optionally present, need ON.
nonHO	The field is not present in case of handover within E-UTRA or to E-UTRA; otherwise it is
	optional present, need ON.
SCellAdd	The field is mandatory present upon SCell addition; otherwise it is not present.
SCellAdd2	The field is mandatory present upon SCell addition; otherwise it is optionally present,
	need ON.

RRCConnectionReconfigurationComplete

The RRCConnectionReconfigurationComplete message is used to confirm the successful completion of an RRC connection reconfiguration.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

RRCConnectionReconfigurationComplete message

```
-- ASN1START
RRCConnectionReconfigurationComplete ::= SEQUENCE {
   rrc-TransactionIdentifier
                                RRC-TransactionIdentifier,
   criticalExtensions
                                    CHOICE {
      rrcConnectionReconfigurationComplete-r8
                                    RRCC onnection Reconfiguration Complete \hbox{-} r8 \hbox{-} IEs,
      criticalExtensionsFuture
                                    SEQUENCE {}
   }
RRCConnectionReconfigurationComplete-r8-IEs ::= SEQUENCE {
                                RRCC onnection Reconfiguration Complete-v8a0\text{-}IEs\ OPTIONAL
   nonCriticalExtension
RRCConnectionReconfigurationComplete-v8a0-IEs ::= SEQUENCE {
   lateNonCriticalExtension
                                    OCTET STRING
                                                                     OPTIONAL,
```

```
nonCriticalExtension
                             RRCConnectionReconfigurationComplete-v1020-IEs
                                                                            OPTIONAL
}
RRCConnectionReconfigurationComplete-v1020-IEs ::= SEQUENCE {
  rlf-InfoAvailable-r10
                             ENUMERATED {true}
                                                           OPTIONAL,
  logMeasAvailable-r10
                                ENUMERATED {true}
                                                              OPTIONAL,
  nonCriticalExtension
                             RRCConnectionReconfigurationComplete-v1130-IEs OPTIONAL
RRCConnectionReconfigurationComplete-v1130-IEs ::= SEQUENCE {
  connEstFailInfoAvailable-r11
                                ENUMERATED {true}
                                                              OPTIONAL,
  non Critical Extension \\
                                                           OPTIONAL
                             SEQUENCE {}
-- ASN1STOP
```

RRCConnectionReestablishment

The RRCConnectionReestablishment message is used to re-establish SRB1.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E-UTRAN to UE

RRCConnectionReestablishment message

```
-- ASN1START

RRCConnectionReestablishment ::= SEQUENCE {
    rrc-TransactionIdentifier RRC-TransactionIdentifier,
    criticalExtensions CHOICE {
        c1 CHOICE {
            rrcConnectionReestablishment-r8 RRCConnectionReestablishment-r8-IEs,
            spare7 NULL,
            spare6 NULL, spare4 NULL,
            spare3 NULL, spare1 NULL
        },
```

```
criticalExtensionsFuture
                                 SEQUENCE {}
   }
RRCConnectionReestablishment-r8-IEs ::= SEQUENCE {
   radioResourceConfigDedicated
                                 RadioResourceConfigDedicated,
   nextHop Chaining Count\\
                                 NextHopChainingCount,
  nonCriticalExtension
                              RRCConnectionReestablishment-v8a0-IEs OPTIONAL
RRCConnectionReestablishment-v8a0-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                                 OCTET STRING
                                                               OPTIONAL,
   nonCriticalExtension
                              SEQUENCE {}
                                                               OPTIONAL
-- ASN1STOP
```

RRCConnectionReestablishmentComplete

The RRCConnectionReestablishmentComplete message is used to confirm the successful completion of an RRC connection reestablishment.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

RRCConnectionReestablishmentComplete message

```
RRCConnectionReestablishmentComplete-r8-IEs ::= SEQUENCE {
                              RRCConnectionReestablishmentComplete-v920-IEs OPTIONAL
   nonCriticalExtension
}
RRCConnectionReestablishmentComplete-v920-IEs ::= SEQUENCE {
   rlf-InfoAvailable-r9
                              ENUMERATED {true}
                                                            OPTIONAL,
  nonCriticalExtension
                              RRCConnectionReestablishmentComplete-v8a0-IEs OPTIONAL
RRCConnectionReestablishmentComplete-v8a0-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                                 OCTET STRING
                                                               OPTIONAL,
   nonCriticalExtension
                              RRCConnectionReestablishmentComplete-v1020-IEs OPTIONAL
RRCConnectionReestablishmentComplete-v1020-IEs ::= SEQUENCE {
  logMeasAvailable-r10
                                ENUMERATED {true}
                                                               OPTIONAL,
   nonCriticalExtension
                              RRCConnectionReestablishmentComplete-v1130-IEs OPTIONAL
RRCC onnection Reestablishment Complete-v1130-IEs ::= SEQUENCE \ \{ \\
   connEstFailInfoAvailable-r11
                                 ENUMERATED {true}
                                                               OPTIONAL,
   nonCriticalExtension
                              SEQUENCE {}
                                                            OPTIONAL
-- ASN1STOP
```

$RRCConnection Reestablish ment Complete \ field \ descriptions$

rlf-InfoAvailable

This field is used to indicate the availability of radio link failure or handover failure related measurements

RRCConnectionReestablishmentReject

The *RRCConnectionReestablishmentReject* message is used to indicate the rejection of an RRC connection reestablishment request.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E-UTRAN to UE

RRCConnectionReestablishmentReject message

```
-- ASN1START
RRCConnectionReestablishmentReject ::= SEQUENCE \ \{
   criticalExtensions
                                  CHOICE {
      rrcConnectionReestablishmentReject-r8
                                  RRCConnectionReestablishmentReject-r8-IEs,
      criticalExtensionsFuture
                                  SEQUENCE {}
   }
RRCConnectionReestablishmentReject-r8-IEs ::= SEQUENCE {
   nonCriticalExtension
                               RRCC on nection Reestablish ment Reject-v8a0\text{-}IEs\ OPTIONAL
}
RRCConnectionReestablishmentReject-v8a0-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                                  OCTET STRING
                                                                  OPTIONAL,
   nonCriticalExtension
                               SEQUENCE {}
                                                                  OPTIONAL
}
-- ASN1STOP
```

RRCConnectionReestablishmentRequest

The RRCConnectionReestablishmentRequest message is used to request the reestablishment of an RRC connection.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to E-UTRAN

RRCConnectionReestablishmentRequest message

-- ASN1START

```
RRCConnectionReestablishmentRequest ::= SEQUENCE {
   criticalExtensions
                                  CHOICE {
      rrcConnectionReestablishmentRequest-r8\\
                                  RRCConnectionReestablishmentRequest-r8-IEs,
      criticalExtensionsFuture
                                  SEQUENCE {}
   }
RRCConnectionReestablishmentRequest-r8-IEs ::= SEQUENCE {
   ue-Identity
                                  ReestabUE-Identity,
   reestablishmentCause
                                  ReestablishmentCause,
   spare
                               BIT STRING (SIZE (2))
ReestabUE-Identity ::=
                               SEQUENCE {
   c-RNTI
                                  C-RNTI,
                                  PhysCellId,
   physCellId
                                  ShortMAC-I
   shortMAC-I
ReestablishmentCause ::=
                               ENUMERATED {
                               reconfigurationFailure, handoverFailure,
                               otherFailure, spare1}
-- ASN1STOP
```

RRCConnectionReestablishmentRequest field descriptions		
physCellId		
The Physical Cell Identity of the PCell the UE was connected to prior to the failure.		
reestablishmentCause		
Indicates the failure cause that triggered the re-establishment procedure.		
ue-Identity		
UE identity included to retrieve UE context and to facilitate contention resolution by lower layers.		

RRCConnectionReject

The RRCConnectionReject message is used to reject the RRC connection establishment.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E-UTRAN to UE

RRCConnectionReject message

```
-- ASN1START
RRCConnectionReject ::=
                                SEQUENCE {
   criticalExtensions
                                CHOICE {
      c1
                                CHOICE {
         rrcConnectionReject-r8
                                      RRCConnectionReject-r8-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                SEQUENCE {}
   }
RRCConnectionReject-r8-IEs ::=
                                SEQUENCE {
   waitTime
                             INTEGER (1..16),
  nonCriticalExtension
                              RRCConnectionReject-v8a0-IEs
                                                               OPTIONAL
RRCConnectionReject-v8a0-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                                OCTET STRING
                                                               OPTIONAL,
   nonCriticalExtension
                                                               OPTIONAL
                             RRCConnectionReject-v1020-IEs
}
RRCConnectionReject-v1020-IEs ::= SEQUENCE {
   extendedWaitTime-r10
                                INTEGER (1..1800)
                                                               OPTIONAL, -- Need ON
  nonCriticalExtension
                              RRCConnectionReject-v1130-IEs
                                                               OPTIONAL
RRCConnectionReject-v1130-IEs ::= SEQUENCE {
   deprioritisationReq-r11
                                SEQUENCE {
      deprioritisationType-r11
                                ENUMERATED {frequency, e-utra},
```

```
deprioritisationTimer-r11 ENUMERATED {min5, min10, min15, min30}
}
OPTIONAL, -- Need ON
nonCriticalExtension SEQUENCE {}
OPTIONAL
}
-- ASN1STOP
```

RRCConnectionReject field descriptions

deprioritisationReq

Indicates whether the current frequency or RAT is to be de-prioritised. The UE shall be able to store a depriotisation request for up to 8 frequencies (applicable when receiving another frequency specific deprioritisation request before T325 expiry).

deprioritisationTimer

Indicates the period for which either the current carrier frequency or E-UTRA is deprioritised. Value *minN* corresponds to N minutes.

extendedWaitTime

Value in seconds for the wait time for Delay Tolerant access requests.

waitTime

Wait time value in seconds.

RRCConnectionRelease

The RRCConnectionRelease message is used to command the release of an RRC connection.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

RRCConnectionRelease message

```
-- ASN1START
RRCConnectionRelease ::=
                               SEQUENCE {
   rrc-TransactionIdentifier
                               RRC-TransactionIdentifier,
   criticalExtensions
                                   CHOICE {
      c1
                                   CHOICE {
         rrcConnectionRelease-r8
                                            RRCConnectionRelease-r8-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                  SEQUENCE {}
   }
```

```
RRCConnectionRelease-r8-IEs ::=
                                SEQUENCE {
  releaseCause
                             ReleaseCause,
  redirectedCarrierInfo
                             RedirectedCarrierInfo
                                                           OPTIONAL, -- Need ON
  idleModeMobilityControlInfo
                                   Idle Mode Mobility Control Info\\
                                                                    OPTIONAL, -- Need OP
  nonCriticalExtension
                             RRCConnectionRelease-v890-IEs
                                                              OPTIONAL
RRCConnectionRelease-v890-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                                OCTET STRING (CONTAINING RRCConnectionRelease-v9e0-IEs)
  OPTIONAL,
  nonCriticalExtension
                      RRCConnectionRelease-v920-IEs
                                                              OPTIONAL
-- Late non critical extensions
RRCConnectionRelease-v9e0-IEs ::= SEQUENCE {
  redirectedCarrierInfo-v9e0
                                RedirectedCarrierInfo-v9e0
                                                              OPTIONAL, -- Cond NoRedirect-r8
  idleModeMobilityControlInfo-v9e0 IdleModeMobilityControlInfo-v9e0 OPTIONAL, -- Cond
IdleInfoEUTRA
  nonCriticalExtension
                             SEQUENCE {}
                                                              OPTIONAL
}
-- Regular non critical extensions
RRCConnectionRelease-v920-IEs ::= SEQUENCE {
  cellInfoList-r9
                             CHOICE {
     geran-r9
                             CellInfoListGERAN-r9,
     utra-FDD-r9
                                CellInfoListUTRA-FDD-r9,
     utra-TDD-r9
                                CellInfoListUTRA-TDD-r9,
     utra-TDD-r10
                             CellInfoListUTRA-TDD-r10
                                               OPTIONAL, -- Cond Redirection
   }
  nonCriticalExtension
                        RRCConnectionRelease-v1020-IEs
                                                              OPTIONAL
RRCConnectionRelease-v1020-IEs ::=SEQUENCE {
  extendedWaitTime-r10
                                INTEGER (1..1800)
                                                     OPTIONAL, -- Need ON
  nonCriticalExtension
                          SEQUENCE {} OPTIONAL
```

```
}
                        ENUMERATED {loadBalancingTAUrequired,
ReleaseCause ::=
                                 other, cs-FallbackHighPriority-v1020, spare1}
RedirectedCarrierInfo ::=
                              CHOICE {
                              ARFCN-ValueEUTRA,
   eutra
   geran
                              CarrierFreqsGERAN,
                              ARFCN-ValueUTRA,
   utra-FDD
   utra-TDD
                              ARFCN-ValueUTRA,
   cdma2000-HRPD
                                    CarrierFreqCDMA2000,
  cdma2000-1xRTT
                                    CarrierFreqCDMA2000,
                                           utra-TDD-r10
                                                                         CarrierFreqListUTRA-TDD-r10
RedirectedCarrierInfo-v9e0 ::=
                                 SEQUENCE {
                                    ARFCN-ValueEUTRA-v9e0
  eutra-v9e0
}
CarrierFreqListUTRA-TDD-r10 ::=
                                       SEQUENCE (SIZE (1..maxFreqUTRA-TDD-r10)) OF ARFCN-
ValueUTRA
IdleModeMobilityControlInfo ::=
                                 SEQUENCE {
   freq Priority List EUTRA\\
                                 FreqPriorityListEUTRA
                                                             OPTIONAL,
                                                                            -- Need ON
   freqPriorityListGERAN
                                 FreqsPriorityListGERAN
                                                                OPTIONAL,
                                                                               -- Need ON
   freqPriorityListUTRA-FDD
                                 FreqPriorityListUTRA-FDD
                                                                OPTIONAL,
                                                                               -- Need ON
  freqPriorityListUTRA-TDD
                                 FreqPriorityListUTRA-TDD
                                                                OPTIONAL,
                                                                               -- Need ON
   band Class Priority List HRPD \\
                                    Band Class Priority List HRPD \\
                                                                   OPTIONAL,
                                                                                  -- Need ON
   band Class Priority List 1XRTT\\
                                    Band Class Priority List 1XRTT\\
                                                                                  -- Need ON
                                                                   OPTIONAL,
   t320
                              ENUMERATED {
                                 min5, min10, min20, min30, min60, min120, min180,
                                                         OPTIONAL,
                                                                         -- Need OR
                                 spare1}
```

```
IdleModeMobilityControlInfo-v9e0 ::= SEQUENCE {
   freqPriorityListEUTRA-v9e0
                                    SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityEUTRA-v9e0
}
FreqPriorityListEUTRA ::=
                              SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityEUTRA
FreqPriorityEUTRA ::=
                              SEQUENCE {
   carrierFreq
                                 ARFCN-ValueEUTRA,
  cellReselectionPriority
                                 CellReselectionPriority
}
FreqPriorityEUTRA-v9e0 ::=
                                 SEQUENCE {
                             ARFCN-ValueEUTRA-v9e0
                                                            OPTIONAL -- Cond EARFCN-max
  carrierFreq-v9e0
FreqsPriorityListGERAN ::=
                                 SEQUENCE (SIZE (1..maxGNFG)) OF FreqsPriorityGERAN
FreqsPriorityGERAN ::=
                                 SEQUENCE {
  carrierFreqs
                              CarrierFreqsGERAN,
  cellReselectionPriority
                                 CellReselectionPriority
FreqPriorityListUTRA-FDD ::=
                                 SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF FreqPriorityUTRA-FDD
FreqPriorityUTRA-FDD ::=
                              SEQUENCE {
                                 ARFCN-ValueUTRA,
  carrierFreq
  cellReselectionPriority
                                 CellReselectionPriority
FreqPriorityListUTRA-TDD ::=
                                 SEQUENCE (SIZE (1...maxUTRA-TDD-Carrier)) OF FreqPriorityUTRA-TDD
FreqPriorityUTRA\text{-}TDD ::=
                                 SEQUENCE {
  carrierFreq
                                 ARFCN-ValueUTRA,
  cellReselectionPriority
                                 CellReselectionPriority
```

```
}
                                 SEQUENCE (SIZE (1..maxCDMA-BandClass)) OF BandClassPriorityHRPD
BandClassPriorityListHRPD ::=
BandClassPriorityHRPD ::=
                                 SEQUENCE {
   bandClass
                              BandclassCDMA2000,
  cellReselectionPriority
                                 CellReselectionPriority
BandClassPriorityList1XRTT ::= \ SEQUENCE \ (SIZE \ (1..maxCDMA-BandClass)) \ OF \ BandClassPriority1XRTT
BandClassPriority1XRTT ::=
                                 SEQUENCE {
   bandClass
                              BandclassCDMA2000,
  cellReselectionPriority
                                 CellReselectionPriority
CellInfoListGERAN-r9 ::=
                           SEQUENCE (SIZE (1..maxCellInfoGERAN-r9)) OF CellInfoGERAN-r9
CellInfoGERAN-r9 ::=
                              SEQUENCE {
   physCellId-r9
                              PhysCellIdGERAN,
  carrierFreq-r9
                              CarrierFreqGERAN,
   systemInformation-r9
                                 SystemInfoListGERAN
CellInfoListUTRA-FDD-r9 ::=
                                 SEQUENCE (SIZE (1..maxCellInfoUTRA-r9)) OF CellInfoUTRA-FDD-r9
CellInfoUTRA-FDD-r9 ::=
                                 SEQUENCE {
   physCellId-r9
                              PhysCellIdUTRA-FDD,
   utra-BCCH-Container-r9
                                    OCTET STRING
CellInfoListUTRA-TDD-r9 ::=
                                 SEQUENCE (SIZE (1..maxCellInfoUTRA-r9)) OF CellInfoUTRA-TDD-r9
CellInfoUTRA-TDD-r9 ::=
                                 SEQUENCE {
                              PhysCellIdUTRA-TDD,
   physCellId-r9
```

```
utra-BCCH-Container-r9 OCTET STRING

CellInfoListUTRA-TDD-r10 ::= SEQUENCE (SIZE (1..maxCellInfoUTRA-r9)) OF CellInfoUTRA-TDD-r10

CellInfoUTRA-TDD-r10 ::= SEQUENCE {
    physCellId-r10 PhysCellIdUTRA-TDD,
        carrierFreq-r10 ARFCN-ValueUTRA,
        utra-BCCH-Container-r10 OCTET STRING
}

-- ASN1STOP
```

RRCConnectionRelease field descriptions

carrierFreq or bandClass

The carrier frequency (UTRA and E-UTRA) and band class (HRPD and 1xRTT) for which the associated cellReselectionPriority is applied.

carrierFreqs

The list of GERAN carrier frequencies organised into one group of GERAN carrier frequencies.

cellInfoList

Used to provide system information of one or more cells on the redirected inter-RAT carrier frequency. The system information can be used if, upon redirection, the UE selects an inter-RAT cell indicated by the *physCellId* and *carrierFreq* (GERAN and UTRA TDD) or by the *physCellId* (other RATs). The choice shall match the *redirectedCarrierInfo*. In particular, E-UTRAN only applies value *utra-TDD-r10* in case *redirectedCarrierInfo* is set to *utra-TDD-r10*.

extendedWaitTime

Value in seconds for the wait time for Delay Tolerant access requests.

freqPriorityListX

Provides a cell reselection priority for each frequency, by means of separate lists for each RAT (including E-UTRA). The UE shall be able to store at least 3 occurrences of *FreqsPriorityGERAN*. If E-UTRAN includes *freqPriorityListEUTRA-v9e0* it includes the same number of entries, and listed in the same order, as in *freqPriorityListEUTRA* (i.e. without suffix).

idleModeMobilityControlInfo

Provides dedicated cell reselection priorities. Used for cell reselection as specified in TS 36.304 [4]. For E-UTRA and UTRA frequencies, a UE that supports multi-band cells for the concerned RAT considers the dedicated priorities to be common for all overlapping bands (i.e. regardless of the ARFCN that is used).

redirectedCarrierInfo

The redirectedCarrierInfo indicates a carrier frequency (downlink for FDD) and is used to redirect the UE to an E-UTRA or an inter-RAT carrier frequency, by means of the cell selection upon leaving RRC_CONNECTED as specified in TS 36.304 [4].

releaseCause

The releaseCause is used to indicate the reason for releasing the RRC Connection. The cause value cs-FallbackHighPriority is only applicable when redirectedCarrierInfo is present with the value set to utra-FDD, utra-TDD or utra-TDD-r10.

E-UTRAN should not set the releaseCause to loadBalancingTAURequired or to cs-FallbackHighPriority if the extendedWaitTime is present.

systemInformation

Container for system information of the GERAN cell i.e. one or more System Information (SI) messages as defined in TS 44.018 [45, table 9.1.1].

t320

Timer T320 as described in section 7.3. Value minN corresponds to N minutes.

utra-BCCH-Container

Contains System Information Container message as defined in TS 25.331 [19].

Conditional presence	Explanation
EARFCN-max	The field is mandatory present if the corresponding <i>carrierFreq</i> (i.e. without suffix) is set to
	maxEARFCN. Otherwise the field is not present.
IdleInfoEUTRA	The field is optionally present, need OP, if the IdleModeMobilityControlInfo (i.e. without
	suffix) is included and includes freqPriorityListEUTRA; otherwise the field is not present.
NoRedirect-r8	The field is optionally present, need OP, if the redirectedCarrierInfo (i.e. without suffix) is
	not included; otherwise the field is not present.
Redirection	The field is optionally present, need ON, if the redirectedCarrierInfo is included and set to
	geran, utra-FDD, utra-TDD or utra-TDD-r10; otherwise the field is not present.

RRCConnectionRequest

The RRCConnectionRequest message is used to request the establishment of an RRC connection.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to E-UTRAN

RRCConnectionRequest message

```
-- ASN1START
RRCConnectionRequest ::=
                               SEQUENCE {
   criticalExtensions
                                  CHOICE {
      rrcConnectionRequest-r8
                                        RRCConnectionRequest-r8-IEs,
      criticalExtensionsFuture
                                  SEQUENCE {}
   }
RRCConnectionRequest-r8-IEs ::=
                                  SEQUENCE {
  ue-Identity
                                  InitialUE-Identity,
  establishmentCause
                                  EstablishmentCause,
                               BIT STRING (SIZE (1))
   spare
InitialUE-Identity ::=
                               CHOICE {
   s-TMSI
                                  S-TMSI,
  randomValue
                                  BIT STRING (SIZE (40))
EstablishmentCause ::=
                               ENUMERATED {
                               emergency, highPriorityAccess, mt-Access, mo-Signalling,
```

mo-Data, delayTolerantAccess-v1020, spare2, spare1}
--- ASN1STOP

RRCConnectionRequest field descriptions

establishmentCause

Provides the establishment cause for the RRC connection request as provided by the upper layers. W.r.t. the cause value names: highPriorityAccess concerns AC11..AC15, "mt" stands for "Mobile Terminating" and "mo" for "Mobile Originating.

random Value

Integer value in the range 0 to 2⁴⁰ – 1.

ue-Identity

UE identity included to facilitate contention resolution by lower layers.

RRCConnectionSetup

The RRCConnectionSetup message is used to establish SRB1.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E-UTRAN to UE

RRCConnectionSetup message

```
-- ASN1START
RRCConnectionSetup ::=
                                  SEQUENCE {
   rrc-TransactionIdentifier
                               RRC-TransactionIdentifier,
   criticalExtensions
                                  CHOICE {
      c1
                                  CHOICE {
         rrcConnectionSetup-r8
                                         RRCConnectionSetup-r8-IEs,
         spare7 NULL,
         spare6 NULL, spare5 NULL, spare4 NULL,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                  SEQUENCE {}
   }
RRCConnectionSetup-r8-IEs ::=
                                  SEQUENCE {
   radio Resource Config Dedicated \\
                                  RadioResourceConfigDedicated,
   nonCriticalExtension
                               RRCConnectionSetup-v8a0-IEs
                                                                     OPTIONAL
```

```
RRCConnectionSetup-v8a0-IEs ::= SEQUENCE {
    lateNonCriticalExtension OCTET STRING OPTIONAL,
    nonCriticalExtension SEQUENCE {} OPTIONAL
}
-- ASN1STOP
```

RRCConnectionSetupComplete

The *RRCConnectionSetupComplete* message is used to confirm the successful completion of an RRC connection establishment.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

RRCConnectionSetupComplete message

```
-- ASN1START
RRCConnectionSetupComplete ::=
                                 SEQUENCE {
   rrc-TransactionIdentifier
                              RRC-TransactionIdentifier,
   criticalExtensions
                                 CHOICE {
                                 CHOICE{
      c1
         rrcConnectionSetupComplete-r8
                                          RRCConnectionSetupComplete-r8-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                 SEQUENCE {}
   }
RRCConnectionSetupComplete-r8-IEs ::= SEQUENCE {
   selectedPLMN-Identity
                                 INTEGER (1..maxPLMN-r11),
   registeredMME
                                 RegisteredMME
                                                                OPTIONAL,
   dedicatedInfoNAS
                                 DedicatedInfoNAS,
  nonCriticalExtension
                              RRCConnectionSetupComplete-v8a0-IEs OPTIONAL
```

```
}
RRCConnectionSetupComplete-v8a0-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                               OCTET STRING
                                                            OPTIONAL,
  nonCriticalExtension
                            RRCConnectionSetupComplete-v1020-IEs OPTIONAL
RRCConnectionSetupComplete-v1020-IEs ::= SEQUENCE {
   gummei-Type-r10
                                  ENUMERATED {native, mapped}
                                                                       OPTIONAL,
  rlf-InfoAvailable-r10
                            ENUMERATED {true}
                                                            OPTIONAL,
                                                               OPTIONAL,
  logMeasAvailable-r10
                               ENUMERATED {true}
  rn-SubframeConfigReq-r10
                               ENUMERATED {required, notRequired} OPTIONAL,
  nonCriticalExtension
                            RRCConnectionSetupComplete-v1130-IEs OPTIONAL
RRCConnectionSetupComplete-v1130-IEs ::= SEQUENCE {
  connEstFailInfoAvailable-r11
                               ENUMERATED {true}
                                                            OPTIONAL,
  nonCriticalExtension
                            SEQUENCE {}
                                                         OPTIONAL
RegisteredMME ::=
                            SEQUENCE {
  plmn-Identity
                            PLMN-Identity
                                                         OPTIONAL,
                            BIT STRING (SIZE (16)),
  mmegi
                            MMEC
  mmec
-- ASN1STOP
```

RRCConnectionSetupComplete field descriptions

gummei-Type

This field is used to indicate whether the GUMMEI included is native (assigned by EPC) or mapped (from 2G/3G identifiers).

mmegi

Provides the Group Identity of the registered MME within the PLMN, as provided by upper layers, see TS 23.003 [27].

registeredMME

This field is used to transfer the GUMMEI of the MME where the UE is registered, as provided by upper layers.

rn-SubframeConfigReq

If present, this field indicates that the connection establishment is for an RN and whether a subframe configuration is requested or not.

selectedPLMN-Identity

Index of the PLMN selected by the UE from the *plmn-IdentityList* included in SIB1. 1 if the 1st PLMN is selected from the *plmn-IdentityList* included in SIB1, 2 if the 2nd PLMN is selected from the *plmn-IdentityList* included in SIB1 and so on.

SecurityModeCommand

The SecurityModeCommand message is used to command the activation of AS security.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

SecurityModeCommand message

```
-- ASN1START
SecurityModeCommand ::=
                                 SEQUENCE {
   rrc-TransactionIdentifier
                              RRC-TransactionIdentifier,
   criticalExtensions
                                 CHOICE {
      c1
                                 CHOICE{
         securityModeCommand-r8
                                          SecurityModeCommand-r8-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                 SEQUENCE {}
   }
SecurityModeCommand-r8-IEs ::=
                                 SEQUENCE {
   securityConfigSMC
                                 SecurityConfigSMC,
   nonCriticalExtension
                              SecurityModeCommand-v8a0-IEs
                                                                OPTIONAL
}
```

```
SecurityModeCommand-v8a0-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

SecurityConfigSMC ::= SEQUENCE {

securityAlgorithmConfig SecurityAlgorithmConfig,

...

}

-- ASN1STOP
```

SecurityModeComplete

The SecurityModeComplete message is used to confirm the successful completion of a security mode command.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

SecurityModeComplete message

```
-- ASN1START
SecurityModeComplete ::=
                               SEQUENCE {
   rrc-TransactionIdentifier
                              RRC-TransactionIdentifier,
  criticalExtensions
                                  CHOICE {
      securityModeComplete-r8
                                        SecurityModeComplete-r8-IEs,
      criticalExtensionsFuture
                                  SEQUENCE {}
   }
SecurityModeComplete-r8-IEs ::=
                                 SEQUENCE {
                                                                                OPTIONAL
   nonCriticalExtension
                              SecurityModeComplete-v8a0-IEs
SecurityModeComplete-v8a0-IEs ::= SEQUENCE {
```

```
lateNonCriticalExtension OCTET STRING OPTIONAL,
nonCriticalExtension SEQUENCE {} OPTIONAL
}
-- ASN1STOP
```

SecurityModeFailure

The SecurityModeFailure message is used to indicate an unsuccessful completion of a security mode command.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

SecurityModeFailure message

```
-- ASN1START
SecurityModeFailure ::=
                              SEQUENCE {
   rrc-TransactionIdentifier
                              RRC-TransactionIdentifier,
   criticalExtensions
                                 CHOICE {
      securityModeFailure-r8
                                     SecurityModeFailure-r8-IEs,
      criticalExtensionsFuture
                                 SEQUENCE {}
   }
SecurityModeFailure-r8-IEs ::= SEQUENCE {
   nonCriticalExtension
                                                                             OPTIONAL
                              SecurityModeFailure-v8a0-IEs
SecurityModeFailure-v8a0-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                                 OCTET STRING
                                                                OPTIONAL,
   nonCriticalExtension
                              SEQUENCE {}
                                                                OPTIONAL
-- ASN1STOP
```

SystemInformation

The *SystemInformation* message is used to convey one or more System Information Blocks. All the SIBs included are transmitted with the same periodicity.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: BCCH

Direction: E-UTRAN to UE

SystemInformation message

```
-- ASN1START
SystemInformation ::=
                               SEQUENCE {
   criticalExtensions
                                   CHOICE {
      systemInformation-r8
                                      SystemInformation-r8-IEs,
      criticalExtensionsFuture
                                   SEQUENCE {}
   }
SystemInformation-r8-IEs ::=
                               SEQUENCE {
                                   SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {
   sib-TypeAndInfo
      sib2
                                   SystemInformationBlockType 2,\\
                                   SystemInformationBlockType3,
      sib3
      sib4
                                   SystemInformationBlockType4,
                                   SystemInformationBlockType5,
      sib5
      sib6
                                   SystemInformationBlockType6,
      sib7
                                   SystemInformationBlockType7,
      sib8
                                   SystemInformationBlockType8,
                                   SystemInformationBlockType9,
      sib9
      sib10
                                   SystemInformationBlockType10,
      sib11
                                   SystemInformationBlockType11,
                                      SystemInformationBlockType12-r9,
      sib12-v920
      sib13-v920
                                      SystemInformationBlockType13-r9,
      sib14-v1130
                                      SystemInformationBlockType14-r11,
                                      SystemInformationBlockType15-r11,
      sib15-v1130
      sib16-v1130
                                      SystemInformationBlockType16-r11
```

```
nonCriticalExtension SystemInformation-v8a0-IEs OPTIONAL

SystemInformation-v8a0-IEs ::= SEQUENCE {
    lateNonCriticalExtension OCTET STRING OPTIONAL,
    nonCriticalExtension SEQUENCE {}

-- ASN1STOP
```

SystemInformationBlockType1

SystemInformationBlockType1 contains information relevant when evaluating if a UE is allowed to access a cell and defines the scheduling of other system information.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: BCCH

Direction: E-UTRAN to UE

SystemInformationBlockType1 message

```
-- ASN1START
SystemInformationBlockType1 ::=
                                 SEQUENCE {
   cellAccessRelatedInfo
                                 SEQUENCE {
                                 PLMN-IdentityList,
      plmn-IdentityList
      trackingAreaCode
                                    TrackingAreaCode,
      cellIdentity
                                 CellIdentity,
      cellBarred
                                 ENUMERATED {barred, notBarred},
      intraFreqReselection
                                 ENUMERATED {allowed, notAllowed},
      csg-Indication
                                    BOOLEAN,
                                                    OPTIONAL -- Need OR
      csg-Identity
                                 CSG-Identity
   },
  cellSelectionInfo
                              SEQUENCE {
      q-RxLevMin
                                    Q-RxLevMin,
                                                          OPTIONAL -- Need OP
      q-RxLevMinOffset
                                    INTEGER (1..8)
   },
  p-Max
                              P-Max
                                                    OPTIONAL,
                                                                      -- Need OP
```

```
freqBandIndicator
                                 FreqBandIndicator,
   schedulingInfoList
                                 SchedulingInfoList,
                                                          OPTIONAL, -- Cond TDD
   tdd-Config
                                 TDD-Config
   si-WindowLength
                                    ENUMERATED {
                                 ms1, ms2, ms5, ms10, ms15, ms20,
                                 ms40},
                                 INTEGER (0..31),
  systemInfoValueTag
                              SystemInformationBlockType1-v890-IEs OPTIONAL
  nonCriticalExtension
SystemInformationBlockType1-v890-IEs::= SEQUENCE {
   lateNonCriticalExtension
                                 OCTET STRING (CONTAINING SystemInformationBlockType1-v8h0-IEs)
      OPTIONAL,
  nonCriticalExtension
                              SystemInformationBlockType1-v920-IEs OPTIONAL
-- Late non critical extensions
SystemInformationBlockType1-v8h0-IEs ::= SEQUENCE {
   multiBandInfoList\\
                                 MultiBandInfoList\\
                                                       OPTIONAL, -- Need OR
   nonCriticalExtension
                              SystemInformationBlockType1-v9e0-IEs OPTIONAL
SystemInformationBlockType1-v9e0-IEs ::= SEQUENCE {
   freqBandIndicator-v9e0
                                 FreqBandIndicator-v9e0
                                                          OPTIONAL, -- Cond FBI-max
                                 MultiBandInfoList-v9e0
   multiBandInfoList-v9e0
                                                          OPTIONAL, -- Cond mFBI-max
  nonCriticalExtension
                              SEQUENCE {}
                                                          OPTIONAL
-- Regular non critical extensions
SystemInformationBlockType1-v920-IEs ::= SEQUENCE {
   ims-EmergencySupport-r9
                                    ENUMERATED {true}
                                                                OPTIONAL, -- Need OR
                                 CellSelectionInfo-v920
  cellSelectionInfo-v920
                                                          OPTIONAL, -- Cond RSRQ
   nonCriticalExtension
                              SystemInformationBlockType1-v1130-IEs OPTIONAL
```

```
SystemInformationBlockType1-v1130-IEs ::= SEQUENCE {
   tdd-Config-v1130
                              TDD-Config-v1130
                                                       OPTIONAL, -- Cond TDD-OR
   cellSelectionInfo-v1130
                              CellSelectionInfo-v1130
                                                       OPTIONAL, -- Cond WB-RSRQ
  nonCriticalExtension
                           SEQUENCE {}
                                                       OPTIONAL
PLMN-IdentityList ::=
                                 SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-IdentityInfo
PLMN-IdentityInfo ::=
                                  SEQUENCE {
   plmn-Identity
                                  PLMN-Identity,
  cellReservedForOperatorUse
                                        ENUMERATED {reserved, notReserved}
SchedulingInfoList ::= SEQUENCE (SIZE (1..maxSI-Message)) OF SchedulingInfo
SchedulingInfo ::= SEQUENCE {
   si-Periodicity
                              ENUMERATED {
                                  rf8, rf16, rf32, rf64, rf128, rf256, rf512},
  sib-MappingInfo
                                  SIB-MappingInfo
SIB-MappingInfo ::= SEQUENCE (SIZE (0..maxSIB-1)) OF SIB-Type
SIB-Type ::=
                           ENUMERATED {
                              sibType3, sibType4, sibType5, sibType6,
                              sibType7, sibType8, sibType9, sibType10,
                              sibType11, sibType12-v920, sibType13-v920,
                              sibType14-v1130, sibType15-v1130,
                               sibType16-v1130, spare2, spare1, ...}
CellSelectionInfo-v920 ::=
                              SEQUENCE {
   q-QualMin-r9
                              Q-QualMin-r9,
   q-QualMinOffset-r9
                                  INTEGER (1..8)
                                                                OPTIONAL -- Need OP
```

```
CellSelectionInfo-v1130 ::= SEQUENCE {
    q-QualMinWB-r11 Q-QualMin-r9
}
-- ASN1STOP
```

SystemInformationBlockType1 field descriptions

cellBarred

barred means the cell is barred, as defined in TS 36.304 [4].

cellReservedForOperatorUse

As defined in TS 36.304 [4].

csg-Identity

Identity of the Closed Subscriber Group the cell belongs to.

csg-Indication

If set to TRUE the UE is only allowed to access the cell if it is a CSG member cell, if selected during manual CSG selection or to obtain limited service, see TS 36.304 [4].

ims-EmergencySupport

Indicates whether the cell supports IMS emergency bearer services for UEs in limited service mode. If absent, IMS emergency call is not supported by the network in the cell for UEs in limited service mode.

intraFreqReselection

Used to control cell reselection to intra-frequency cells when the highest ranked cell is barred, or treated as barred by the UE, as specified in TS 36.304 [4].

multiBandInfoList

A list of additional frequency band indicators, as defined in TS 36.101 [42, table 5.5-1] that the cell belongs to. If the UE supports the frequency band in the *freqBandIndicator* IE it shall apply that frequency band. Otherwise, the UE shall apply the first listed band which it supports in the *multiBandInfoList* IE. If E-UTRAN includes *multiBandInfoList-v9e0* it includes the same number of entries, and listed in the same order, as in *multiBandInfoList* (i.e. without suffix). See Annex D for more descriptions.

plmn-IdentityList

List of PLMN identities. The first listed PLMN-Identity is the primary PLMN.

р-Мах

Value applicable for the cell. If absent the UE applies the maximum power according to the UE capability.

q-QualMin

Parameter 'Q_{qualmin}' in TS 36.304 [4]. If *cellSelectionInfo-v920* is not present, the UE applies the (default) value of negative infinity for Q_{qualmin}. NOTE 1.

q-QualMinOffset

Parameter ' $Q_{qualminoffset}$ ' in TS 36.304 [4]. Actual value $Q_{qualminoffset}$ = IE value [dB]. If *cellSelectionInfo-v920* is not present or the field is not present, the UE applies the (default) value of 0 dB for $Q_{qualminoffset}$. Affects the minimum required quality level in the cell.

q-QualMinWB

If this field is present and supported by the UE, the UE shall, when performing RSRQ measurements, use a wider bandwidth in accordance with TS 36.133 [16]. NOTE 1.

q-RxLevMinOffset

Parameter Q_{rxlevminoffset} in TS 36.304 [4]. Actual value Q_{rxlevminoffset} = IE value * 2 [dB]. If absent, the UE applies the (default) value of 0 dB for Q_{rxlevminoffset}. Affects the minimum required Rx level in the cell.

sib-MappingInfo

List of the SIBs mapped to this *SystemInformation* message. There is no mapping information of SIB2; it is always present in the first *SystemInformation* message listed in the *schedulingInfoList* list.

si-Periodicity

Periodicity of the SI-message in radio frames, such that rf8 denotes 8 radio frames, rf16 denotes 16 radio frames, and so on.

si-WindowLength

Common SI scheduling window for all SIs. Unit in milliseconds, where ms1 denotes 1 millisecond, ms2 denotes 2 milliseconds and so on.

systemInfoValueTag

Common for all SIBs other than MIB, SIB1, SIB10, SIB11, SIB12 and SIB14. Change of MIB and SIB1 is detected by acquisition of the corresponding message.

trackingAreaCode

A trackingAreaCode that is common for all the PLMNs listed.

NOTE 1: The value the UE applies for parameter ${}^{\prime}Q_{qualmin}{}^{\prime}$ in TS 36.304 [4] depends on the q-QualMin fields signalled by E-UTRAN and supported by the UE. In case multiple candidate options are available, the UE shall select the highest priority candidate option according to the priority order indicated by the following table (top row is highest priority).

q-QualMinWB	Value of parameter 'Q _{qualmin} ' in TS 36.304 [4]
Included	q-QualMinWB
Not included	q-QualMin

Conditional presence	Explanation
FBI-max	The field is mandatory present if <i>freqBandIndicator</i> (i.e. without suffix) is set to <i>maxFBI</i> .
	Otherwise the field is not present.
mFBI-max	The field is mandatory present if one or more entries in <i>multiBandInfoList</i> (i.e. without
	suffix, introduced in -v8h0) is set to <i>maxFBI</i> . Otherwise the field is not present.
RSRQ	The field is mandatory present if SIB3 is being broadcast and threshServingLowQ is
	present in SIB3; otherwise optionally present, Need OP.
TDD	This field is mandatory present for TDD; it is not present for FDD and the UE shall delete
	any existing value for this field.
TDD-OR	The field is optional present for TDD, need OR; it is not present for FDD.
WB-RSRQ	The field is optionally present, need OP if the measurement bandwidth indicated by
	allowedMeasBandwidth in systemInformationBlockType3 is 50 resource blocks or larger;
	otherwise it is not present.

UEAssistanceInformation

The UEAssistanceInformation message is used for the indication of UE assistance information to the eNB.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

UEAssistanceInformation message

```
-- ASN1START
UEAssistanceInformation-r11 ::=
                                        SEQUENCE {
   criticalExtensions
                                  CHOICE {
      c1
                                  CHOICE {
         ueAssistanceInformation-r11
                                           UEAssistanceInformation-r11-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                 SEQUENCE {}
UEAssistanceInformation-r11-IEs ::=
                                     SEQUENCE {
                                 ENUMERATED {normal, lowPowerConsumption} OPTIONAL,
   powerPrefIndication-r11
```

```
lateNonCriticalExtension OCTET STRING OPTIONAL,
nonCriticalExtension SEQUENCE {} OPTIONAL
}
-- ASN1STOP
```

UEAssistanceInformation field descriptions

powerPrefIndication

Value *lowPowerConsumption* indicates the UE prefers a configuration that is primarily optimised for power saving. Otherwise the value is set to *normal*.

UECapabilityEnquiry

The *UECapabilityEnquiry* message is used to request the transfer of UE radio access capabilities for E-UTRA as well as for other RATs.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

UECapabilityEnquiry message

```
-- ASN1START
UECapabilityEnquiry ::=
                                   SEQUENCE {
   rrc-TransactionIdentifier
                               RRC-TransactionIdentifier,
   criticalExtensions
                                   CHOICE {
      c1
                                   CHOICE {
         ueCapabilityEnquiry-r8
                                         UECapabilityEnquiry-r8-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                  SEQUENCE {}
UECapabilityEnquiry-r8-IEs ::=
                                  SEQUENCE {
   ue-CapabilityRequest
                                   UE-CapabilityRequest,
   nonCriticalExtension
                                UECapabilityEnquiry-v8a0-IEs
                                                               OPTIONAL
```

```
UECapabilityEnquiry-v8a0-IEs ::= SEQUENCE {
   lateNonCriticalExtension
                                 OCTET STRING
                                                               OPTIONAL,
   nonCriticalExtension
                              UECapabilityEnquiry-v1180-IEs
                                                               OPTIONAL
UECapabilityEnquiry-v1180-IEs ::= SEQUENCE {
   requestedFrequencyBands-r11
                                    SEQUENCE (SIZE (1..16)) OF FreqBandIndicator-r11
   OPTIONAL,
   nonCriticalExtension
                              SEQUENCE {}
                                                      OPTIONAL
                          SEQUENCE (SIZE (1..maxRAT-Capabilities)) OF RAT-Type
UE-CapabilityRequest ::=
-- ASN1STOP
```

UECapabilityEnquiry field descriptions

ue-CapabilityRequest

List of the RATs for which the UE is requested to transfer the UE radio access capabilities i.e. E-UTRA, UTRA, GERAN-CS, GERAN-PS, CDMA2000.

requestedFrequencyBands

List of frequency bands for which the UE is requested to provide supported CA band combinations and non CA bands.

UECapabilityInformation

The UECapabilityInformation message is used to transfer of UE radio access capabilities requested by the E-UTRAN.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

UECapabilityInformation message

```
-- ASN1START

UECapabilityInformation ::= SEQUENCE {
    rrc-TransactionIdentifier RRC-TransactionIdentifier,
    criticalExtensions CHOICE {
        c1 CHOICE {
            ueCapabilityInformation-r8 UECapabilityInformation-r8-IEs,
            spare7 NULL,
            spare6 NULL, spare5 NULL, spare4 NULL,
```

```
spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                  SEQUENCE {}
   }
UECapabilityInformation-r8-IEs ::= SEQUENCE {
   ue-CapabilityRAT-ContainerList
                                     UE-CapabilityRAT-ContainerList,
   nonCriticalExtension
                               UECapabilityInformation-v8a0-IEs
}
UECapabilityInformation-v8a0-IEs ::= SEQUENCE {
   late Non Critical Extension \\
                                  OCTET STRING
                                                                 OPTIONAL,
   nonCriticalExtension
                                                                 OPTIONAL
                               SEQUENCE {}
-- ASN1STOP
```

UEInformationRequest

The *UEInformationRequest* is the command used by E-UTRAN to retrieve information from the UE.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

UEInformationRequest message

```
-- ASN1START

UEInformationRequest-r9 ::= SEQUENCE {
    rrc-TransactionIdentifier RRC-TransactionIdentifier,
    criticalExtensions CHOICE {
        c1 CHOICE {
            ueInformationRequest-r9 UEInformationRequest-r9-IEs,
            spare3 NULL, spare2 NULL
    },
```

```
criticalExtensionsFuture
                                SEQUENCE {}
   }
UEInformationRequest-r9-IEs ::=
                                SEQUENCE {
  rach-ReportReq-r9
                                BOOLEAN,
  rlf-ReportReq-r9
                             BOOLEAN,
  nonCriticalExtension
                             UEInformationRequest-v930-IEs
                                                              OPTIONAL
UEInformationRequest-v930-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                                OCTET STRING
                                                              OPTIONAL,
  nonCriticalExtension
                             UEInformationRequest-v1020-IEs
                                                              OPTIONAL
UEInformationRequest-v1020-IEs ::= SEQUENCE {
  logMeasReportReq-r10
                                ENUMERATED {true}
                                                                 OPTIONAL, -- Need ON
  nonCriticalExtension
                             UEInformationRequest-v1130-IEs
                                                              OPTIONAL
UEInformationRequest-v1130-IEs ::= SEQUENCE {
  connEstFailReportReq-r11
                                ENUMERATED {true}
                                                                 OPTIONAL, -- Need ON
  nonCriticalExtension
                             SEQUENCE {}
                                                              OPTIONAL
-- ASN1STOP
```

UEInformationRequest field descriptions

rach-ReportReq

This field is used to indicate whether the UE shall report information about the random access procedure.

UEInformationResponse

The UEInformationResponse message is used by the UE to transfer the information requested by the E-UTRAN.

Signalling radio bearer: SRB1 or SRB2 (when logged measurement information is included)

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

UEInformationResponse message

```
-- ASN1START
UEInformationResponse-r9 ::=
                                  SEQUENCE {
   rrc-TransactionIdentifier
                               RRC-TransactionIdentifier,
   criticalExtensions
                                  CHOICE {
      c1
                               CHOICE {
         ueInformationResponse-r9
                                           UEInformationResponse-r9-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                     SEQUENCE {}
   }
UEInformationResponse-r9-IEs ::=
                                  SEQUENCE {
  rach-Report-r9
                                     SEQUENCE {
      numberOfPreamblesSent-r9
                                        NumberOfPreamblesSent-r11,
      contentionDetected-r9
                                        BOOLEAN
                                                     OPTIONAL,
   }
  rlf-Report-r9
                                  RLF-Report-r9
                                                       OPTIONAL,
   nonCriticalExtension
                                  UEInformationResponse-v930-IEs
                                                                          OPTIONAL
}
-- Late non critical extensions
UEInformationResponse-v9e0-IEs ::= SEQUENCE {
  rlf-Report-v9e0
                                  RLF-Report-v9e0
                                                                 OPTIONAL,
  non Critical Extension \\
                               SEQUENCE {}
                                                              OPTIONAL
}
-- Regular non critical extensions
UEInformationResponse-v930-IEs ::= SEQUENCE {
   lateNonCriticalExtension
                                  OCTET STRING (CONTAINING UEInformationResponse-v9e0-IEs)
   OPTIONAL,
  nonCriticalExtension
                               UEInformationResponse-v1020-IEs
                                                                    OPTIONAL
```

```
}
UEInformationResponse-v1020-IEs ::= SEQUENCE {
  logMeasReport-r10
                                LogMeasReport-r10
                                                           OPTIONAL,
  nonCriticalExtension
                              UEInformationResponse-v1130-IEs
                                                                 OPTIONAL
UEInformationResponse-v1130-IEs ::= SEQUENCE {
   connEstFailReport-r11
                                ConnEstFailReport-r11
                                                            OPTIONAL,
   nonCriticalExtension
                             SEQUENCE {}
                                                            OPTIONAL
RLF-Report-r9 ::=
                              SEQUENCE {
   measResultLastServCell-r9
                                    SEQUENCE {
      rsrpResult-r9
                                    RSRP-Range,
      rsrqResult-r9
                                    RSRQ-Range
                                                     OPTIONAL
   },
   measResultNeighCells-r9
                                    SEQUENCE {
      measResultListEUTRA-r9
                                      MeasResultList2EUTRA-r9
                                                                     OPTIONAL,
                                                                     OPTIONAL.
      measResultListUTRA-r9
                                      MeasResultList2UTRA-r9
      measResultListGERAN-r9
                                      MeasResultListGERAN
                                                                     OPTIONAL,
      measResultsCDMA2000-r9
                                      MeasResultList2CDMA2000-r9
                                                                       OPTIONAL
   } OPTIONAL,
                             LocationInfo-r10
   [[ locationInfo-r10
                                                OPTIONAL,
      failedPCellId-r10
                                    CHOICE {
         cellGlobalId-r10
                                      CellGlobalIdEUTRA,
         pci-arfcn-r10
                                      SEQUENCE {
            physCellId-r10
                                            PhysCellId,
            carrierFreq-r10
                                            ARFCN-ValueEUTRA
         }
                                                     OPTIONAL,
      reestablishmentCellId-r10
                                CellGlobalIdEUTRA
                                                               OPTIONAL,
      timeConnFailure-r10
                                INTEGER (0..1023)
                                                           OPTIONAL,
      connectionFailureType-r10
                                 ENUMERATED {rlf, hof}
                                                              OPTIONAL,
```

```
previousPCellId-r10
                                CellGlobalIdEUTRA
                                                              OPTIONAL
  ]],
   [[ failedPCellId-v1090
                                SEQUENCE {
         carrierFreq-v1090
                                    ARFCN-ValueEUTRA-v9e0
                                                     OPTIONAL
      }
  ]],
  [[ basicFields-r11
                                SEQUENCE {
        c-RNTI-r11
                                    C-RNTI,
         rlf-Cause-r11
                                 ENUMERATED {
                                    t310-Expiry, randomAccessProblem,
                                    rlc-MaxNumRetx, spare1},
         timeSinceFailure-r11
                                TimeSinceFailure-r11
                                                     OPTIONAL,
      previousUTRA-CellId-r11
                                    SEQUENCE {
         carrierFreq-r11
                                    ARFCN-ValueUTRA,
         physCellId-r11
                                    CHOICE {
            fdd-r11
                                       PhysCellIdUTRA-FDD,
            tdd-r11
                                       PhysCellIdUTRA-TDD
         cellGlobalId-r11
                                CellGlobalIdUTRA
                                                        OPTIONAL
                                                     OPTIONAL,
      selectedUTRA-CellId-r11
                                    SEQUENCE {
         carrierFreq-r11
                                    ARFCN-ValueUTRA,
         physCellId-r11
                                   CHOICE {
            fdd-r11
                                       PhysCellIdUTRA-FDD,
            tdd-r11
                                       PhysCellIdUTRA-TDD
         }
                                                     OPTIONAL
  ]]
RLF-Report-v9e0 ::=
                              SEQUENCE {
   measResultListEUTRA-v9e0
                                    MeasResultList2EUTRA-v9e0
```

```
MeasResultList2EUTRA-r9 ::=
                                   SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2EUTRA-r9
                                   SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2EUTRA-v9e0
MeasResultList2EUTRA-v9e0 ::=
MeasResult2EUTRA-r9 ::=
                                SEQUENCE {
  carrierFreq-r9
                             ARFCN-ValueEUTRA,
  measResultList-r9
                                MeasResultListEUTRA
MeasResult2EUTRA-v9e0 ::=
                                   SEQUENCE {
  carrierFreq-v9e0
                                ARFCN-ValueEUTRA-v9e0
                                                              OPTIONAL
MeasResultList2UTRA-r9 ::=
                                SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2UTRA-r9
MeasResult2UTRA-r9 ::=
                                SEQUENCE {
  carrierFreq-r9
                             ARFCN-ValueUTRA,
  measResultList-r9
                                MeasResultListUTRA
MeasResultList2CDMA2000-r9 ::=
                                   SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2CDMA2000-r9
MeasResult2CDMA2000-r9 ::=
                                   SEQUENCE {
  carrierFreq-r9
                             CarrierFreqCDMA2000,
  measResultList-r9
                                MeasResultsCDMA2000
LogMeasReport-r10 ::=
                             SEQUENCE {
   absoluteTimeStamp-r10
                                AbsoluteTimeInfo-r10,
  traceReference-r10
                                TraceReference-r10,
  traceRecordingSessionRef-r10
                                OCTET STRING (SIZE (2)),
  tce-Id-r10
                             OCTET STRING (SIZE (1)),
  logMeasInfoList-r10
                                LogMeasInfoList-r10,
  logMeasAvailable-r10
                                ENUMERATED {true}
                                                              OPTIONAL,
```

```
}
                          SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF LogMeasInfo-r10
LogMeasInfoList-r10 ::=
LogMeasInfo-r10 ::=
                       SEQUENCE {
  locationInfo-r10
                             LocationInfo-r10
                                               OPTIONAL,
  relativeTimeStamp-r10
                                INTEGER (0..7200),
  servCellIdentity-r10
                             CellGlobalIdEUTRA,
  measResultServCell-r10
                                SEQUENCE {
      rsrpResult-r10
                                   RSRP-Range,
     rsrqResult-r10
                                   RSRQ-Range
   },
  measResultNeighCells-r10
                                SEQUENCE {
     measResultListEUTRA-r10
                                      MeasResultList2EUTRA-r9
                                                                 OPTIONAL,
     measResultListUTRA-r10
                                      MeasResultList2UTRA-r9
                                                                 OPTIONAL,
      measResultListGERAN-r10
                                      MeasResultList2GERAN-r10 OPTIONAL,
     measResultListCDMA2000-r10
                                         MeasResultList2CDMA2000-r9 OPTIONAL
   } OPTIONAL,
   [[ measResultListEUTRA-v1090
                                      MeasResultList2EUTRA-v9e0 OPTIONAL
  ]]
MeasResultList2GERAN-r10 ::=
                                   SEQUENCE (SIZE (1..maxCellListGERAN)) OF MeasResultListGERAN
ConnEstFailReport-r11 ::=
                                SEQUENCE {
  failedCellId-r11
                             CellGlobalIdEUTRA,
  locationInfo-r11
                             LocationInfo-r10
                                                     OPTIONAL,
  measResultFailedCell-r11
                                   SEQUENCE {
     rsrpResult-r11
                                      RSRP-Range,
      rsrqResult-r11
                                                           OPTIONAL
                                      RSRQ-Range
  measResultNeighCells-r11
                                   SEQUENCE {
     measResultListEUTRA-r11
                                      MeasResultList2EUTRA-r9
                                                                    OPTIONAL,
     measResultListUTRA-r11
                                      MeasResultList2UTRA-r9
                                                                    OPTIONAL,
```

```
measResultListGERAN-r11
                                    MeasResultListGERAN
                                                                 OPTIONAL,
                                                                      OPTIONAL
     measResultsCDMA2000-r11
                                       MeasResultList2CDMA2000-r9
   } OPTIONAL,
  numberOfPreamblesSent-r11
                                 NumberOfPreamblesSent-r11,
  contentionDetected-r11
                               BOOLEAN,
  maxTxPowerReached-r11
                                 BOOLEAN,
  timeSinceFailure-r11
                           TimeSinceFailure-r11,
  measResultListEUTRA-v1130
                                 MeasResultList2EUTRA-v9e0
                                                             OPTIONAL,
NumberOfPreamblesSent-r11::=
                                 INTEGER (1..200)
TimeSinceFailure-r11 ::=
                               INTEGER (0..172800)
-- ASN1STOP
```

UEInformationResponse field descriptions

absoluteTimeStamp

Indicates the absolute time when the logged measurement configuration logging is provided, as indicated by E-UTRAN within absoluteTimeInfo.

carrierFreq

In case the UE includes *carrierFreq-v9e0* and/ or *carrierFreq-v1090*, the UE shall set the corresponding entry of *carrierFreq-r9* and/ or *carrierFreq-r10* respectively to *maxEARFCN*. For E-UTRA and UTRA frequencies, the UE sets the ARFCN according to the band used when obtaining the concerned measurement results.

connectionFailureType

This field is used to indicate whether the connection failure is due to radio link failure or handover failure.

contentionDetected

This field is used to indicate that contention was detected for at least one of the transmitted preambles, see TS 36.321 [6].

c-RNTI

This field indicates the C-RNTI used in the PCell upon detecting radio link failure or the C-RNTI used in the source PCell upon handover failure.

failedCellId

This field is used to indicate the cell in which connection establishment failed.

failedPCellId

This field is used to indicate the PCell in which RLF is detected or the target PCell of the failed handover. The UE sets the EARFCN according to the band used for transmission/ reception when the failure occurred.

maxTxPowerReached

This field is used to indicate whether or not the maximum power level was used for the last transmitted preamble, see TS 36.321 [6].

meas ResultFailedCell

This field refers to the last measurement results taken in the cell, where connection establishment failure happened.

measResultLastServCell

This field refers to the last measurement results taken in the PCell, where radio link failure or handover failure happened.

measResultListEUTRA

If measResultListEUTRA-v9e0, measResultListEUTRA-v1090 or measResultListEUTRA-v1130 is included, the UE shall include the same number of entries, and listed in the same order, as in measResultListEUTRA-r9, measResultListEUTRA-r10 and/ or measResultListEUTRA-r11 respectively.

numberOfPreamblesSent

This field is used to indicate the number of RACH preambles that were transmitted. Corresponds to parameter PREAMBLE_TRANSMISSION_COUNTER in TS 36.321 [6].

previousPCellId

This field is used to indicate the source PCell of the last handover (source PCell when the last *RRC-Connection-Reconfiguration* message including *mobilityControlInfo*was received).

previousUTRA-CellId

This field is used to indicate the source UTRA cell of the last successful handover to E-UTRAN, when RLF occurred at the target PCell. The UE sets the ARFCN according to the band used for transmission/ reception on the concerned cell.

reestablishmentCellId

This field is used to indicate the cell in which the re-establishment attempt was made after connection failure.

relativeTimeStamp

Indicates the time of logging measurement results, measured relative to the absoluteTimeStamp. Value in seconds.

rlf-Cause

This field is used to indicate the cause of the last radio link failure that was detected. In case of handover failure information reporting (i.e., the *connectionFailureType* is set to 'hof'), the UE is allowed to set this field to any value.

selectedUTRA-CellId

This field is used to indicate the UTRA cell that the UE selects after RLF is detected, while T311 is running. The UE sets the ARFCN according to the band selected for transmission/ reception on the concerned cell.

tce-ld

Parameter Trace Collection Entity Id: See TS 32.422 [58].

timeConnFailure

This field is used to indicate the time elapsed since the last HO initialization until connection failure. Actual value = IE value * 100ms. The maximum value 1023 means 102.3s or longer.

timeSinceFailure

This field is used to indicate the time that elapsed since the connection (establishment) failure. Value in seconds.

traceRecordingSessionRef

Parameter Trace Recording Session Reference: See TS 32.422 [58].

ULHandoverPreparationTransfer (CDMA2000)

The *ULHandoverPreparationTransfer* message is used for the uplink transfer of handover related CDMA2000 information when requested by the higher layers.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH
Direction: UE to E-UTRAN

ULHandoverPreparationTransfer message

```
-- ASN1START
ULHandoverPreparationTransfer ::= SEQUENCE {
   criticalExtensions
                                 CHOICE {
      c1
                                 CHOICE {
         ulHandoverPreparationTransfer-r8
                                         ULHandoverPreparationTransfer-r8-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                    SEQUENCE {}
ULHandoverPreparationTransfer-r8-IEs ::= SEQUENCE {
  cdma2000-Type
                                 CDMA2000-Type,
                              BIT STRING (SIZE (56)) OPTIONAL,
  meid
   dedicatedInfo
                              DedicatedInfoCDMA2000,
   nonCriticalExtension
                              ULHandoverPreparationTransfer-v8a0-IEs OPTIONAL
ULHandoverPreparationTransfer-v8a0-IEs ::= SEQUENCE {
  lateNonCriticalExtension
                                 OCTET STRING
                                                               OPTIONAL,
   nonCriticalExtension
                              SEQUENCE {}
                                                               OPTIONAL
-- ASN1STOP
```

ULHandoverPreparationTransfer field descriptions

meic

The 56 bit mobile identification number provided by the CDMA2000 Upper layers.

ULInformationTransfer

The *ULInformationTransfer* message is used for the uplink transfer of NAS or non-3GPP dedicated information.

Signalling radio bearer: SRB2 or SRB1(only if SRB2 not established yet). If SRB2 is suspended, the UE does not send this message until SRB2 is resumed

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

ULInformationTransfer message

```
-- ASN1START
ULInformationTransfer ::=
                              SEQUENCE {
   criticalExtensions
                                 CHOICE {
      c1
                                 CHOICE {
         ulInformationTransfer-r8
                                       ULInformationTransfer-r8-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                 SEQUENCE {}
   }
ULInformationTransfer-r8-IEs ::= SEQUENCE {
   dedicatedInfoType
                           CHOICE {
      dedicatedInfoNAS
                                    DedicatedInfoNAS,
      dedicatedInfoCDMA2000-1XRTT
                                           DedicatedInfoCDMA2000,
      dedicatedInfoCDMA2000-HRPD
                                          DedicatedInfoCDMA2000
   },
                              ULInformationTransfer-v8a0-IEs
   nonCriticalExtension
                                                                               OPTIONAL
ULInformationTransfer-v8a0-IEs ::= SEQUENCE {
   lateNonCriticalExtension
                                 OCTET STRING
                                                                OPTIONAL,
   nonCriticalExtension
                              SEQUENCE {}
                                                                OPTIONAL
```

```
-- ASN1STOP
```

6.3 RRC information elements

6.3.1 System information blocks

SystemInformationBlockType2

The IE SystemInformationBlockType2 contains radio resource configuration information that is common for all UEs.

NOTE: UE timers and constants related to functionality for which parameters are provided in another SIB are included in the corresponding SIB.

SystemInformationBlockType2 information element

```
-- ASN1START
SystemInformationBlockType2 ::=
                                SEQUENCE {
   ac-BarringInfo
                                 SEQUENCE {
                                       BOOLEAN,
      ac-BarringForEmergency
      ac-BarringForMO-Signalling
                                       AC-BarringConfig
                                                                  OPTIONAL, -- Need OP
      ac-BarringForMO-Data
                                    AC-BarringConfig
                                                               OPTIONAL -- Need OP
   }
                                                         OPTIONAL, -- Need OP
  radio Resource Config Common \\
                                    RadioResourceConfigCommonSIB,
   ue-TimersAndConstants
                                 UE-TimersAndConstants,
  freqInfo
                              SEQUENCE {
      ul-CarrierFreq
                                    ARFCN-ValueEUTRA
                                                                  OPTIONAL, -- Need OP
                                 ENUMERATED {n6, n15, n25, n50, n75, n100}
      ul-Bandwidth
                                                         OPTIONAL, -- Need OP
      additionalSpectrumEmission
                                       AdditionalSpectrumEmission
  mbsfn-SubframeConfigList
                                 MBSFN-SubframeConfigList
                                                                  OPTIONAL, -- Need OR
   time A lignment Timer Common\\
                                    TimeAlignmentTimer,
  lateNonCriticalExtension
                              OCTET STRING (CONTAINING SystemInformationBlockType2-v8h0-IEs)
            OPTIONAL,
   [[ ssac-BarringForMMTEL-Voice-r9
                                       AC-BarringConfig
                                                                  OPTIONAL, -- Need OP
      ssac-BarringForMMTEL-Video-r9
                                                                  OPTIONAL -- Need OP
                                       AC-BarringConfig
```

```
]],
                                                             OPTIONAL -- Need OP
  [[ ac-BarringForCSFB-r10
                                    AC-BarringConfig
  ]]
SystemInformationBlockType2-v8h0-IEs ::= SEQUENCE {
   multiBandInfoList\\
                              SEQUENCE (SIZE (1..maxMultiBands)) OF AdditionalSpectrumEmission
   OPTIONAL, -- Need OR
  nonCriticalExtension
                           SystemInformationBlockType2-v9e0-IEs OPTIONAL
SystemInformationBlockType2-v9e0-IEs ::= SEQUENCE {
   ul-CarrierFreq-v9e0
                                 ARFCN-ValueEUTRA-v9e0
                                                                OPTIONAL, -- Cond ul-FreqMax
  non Critical Extension \\
                              SEQUENCE {}
                                                          OPTIONAL
AC-BarringConfig ::=
                              SEQUENCE {
   ac-BarringFactor
                              ENUMERATED {
                                 p00, p05, p10, p15, p20, p25, p30, p40,
                                 p50, p60, p70, p75, p80, p85, p90, p95},
  ac-BarringTime
                                 ENUMERATED {s4, s8, s16, s32, s64, s128, s256, s512},
  ac-BarringForSpecialAC
                                    BIT STRING (SIZE(5))
MBSFN-SubframeConfigList ::=
                                 SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig
-- ASN1STOP
```

SystemInformationBlockType2 field descriptions

ac-BarringFactor

If the random number drawn by the UE is lower than this value, access is allowed. Otherwise the access is barred. The values are interpreted in the range [0,1): p00 = 0, p05 = 0.05, p10 = 0.10,..., p95 = 0.95. Values other than p00 can only be set if all bits of the corresponding *ac-BarringForSpecialAC* are set to 0.

ac-BarringForCSFB

Access class barring for mobile originating CS fallback.

ac-BarringForEmergency

Access class barring for AC 10.

ac-BarringForMO-Data

Access class barring for mobile originating calls.

ac-BarringForMO-Signalling

Access class barring for mobile originating signalling.

ac-BarringForSpecialAC

Access class barring for AC 11-15. The first/ leftmost bit is for AC 11, the second bit is for AC 12, and so on.

ac-BarringTime

Mean access barring time value in seconds.

additionalSpectrumEmission

The UE requirements related to IE Additional Spectrum Emission are defined in TS 36.101 [42, table 6.2.4.1].

mbsfn-SubframeConfigList

Defines the subframes that are reserved for MBSFN in downlink.

multiBandInfoList

A list of *additionalSpectrumEmission* i.e. one for each additional frequency band included in *multiBandInfoList* in *SystemInformationBlockType1*, listed in the same order.

ssac-BarringForMMTEL-Video

Service specific access class barring for MMTEL video originating calls.

ssac-BarringForMMTEL-Voice

Service specific access class barring for MMTEL voice originating calls.

ul-Bandwidth

Parameter: transmission bandwidth configuration, N_{RB}, in uplink, see TS 36.101 [42, table 5.6-1]. Value n6 corresponds to 6 resource blocks, n15 to 15 resource blocks and so on. If for FDD this parameter is absent, the uplink bandwidth is equal to the downlink bandwidth. For TDD this parameter is absent and it is equal to the downlink bandwidth.

ul-CarrierFreq

For FDD: If absent, the (default) value determined from the default TX-RX frequency separation defined in TS 36.101 [42, table 5.7.3-1] applies.

For TDD: This parameter is absent and it is equal to the downlink frequency.

Conditional presence	Explanation
ul-FreqMax	The field is mandatory present if <i>ul-CarrierFreq</i> (i.e. without suffix) is present and set to
	maxEARFCN. Otherwise the field is not present.

SystemInformationBlockType3

The IE *SystemInformationBlockType3* contains cell re-selection information common for intra-frequency, inter-frequency and/ or inter-RAT cell re-selection (i.e. applicable for more than one type of cell re-selection but not necessarily all) as well as intra-frequency cell re-selection information other than neighbouring cell related.

SystemInformationBlockType3 information element

-- ASN1START SystemInformationBlockType3 ::= SEQUENCE { cellReselectionInfoCommon SEQUENCE { q-Hyst ENUMERATED { dB0, dB1, dB2, dB3, dB4, dB5, dB6, dB8, dB10, dB12, dB14, dB16, dB18, dB20, dB22, dB24},

```
speedStateReselectionPars
                                  SEQUENCE {
      mobilityStateParameters
                                     MobilityStateParameters,
      q-HystSF
                               SEQUENCE {
         sf-Medium
                                     ENUMERATED {
                                        dB-6, dB-4, dB-2, dB0},
         sf-High
                                     ENUMERATED {
                                        dB-6, dB-4, dB-2, dB0}
                                                                    -- Need OP
                                                     OPTIONAL
},
cellReselectionServingFreqInfo
                               SEQUENCE {
                                                        OPTIONAL,
                                                                        -- Need OP
   s-NonIntraSearch
                               ReselectionThreshold
   threshServingLow
                                  ReselectionThreshold,
   cellReselectionPriority
                                  CellReselectionPriority
},
intra Freq Cell Reselection Info\\
                               SEQUENCE {
   q-RxLevMin
                                  Q-RxLevMin,
   p-Max
                               P-Max
                                                     OPTIONAL,
                                                                    -- Need OP
   s-IntraSearch
                               ReselectionThreshold
                                                        OPTIONAL,
                                                                        -- Need OP
   allowed Meas Bandwidth \\
                                  AllowedMeasBandwidth
                                                              OPTIONAL,
                                                                              -- Need OP
                                  PresenceAntennaPort1,
   presenceAntennaPort1
   neigh Cell Config\\
                                  NeighCellConfig,
   t-ReselectionEUTRA
                                     T-Reselection,
   t-ReselectionEUTRA-SF
                                     SpeedStateScaleFactors
                                                              OPTIONAL
                                                                              -- Need OP
},
...,
lateNonCriticalExtension
                                  OCTET STRING
                                                        OPTIONAL,
[[ s-IntraSearch-v920
                                  SEQUENCE {
      s-IntraSearchP-r9
                                  ReselectionThreshold,
      s-IntraSearchQ-r9
                                     ReselectionThresholdQ-r9
                                                     OPTIONAL,
                                                                    -- Need OP
   s-NonIntraSearch-v920
                                  SEQUENCE {
      s-NonIntraSearchP-r9
                                     ReselectionThreshold,
                                     ReselectionThresholdQ-r9
      s-NonIntraSearchQ-r9
                                                     OPTIONAL,
                                                                     -- Need OP
```

```
q-QualMin-r9 Q-QualMin-r9 OPTIONAL, -- Need OP
threshServingLowQ-r9 ReselectionThresholdQ-r9 OPTIONAL -- Need OP

]],
[[ q-QualMinWB-r11 Q-QualMin-r9 OPTIONAL -- Cond WB-RSRQ
]]
}
-- ASN1STOP
```

SystemInformationBlockType3 field descriptions

allowedMeasBandwidth

If absent, the value corresponding to the downlink bandwidth indicated by the *dl-Bandwidth* included in *MasterInformationBlock* applies.

cellReselectionInfoCommon

Cell re-selection information common for cells.

cellReselectionServingFreqInfo

Information common for Cell re-selection to inter-frequency and inter-RAT cells.

intraFreqcellReselectionInfo

Cell re-selection information common for intra-frequency cells.

p-Max

Value applicable for the intra-frequency neighbouring E-UTRA cells. If absent the UE applies the maximum power according to the UE capability.

q-Hyst

Parameter Q_{hyst} in 36.304 [4], Value in dB. Value dB1 corresponds to 1 dB, dB2 corresponds to 2 dB and so on.

q-HystSF

Parameter 'Speed dependent ScalingFactor for Q_{hyst} ' in TS 36.304 [4]. The sf-Medium and sf-High concern the additional hysteresis to be applied, in Medium and High Mobility state respectively, to Q_{hyst} as defined in TS 36.304 [4]. In dB. Value dB-6 corresponds to -6dB, dB-4 corresponds to -4dB and so on.

q-QualMin

Parameter ' $Q_{qualmin}$ ' in TS 36.304 [4], applicable for intra-frequency neighrbour cells. If the field is not present, the UE applies the (default) value of negative infinity for $Q_{qualmin}$. NOTE 1.

q-QualMinWB

If this field is present and supported by the UE, the UE shall, when performing RSRQ measurements, use a wider bandwidth in accordance with TS 36.133 [16]. NOTE 1.

q-RxLevMin

Parameter 'Q_{rxlevmin}' in TS 36.304 [4], applicable for intra-frequency neighbour cells.

s-IntraSearch

Parameter 'S_{IntraSearchP}' in TS 36.304 [4]. If the field *s-IntraSearchP* is present, the UE applies the value of *s-IntraSearchP* instead. Otherwise if neither *s-IntraSearch* nor *s-IntraSearchP* is present, the UE applies the (default) value of infinity for S_{IntraSearchP}.

s-IntraSearchP

Parameter 'S_{IntraSearchP}' in TS 36.304 [4]. See descriptions under s-IntraSearch.

s-IntraSearchQ

Parameter ' $S_{IntraSearchQ}$ ' in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of 0 dB for $S_{IntraSearchQ}$.

s-NonIntraSearch

Parameter $S_{\text{nonIntraSearchP}}$ in TS 36.304 [4]. If the field s-NonIntraSearchP is present, the UE applies the value of s-NonIntraSearchP instead. Otherwise if neither s-NonIntraSearch nor s-NonIntraSearchP is present, the UE applies the (default) value of infinity for $S_{\text{nonIntraSearchP}}$.

s-NonIntraSearchP

Parameter 'S_{nonIntraSearchP}' in TS 36.304 [4]. See descriptions under s-NonIntraSearch.

s-NonIntraSearchQ

Parameter $S_{\text{nonIntraSearchQ}}$ in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of 0 dB for $S_{\text{nonIntraSearchQ}}$.

speedStateReselectionPars

Speed dependent reselection parameters, see TS 36.304 [4]. If this field is absent, i.e, *mobilityStateParameters* is also not present, UE behaviour is specified in TS 36.304 [4].

threshServingLow

Parameter 'Thresh_{Serving, LowP}' in TS 36.304 [4].

thresh Serving Low Q

Parameter 'Thresh_{Serving, LowQ}' in TS 36.304 [4].

t-ReselectionEUTRA

Parameter 'Treselection_{EUTRA}' in TS 36.304 [4].

t-ReselectionEUTRA-SF

Parameter 'Speed dependent ScalingFactor for Treselection_{EUTRA}' in TS 36.304 [4]. If the field is not present, the UE behaviour is specified in TS 36.304 [4].

NOTE 1: The value the UE applies for parameter 'Q_{qualmin}' in TS 36.304 [4] depends on the *q-QualMin* fields signalled by E-UTRAN and supported by the UE. In case multiple candidate options are available, the UE shall select the highest priority candidate option according to the priority order indicated by the following table (top row is highest priority).

q-QualMinWB	Value of parameter 'Q _{qualmin} ' in TS 36.304 [4]
Included	q-QualMinWB
Not included	q-QualMin

Conditional presence	Explanation
WB-RSRQ	The field is optionally present, need OP if the measurement bandwidth indicated by
	allowedMeasBandwidth is 50 resource blocks or larger; otherwise it is not present.

SystemInformationBlockType4

The IE *SystemInformationBlockType4* contains neighbouring cell related information relevant only for intra-frequency cell re-selection. The IE includes cells with specific re-selection parameters as well as blacklisted cells.

SystemInformationBlockType4 information element

```
-- ASN1START
SystemInformationBlockType4 ::=
                                  SEQUENCE {
   intra Freq Neigh Cell List \\
                                                            OPTIONAL, -- Need OR
                                  IntraFreqNeighCellList
                                                                  OPTIONAL, -- Need OR
   intraFreqBlackCellList
                                  IntraFreqBlackCellList\\
                                                               OPTIONAL, -- Cond CSG
   csg-PhysCellIdRange
                                      PhysCellIdRange
   lateNonCriticalExtension
                                      OCTET STRING
                                                               OPTIONAL
IntraFreqNeighCellList ::=
                            SEQUENCE (SIZE (1..maxCellIntra)) OF IntraFreqNeighCellInfo
IntraFreqNeighCellInfo ::=
                            SEQUENCE {
   physCellId
                                      PhysCellId,
   q-OffsetCell
                                  Q-OffsetRange,
IntraFreqBlackCellList ::=
                            SEQUENCE (SIZE (1..maxCellBlack)) OF PhysCellIdRange
-- ASN1STOP
```

SystemInformationBlockType4 field descriptions

csg-PhysCellIdRange

Set of physical cell identities reserved for CSG cells on the frequency on which this field was received. The received csg-PhysCellIdRange applies if less than 24 hours has elapsed since it was received and the UE is camped on a cell of the same primary PLMN where this field was received. The 3 hour validity restriction (section 5.2.1.3) does not apply to this field. The UE shall not apply any stored csg-PhysCellIdRange when it is in any cell selection state defined in TS 36.304 [4].

intraFreqBlackCellList

List of blacklisted intra-frequency neighbouring cells.

intraFreqNeighbCellList

List of intra-frequency neighbouring cells with specific cell re-selection parameters.

q-OffsetCell

Parameter 'Qoffsets,n' in TS 36.304 [4].

Conditional presence	Explanation
CSG	This field is optional, need OP, for non-CSG cells, and mandatory for CSG cells.

SystemInformationBlockType5

The IE *SystemInformationBlockType5* contains information relevant only for inter-frequency cell re-selection i.e. information about other E-UTRA frequencies and inter-frequency neighbouring cells relevant for cell re-selection. The IE includes cell re-selection parameters common for a frequency as well as cell specific re-selection parameters.

SystemInformationBlockType5 information element

```
-- ASN1START
SystemInformationBlockType5 ::=
                                 SEQUENCE {
   interFreqCarrierFreqList
                              InterFreqCarrierFreqList,
  lateNonCriticalExtension
                                    OCTET STRING(CONTAINING SystemInformationBlockType5-v8h0-IEs)
            OPTIONAL.
SystemInformationBlockType5-v8h0-IEs ::= SEQUENCE {
   interFreqCarrierFreqList-v8h0 SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v8h0
OPTIONAL, -- Need OP
   nonCriticalExtension
                           SystemInformationBlockType5-v9e0-IEs OPTIONAL
SystemInformationBlockType5-v9e0-IEs ::= SEQUENCE {
   interFreqCarrierFreqList-v9e0 SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v9e0
   OPTIONAL, -- Need OR
   nonCriticalExtension
                           SEQUENCE {}
                                                             OPTIONAL
InterFreqCarrierFreqList ::= SEQUENCE (SIZE (1...maxFreq)) OF InterFreqCarrierFreqInfo
```

```
InterFreqCarrierFreqInfo ::= SEQUENCE {
   dl-CarrierFreq
                                 ARFCN-ValueEUTRA,
  q-RxLevMin
                                 O-RxLevMin,
                              P-Max
                                                      OPTIONAL,
                                                                     -- Need OP
   p-Max
                                    T-Reselection,
   t-ReselectionEUTRA
   t-ReselectionEUTRA-SF
                                    SpeedStateScaleFactors
                                                               OPTIONAL,
                                                                              -- Need OP
   threshX-High
                              ReselectionThreshold,
   threshX-Low
                                 ReselectionThreshold,
   allowedMeasBandwidth
                                 AllowedMeasBandwidth,
   presenceAntennaPort1
                                 PresenceAntennaPort1,
                                                                           -- Need OP
  cellReselectionPriority
                                 CellReselectionPriority
                                                            OPTIONAL,
   neighCellConfig
                                 NeighCellConfig,
  q-OffsetFreq
                              Q-OffsetRange
                                                         DEFAULT dB0,
   interFreqNeighCellList
                                 InterFreqNeighCellList
                                                            OPTIONAL,
                                                                           -- Need OR
   inter Freq Black Cell List \\
                                 InterFreqBlackCellList\\
                                                            OPTIONAL,
                                                                           -- Need OR
   [[ q-QualMin-r9
                              Q-QualMin-r9
                                                         OPTIONAL,
                                                                        -- Need OP
      threshX-Q-r9
                              SEQUENCE {
         threshX-HighQ-r9
                                    ReselectionThresholdQ-r9,
         threshX-LowQ-r9
                                       ReselectionThresholdQ-r9
     }
                                                      OPTIONAL
                                                                     -- Cond RSRQ
   ]],
   [[ q-QualMinWB-r11
                                    Q-QualMin-r9
                                                               OPTIONAL -- Cond WB-RSRQ
   ]]
InterFreqCarrierFreqInfo-v8h0 ::= SEQUENCE {
  multiBandInfoList\\
                                 MultiBandInfoList
                                                            OPTIONAL -- Need OR
}
InterFreqCarrierFreqInfo-v9e0 ::= SEQUENCE {
   dl-CarrierFreq-v9e0
                                 ARFCN-ValueEUTRA-v9e0 OPTIONAL, -- Cond dl-FreqMax
   multiBandInfoList-v9e0
                                 MultiBandInfoList-v9e0OPTIONAL -- Need OR
}
```

InterFreqNeighCellList ::= SEQUENCE (SIZE (1..maxCellInter)) OF InterFreqNeighCellInfo

InterFreqNeighCellInfo ::= SEQUENCE {
 physCellId PhysCellId,
 q-OffsetCell Q-OffsetRange
}

InterFreqBlackCellList ::= SEQUENCE (SIZE (1..maxCellBlack)) OF PhysCellIdRange

SystemInformationBlockType5 field descriptions

interFreqBlackCellList

List of blacklisted inter-frequency neighbouring cells.

interFreqCarrierFreqList

List of neighbouring inter-frequencies. E-UTRAN does not configure more than one entry for the same physical frequency regardless of the E-ARFCN used to indicate this. If E-UTRAN includes *interFreqCarrierFreqList-v8h0* and/ or *interFreqCarrierFreqList-v9e0* it includes the same number of entries, and listed in the same order, as in *interFreqCarrierFreqList* (i.e. without suffix). See Annex D for more descriptions.

interFreqNeighCellList

List of inter-frequency neighbouring cells with specific cell re-selection parameters.

multiBandInfoList

Indicates the list of frequency bands in addition to the band represented by *dl-CarrierFreq* for which cell reselection parameters are common. E-UTRAN indicates at most *maxMultiBands* frequency bands (i.e. the total number of entries across both *multiBandInfoList* and *multiBandInfoList-v9e0* is below this limit).

p-Max

Value applicable for the neighbouring E-UTRA cells on this carrier frequency. If absent the UE applies the maximum power according to the UE capability.

q-OffsetCell

Parameter 'Qoffset_{s,n}' in TS 36.304 [4].

q-OffsetFreq

Parameter 'Qoffset_{frequency}' in TS 36.304 [4].

q-QualMin

Parameter ' $Q_{qualmin}$ ' in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for $Q_{qualmin}$. NOTE 1.

q-QualMinWB

If this field is present and supported by the UE, the UE shall, when performing RSRQ measurements, use a wider bandwidth in accordance with TS 36.133 [16]. NOTE 1.

threshX-High

Parameter 'Thresh_{X, HighP}' in TS 36.304 [4].

threshX-HighQ

Parameter 'Thresh_{X, HighQ}' in TS 36.304 [4].

threshX-Low

Parameter 'Thresh_{X, LowP}' in TS 36.304 [4].

threshX-LowQ

Parameter 'Thresh_{X, LowQ}' in TS 36.304 [4].

t-ReselectionEUTRA

Parameter 'Treselection_{EUTRA}' in TS 36.304 [4].

t-ReselectionEUTRA-SF

Parameter 'Speed dependent ScalingFactor for Treselection_{EUTRA}' in TS 36.304 [4]. If the field is not present, the UE behaviour is specified in TS 36.304 [4].

NOTE 1: The value the UE applies for parameter 'Q_{qualmin}' in TS 36.304 [4] depends on the *q-QualMin* fields signalled by E-UTRAN and supported by the UE. In case multiple candidate options are available, the UE shall select the highest priority candidate option according to the priority order indicated by the following table (top row is highest priority).

q-QualMinWB	Value of parameter 'Q _{qualmin} ' in TS 36.304 [4]
Included	q-QualMinWB
Not included	g-QualMin

Conditional presence	Explanation
dl-FreqMax	The field is mandatory present if, for the corresponding entry in InterFreqCarrierFreqList
	(i.e. without suffix), dl-CarrierFreq (i.e. without suffix) is set to maxEARFCN. Otherwise
	the field is not present.
RSRQ	The field is mandatory present if threshServingLowQ is present in
	systemInformationBlockType3; otherwise it is not present.
WB-RSRQ	The field is optionally present, need OP if the measurement bandwidth indicated by
	allowedMeasBandwidth is 50 resource blocks or larger; otherwise it is not present.

SystemInformationBlockType6

The IE *SystemInformationBlockType6* contains information relevant only for inter-RAT cell re-selection i.e. information about UTRA frequencies and UTRA neighbouring cells relevant for cell re-selection. The IE includes cell re-selection parameters common for a frequency.

SystemInformationBlockType6 information element

```
-- ASN1START
SystemInformationBlockType6 ::=
                                SEQUENCE {
  carrierFreqListUTRA-FDD
                                   CarrierFreqListUTRA-FDD
                                                                OPTIONAL,
                                                                               -- Need OR
  carrierFreqListUTRA-TDD
                                   CarrierFreqListUTRA-TDD
                                                                OPTIONAL,
                                                                               -- Need OR
                                T-Reselection.
  t-ReselectionUTRA
  t-ReselectionUTRA-SF
                                SpeedStateScaleFactors
                                                          OPTIONAL,
                                                                         -- Need OP
  lateNonCriticalExtension
                                OCTET STRING(CONTAINING SystemInformationBlockType6-v8h0-IEs)
           OPTIONAL
SystemInformationBlockType6-v8h0-IEs ::= SEQUENCE {
   carrierFreqListUTRA-FDD-v8h0 SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF CarrierFreqInfoUTRA-
FDD-v8h0 OPTIONAL, -- Cond UTRA-FDD
  nonCriticalExtension
                          SEQUENCE {}
                                                          OPTIONAL
CarrierFreqListUTRA-FDD ::=
                             SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF CarrierFreqUTRA-FDD
CarrierFreqUTRA-FDD ::=
                                SEQUENCE {
```

```
ARFCN-ValueUTRA,
  carrierFreq
  cellReselectionPriority
                                CellReselectionPriority
                                                           OPTIONAL,
                                                                          -- Need OP
  threshX-High
                             ReselectionThreshold,
  threshX-Low
                                ReselectionThreshold,
  q-RxLevMin
                                INTEGER (-60..-13),
  p-MaxUTRA
                                INTEGER (-50..33),
  q-QualMin
                                INTEGER (-24..0),
  [[ threshX-Q-r9
                             SEQUENCE {
         threshX-HighQ-r9
                                   ReselectionThresholdQ-r9,
         threshX-LowQ-r9
                                      ReselectionThresholdQ-r9
                                                     OPTIONAL
                                                                    -- Cond RSRQ
  ]]
CarrierFreqInfoUTRA-FDD-v8h0 ::=
                                      SEQUENCE {
  multiBandInfoList
                                SEQUENCE (SIZE (1..maxMultiBands)) OF FreqBandIndicator-UTRA-FDD
           OPTIONAL -- Need OR
                             SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF CarrierFreqUTRA-TDD
CarrierFreqListUTRA-TDD ::=
CarrierFreqUTRA-TDD ::=
                                SEQUENCE {
  carrierFreq
                                ARFCN-ValueUTRA,
  cellReselectionPriority
                                CellReselectionPriority
                                                           OPTIONAL,
                                                                          -- Need OP
  threshX-High
                             ReselectionThreshold,
  threshX-Low
                                ReselectionThreshold,
  q-RxLevMin
                                INTEGER (-60..-13),
                                INTEGER (-50..33),
  p-MaxUTRA
FreqBandIndicator-UTRA-FDD ::=
                                         INTEGER (1..86)
-- ASN1STOP
```

SystemInformationBlockType6 field descriptions

carrierFreqListUTRA-FDD

List of carrier frequencies of UTRA FDD. E-UTRAN does not configure more than one entry for the same physical frequency regardless of the ARFCN used to indicate this. If E-UTRAN includes *carrierFreqListUTRA-FDD-v8h0* it includes the same number of entries, and listed in the same order, as in *carrierFreqListUTRA-FDD* (i.e. without suffix). See Annex D for more descriptions.

carrierFregListUTRA-TDD

List of carrier frequencies of UTRA TDD. E-UTRAN does not configure more than one entry for the same physical frequency regardless of the ARFCN used to indicate this.

multiBandInfoList

Indicates the list of frequency bands in addition to the band represented by *carrierFreq* in the *CarrierFreqUTRA-FDD* for which UTRA cell reselection parameters are common.

p-MaxUTRA

The maximum allowed transmission power on the (uplink) carrier frequency, see TS 25.304 [40]. In dBm

q-QualMin

Parameter 'Q_{qualmin}' in TS 25.304 [40]. Actual value = IE value [dB].

q-RxLevMin

Parameter 'Q_{rxlevmin}' in TS 25.304 [40]. Actual value = IE value * 2+1 [dBm].

t-ReselectionUTRA

Parameter 'Treselection_{UTRAN}' in TS 36.304 [4].

t-ReselectionUTRA-SF

Parameter 'Speed dependent ScalingFactor for Treselection_{UTRA}' in TS 36.304 [4]. If the field is not present, the UE behaviour is specified in TS 36.304 [4].

threshX-High

Parameter 'Thresh_{X, HighP}' in TS 36.304 [4].

threshX-HighQ

Parameter 'Thresh_{X, HighQ}' in TS 36.304 [4].

threshX-Low

Parameter 'Thresh_{X, LowP}' in TS 36.304 [4].

threshX-LowQ

Parameter 'Thresh_{X, LowQ}' in TS 36.304 [4].

Conditional presence	Explanation
RSRQ	The field is mandatory present if the <i>threshServingLowQ</i> is present in
	systemInformationBlockType3; otherwise it is not present.
UTRA-FDD	The field is optionally present, need OR, if the <i>carrierFreqListUTRA-FDD</i> is present.
	Otherwise it is not present.

SystemInformationBlockType7

The IE *SystemInformationBlockType7* contains information relevant only for inter-RAT cell re-selection i.e. information about GERAN frequencies relevant for cell re-selection. The IE includes cell re-selection parameters for each frequency.

SystemInformationBlockType7 information element


```
CarrierFreqsInfoListGERAN ::=
                                    SEQUENCE (SIZE (1..maxGNFG)) OF CarrierFreqsInfoGERAN
CarrierFreqsInfoGERAN ::=
                                 SEQUENCE {
                              CarrierFreqsGERAN,
  carrierFreqs
   commonInfo
                                 SEQUENCE {
                                                                OPTIONAL, -- Need OP
      cellReselectionPriority
                                    CellReselectionPriority
      ncc-Permitted
                                 BIT STRING (SIZE (8)),
      q-RxLevMin
                                    INTEGER (0..45),
                                       INTEGER (0..39)
                                                                      OPTIONAL, -- Need OP
      p-MaxGERAN
      threshX-High
                                 ReselectionThreshold.
      threshX-Low
                                    ReselectionThreshold
   },
-- ASN1STOP
```

SystemInformationBlockType7 field descriptions

carrierFreqs

The list of GERAN carrier frequencies organised into one group of GERAN carrier frequencies.

carrierFreqsInfoList

Provides a list of neighbouring GERAN carrier frequencies, which may be monitored for neighbouring GERAN cells. The GERAN carrier frequencies are organised in groups and the cell reselection parameters are provided per group of GERAN carrier frequencies.

commonInfo

Defines the set of cell reselection parameters for the group of GERAN carrier frequencies.

ncc-Permitted

Field encoded as a bit map, where bit N is set to "0" if a BCCH carrier with NCC = N-1 is not permitted for monitoring and set to "1" if the BCCH carrier with NCC = N-1 is permitted for monitoring; N = 1 to 8; bit 1 of the bitmap is the leading bit of the bit string.

p-MaxGERAN

Maximum allowed transmission power for GERAN on an uplink carrier frequency, see TS 45.008 [28]. Value in dBm. Applicable for the neighbouring GERAN cells on this carrier frequency. If *pmaxGERAN* is absent, the maximum power according to the UE capability is used.

q-RxLevMin

Parameter ' $Q_{rxlevmin}$ ' in TS 36.304 [1], minimum required RX level in the GSM cell. The actual value of $Q_{rxlevmin}$ in dBm = (IE value * 2) – 115.

threshX-High

Parameter 'Thresh_{X, HighP}' in TS 36.304 [4].

threshX-Low

Parameter 'Thresh_{X, LowP}' in TS 36.304 [4].

t-ReselectionGERAN

Parameter 'Treselection_{GERAN}' in TS 36.304 [4].

t-ReselectionGERAN-SF

Parameter 'Speed dependent ScalingFactor for Treselection_{GERAN}' in TS 36.304 [4]. If the field is not present, the UE behaviour is specified in TS 36.304 [4].

SystemInformationBlockType8

The IE *SystemInformationBlockType8* contains information relevant only for inter-RAT cell re-selection i.e. information about CDMA2000 frequencies and CDMA2000 neighbouring cells relevant for cell re-selection. The IE includes cell re-selection parameters common for a frequency as well as cell specific re-selection parameters.

SystemInformationBlockType8 information element

```
-- ASN1START
SystemInformationBlockType8 ::=
                                                                               SEQUENCE {
       systemTimeInfo
                                                                               SystemTimeInfoCDMA2000
                                                                                                                                                                      OPTIONAL, -- Need OR
       searchWindowSize
                                                                               INTEGER (0..15)
                                                                                                                                                               OPTIONAL, -- Need OR
       parametersHRPD
                                                                               SEQUENCE {
              preRegistrationInfoHRPD
                                                                                              PreRegistrationInfoHRPD,
                                                                                              CellReselectionParametersCDMA2000 OPTIONAL -- Need OR
              cellReselectionParametersHRPD
                                                                                                                                         OPTIONAL, -- Need OR
       }
                                                                                       SEQUENCE {
       parameters1XRTT
                                                                                              CSFB-RegistrationParam1XRTT
                                                                                                                                                                             OPTIONAL, -- Need OP
              csfb-RegistrationParam1XRTT
              longCodeState1XRTT\\
                                                                                              BIT STRING (SIZE (42))
                                                                                                                                                                      OPTIONAL, -- Need OR
              cellReselectionParameters1XRTT
                                                                                              CellReselectionParametersCDMA2000 OPTIONAL -- Need OR
                                                                                                                                          OPTIONAL, -- Need OR
       }
       ...,
       lateNonCriticalExtension
                                                                               OCTET STRING
                                                                                                                                                        OPTIONAL,
       [[ csfb-SupportForDualRxUEs-r9
                                                                                              BOOLEAN
                                                                                                                                                                       OPTIONAL, -- Need OR
              cell Reselection Parameters HRPD-v920 Cell Reselection Parameters CDMA 2000-v920\ OPTIONAL,\ --\ Conditional Conditions and Conditional Conditional Conditional Conditions and Conditional 
NCL-HRPD
              cellReselectionParameters1XRTT-v920 CellReselectionParametersCDMA2000-v920 OPTIONAL, -- Cond
NCL-1XRTT
              csfb-RegistrationParam1XRTT-v920 CSFB-RegistrationParam1XRTT-v920
                                                                                                                                                                                            OPTIONAL, -- Cond
REG-1XRTT
              ac-BarringConfig1XRTT-r9
                                                                                       AC-BarringConfig1XRTT-r9 OPTIONAL -- Cond REG-1XRTT
      ]],
       [[ csfb-DualRxTxSupport-r10
                                                                                      ENUMERATED {true}
                                                                                                                                                        OPTIONAL -- Cond REG-1XRTT
       ]],
       [[ sib8-PerPLMN-List-r11
                                                                                      SIB8-PerPLMN-List-r11
                                                                                                                                                        OPTIONAL -- Need OR
       ]]
CellReselectionParametersCDMA2000 ::= SEQUENCE {
```

```
BandClassListCDMA2000,
  bandClassList
  neighCellList
                             NeighCellListCDMA2000,
                                           t-ReselectionCDMA2000
                                                                         T-Reselection,
            t-ReselectionCDMA2000-SF
                                                                         OPTIONAL -- Need OP
                                            SpeedStateScaleFactors
CellReselectionParametersCDMA2000-r11 ::= SEQUENCE {
   band Class List\\
                             BandClassListCDMA2000,
  neighCellList-r11
                                SEQUENCE (SIZE (1..16)) OF NeighCellCDMA2000-r11,
                                           t-ReselectionCDMA2000
                                                                            T-Reselection,
           t-ReselectionCDMA2000-SF
                                            SpeedStateScaleFactors
                                                                         OPTIONAL -- Need OP
CellReselectionParametersCDMA2000-v920 ::= SEQUENCE {
  neighCellList-v920
                                   NeighCellListCDMA2000-v920
}
NeighCellListCDMA2000 ::=
                                SEQUENCE (SIZE (1..16)) OF NeighCellCDMA2000
NeighCellCDMA2000 ::= SEQUENCE {
   bandClass
                             BandclassCDMA2000,
  neighCellsPerFreqList
                                NeighCellsPerBandclassListCDMA2000
NeighCellCDMA2000-r11 ::= SEQUENCE {
  bandClass
                             BandclassCDMA2000,
  neighFreqInfoList-r11
                                SEQUENCE (SIZE (1..16)) OF NeighCellsPerBandclassCDMA2000-r11
NeighCellsPerBandclassListCDMA2000 ::= SEQUENCE (SIZE (1..16)) OF NeighCellsPerBandclassCDMA2000
NeighCellsPerBandclassCDMA2000 ::= SEQUENCE {
   arfcn
                             ARFCN-ValueCDMA2000,
  physCellIdList
                                PhysCellIdListCDMA2000
```

```
NeighCellsPerBandclassCDMA2000-r11 ::= SEQUENCE {
   arfcn
                             ARFCN-ValueCDMA2000,
  physCellIdList-r11
                                SEQUENCE (SIZE (1..40)) OF PhysCellIdCDMA2000
                                   SEQUENCE (SIZE (1..16)) OF NeighCellCDMA2000-v920
NeighCellListCDMA2000-v920 ::=
NeighCellCDMA2000-v920 ::=
                                   SEQUENCE {
   neighCellsPerFreqList-v920
                                NeighCellsPerBandclassListCDMA2000-v920
}
NeighCellsPerBandclassListCDMA2000-v920 ::= SEQUENCE (SIZE (1..16)) OF
NeighCellsPerBandclassCDMA2000-v920
NeighCellsPerBandclassCDMA2000-v920 ::= SEQUENCE {
  physCellIdList-v920
                                PhysCellIdListCDMA2000-v920
PhysCellIdListCDMA2000 ::=
                                SEQUENCE (SIZE (1..16)) OF PhysCellIdCDMA2000
PhysCellIdListCDMA2000-v920 ::=
                                   SEQUENCE (SIZE (0..24)) OF PhysCellIdCDMA2000
BandClassListCDMA2000 ::=
                                SEQUENCE (SIZE (1..maxCDMA-BandClass)) OF BandClassInfoCDMA2000
BandClassInfoCDMA2000 ::= SEQUENCE {
   bandClass
                             BandclassCDMA2000,
  cellReselectionPriority
                                                              OPTIONAL, -- Need OP
                                CellReselectionPriority
  threshX-High
                             INTEGER (0..63),
  threshX-Low
                                INTEGER (0..63),
AC-BarringConfig1XRTT-r9 ::=
                                SEQUENCE {
  ac-Barring0to9-r9
                                INTEGER (0..63),
```

```
ac-Barring10-r9
                                 INTEGER (0..7),
   ac-Barring11-r9
                                 INTEGER (0..7),
   ac-Barring12-r9
                                 INTEGER (0..7),
   ac-Barring13-r9
                                 INTEGER (0..7),
   ac-Barring14-r9
                                 INTEGER (0..7),
   ac-Barring15-r9
                                 INTEGER (0..7),
   ac-BarringMsg-r9
                                 INTEGER (0..7),
                              INTEGER (0..7),
   ac-BarringReg-r9
   ac-BarringEmg-r9
                                 INTEGER (0..7)
SIB8-PerPLMN-List-r11 ::=
                                 SEQUENCE (SIZE (1..maxPLMN-r11)) OF SIB8-PerPLMN-r11
SIB8-PerPLMN-r11 ::=
                              SEQUENCE {
   plmn-Identity-r11
                                 INTEGER (1..maxPLMN-r11),
   parametersCDMA2000-r11
                                    CHOICE {
      explicitValue
                                 ParametersCDMA2000-r11,
      defaultValue
                                 NULL
ParametersCDMA2000-r11 ::=
                                 SEQUENCE {
   systemTimeInfo-r11
                                 CHOICE {
      explicitValue
                                 SystemTimeInfoCDMA2000,
      defaultValue
                                 NULL
   }
                                                   OPTIONAL, -- Need OR
   searchWindowSize-r11
                                 INTEGER (0..15),
   parametersHRPD-r11
                                    SEQUENCE {
                                       PreRegistrationInfoHRPD,
      preRegistrationInfoHRPD-r11
      cellReselectionParametersHRPD-r11 CellReselectionParametersCDMA2000-r11 OPTIONAL -- Need OR
         OPTIONAL, -- Need OR
   parameters1XRTT-r11
                                    SEQUENCE {
      csfb-RegistrationParam1XRTT-r11
                                          CSFB-RegistrationParam1XRTT
                                                                              OPTIONAL, -- Need OP
      csfb-RegistrationParam1XRTT-Ext-r11 CSFB-RegistrationParam1XRTT-v920
                                                                              OPTIONAL, -- Cond REG-
1XRTT-PerPLMN
```

```
BIT STRING (SIZE (42)) OPTIONAL, -- Cond PerPLMN-LC
     longCodeState1XRTT-r11
     cellReselectionParameters1XRTT-r11 CellReselectionParametersCDMA2000-r11 OPTIONAL, -- Need OR
     ac-BarringConfig1XRTT-r11
                                     AC-BarringConfig1XRTT-r9
                                                                    OPTIONAL, -- Cond REG-
1XRTT-PerPLMN
     csfb-SupportForDualRxUEs-r11
                                     BOOLEAN
                                                                    OPTIONAL. -- Need OR
     csfb-DualRxTxSupport-r11
                                  ENUMERATED {true}
                                                            OPTIONAL -- Cond REG-1XRTT-
PerPLMN
        OPTIONAL, -- Need OR
-- ASN1STOP
```

SystemInformationBlockType8 field descriptions

ac-BarringConfig1XRTT

Contains the access class barring parameters the UE uses to calculate the access class barring factor, see C.S0097 [53].

ac-Barring0to9

Parameter used for calculating the access class barring factor for access overload classes 0 through 9. It is the parameter 'PSIST' in C.S0004 [34] for access overload classes 0 through 9.

ac-BarringEmg

Parameter used for calculating the access class barring factor for emergency calls and emergency message transmissions for access overload classes 0 through 9. It is the parameter 'PSIST_EMG' in C.S0004 [34].

ac-BarringMsg

Parameter used for modifying the access class barring factor for message transmissions. It is the parameter 'MSG_PSIST' in C.S0004 [34].

ac-BarringN

Parameter used for calculating the access class barring factor for access overload class N (N = 10 to 15). It is the parameter 'PSIST' in C.S0004 [34] for access overload class N.

ac-BarringReg

Parameter used for modifying the access class barring factor for autonomous registrations. It is the parameter 'REG_PSIST' in C.S0004 [34].

bandClass

Identifies the Frequency Band in which the Carrier can be found. Details can be found in C.S0057 [24, Table 1.5].

bandClassList

List of CDMA2000 frequency bands.

cellReselectionParameters1XRTT

Cell reselection parameters applicable only to CDMA2000 1xRTT system.

cellReselectionParameters1XRTT-Ext

Cell reselection parameters applicable for cell reselection to CDMA2000 1XRTT system.

cellReselectionParameters1XRTT-v920

Cell reselection parameters applicable for cell reselection to CDMA2000 1XRTT system. The field is not present if *cellReselectionParameters1XRTT* is not present; otherwise it is optionally present.

cellReselectionParametersHRPD

Cell reselection parameters applicable for cell reselection to CDMA2000 HRPD system

cellReselectionParametersHRPD-Ext

Cell reselection parameters applicable for cell reselection to CDMA2000 HRPD system.

cellReselectionParametersHRPD-v920

Cell reselection parameters applicable for cell reselection to CDMA2000 HRPD system. The field is not present if cellReselectionParametersHRPD is not present; otherwise it is optionally present.

SystemInformationBlockType8 field descriptions

csfb-DualRxTxSupport

Value TRUE indicates that the network supports dual Rx/Tx enhanced 1xCSFB, which enables UEs capable of dual Rx/Tx enhanced 1xCSFB to switch off their 1xRTT receiver/transmitter while camped in E-UTRAN [51].

csfb-RegistrationParam1XRTT

Contains the parameters the UE will use to determine if it should perform a CDMA2000 1xRTT Registration/Re-Registration. This field is included if either CSFB or enhanced CS fallback to CDMA2000 1xRTT is supported.

csfb-SupportForDualRxUEs

Value TRUE indicates that the network supports dual Rx CSFB [51].

IongCodeState1XRTT

The state of long code generation registers in CDMA2000 1XRTT system as defined in C.S0002 [12, Section 1.3] at $\lceil t/10 \rceil \times 10 + 320$ ms, where t equals to the cdma-SystemTime. This field is required for SRVCC handover and enhanced CS fallback to CDMA2000 1xRTT operation. Otherwise this IE is not needed. This field is excluded when estimating changes in system information, i.e. changes of longCodeState1XRTT should neither result in system information change notifications nor in a modification of systemInfoValueTag in SIB1.

neighCellList

List of CDMA2000 neighbouring cells. The total number of neighbouring cells in neighCellList for each RAT (1XRTT or HRPD) is limited to 32.

neighCellList-v920

Extended List of CDMA2000 neighbouring cells. The combined total number of CDMA2000 neighbouring cells in both neighCellList and neighCellList-v920 is limited to 32 for HRPD and 40 for 1xRTT.

neighCellsPerFreqList

List of carrier frequencies and neighbour cell ids in each frequency within a CDMA2000 Band, see C.S0002 [12] or C.S0024 [26].

neighCellsPerFreqList-v920

Extended list of neighbour cell ids, in the same CDMA2000 Frequency Band as the corresponding instance in 'NeighCellListCDMA2000'.

parameters1XRTT

Parameters applicable for interworking with CDMA2000 1XRTT system.

parametersCDMA2000

Provides the corresponding SIB8 parameters for the CDMA2000 network associated with the PLMN indicated in *plmn-ldentity*. A choice is used to indicate whether for this PLMN the parameters are signalled explicitly or set to the (default) values common for all PLMNs i.e. the values not included in *sib8-PerPLMN-List*.

parametersHRPD

Parameters applicable only for interworking with CDMA2000 HRPD systems.

physCellIdList

Identifies the list of CDMA2000 cell ids, see C.S0002 [12] or C.S0024 [26].

physCellIdList-v920

Extended list of CDMA2000 cell ids, in the same CDMA2000 ARFCN as the corresponding instance in 'NeighCellsPerBandclassCDMA2000'.

plmn-Identity

Indicates the PLMN associated with this CDMA2000 network. Value 1 indicates the PLMN listed 1st in *plmn-IdentityList* included in SIB1, value 2 indicates the PLMN listed 2nd in *plmn-IdentityList* included in SIB1 and so on. A PLMN which identity is not indicated in the *sib8-PerPLMN-List*, does not support inter-working with CDMA2000.

preRegistrationInfoHRPD

The CDMA2000 HRPD Pre-Registration Information tells the UE if it should pre-register with the CDMA2000 HRPD network and identifies the Pre-registration zone to the UE.

searchWindowSize

The search window size is a CDMA2000 parameter to be used to assist in searching for the neighbouring pilots. For values see C.S0005 [25, Table 2.6.6.2.1-1] and C.S0024 [26, Table 8.7.6.2-4]. This field is required for a UE with *rx-ConfigHRPD= single* and/ or *rx-Config1XRTT= single* to perform handover, cell re-selection, UE measurement based redirection and enhanced 1xRTT CS fallback from E-UTRAN to CDMA2000 according to this specification and TS 36.304 [4].

sib8-PerPLMN-List

This field provides the values for the interworking CDMA2000 networks corresponding, if any, to the UE"s RPLMN.

SystemInformationBlockType8 field descriptions

systemTimeInfo

Information on CDMA2000 system time. This field is required for a UE with *rx-ConfigHRPD= single* and/ or *rx-Config1XRTT= single* to perform handover, cell re-selection, UE measurement based redirection and enhanced 1xRTT CS fallback from E-UTRAN to CDMA2000 according to this specification and TS 36.304 [4]. This field is excluded when estimating changes in system information, i.e. changes of *systemTimeInfo* should neither result in system information change notifications nor in a modification of *systemInfoValueTag* in SIB1.

For the field included in ParametersCDMA2000, a choice is used to indicate whether for this PLMN the parameters are signalled explicitly or set to the (default) value common for all PLMNs i.e. the value not included in sib8-PerPLMN-List.

threshX-High

Parameter 'Thresh_{X, HighP}' in TS 36.304 [4]. This specifies the high threshold used in reselection towards this CDMA2000 band class expressed as an unsigned binary number equal to FLOOR (-2 x 10 x log_{10} E_c/I_o) in units of 0.5 dB, as defined in C.S0005 [25].

threshX-Low

Parameter 'Thresh_{X, LowP}' in TS 36.304 [4]. This specifies the low threshold used in reselection towards this CDMA2000 band class expressed as an unsigned binary number equal to FLOOR (-2 x 10 x log_{10} E_c/I_o) in units of 0.5 dB, as defined in C.S0005 [25].

t-ReselectionCDMA2000

Parameter 'Treselection_{CDMA_HRPD}' or 'Treselection_{CDMA_1xRTT}' in TS 36.304 [4].

t-ReselectionCDMA2000-SF

Parameter 'Speed dependent ScalingFactor for Treselection_{CDMA-HRPD}' or Treselection_{CDMA-1xRTT}' in TS 36.304 [4]. If the field is not present, the UE behaviour is specified in TS 36.304 [4].

Conditional presence	Explanation
NCL-1XRTT	The field is optional present, need OR, if <i>cellReselectionParameters1xRTT</i> is present;
	otherwise it is not present.
NCL-HRPD	The field is optional present, need OR, if cellReselectionParametersHRPD is present;
	otherwise it is not present.
PerPLMN-LC	The field is optional present, need OR, when systemTimeInfo is included in
	SIB8PerPLMN for this CDMA2000 network; otherwise it is not present.
REG-1XRTT	The field is optional present, need OR, if csfb-RegistrationParam1XRTT is present;
	otherwise it is not present.
REG-1XRTT-PerPLMN	The field is optional present, need OR, if csfb-RegistrationParam1XRTT is included in
	SIB8PerPLMN for this CDMA2000 network; otherwise it is not present.

SystemInformationBlockType9

The IE SystemInformationBlockType9 contains a home eNB name (HNB Name).

SystemInformationBlockType9 information element

```
-- ASN1START

SystemInformationBlockType9 ::= SEQUENCE {
   hnb-Name OCTET STRING (SIZE(1..48)) OPTIONAL, -- Need OR
   ...,
   lateNonCriticalExtension OCTET STRING OPTIONAL
}

-- ASN1STOP
```

SystemInformationBlockType9 field descriptions

hnb-Name

Carries the name of the home eNB, coded in UTF-8 with variable number of bytes per character, see TS 22.011 [10].

SystemInformationBlockType10

The IE SystemInformationBlockType10 contains an ETWS primary notification.

SystemInformationBlockType10 information element

SystemInformationBlockType10 field descriptions

messageldentifier

Identifies the source and type of ETWS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39, 9.2.1.44]) contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37, 9.4.1.2.2], while the trailing bit contains bit 0 of the second octet of the same equivalent IE.

serialNumber

Identifies variations of an ETWS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39, 9.2.1.45]) contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37, 9.4.1.2.1], while the trailing bit contains bit 0 of the second octet of the same equivalent IE.

dummy

This field is not used in the specification. If received it shall be ignored by the UE.

warningType

Identifies the warning type of the ETWS primary notification and provides information on emergency user alert and UE popup. The first octet (which is equivalent to the first octet of the equivalent IE defined in TS 36.413 [39, 9.2.1.50]) contains the first octet of the equivalent IE defined in and encoded according to TS 23.041 [37, 9.3.24], and so on.

SystemInformationBlockType11

The IE SystemInformationBlockType11 contains an ETWS secondary notification.

SystemInformationBlockType11 information element

```
SystemInformationBlockType11 ::=
                                SEQUENCE {
  messageIdentifier
                                BIT STRING (SIZE (16)),
  serialNumber
                             BIT STRING (SIZE (16)),
  warningMessageSegmentType
                                   ENUMERATED {notLastSegment, lastSegment},
  warningMessageSegmentNumber
                                      INTEGER (0..63),
  warningMessageSegment
                                   OCTET STRING,
  dataCodingScheme
                                OCTET STRING (SIZE (1))
                                                              OPTIONAL, -- Cond Segment1
  lateNonCriticalExtension
                                   OCTET STRING
                                                           OPTIONAL
-- ASN1STOP
```

SystemInformationBlockType11 field descriptions

dataCodingScheme

Identifies the alphabet/coding and the language applied variations of an ETWS notification. The octet (which is equivalent to the octet of the equivalent IE defined in TS 36.413 [39, 9.2.1.52]) contains the octet of the equivalent IE defined in TS 23.041 [37, 9.4.2.2.4] and encoded according to TS 23.038 [38].

messageldentifier

Identifies the source and type of ETWS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39, 9.2.1.44]) contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37, 9.4.1.2.2], while the trailing bit contains bit 0 of second octet of the same equivalent IE.

serialNumber

Identifies variations of an ETWS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39, 9.2.1.45]) contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37, 9.4.1.2.1], while the trailing bit contains bit 0 of second octet of the same equivalent IE.

warningMessageSegment

Carries a segment of the *Warning Message Contents* IE defined in TS 36.413 [39, 9.2.1.53]. The first octet of the *Warning Message Contents* IE is equivalent to the first octet of the *CB data* IE defined in and encoded according to TS 23.041 [37, 9.4.2.2.5] and so on.

warningMessageSegmentNumber

Segment number of the ETWS warning message segment contained in the SIB. A segment number of zero corresponds to the first segment, one corresponds to the second segment, and so on.

warningMessageSegmentType

Indicates whether the included ETWS warning message segment is the last segment or not.

Conditional presence	Explanation
Segment1	The field is mandatory present in the first segment of SIB11, otherwise it is not present.

SystemInformationBlockType12

The IE SystemInformationBlockType12 contains a CMAS notification.

SystemInformationBlockType12 information element

```
SystemInformationBlockType12-r9 ::=
                                   SEQUENCE {
   messageIdentifier-r9
                             BIT STRING (SIZE (16)),
   serialNumber-r9
                                 BIT STRING (SIZE (16)),
  warningMessageSegmentType-r9
                                    ENUMERATED {notLastSegment, lastSegment},
   warningMessageSegmentNumber-r9
                                       INTEGER (0..63),
  warningMessageSegment-r9
                                    OCTET STRING,
  dataCodingScheme-r9
                                    OCTET STRING (SIZE (1))
                                                                  OPTIONAL, -- Cond Segment1
                                                           OPTIONAL,
  lateNonCriticalExtension
                                 OCTET STRING
-- ASN1STOP
```

SystemInformationBlockType12 field descriptions

dataCodingScheme

Identifies the alphabet/coding and the language applied variations of a CMAS notification. The octet (which is equivalent to the octet of the equivalent IE defined in TS 36.413 [39, 9.2.1.52]) contains the octet of the equivalent IE defined in TS 23.041 [37, 9.4.2.2.4] and encoded according to TS 23.038 [38].

messageldentifier

Identifies the source and type of CMAS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39, 9.2.1.44]) contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37, 9.4.1.2.2], while the trailing bit contains bit 0 of second octet of the same equivalent IE.

serialNumber

Identifies variations of a CMAS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39, 9.2.1.45]) contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37, 9.4.1.2.1], while the trailing bit contains bit 0 of second octet of the same equivalent IE.

warningMessageSegment

Carries a segment of the *Warning Message Contents* IE defined in TS 36.413 [39]. The first octet of the *Warning Message Contents* IE is equivalent to the first octet of the *CB data* IE defined in and encoded according to TS 23.041 [37, 9.4.2.2.5] and so on.

warningMessageSegmentNumber

Segment number of the CMAS warning message segment contained in the SIB. A segment number of zero corresponds to the first segment, one corresponds to the second segment, and so on.

warningMessageSegmentType

Indicates whether the included CMAS warning message segment is the last segment or not.

Conditional presence	Explanation
Segment1	The field is mandatory present in the first segment of SIB12, otherwise it is not present.

SystemInformationBlockType13

The IE *SystemInformationBlockType13* contains the information required to acquire the MBMS control information associated with one or more MBSFN areas.

SystemInformationBlockType13 information element

SystemInformationBlockType14

The IE SystemInformationBlockType14 contains the EAB parameters.

SystemInformationBlockType14 information element

```
-- ASN1START
SystemInformationBlockType14-r11 ::= SEQUENCE {
  eab-Param-r11
                                   CHOICE {
     eab-Common-r11
                                         EAB-Config-r11,
                                      SEQUENCE (SIZE (1..maxPLMN-r11)) OF EAB-ConfigPLMN-r11
     eab-PerPLMN-List-r11
                                            OPTIONAL, -- Need OR
   }
  lateNonCriticalExtension
                                   OCTET STRING
                                                        OPTIONAL,
EAB-ConfigPLMN-r11 ::=
                                SEQUENCE {
  eab-Config-r11
                                EAB-Config-r11
                                                       OPTIONAL -- Need OR
}
EAB-Config-r11 ::=
                             SEQUENCE {
  eab-Category-r11
                             ENUMERATED \{a, b, c\},
  eab-BarringBitmap-r11
                                BIT STRING (SIZE (10))
-- ASN1STOP
```

SystemInformationBlockType14 field descriptions

eab-BarringBitmap

Extended access class barring for AC 0-9. The first/ leftmost bit is for AC 0, the second bit is for AC 1, and so on.

eab-Category

Indicates the category of UEs for which EAB applies. Value *a* corresponds to all UEs, value *b* corresponds to the UEs that are neither in their HPLMN nor in a PLMN that is equivalent to it, and value *c* corresponds to the UEs that are neither in the PLMN listed as most preferred PLMN of the country where the UEs are roaming in the operator-defined PLMN selector list on the USIM, nor in their HPLMN nor in a PLMN that is equivalent to their HPLMN, see TS 22.011 [10].

eab-Common

The EAB parameters applicable for all PLMN(s).

eab-PerPLMN-List

The EAB parameters per PLMN, listed in the same order as the PLMN(s) occur in *plmn-IdentityList* in *SystemInformationBlockType1*.

SystemInformationBlockType15

The IE *SystemInformationBlockType15* contains the MBMS Service Area Identities (SAI) of the current and/ or neighbouring carrier frequencies.

SystemInformationBlockType15 information element

```
-- ASN1START
SystemInformationBlockType15-r11 ::= SEQUENCE {
  mbms-SAI-IntraFreq-r11
                                      MBMS-SAI-List-r11
                                                                 OPTIONAL, -- Need OR
                                                                    OPTIONAL, -- Need OR
  mbms-SAI-InterFreqList-r11
                                      MBMS-SAI-InterFreqList-r11
  lateNonCriticalExtension
                                   OCTET STRING
                                                              OPTIONAL,
  [[ mbms-SAI-InterFreqList-v1140
                                      MBMS-SAI-InterFreqList-v1140 OPTIONAL -- Cond InterFreq
  11
                                SEQUENCE (SIZE (1..maxSAI-MBMS-r11)) OF MBMS-SAI-r11
MBMS-SAI-List-r11 ::=
MBMS-SAI-r11 ::=
                                INTEGER (0..65535)
MBMS-SAI-InterFreqList-r11 ::=
                                   SEQUENCE (SIZE (1..maxFreq)) OF MBMS-SAI-InterFreq-r11
MBMS-SAI-InterFreqList-v1140 ::=
                                   SEQUENCE (SIZE (1..maxFreq)) OF MBMS-SAI-InterFreq-v1140
MBMS-SAI-InterFreq-r11 ::=
                                   SEQUENCE {
  dl-CarrierFreq-r11
                                   ARFCN-ValueEUTRA-r9,
  mbms-SAI-List-r11
                                   MBMS-SAI-List-r11
```

mbms-SAI-InterFreqList Contains a list of neighboring frequencies including additional bands, if any, that provide MBMS services and the corresponding MBMS SAIs. mbms-SAI-IntraFreq Contains the list of MBMS SAIs for the current frequency. A duplicate MBMS SAI indicates that this and all following SAIs are not offered by this cell but only by neighbour cells on the current frequency. For MBMS service continuity, the UE shall use all MBMS SAIs listed in mbms-SAI-IntraFreq to derive the MBMS frequencies of interest. mbms-SAI-List Contains a list of MBMS SAIs for a specific frequency. multiBandInfoList

A list of additional frequency bands applicable for the cells participating in the MBSFN transmission.

Conditional presence	Explanation
InterFreq	The field is optionally present, need OR, if the mbms-SAI-InterFreqList-r11 is present.
	Otherwise it is not present.

SystemInformationBlockType16

The IE *SystemInformationBlockType16* contains information related to GPS time and Coordinated Universal Time (UTC). The UE may use the parameters provided in this system information block to obtain the UTC, the GPS and the local time.

NOTE: The UE may use the time information for numerous purposes, possibly involving upper layers e.g. to assist GPS initialisation, to synchronise the UE clock (a.o. to determine MBMS session start/ stop).

SystemInformationBlockType16 information element

```
-- ASN1START
SystemInformationBlockType16-r11 ::=
                                      SEQUENCE {
   timeInfo-r11
                                SEQUENCE {
      timeInfoUTC-r11
                                      INTEGER (0..549755813887),
      dayLightSavingTime-r11
                                      BIT STRING (SIZE (2))
                                                              OPTIONAL, -- Need OR
      leapSeconds-r11
                                                              OPTIONAL, -- Need OR
                                   INTEGER (-127..128)
      localTimeOffset-r11
                                   INTEGER (-63..64)
                                                           OPTIONAL -- Need OR
                                                     OPTIONAL, -- Need OR
  lateNonCriticalExtension
                                OCTET STRING
                                                        OPTIONAL.
```

```
...
}
-- ASN1STOP
```

SystemInformationBlockType16 field descriptions

dayLightSavingTime

It indicates if and how daylight saving time (DST) is applied to obtain the local time. The semantics is the same as the semantics of the *Daylight Saving Time* IE in TS 24.301 [35] and TS 24.008 [49]. The first/leftmost bit of the bit string contains the b2 of octet 3, i.e. the value part of the *Daylight Saving Time* IE, and the second bit of the bit string contains b1 of octet 3.

leapSeconds

Number of leap seconds offset between GPS Time and UTC. UTC and GPS time are related i.e. GPS time - leapSeconds = UTC time.

IocalTimeOffset

Offset between UTC and local time in units of 15 minutes. Actual value = IE value * 15 minutes. Local time of the day is calculated as UTC time + *localTimeOffset*.

timeInfoUTC

Coordinated Universal Time corresponding to the SFN boundary at or immediately after the ending boundary of the SI-window in which SystemInformationBlockType16 is transmitted. The field counts the number of UTC seconds in 10 ms units since 00:00:00 on Gregorian calendar date 1 January, 1900 (midnight between Sunday, December 31, 1899 and Monday, January 1, 1900), including leap seconds and other additions prior to 1972. NOTE 1. This field is excluded when estimating changes in system information, i.e. changes of *timeInfoUTC* should neither result in system information change notifications nor in a modification of *systemInfoValueTag* in SIB1.

NOTE 1: For the sake of the field definition, it is assumed UTC existed prior to 1 January 1972. As this field counts total elapsed time, conversion to calendar UTC time needs to allow for leap second and other calendar adjustments since 1 January 1900. For example, time 00:00 on 1 January 1972 UTC corresponds to a *timeInfoUTC* of 2,272,060,800 seconds.

6.3.2 Radio resource control information elements

Antennalnfo

The IE *AntennaInfoCommon* and the *AntennaInfoDedicated* are used to specify the common and the UE specific antenna configuration respectively.

Antennalnfo information elements

```
-- ASN1START

AntennaInfoCommon ::= SEQUENCE {
  antennaPortsCount ENUMERATED {an1, an2, an4, spare1}
}

AntennaInfoDedicated ::= SEQUENCE {
  transmissionMode ENUMERATED {
    tm1, tm2, tm3, tm4, tm5, tm6,
```

```
tm7, tm8-v920},
  codebookSubsetRestriction
                                 CHOICE {
      n2TxAntenna-tm3
                                       BIT STRING (SIZE (2)),
      n4TxAntenna-tm3
                                       BIT STRING (SIZE (4)),
      n2TxAntenna-tm4
                                       BIT STRING (SIZE (6)),
      n4TxAntenna-tm4
                                       BIT STRING (SIZE (64)),
      n2TxAntenna-tm5
                                       BIT STRING (SIZE (4)),
      n4TxAntenna-tm5
                                       BIT STRING (SIZE (16)),
                                       BIT STRING (SIZE (4)),
      n2TxAntenna-tm6
      n4TxAntenna-tm6
                                       BIT STRING (SIZE (16))
         OPTIONAL,
                                                                -- Cond TM
   }
   ue-TransmitAntennaSelection
                                    CHOICE{
      release
                              NULL,
      setup
                              ENUMERATED {closedLoop, openLoop}
AntennaInfoDedicated-v920 ::=
                                 SEQUENCE {
  codebookSubsetRestriction-v920
                                    CHOICE {
      n2TxAntenna-tm8-r9
                                       BIT STRING (SIZE (6)),
      n4TxAntenna-tm8-r9
                                       BIT STRING (SIZE (32))
         OPTIONAL
                                                                -- Cond TM8
AntennaInfoDedicated-r10 ::=
                              SEQUENCE {
   transmissionMode-r10
                                 ENUMERATED {
                                 tm1, tm2, tm3, tm4, tm5, tm6, tm7, tm8-v920,
                                 tm9-v1020, tm10-v1130, spare6, spare5, spare4,
                                 spare3, spare2, spare1},
  codebookSubsetRestriction-r10
                                 BIT STRING
                                                   OPTIONAL,
                                                                      -- Cond TMX
   ue-TransmitAntennaSelection
                                 CHOICE{
                              NULL,
      release
                              ENUMERATED {closedLoop, openLoop}
      setup
```

-- ASN1STOP

Antennalnfo field descriptions

antennaPortsCount

Parameter represents the number of cell specific antenna ports where an1 corresponds to 1, an2 to 2 antenna ports etc. see TS 36.211 [21, 6.2.1].

codebookSubsetRestriction

Parameter: codebookSubsetRestriction, see TS 36.213 [23, 7.2] and TS 36.211 [21, 6.3.4.2.3]. The number of bits in the codebookSubsetRestriction for applicable transmission modes is defined in TS 36.213 [23, Table 7.2-1b]. If the UE is configured with transmissionMode tm8, E-UTRAN configures the field codebookSubsetRestriction if PMI/RI reporting is configured. If the UE is configured with transmissionMode tm9, E-UTRAN configures the field codebookSubsetRestriction if PMI/RI reporting is configured and if the number of CSI-RS ports is greater than 1. E-UTRAN does not configure the field codebookSubsetRestriction in other cases where the UE is configured with transmissionMode tm8 or tm9.

transmissionMode

Points to one of Transmission modes defined in TS 36.213 [23, 7.1] where tm1 refers to transmission mode 1, tm2 to transmission mode 2 etc.

ue-TransmitAntennaSelection

For value *setup* the field indicates whether UE transmit antenna selection control is closed-loop or open-loop as described in TS 36.213 [23, 8.7]. EUTRAN configures the same value for all serving cells.

Conditional presence	Explanation
TM	The field is mandatory present if the <i>transmissionMode</i> is set to tm3, tm4, tm5 or tm6.
	Otherwise the field is not present and the UE shall delete any existing value for this field.
TM8	The field is optional present, need OR, if AntennaInfoDedicated is included and
	transmissionMode is set to tm8. If AntennaInfoDedicated is included and
	transmissionMode is set to a value other than tm8, the field is not present and the UE
	shall delete any existing value for this field. Otherwise the field is not present.
TMX	The field is mandatory present if the <i>transmissionMode-r10</i> is set to <i>tm3</i> , <i>tm4</i> , <i>tm5</i> or <i>tm6</i> .
	The field is optionally present, need OR, if the <i>transmissionMode-r10</i> is set to <i>tm8</i> or <i>tm9</i> .
	Otherwise the field is not present and the UE shall delete any existing value for this field.

AntennalnfoUL

The IE *AntennaInfoUL* is used to specify the UL antenna configuration.

AntennalnfoUL information elements

AntennalnfoUL field descriptions

fourAntennaPortActivated

Parameter indicates if four antenna ports are used. See TS 36.213 [23, 8.2]. E-UTRAN optionally configures fourAntennaPortActivated only if transmissionModeUL is set to tm2.

transmissionModeUL

Points to one of UL Transmission modes defined in TS 36.213 [23, 8.0] where tm1 refers to transmission mode 1, tm2 to transmission mode 2 etc.

– CQI-ReportConfig

The IE *CQI-ReportConfig* is used to specify the CQI reporting configuration.

CQI-ReportConfig information elements

```
-- ASN1START
CQI-ReportConfig ::=
                             SEQUENCE {
  cqi-ReportModeAperiodic
                                CQI-ReportModeAperiodic OPTIONAL,
                                                                         -- Need OR
  nomPDSCH-RS-EPRE-Offset
                                      INTEGER (-1..6),
                             CQI-ReportPeriodic OPTIONAL
                                                                    -- Need ON
  cqi-ReportPeriodic
CQI-ReportConfig-v920 ::=
                          SEQUENCE {
  cqi-Mask-r9
                             ENUMERATED {setup}
                                                        OPTIONAL,
                                                                      -- Cond cqi-Setup
  pmi-RI-Report-r9
                             ENUMERATED {setup}
                                                        OPTIONAL
                                                                      -- Cond PMIRI
CQI-ReportConfig-r10 ::= SEQUENCE {
  cqi-ReportAperiodic-r10
                                   CQI-ReportAperiodic-r10
                                                                 OPTIONAL, -- Need ON
  nomPDSCH-RS-EPRE-Offset\\
                                   INTEGER (-1..6),
                                                          OPTIONAL, -- Need ON
  cqi-ReportPeriodic-r10
                                CQI-ReportPeriodic-r10
                                                                 OPTIONAL, -- Cond PMIRIPCell
  pmi-RI-Report-r9
                                ENUMERATED {setup}
  csi-SubframePatternConfig-r10
                                CHOICE {
                             NULL,
     release
                             SEQUENCE {
     setup
        csi-MeasSubframeSet1-r10
                                      MeasSubframePattern-r10,
        csi-MeasSubframeSet2-r10
                                      MeasSubframePattern-r10
                                                     OPTIONAL -- Need ON
```

```
CQI-ReportConfig-v1130 ::= SEQUENCE {
   cqi-ReportPeriodic-v1130
                                 CQI-ReportPeriodic-v1130,
  cqi-ReportBoth-r11
                                 CQI-ReportBoth-r11
}
CQI-ReportConfigSCell-r10 ::=
                                       SEQUENCE {
   cqi-ReportModeAperiodic-r10
                                    CQI-ReportModeAperiodic OPTIONAL,
                                                                              -- Need OR
  nomPDSCH-RS-EPRE-Offset-r10
                                          INTEGER (-1..6),
   cqi-ReportPeriodicSCell-r10
                                    CQI-ReportPeriodic-r10
                                                               OPTIONAL, -- Need ON
  pmi-RI-Report-r10
                                 ENUMERATED {setup}
                                                                  OPTIONAL -- Cond PMIRISCell
CQI-ReportPeriodic ::=
                       CHOICE {
   release
                           NULL,
                           SEQUENCE {
   setup
      cqi-PUCCH-ResourceIndex
                                       INTEGER (0..1185),
      cqi-pmi-ConfigIndex
                                    INTEGER (0..1023),
      cqi-FormatIndicatorPeriodic
                                       CHOICE {
         widebandCQI
                                       NULL,
         subbandCQI
                                       SEQUENCE {
            k
                                       INTEGER (1..4)
         }
      },
      ri-ConfigIndex
                                    INTEGER (0..1023) OPTIONAL,
                                                                           -- Need OR
      simultaneous Ack Nack And CQI\\
                                       BOOLEAN
   }
CQI-ReportPeriodic-r10 ::= CHOICE {
   release
                              NULL,
                              SEQUENCE {
   setup
      cqi-PUCCH-ResourceIndex-r10
                                          INTEGER (0..1184),
      cqi-PUCCH-ResourceIndexP1-r10 INTEGER (0..1184)
                                                                  OPTIONAL, -- Need OR
      cqi-pmi-ConfigIndex
                                INTEGER (0..1023),
                                       CHOICE {
      cqi-FormatIndicatorPeriodic-r10
```

```
widebandCQI-r10
                                          SEQUENCE {
            csi-ReportMode-r10
                                ENUMERATED {submode1, submode2}
                                                                        OPTIONAL -- Need OR
         },
         subbandCQI-r10
                                       SEQUENCE {
            k
                                    INTEGER (1..4),
            periodicityFactor-r10
                                          ENUMERATED {n2, n4}
         }
      },
                                                                           -- Need OR
      ri-ConfigIndex
                                 INTEGER (0..1023)
                                                      OPTIONAL,
      simultaneous Ack Nack And CQI
                                    BOOLEAN,
      cqi-Mask-r9
                                ENUMERATED {setup}
                                                            OPTIONAL,
                                                                                 -- Need OR
      csi-ConfigIndex-r10
                                 CHOICE {
         release
                                 NULL,
         setup
                                 SEQUENCE {
            cqi-pmi-ConfigIndex2-r10
                                       INTEGER (0..1023),
            ri-ConfigIndex2-r10
                                       INTEGER (0..1023)
                                                           OPTIONAL
                                                                           -- Need OR
         }
            OPTIONAL
                                                                     -- Need ON
CQI-ReportPeriodic-v1130 ::= SEQUENCE {
   simultaneousAckNackAndCQI-Format3-r11
                                            ENUMERATED {setup}
                                                                        OPTIONAL, -- Need OR
  cqi-ReportPeriodicProcExtToReleaseList-r11 CQI-ReportPeriodicProcExtToReleaseList-r11 OPTIONAL, --
Need ON
   cqi-ReportPeriodicProcExtToAddModList-r11 CQI-ReportPeriodicProcExtToAddModList-r11 OPTIONAL --
Need ON
}
CQI-ReportPeriodicProcExtToAddModList-r11 ::=
                                               SEQUENCE (SIZE (1..maxCQI-ProcExt-r11)) OF CQI-
ReportPeriodicProcExt-r11
CQI-ReportPeriodicProcExtToReleaseList-r11 ::= SEQUENCE (SIZE (1..maxCQI-ProcExt-r11)) OF CQI-
ReportPeriodicProcExtId-r11
CQI-ReportPeriodicProcExt-r11 ::=
                                    SEQUENCE {
   cqi-ReportPeriodicProcExtId-r11 CQI-ReportPeriodicProcExtId-r11,
```

```
cqi-pmi-ConfigIndex-r11
                                INTEGER (0..1023),
  cqi-FormatIndicatorPeriodic-r11 CHOICE {
     widebandCQI-r11
                                SEQUENCE {
                                ENUMERATED {submode1, submode2} OPTIONAL -- Need OR
        csi-ReportMode-r11
      },
     subbandCQI-r11
                             SEQUENCE {
         k
                             INTEGER (1..4),
                                ENUMERATED {n2, n4}
         periodicityFactor-r11
   },
  ri-ConfigIndex-r11
                             INTEGER (0..1023)
                                                           OPTIONAL, -- Need OR
  csi-ConfigIndex-r11
                             CHOICE {
     release
                             NULL,
                             SEQUENCE {
     setup
        cqi-pmi-ConfigIndex2-r11
                                   INTEGER (0..1023),
        ri-ConfigIndex2-r11
                                   INTEGER (0..1023)
                                                        OPTIONAL
                                                                       -- Need OR
                                                  OPTIONAL,
                                                                 -- Need ON
CQI-ReportAperiodic-r10 ::=
                             CHOICE {
  release
                             NULL,
                             SEQUENCE {
  setup
     cqi-ReportModeAperiodic-r10
                                      CQI-ReportModeAperiodic,
     aperiodicCSI-Trigger-r10
                                   SEQUENCE {
         trigger1-r10
                                BIT STRING (SIZE (8)),
        trigger2-r10
                                BIT STRING (SIZE (8))
                                                         OPTIONAL -- Need OR
CQI-ReportAperiodicProc-r11 ::=
                                SEQUENCE {
  cqi-ReportModeAperiodic-r11
                                   CQI-ReportModeAperiodic,
  trigger01-r11
                             BOOLEAN,
```

```
BOOLEAN,
   trigger10-r11
   trigger11-r11
                              BOOLEAN
CQI-ReportModeAperiodic ::=
                                    ENUMERATED {
                                 rm12, rm20, rm22, rm30, rm31,
                                 spare3, spare2, spare1
CQI-ReportBoth-r11 ::=
                           SEQUENCE {
   csi-IM-ConfigToReleaseList-r11
                                    CSI-IM-ConfigToReleaseList-r11 OPTIONAL, -- Need ON
  csi-IM-ConfigToAddModList-r11
                                    CSI-IM-ConfigToAddModList-r11OPTIONAL, -- Need ON
  csi-ProcessToReleaseList-r11
                                 CSI-ProcessToReleaseList-r11 OPTIONAL, -- Need ON
   csi-ProcessToAddModList-r11
                                    CSI-ProcessToAddModList-r11
                                                                     OPTIONAL -- Need ON
CSI-IM-ConfigToAddModList-r11 ::=
                                    SEQUENCE (SIZE (1..maxCSI-IM-r11)) OF CSI-IM-Config-r11
CSI-IM-ConfigToReleaseList-r11 ::=
                                    SEQUENCE (SIZE (1..maxCSI-IM-r11)) OF CSI-IM-ConfigId-r11
CSI-ProcessToAddModList-r11 ::=
                                    SEQUENCE (SIZE (1..maxCSI-Proc-r11)) OF CSI-Process-r11
CSI-ProcessToReleaseList-r11 ::= SEQUENCE (SIZE (1..maxCSI-Proc-r11)) OF CSI-ProcessId-r11
CQI-ReportBothProc-r11 ::=
                                 SEQUENCE {
   ri-Ref-CSI-ProcessId-r11
                                 CSI-ProcessId-r11
                                                            OPTIONAL,
                                                                           -- Need OR
  pmi-RI-Report-r11
                                 ENUMERATED {setup}
                                                                  OPTIONAL
                                                                                 -- Need OR
-- ASN1STOP
```

CQI-ReportConfig field descriptions

aperiodicCSI-Trigger

Indicates for which serving cell(s) the aperiodic CSI report is triggered when one or more SCells are configured.
trigger1 corresponds to the CSI request field 10 and trigger2 corresponds to the CSI request field 11, see TS 36.213
[23, table 7.2.1-1A]. The leftmost bit, bit 0 in the bit string corresponds to the cell with ServCellIndex=0 and bit 1 in the bit string corresponds to the cell with ServCellIndex=1 etc. Each bit has either value 0 (means no aperiodic CSI report is triggered) or value 1 (means the aperiodic CSI report is triggered). At most 5 bits can be set to value 1 in the bit string. E-UTRAN configures value 1 only for cells configured with transmissionMode set in range tm1 to tm9. One value applies for all serving cells configured with transmissionMode set in range tm1 to tm9 (the associated functionality is common i.e. not performed independently for each cell).

cgi-Mask

Limits CQI/PMI/PTI/RI reports to the on-duration period of the DRX cycle, see TS 36.321 [6]. One value applies for all CSI processes and all serving cells (the associated functionality is common i.e. not performed independently for each cell).

cgi-FormatIndicatorPeriodic

Parameter: PUCCH CQI Feedback Type, see TS 36.213 [23, table 7.2.2-1]. Depending on transmissionMode, reporting mode is implicitly given from the table.

cqi-pmi-ConfigIndex

Parameter: *CQI/PMI Periodicity and Offset Configuration Index I_{CQI/PMI}*, see TS 36.213 [23, tables 7.2.2-1A and 7.2.2-1C]. If subframe patterns for CSI (CQI/PMI/PTI/RI) reporting are configured (i.e. *csi-SubframePatternConfig* is configured), the parameter applies to the subframe pattern corresponding to *csi-MeasSubframeSet1*.

cgi-pmi-ConfigIndex2

Parameter: CQI/PMI Periodicity and Offset Configuration Index I_{CQI/PMI}, see TS 36.213 [23, tables 7.2.2-1A and 7.2.2-1C]. The parameter applies to the subframe pattern corresponding to csi-MeasSubframeSet2.

cgi-PUCCH-ResourceIndex, cgi-PUCCH-ResourceIndexP1

Parameter $n_{\text{PUCCH}}^{(2,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23, 7.2]. E-UTRAN does not apply value 1185. One value applies for all CSI processes.

cqi-ReportAperiodic

E-UTRAN does not configure CQI-ReportAperiodic when transmission mode 10 is configured for all serving cells.

cgi-ReportModeAperiodic

Parameter: reporting mode. Value rm12 corresponds to Mode 1-2, rm20 corresponds to Mode 2-0, rm22 corresponds to Mode 2-2 etc. PUSCH reporting modes are described in TS 36.213 [23, 7.2.1]. The UE shall ignore *cqi-ReportModeAperiodic-r10* when transmission mode 10 is configured for the serving cell on this carrier frequency.

CQI-ReportPeriodicProcExt

A set of periodic CQI related parameters for which E-UTRAN may configure different values for each CSI process. For a serving frequency E-UTRAN configures one or more *CQI-ReportPeriodicProcExt* only when transmission mode 10 is configured for the serving cell on this carrier frequency.

csi-ConfigIndex

E-UTRAN configures *csi-ConfigIndex* only for PCell and only if *csi-SubframePatternConfig* is configured. The UE shall release *csi-ConfigIndex* if *csi-SubframePatternConfig* is released.

csi-IM-ConfigToAddModList

For a serving frequency E-UTRAN configures one or more *CSI-IM-Config* only when transmission mode 10 is configured for the serving cell on this carrier frequency.

csi-MeasSubframeSet1, csi-MeasSubframeSet2

Indicates the CSI measurement subframe sets. csi-MeasSubframeSet1 refers to $C_{CSI,0}$ in TS 36.213 [23, 7.2] and csi-MeasSubframeSet2 refers to $C_{CSI,1}$ in TS 36.213 [23, 7.2].

csi-ProcessToAddModList

For a serving frequency E-UTRAN configures one or more *CSI-Process* only when transmission mode 10 is configured for the serving cell on this carrier frequency.

csi-ReportMode

Parameter: PUCCH_format1-1_CSI_reporting_mode, see TS 36.213 [23, 7.2.2].

Κ

Parameter: K, see TS 36.213 [23, 7.2.2].

nomPDSCH-RS-EPRE-Offset

Parameter: Δ_{offset} see TS 36.213 [23, 7.2.3]. Actual value = IE value * 2 [dB].

periodicityFactor

Parameter: H', see TS 36.213 [23, 7.2.2].

pmi-RI-Report

See TS 36.213 [23, 7.2]. The presence of this field means PMI/RI reporting is configured; otherwise the PMI/RI reporting is not configured. EUTRAN configures this field only when *transmissionMode* is set to *tm8*, *tm9* or *tm10*. The UE shall ignore *pmi-RI-Report-r9*/ *pmi-RI-Report-r10* when transmission mode 10 is configured for the serving cell on this carrier frequency.

ri-ConfigIndex

Parameter: *RI Config Index I_{RI}*, see TS 36.213 [23, 7.2.2-1B]. If subframe patterns for CSI (CQI/PMI/PTI/RI) reporting are configured (i.e. *csi-SubframePatternConfig* is configured), the parameter applies to the subframe pattern corresponding to *csi-MeasSubframeSet1*.

CQI-ReportConfig field descriptions

ri-ConfigIndex2

Parameter: *RI Config Index I_{RI}*, see TS 36.213 [23, 7.2.2-1B]. The parameter applies to the subframe pattern corresponding to *csi-MeasSubframeSet2*. E-UTRAN configures *ri-ConfigIndex2* only if *ri-ConfigIndex* is configured.

ri-Ref-CSI-ProcessId

CSI process whose RI value the UE inherits when reporting RI, in the same subframe, for CSI reporting. E-UTRAN ensures that the CSI process that inherits the RI value is configured in accordance with the conditions specified in 36.213 [23, 7.2.1, 7.2.2].

simultaneousAckNackAndCQI

Parameter: Simultaneous-AN-and-CQI. see TS 36.213 [23, 10.1] TRUE indicates that simultaneous transmission of ACK/NACK and CQI is allowed. One value applies for all CSI processes. For SCells this field is not applicable and the UE shall ignore the value.

simultaneousAckNackAndCQI-Format3

Indicates that the UE shall perform simultaneous transmission of HARQ A/N and periodic CQI report multiplexing on PUCCH format 3, see TS 36.213 [23, 7.2, 10.1.1]. E-UTRAN configures this information only when *pucch-Format* is set to *format3*. One value applies for all CSI processes. For SCells this field is not applicable and the UE shall ignore the value.

trigger01

Indicates whether or not reporting for this CSI-process is triggered by CSI request field set to 01, for a CSI request applicable for the serving cell on the same frequency as the CSI process, see TS 36.213 [23, table 7.2.1-1B].

trigger10, trigger11

Indicates whether or not reporting for this CSI-process is triggered by CSI request field set to 10 or 11, see TS 36.213 [23, table 7.2.1-1B]. EUTRAN configures at most 5 CSI processes, across all serving frequencies, to be triggered by a CSI request field set to value 10. The same restriction applies for value 11.

Conditional presence	Explanation
cqi-Setup	This field is not present for an Scell, while it is conditionally present for the Pcell according to the following. The field is optional present, need OR, if the <i>cqi-ReportPeriodic</i> in the <i>cqi-ReportConfig</i> is set to <i>setup</i> . If the field <i>cqi-ReportPeriodic</i> is present and set to <i>release</i> , the field is not present and the UE shall delete any existing value for this field. Otherwise the field is not present.
PMIRI	The field is optional present, need OR, if <i>cqi-ReportPeriodic</i> is included and set to <i>setup</i> , or <i>cqi-ReportModeAperiodic</i> is included. If the field <i>cqi-ReportPeriodic</i> is present and set to <i>release</i> and <i>cqi-ReportModeAperiodic</i> is absent, the field is not present and the UE shall delete any existing value for this field. Otherwise the field is not present.
PMIRIPCell	The field is optional present, need OR, if cqi-ReportPeriodic is included in the CQI-ReportConfig-r10 and set to setup, or cqi-ReportAperiodic is included in the CQI-ReportConfig-r10 and set to setup. If the field cqi-ReportPeriodic is present in the CQI-ReportConfig-r10 and set to release and cqi-ReportAperiodic is included in the CQI-ReportConfig-r10 and set to release, the field is not present and the UE shall delete any existing value for this field. Otherwise the field is not present.
PMIRISCell	The field is optional present, need OR, if cqi-ReportPeriodicSCell is included and set to setup, or cqi-ReportModeAperiodic-r10 is included in the CQI-ReportConfigSCell. If the field cqi-ReportPeriodicSCell is present and set to release and cqi-ReportModeAperiodic-r10 is absent in the CQI-ReportConfigSCell, the field is not present and the UE shall delete any existing value for this field. Otherwise the field is not present.

CQI-ReportPeriodicProcExtId

The IE *CQI-ReportPeriodicProcExtId* is used to identify a periodic CQI reporting configuration that E-UTRAN may configure in addition to the configuration specified by the IE *CQI-ReportPeriodic-r10*. These additional configurations are specified by the IE *CQI-ReportPeriodicProcExt-r11*. The identity is unique within the scope of a carrier frequency.

CQI-ReportPeriodicProcExtId information elements

ASN1START	
CQI-ReportPeriodicProcExtId-r11 ::=	INTEGER (1maxCQI-ProcExt-r11)
ASN1STOP	

CrossCarrierSchedulingConfig

The IE CrossCarrierSchedulingConfig is used to specify the configuration when the cross carrier scheduling is used in a cell.

CrossCarrierSchedulingConfig information elements

```
-- ASN1START
CrossCarrierSchedulingConfig-r10 ::=
                                      SEQUENCE {
   schedulingCellInfo-r10
                                   CHOICE {
      own-r10
                                      SEQUENCE {
                                                                   -- No cross carrier scheduling
         cif-Presence-r10
                                         BOOLEAN
      },
      other-r10
                                      SEQUENCE {
                                                                   -- Cross carrier scheduling
         schedulingCellId-r10
                                      ServCellIndex-r10,
         pdsch-Start-r10
                                         INTEGER (1..4)
   }
-- ASN1STOP
```

CrossCarrierSchedulingConfig field descriptions

cif-Presence

The field is used to indicate whether carrier indicator field is present (value TRUE) or not (value FALSE) in PDCCH/EPDCCH DCI formats, see TS 36.212 [22, 5.3.3.1].

ndsch-Start

The starting OFDM symbol of PDSCH for the concerned SCell, see TS 36.213 [23. 7.1.6.4]. Values 1, 2, 3 are applicable when *dl-Bandwidth* for the concerned SCell is greater than 10 resource blocks, values 2, 3, 4 are applicable when *dl-Bandwidth* for the concerned SCell is less than or equal to 10 resource blocks, see TS 36.211 [21, Table 6,7-1]

schedulingCellId

Indicates which cell signals the downlink allocations and uplink grants, if applicable, for the concerned SCell.

CSI-IM-Config

The IE *CSI-IM-Config* is the CSI Interference Measurement (IM) configuration that E-UTRAN may configure on a serving frequency, see TS 36.213 [23, 7.2.6].

CSI-IM-Config information elements

```
-- ASN1START

CSI-IM-Config-r11 ::= SEQUENCE {
```

```
csi-IM-ConfigId-r11 CSI-IM-ConfigId-r11,
resourceConfig-r11 INTEGER (0..31),
subframeConfig-r11 INTEGER (0..154),
...

--- ASN1STOP
```

CSI-IM-Config field descriptions

resourceConfig

Parameter: CSI reference signal configuration, see TS 36.213 [23, 7.2.6] and TS 36.211 [21, table 6.10.5.2-1 and 6.10.5.2-2] for 4 REs.

subframeConfig

Parameter: $I_{\rm CSI-RS}$, see TS 36.213 [23, 7.2.6] and TS 36.211 [21, table 6.10.5.3-1].

CSI-IM-Configld

The IE *CSI-IM-ConfigId* is used to identify a CSI-IM configuration that is configured by the IE *CSI-IM-Config*. The identity is unique within the scope of a carrier frequency.

CSI-IM-ConfigId information elements

```
-- ASN1START

CSI-IM-ConfigId-r11 ::= INTEGER (1..maxCSI-IM-r11)

-- ASN1STOP
```

CSI-Process

The IE CSI-Process is the CSI process configuration that E-UTRAN may configure on a serving frequency.

CSI-Process information elements

```
-- ASN1START
CSI-Process-r11 ::=
                     SEQUENCE {
   csi-ProcessId-r11
                        CSI-ProcessId-r11,
  csi-RS-ConfigNZPId-r11
                              CSI-RS-ConfigNZPId-r11,
  csi-IM-ConfigId-r11
                           CSI-IM-ConfigId-r11,
   p-C-AndCBSRList-r11 SEQUENCE (SIZE (1..2)) OF P-C-AndCBSR-r11,
  cqi-ReportBothProc-r11
                           CQI-ReportBothProc-r11
                                                          OPTIONAL,
                                                                         -- Need OR
   cqi-ReportPeriodicProcId-r11 INTEGER (0..maxCQI-ProcExt-r11)
                                                                   OPTIONAL,
                                                                                  -- Need OR
```

CSI-Process field descriptions

cgi-ReportBothProc

Includes CQI configuration parameters applicable for both aperiodic and periodic CSI reporting, for which CSI process specific values may be configured. E-UTRAN configures the field if and only if *cqi-ReportPeriodicProcId* is included and/ or if *cqi-ReportAperiodicProc* is included.

cqi-ReportPeriodicProcId

Refers to a periodic CQI reporting configuration that is configured for the same frequency as the CSI process. Value 0 refers to the set of parameters defined by the REL-10 CQI reporting configuration fields, while the other values refer to the additional configurations E-UTRAN assigns by CQI-ReportPeriodicProcExt-r11 (and as covered by CQI-ReportPeriodicProcExtId).

csi-IM-Configld

Refers to a CSI-IM configuration that is configured for the same frequency as the CSI process.

csi-RS-ConfigNZPId

Refers to a CSI RS configuration using non-zero power transmission that is configured for the same frequency as the CSI process.

p-C

Parameter: P_c , see TS 36.213 [23, 7.2.5].

p-C-AndCBSRList

A *p-C-AndCBSRList* including 2 entries indicates that the subframe patterns configured for CSI (CQI/PMI/PTI/RI) reporting (i.e. as defined by field *csi-MeasSubframeSet1* and *csi-MeasSubframeSet2*) are to be used for this CSI process, while a single entry indicates that the subframe patterns are not to be used for this CSI process. E-UTRAN does not include 2 entries in *p-C-AndCBSRList* for CSI processes concerning a secondary frequency. E-UTRAN includes 2 entries in *p-C-AndCBSRList* when configuring both *cqi-pmi-ConfigIndex* and *cqi-pmi-ConfigIndex2*.

CSI-ProcessId

The IE *CSI-ProcessId* is used to identify a CSI process that is configured by the IE *CSI-Process*. The identity is unique within the scope of a carrier frequency.

CSI-ProcessId information elements

```
-- ASN1START

CSI-ProcessId-r11 ::= INTEGER (1..maxCSI-Proc-r11)

-- ASN1STOP
```

CSI-RS-Config

The IE CSI-RS-Config is used to specify the CSI (Channel-State Information) reference signal configuration.

CSI-RS-Config information elements

```
-- ASN1START
CSI-RS-Config-r10 ::=
                     SEQUENCE {
  csi-RS-r10
                          CHOICE {
                          NULL,
     release
                          SEQUENCE {
      setup
         antennaPortsCount-r10
                                   ENUMERATED {an1, an2, an4, an8},
        resourceConfig-r10
                                   INTEGER (0..31),
        subframeConfig-r10
                                   INTEGER (0..154),
         p-C-r10
                                   INTEGER (-8..15)
                                                  OPTIONAL,
                                                                    -- Need ON
  zeroTxPowerCSI-RS-r10
                             CHOICE {
                          NULL,
     release
     setup
                          SEQUENCE {
        zeroTxPowerResourceConfigList-r10 BIT STRING (SIZE (16)),
        zeroTxPowerSubframeConfig-r10
                                         INTEGER (0..154)
                                                  OPTIONAL
                                                                    -- Need ON
-- ASN1STOP
```

CSI-RS-Config field descriptions

antennaPortsCount

Parameter represents the number of antenna ports used for transmission of CSI reference signals where value an1 corresponds to 1 antenna port, an2 to 2 antenna ports and so on, see TS 36.211 [21, 6.10.5].

p-C

Parameter: P_c , see TS 36.213 [23, 7.2.5].

resourceConfig

Parameter: CSI reference signal configuration, see TS 36.211 [21, table 6.10.5.2-1 and 6.10.5.2-2].

subframeConfig

Parameter: $I_{\rm CSI-RS}$, see TS 36.211 [21, table 6.10.5.3-1].

zeroTxPowerResourceConfigList

Parameter: ZeroPowerCSI-RS, see TS 36.213 [23, 7.2.7].

zeroTxPowerSubframeConfig

Parameter: $I_{\mathrm{CSI-RS}}$, see TS 36.211 [21, table 6.10.5.3-1].

– CSI-RS-ConfigNZP

The IE *CSI-RS-ConfigNZP* is the CSI-RS resource configuration using non-zero power transmission that E-UTRAN may configure on a serving frequency.

CSI-RS-ConfigNZP information elements

```
-- ASN1START
CSI-RS-ConfigNZP-r11 ::=
                           SEQUENCE {
  csi-RS-ConfigNZPId-r11
                                 CSI-RS-ConfigNZPId-r11,
   antennaPortsCount-r11
                              ENUMERATED {an1, an2, an4, an8},
                              INTEGER (0..31),
   resourceConfig-r11
  subframeConfig-r11
                              INTEGER (0..154),
  scramblingIdentity-r11
                              INTEGER (0..503),
   qcl-CRS-Info-r11
                              SEQUENCE {
      qcl-ScramblingIdentity-r11
                                 INTEGER (0..503),
      crs-PortsCount-r11
                                 ENUMERATED {n1, n2, n4, spare1},
      mbsfn-SubframeConfigList-r11CHOICE {
            release
                                 NULL,
                                 SEQUENCE {
            setup
               subframeConfigList
                                       MBSFN-SubframeConfigList
                                                       OPTIONAL -- Need ON
                                                       OPTIONAL, -- Need OR
-- ASN1STOP
```

CSI-RS-ConfigNZP field descriptions

antennaPortsCount

Parameter represents the number of antenna ports used for transmission of CSI reference signals where an1 corresponds to 1, an2 to 2 antenna ports etc. see TS 36.211 [21, 6.10.5].

qcI-CRS-Info

Indicates CRS antenna ports that is quasi co-located with the CSI-RS antenna ports, see TS 36.213 [23, 7.2.5]. EUTRAN configures this field if and only if the UE is configured with *qcl-Operation* set to *typeB*.

resourceConfig

Parameter: CSI reference signal configuration, see TS 36.211 [21, table 6.10.5.2-1 and 6.10.5.2-2].

subframeConfig

Parameter: $I_{\mathrm{CSI-RS}}$, see TS 36.211 [21, table 6.10.5.3-1].

scramblingIdentity

Parameter: Pseudo-random sequence generator parameter, $\,n_{\mathrm{ID}}$, see TS 36.213 [23, 7.2.5].

– CSI-RS-ConfigNZPId

The IE *CSI-RS-ConfigNZPId* is used to identify a CSI-RS resource configuration using non-zero transmission power, as configured by the IE *CSI-RS-ConfigNZP*. The identity is unique within the scope of a carrier frequency.

CSI-RS-ConfigNZPId information elements

```
-- ASN1START

CSI-RS-ConfigNZPId-r11 ::= INTEGER (1..maxCSI-RS-NZP-r11)

-- ASN1STOP
```

– CSI-RS-ConfigZP

The IE *CSI-RS-ConfigZP* is the CSI-RS resource configuration, for which UE assumes zero transmission power, that E-UTRAN may configure on a serving frequency.

CSI-RS-ConfigZP information elements

```
-- ASN1START

CSI-RS-ConfigZP-r11 ::= SEQUENCE {
    csi-RS-ConfigZPId-r11 CSI-RS-ConfigZPId-r11,
    resourceConfigList-r11 BIT STRING (SIZE (16)),
    subframeConfig-r11 INTEGER (0..154),
    ...
}

-- ASN1STOP
```

– CSI-RS-ConfigZPId

The IE *CSI-RS-ConfigZPId* is used to identify a CSI-RS resource configuration for which UE assumes zero transmission power, as configured by the IE *CSI-RS-ConfigZP*. The identity is unique within the scope of a carrier frequency.

CSI-RS-ConfigZPId information elements

```
CSI-RS-ConfigZPId-r11 ::= INTEGER (1..maxCSI-RS-ZP-r11)
-- ASN1STOP
```

DMRS-Config

The IE *DMRS-Config* is the DMRS configuration that E-UTRAN may configure on a serving frequency.

DMRS-Config information elements

DRB-Identity

The IE DRB-Identity is used to identify a DRB used by a UE.

DRB-Identity information elements

```
-- ASN1START

DRB-Identity ::= INTEGER (1..32)

-- ASN1STOP
```

EPDCCH-Config

The IE EPDCCH-Config specifies the subframes and resource blocks for EPDCCH monitoring that E-UTRAN may configure for a serving cell.

EPDCCH-Config information element

```
-- ASN1START
EPDCCH-Config-r11 ::=
                           SEQUENCE{
  config-r11
               CHOICE {
                           NULL,
      release
                              SEQUENCE {
         setup
         subframePatternConfig-r11 CHOICE {
                                 NULL,
            release
                                 SEQUENCE {
            setup
               subframePattern-r11
                                       MeasSubframePattern-r10
            }
                                                            OPTIONAL, -- Need ON
         startSymbol-r11
                                 INTEGER (1..4)
                                                                  OPTIONAL, -- Need OP
         set Config To Release List-r 11 EPDC CH-Set Config To Release List-r 11\\
                                                                        OPTIONAL, -- Need ON
         setConfigToAddModList-r11 EPDCCH-SetConfigToAddModList-r11
                                                                           OPTIONAL -- Need ON
      }
EPDCCH-SetConfigToAddModList-r11 ::= SEQUENCE (SIZE(1..maxEPDCCH-Set-r11)) OF EPDCCH-SetConfig-
r11
EPDCCH-SetConfigToReleaseList-r11 ::= SEQUENCE (SIZE(1..maxEPDCCH-Set-r11)) OF EPDCCH-
SetConfigId-r11
EPDCCH-SetConfig-r11 ::=
                              SEQUENCE {
   setConfigId-r11
                              EPDCCH-SetConfigId-r11,
   transmissionType-r11
                              ENUMERATED {localised, distributed},
   resourceBlockAssignment-r11
                                 SEQUENCE{
      numberPRB-Pairs-r11
                                    ENUMERATED {n2, n4, n8},
      resourceBlockAssignment-r11
                                    BIT STRING (SIZE(4..38))
```

```
dmrs-ScramblingSequenceInt-r11 INTEGER (0..503),

pucch-ResourceStartOffset-r11 INTEGER (0..2047),

re-MappingQCL-ConfigId-r11 PDSCH-RE-MappingQCL-ConfigId-r11 OPTIONAL, -- Need OR

...

}

EPDCCH-SetConfigId-r11 ::= INTEGER (0..1)
```

EPDCCH-Config field descriptions

dmrs-ScramblingSequenceInt

The DMRS scrambling sequence initialization parameter $n_{\mathrm{ID},i}^{\mathrm{EPDCCH}}$ defined in TS 36.211[21, 6.10.3A.1].

EPDCCH-SetConfig

Provides EPDCCH configuration set. See TS 36.213 [23, 9.1.4]. E-UTRAN configures at least one *EPDCCH-SetConfig when EPDCCH-Config* is configured.

numberPRB-Pairs

Indicates the number of physical resource-block pairs used for the EPDCCH set. Value n2 corresponds to 2 physical resource-block pairs; n4 corresponds to 4 physical resource-block pairs and so on. Value n8 is not supported if *dl-Bandwidth* is set to 6 resource blocks.

pucch-ResourceStartOffset

PUCCH format 1a and 1b resource starting offset for the EPDCCH set. See TS 36.213 [23, 10.1.1.2].

re-MappingQCL-Configld

Indicates the starting OFDM symbol, the related rate matching parameters and quasi co-location assumption for EPDCCH when the UE is configured with tm10. This field provides the identity of a configured *PDSCH-RE-MappingQCL-Config.* E-UTRAN configures this field only when tm10 is configured.

resourceBlockAssignment

Indicates the index to a specific combination of physical resource-block pair for EPDCCH set. See TS 36.213 [23, 9.1.4.4]. The size of *resourceBlockAssignment* is specified in TS 36.213 [23, 9.1.4.4] and based on *numberPRB-Pairs* and the signalled value of *dl-Bandwidth*.

setConfigId

Indicates the identity of the EPDCCH configuration set.

startSymbol

Indicates the OFDM starting symbol for any EPDCCH and PDSCH scheduled by EPDCCH on the same cell, see TS 36.213 [23, 9.1.4.1]. If not present, the UE shall release the configuration and shall derive the starting OFDM symbol of EPDCCH and PDSCH scheduled by EPDCCH from PCFICH. Values 1, 2, and 3 are applicable for *dl-Bandwidth* greater than 10 resource blocks. Values 2, 3, and 4 are applicable otherwise. E-UTRAN does not configure the field for UEs configured with tm10.

subframePatternConfig

Configures the subframes which the UE shall monitor the UE-specific search space on EPDCCH, except for predefined rules in TS 36.213 [23, 9.1.4]. If the field is not configured when EPDCCH is configured, the UE shall monitor the UE-specific search space on EPDCCH in all subframes except for pre-defined rules in TS 36.213 [23, 9.1.4].

transmissionType

Indicates whether distributed or localized EPDCCH transmission mode is used as defined in TS 36.211 [21, 6.8A.1].

LogicalChannelConfig

The IE LogicalChannelConfig is used to configure the logical channel parameters.

LogicalChannelConfig information element

```
LogicalChannelConfig ::=
                              SEQUENCE {
   ul-SpecificParameters
                                  SEQUENCE {
      priority
                                  INTEGER (1..16),
      prioritisedBitRate
                                     ENUMERATED {
                                     kBps0, kBps8, kBps16, kBps32, kBps64, kBps128,
                                     kBps256, infinity, kBps512-v1020, kBps1024-v1020,
                                     kBps2048-v1020, spare5, spare4, spare3, spare2,
                                     spare1},
      bucketSizeDuration
                                     ENUMERATED {
                                     ms50, ms100, ms150, ms300, ms500, ms1000, spare2,
                                     spare1},
                                        INTEGER (0..3)
                                                              OPTIONAL
                                                                                -- Need OR
      logicalChannelGroup
   }
         OPTIONAL,
                                                                       -- Cond UL
                                                                 OPTIONAL
                                                                                -- Cond SRmask
   [[ logicalChannelSR-Mask-r9
                                     ENUMERATED {setup}
   ]]
-- ASN1STOP
```

LogicalChannelConfig field descriptions

bucketSizeDuration

Bucket Size Duration for logical channel prioritization in TS 36.321 [6]. Value in milliseconds. Value ms50 corresponds to 50 ms, ms100 corresponds to 100 ms and so on.

logicalChannelGroup

Mapping of logical channel to logical channel group for BSR reporting in TS 36.321 [6].

logicalChannelSR-Mask

Controlling SR triggering on a logical channel basis when an uplink grant is configured. See TS 36.321 [6].

prioritisedBitRate

Prioritized Bit Rate for logical channel prioritization in TS 36.321 [6]. Value in kilobytes/second. Value kBps0 corresponds to 0 kB/second, kBps8 corresponds to 8 kB/second, kBps16 corresponds to 16 kB/second and so on. Infinity is the only applicable value for SRB1 and SRB2

priority

Logical channel priority in TS 36.321 [6]. Value is an integer.

Conditional presence	Explanation	
SRmask	The field is optionally present if <i>ul-SpecificParameters</i> is present, need OR; otherwise it is	
	not present.	
UL	The field is mandatory present for UL logical channels; otherwise it is not present.	

MAC-MainConfig

The IE MAC-MainConfig is used to specify the MAC main configuration for signalling and data radio bearers.

MAC-MainConfig information element

```
-- ASN1START
MAC-MainConfig ::=
                                  SEQUENCE {
   ul-SCH-Config
                                 SEQUENCE {
      maxHARQ-Tx
                                        ENUMERATED {
                                     n1, n2, n3, n4, n5, n6, n7, n8,
                                     n10, n12, n16, n20, n24, n28,
                                                       OPTIONAL, -- Need ON
                                     spare2, spare1}
      periodicBSR-Timer
                                     ENUMERATED {
                                     sf5, sf10, sf16, sf20, sf32, sf40, sf64, sf80,
                                     sf128, sf160, sf320, sf640, sf1280, sf2560,
                                     infinity, spare1} OPTIONAL, -- Need ON
      retxBSR-Timer
                                     ENUMERATED {
                                     sf320, sf640, sf1280, sf2560, sf5120,
                                     sf10240, spare2, spare1},
      ttiBundling
                                     BOOLEAN
   }
                                                    OPTIONAL, -- Need ON
                                                          OPTIONAL, -- Need ON
   drx-Config
                                  DRX-Config
   timeAlignmentTimerDedicated
                                     TimeAlignmentTimer,
                                  CHOICE {
   phr-Config
                                  NULL,
      release
      setup
                                  SEQUENCE {
         periodicPHR-Timer
                                        ENUMERATED {sf10, sf20, sf50, sf100, sf200,
                                              sf500, sf1000, infinity},
         prohibitPHR-Timer
                                        ENUMERATED {sf0, sf10, sf20, sf50, sf100,
                                                 sf200, sf500, sf1000},
                                       ENUMERATED {dB1, dB3, dB6, infinity}
         dl-PathlossChange
   }
                                                    OPTIONAL, -- Need ON
   [[ sr-ProhibitTimer-r9
                                     INTEGER (0..7)
                                                          OPTIONAL -- Need ON
  ]],
   [[ mac-MainConfig-v1020
                                     SEQUENCE {
         sCellDeactivationTimer-r10
                                        ENUMERATED {
```

```
rf2, rf4, rf8, rf16, rf32, rf64, rf128,
                                                    OPTIONAL, -- Need OP
                                        spare}
         extendedBSR-Sizes-r10
                                        ENUMERATED {setup} OPTIONAL, -- Need OR
         extendedPHR-r10
                                                                       OPTIONAL -- Need OR
                                           ENUMERATED {setup}
                                                    OPTIONAL -- Need ON
      }
  ]],
  [[ stag-ToReleaseList-r11
                                     STAG-ToReleaseList-r11 OPTIONAL, -- Need ON
                                     STAG-ToAddModList-r11 OPTIONAL, -- Need ON
      stag-ToAddModList-r11
      drx-Config-v1130
                                     DRX-Config-v1130 OPTIONAL -- Need ON
  ]]
MAC-MainConfigSCell-r11 ::=
                                  SEQUENCE {
                                  STAG-Id-r11
  stag-Id-r11
                                                 OPTIONAL, -- Need OP
DRX-Config ::=
                               CHOICE {
   release
                               NULL,
                               SEQUENCE {
   setup
      onDurationTimer
                                     ENUMERATED {
                                     psf1, psf2, psf3, psf4, psf5, psf6,
                                     psf8, psf10, psf20, psf30, psf40,
                                     psf50, psf60, psf80, psf100,
                                     psf200},
      drx-InactivityTimer
                                     ENUMERATED {
                                     psf1, psf2, psf3, psf4, psf5, psf6,
                                     psf8, psf10, psf20, psf30, psf40,
                                     psf50, psf60, psf80, psf100,
                                     psf200, psf300, psf500, psf750,
                                     psf1280, psf1920, psf2560, psf0-v1020,
                                     spare9, spare8, spare7, spare6,
                                     spare5, spare4, spare3, spare2,
                                     spare1},
      drx-RetransmissionTimer
                                        ENUMERATED {
```

```
psf1, psf2, psf4, psf6, psf8, psf16,
                                     psf24, psf33},
      longDRX-CycleStartOffset
                                  CHOICE {
         sf10
                                  INTEGER(0..9),
         sf20
                                  INTEGER(0..19),
         sf32
                                  INTEGER(0..31),
         sf40
                                  INTEGER(0..39),
         sf64
                                  INTEGER(0..63),
         sf80
                                  INTEGER(0..79),
         sf128
                                  INTEGER(0..127),
         sf160
                                  INTEGER(0..159),
         sf256
                                  INTEGER(0..255),
         sf320
                                  INTEGER(0..319),
         sf512
                                  INTEGER(0..511),
         sf640
                                  INTEGER(0..639),
         sf1024
                                  INTEGER(0..1023),
         sf1280
                                  INTEGER(0..1279),
         sf2048
                                  INTEGER(0..2047),
         sf2560
                                  INTEGER(0..2559)
      },
      shortDRX
                                  SEQUENCE {
         shortDRX-Cycle
                                        ENUMERATED {
                                        sf2, sf5, sf8, sf10, sf16, sf20,
                                        sf32, sf40, sf64, sf80, sf128, sf160,
                                        sf256, sf320, sf512, sf640},
         drxShortCycleTimer
                                        INTEGER (1..16)
            OPTIONAL
                                                              -- Need OR
DRX-Config-v1130 ::=
                                  SEQUENCE {
   drx-RetransmissionTimer-v1130
                                        ENUMERATED {psf0-v1130} OPTIONAL, --Need OR
  longDRX-CycleStartOffset-v1130
                                        CHOICE {
      sf60-v1130
                                        INTEGER(0..59),
                                        INTEGER(0..69)
      sf70-v1130
```

MAC-MainConfig field descriptions

dl-PathlossChange

DL Pathloss Change and the change of the required power backoff due to power management (as allowed by P-MPRc [42]) for PHR reporting in TS 36.321 [6]. Value in dB. Value dB1 corresponds to 1 dB, dB3 corresponds to 3 dB and so on. The same value applies for each serving cell (although the associated functionality is performed independently for each cell).

drx-Config

Used to configure DRX as specified in TS 36.321 [6]. E-UTRAN configures the values in *DRX-Config-v1130* only if the UE indicates support for IDC indication. E-UTRAN configures *drx-Config-v1130* only if *drx-Config* (without suffix) is configured.

drx-InactivityTimer

Timer for DRX in TS 36.321 [6]. Value in number of PDCCH sub-frames. Value psf1 corresponds to 1 PDCCH sub-frame, psf2 corresponds to 2 PDCCH sub-frames and so on.

drx-RetransmissionTimer

Timer for DRX in TS 36.321 [6]. Value in number of PDCCH sub-frames. Value psf1 corresponds to 1 PDCCH sub-frame, psf2 corresponds to 2 PDCCH sub-frames and so on. In case *drx-RetransmissionTimer-v1130* is signalled, the UE shall ignore *drx-RetransmissionTimer* (i.e. without suffix).

drxShortCycleTimer

Timer for DRX in TS 36.321 [6]. Value in multiples of shortDRX-Cycle. A value of 1 corresponds to shortDRX-Cycle, a value of 2 corresponds to 2 * shortDRX-Cycle and so on.

extendedBSR-Sizes

If value setup is configured, the BSR index indicates extended BSR size levels as defined in TS 36.321 [6, Table 6.1.3.1-2].

extendedPHR

Indicates if power headroom shall be reported using the Extended Power Headroom Report MAC control element defined in TS 36.321 [6] (value setup). Otherwise the power headroom shall be reported using the Power Headroom Report MAC control element defined in TS 36.321 [6]. E-UTRAN always configures the value setup if more than one Serving Cell with uplink is configured. E-UTRAN configures extendedPHR only if phr-Config is configured. The UE shall release extendedPHR if phr-Config is released.

IongDRX-CycleStartOffset

longDRX-Cycle and drxStartOffset in TS 36.321 [6]. The value of longDRX-Cycle is in number of sub-frames. Value sf10 corresponds to 10 sub-frames, sf20 corresponds to 20 sub-frames and so on. If shortDRX-Cycle is configured, the value of longDRX-Cycle shall be a multiple of the shortDRX-Cycle value. The value of drxStartOffset value is in number of sub-frames. In case longDRX-CycleStartOffset-v1130 is signalled, the UE shall ignore longDRX-CycleStartOffset (i.e. without suffix).

maxHARQ-Tx

Maximum number of transmissions for UL HARQ in TS 36.321 [6].

onDurationTimer

Timer for DRX in TS 36.321 [6]. Value in number of PDCCH sub-frames. Value psf1 corresponds to 1 PDCCH sub-frame, psf2 corresponds to 2 PDCCH sub-frames and so on.

periodicBSR-Timer

Timer for BSR reporting in TS 36.321 [6]. Value in number of sub-frames. Value sf10 corresponds to 10 sub-frames, sf20 corresponds to 20 sub-frames and so on.

periodicPHR-Timer

Timer for PHR reporting in TS 36.321 [6]. Value in number of sub-frames. Value sf10 corresponds to 10 subframes, sf20 corresponds to 20 subframes and so on.

prohibitPHR-Timer

Timer for PHR reporting in TS 36.321 [6]. Value in number of sub-frames. Value sf0 corresponds to 0 subframes, sf100 corresponds to 100 subframes and so on.

retxBSR-Timer

Timer for BSR reporting in TS 36.321 [6]. Value in number of sub-frames. Value sf640 corresponds to 640 sub-frames, sf1280 corresponds to 1280 sub-frames and so on.

sCellDeactivationTimer

SCell deactivation timer in TS 36.321 [6]. Value in number of radio frames. Value rf4 corresponds to 4 radio frames, value rf8 corresponds to 8 radio frames and so on. E-UTRAN only configures the field if the UE is configured with one or more SCells. If the field is absent, the UE shall delete any existing value for this field and assume the value to be set to *infinity*. The same value applies for each SCell (although the associated functionality is performed independently for each SCell).

shortDRX-Cycle

Short DRX cycle in TS 36.321 [6]. Value in number of sub-frames. Value sf2 corresponds to 2 sub-frames, sf5 corresponds to 5 subframes and so on. In case *shortDRX-Cycle-v1130* is signalled, the UE shall ignore *shortDRX-Cycle* (i.e. without suffix).

sr-ProhibitTimer

Timer for SR transmission on PUCCH in TS 36.321 [6]. Value in number of SR period(s). Value 0 means no timer for SR transmission on PUCCH is configured. Value 1 corresponds to one SR period, Value 2 corresponds to 2*SR periods and so on. SR period is defined in TS 36.213 [23, table 10.1.5-1].

MAC-MainConfig field descriptions

stag-Id

Indicates the TAG of an SCell, see TS 36.321 [6]. If the field is not configured for an SCell (e.g. absent in *MAC-MainConfigSCell*), the SCell is part of the PTAG.

stag-ToAddModList, stag-ToReleaseList

Used to configure one or more STAGs. E-UTRAN ensures that a STAG contains at least one SCell with configured uplink. If, due to SCell release a reconfiguration would result in an "empty" TAG, E-UTRAN includes release of the concerned TAG.

timeAlignmentTimerSTAG

Indicates the value of the time alignment timer for an STAG, see TS 36.321 [6].

ttiBundlina

TRUE indicates that TTI bundling TS 36.321 [6] is enabled while FALSE indicates that TTI bundling is disabled. TTI bundling can be enabled for FDD and for TDD only for configurations 0, 1 and 6. For TDD, E-UTRAN does not simultaneously enable TTI bundling and semi-persistent scheduling in this release of specification. Furthermore, E-UTRAN does not simultaneously configure TTI bundling and SCells with configured uplink.

– PDCP-Config

The IE *PDCP-Config* is used to set the configurable PDCP parameters for data radio bearers.

PDCP-Config information element

```
-- ASN1START
PDCP-Config ::=
                             SEQUENCE {
  discardTimer
                             ENUMERATED {
                                ms50, ms100, ms150, ms300, ms500,
                                ms750, ms1500, infinity
                                               OPTIONAL,
   }
                                                                -- Cond Setup
  rlc-AM
                                SEQUENCE {
     statusReportRequired
                                   BOOLEAN
   }
                                               OPTIONAL,
                                                                -- Cond Rlc-AM
   rlc-UM
                                SEQUENCE {
                                ENUMERATED {len7bits, len12bits}
      pdcp-SN-Size
                                               OPTIONAL,
                                                                -- Cond Rlc-UM
   }
  headerCompression
                                CHOICE {
     notUsed
                                   NULL,
                                SEQUENCE {
      rohe
         maxCID
                                      INTEGER (1..16383)
                                                                   DEFAULT 15,
                                   SEQUENCE {
         profiles
           profile0x0001
                                      BOOLEAN,
           profile0x0002
                                      BOOLEAN,
           profile0x0003
                                      BOOLEAN,
           profile0x0004
                                      BOOLEAN,
           profile0x0006
                                      BOOLEAN,
```

```
profile0x0101
                                      BOOLEAN,
           profile0x0102
                                      BOOLEAN,
           profile0x0103
                                      BOOLEAN,
           profile0x0104
                                      BOOLEAN
        },
  },
  ...,
  [[ rn-IntegrityProtection-r10
                                ENUMERATED {enabled} OPTIONAL -- Cond RN
  ]],
                                ENUMERATED {len15bits} OPTIONAL -- Cond Rlc-AM2
  [[ pdcp-SN-Size-v1130
  11
-- ASN1STOP
```

PDCP-Config field descriptions

discardTimer

Indicates the discard timer value specified in TS 36.323 [8]. Value in milliseconds. Value ms50 means 50 ms, ms100 means 100 ms and so on.

maxCID

Indicates the value of the MAX_CID parameter as specified in TS 36.323 [8]. The total value of MAX_CIDs across all bearers for the UE should be less than or equal to the value of *maxNumberROHC-ContextSessions* parameter as indicated by the UE.

pdcp-SN-Size

Indicates the PDCP Sequence Number length in bits. For RLC UM: value *len7bits* means that the 7-bit PDCP SN format is used and *len12bits* means that the 12-bit PDCP SN format is used. For RLC AM: value *len15bits* means that the 15-bit PDCP SN format is used, otherwise if the field is not included upon setup of the PCDP entity 12-bit PDCP SN format is used, as specified in TS 36.323 [8].

profiles

The profiles used by both compressor and decompressor in both UE and E-UTRAN. The field indicates which of the ROHC profiles specified in TS 36.323 [8] are supported, i.e. value *true* indicates that the profile is supported. Profile 0x0000 shall always be supported when the use of ROHC is configured. If support of two ROHC profile identifiers with the same 8 LSB"s is signalled, only the profile corresponding to the highest value shall be applied.

rn-IntegrityProtection

Indicates that integrity protection or verification shall be applied for all subsequent packets received and sent by the RN on the DRB.

statusReportRequired

Indicates whether or not the UE shall send a PDCP Status Report upon re-establishment of the PDCP entity as specified in TS 36.323 [8].

Conditional presence	Explanation
Ric-AM	The field is mandatory present upon setup of a PDCP entity for a radio bearer configured with RLC AM. The field is optional, need ON, in case of reconfiguration of a PDCP entity at handover for a radio bearer configured with RLC AM. Otherwise the field is not present.
RIc-AM2	The field is optionally present, need OP, upon setup of a PDCP entity for a radio bearer configured with RLC AM. Otherwise the field is not present.
Ric-UM	The field is mandatory present upon setup of a PDCP entity for a radio bearer configured with RLC UM. Otherwise the field is not present.
RN	The field is optionally present when signalled to the RN, need OR. Otherwise the field is not present.
Setup	The field is mandatory present in case of radio bearer setup. Otherwise the field is optionally present, need ON.

– PDSCH-Config

The IE *PDSCH-ConfigCommon* and the IE *PDSCH-ConfigDedicated* are used to specify the common and the UE specific PDSCH configuration respectively.

PDSCH-Config information element

```
-- ASN1START
PDSCH-ConfigCommon ::=
                            SEQUENCE {
  referenceSignalPower
                               INTEGER (-60..50),
  p-b
                             INTEGER (0..3)
PDSCH-ConfigDedicated::=
                            SEQUENCE {
                             ENUMERATED {
  p-a
                               dB-6, dB-4dot77, dB-3, dB-1dot77,
                               dB0, dB1, dB2, dB3}
PDSCH-ConfigDedicated-v1130 ::=
                                  SEQUENCE {
  dmrs-ConfigPDSCH-r11
                                                               OPTIONAL, -- Need ON
                                  DMRS-Config-r11
  qcl-Operation
                             ENUMERATED {typeA, typeB}
                                                               OPTIONAL, -- Need OR
  re-MappingQCLConfigToReleaseList-r11 RE-MappingQCLConfigToReleaseList-r11 OPTIONAL, -- Need ON
  re-MappingQCLConfigToAddModList-r11
                                           RE-MappingQCLConfigToAddModList-r11
                                                                                    OPTIONAL --
Need ON
}
```

```
RE-MappingQCLConfigToAddModList-r11 ::=
                                            SEQUENCE (SIZE (1..maxRE-MapQCL-r11)) OF PDSCH-RE-
MappingQCL-Config-r11
RE-MappingQCLConfigToReleaseList-r11 ::= SEQUENCE (SIZE (1..maxRE-MapQCL-r11)) OF PDSCH-RE-
MappingQCL-ConfigId-r11
PDSCH-RE-MappingQCL-Config-r11 ::=
                                      SEQUENCE {
  pdsch-RE-MappingQCL-ConfigId-r11 PDSCH-RE-MappingQCL-ConfigId-r11,
  optionalSetOfFields-r11
                                SEQUENCE {
     crs-PortsCount-r11
                                   ENUMERATED {n1, n2, n4, spare1},
     crs-FreqShift-r11
                                INTEGER (0..5),
     mbsfn-SubframeConfigList-r11
                                   CHOICE {
                                   NULL,
        release
                                   SEQUENCE {
         setup
            subframeConfigList
                                         MBSFN-SubframeConfigList
                                                        OPTIONAL, -- Need ON
     pdsch-Start-r11
                                   ENUMERATED {reserved, n1, n2, n3, n4, assigned}
   }
                                                        OPTIONAL, -- Need OP
  csi-RS-ConfigZPId-r11
                                CSI-RS-ConfigZPId-r11,
  qcl-CSI-RS-ConfigNZPId-r11
                                   CSI-RS-ConfigNZPId-r11
                                                                    OPTIONAL, -- Need OR
-- ASN1STOP
```

PDSCH-Config field descriptions

optionalSetOfFields

If absent, the UE releases the configuration provided previously, if any, and applies the values from the serving cell configured on the same frequency.

р-а

Parameter: P_A , see TS 36.213 [23, 5.2]. Value dB-6 corresponds to -6 dB, dB-4dot77 corresponds to -4.77 dB etc.

p-b

Parameter: P_B , see TS 36.213 [23, Table 5.2-1].

pdsch-Start

The starting OFDM symbol of PDSCH for the concerned serving cell, see TS 36.213 [23. 7.1.6.4]. Values 1, 2, 3 are applicable when *dl-Bandwidth* for the concerned serving cell is greater than 10 resource blocks, values 2, 3, 4 are applicable when *dl-Bandwidth* for the concerned serving cell is less than or equal to 10 resource blocks, see TS 36.211 [21, Table 6.7-1]. Value *n1* corresponds to 1, value *n2* corresponds to 2 and so on.

qcl-CSI-RS-ConfigNZPId

Indicates the CSI-RS resource that is quasi co-located with the PDSCH antenna ports, see TS 36.213 [23, 7.1.9]. E-UTRAN configures this field if and only if the UE is configured with *qcl-Operation* set to *typeB*.

qcl-Operation

Indicates the quasi co-location behaviour to be used by the UE, type A and type B, as described in TS 36.213 [23, 7.1.10].

referenceSignalPower

Parameter: Reference-signal power, which provides the downlink reference-signal EPRE, see TS 36.213 [23, 5.2]. The actual value in dBm.

re-MappingQCLConfigToAddModList, re-MappingQCLConfigToReleaseList

For a serving frequency E-UTRAN configures at least one *PDSCH-RE-MappingQCL-Config* when transmission mode 10 is configured for the serving cell on this carrier frequency. Otherwise it does not configure this IE.

PDSCH-RE-MappingQCL-Configld

The IE *PDSCH-RE-MappingQCL-ConfigId* is used to identify a set of PDSCH parameters related to resource element mapping and quasi co-location, as configured by the IE *PDSCH-RE-MappingQCL-Config*. The identity is unique within the scope of a carrier frequency.

PDSCH-RE-MappingQCL-Configld information elements

```
-- ASN1START

PDSCH-RE-MappingQCL-ConfigId-r11 ::= INTEGER (1..maxRE-MapQCL-r11)

-- ASN1STOP
```

PHICH-Config

The IE *PHICH-Config* is used to specify the PHICH configuration.

PHICH-Config information element

```
-- ASN1START

PHICH-Config ::= SEQUENCE {
    phich-Duration ENUMERATED {normal, extended},
    phich-Resource ENUMERATED {oneSixth, half, one, two}
}
```

-- ASN1STOP

PHICH-Config field descriptions	
phich-Duration	
Parameter: PHICH-Duration, see TS 36.211 [21, Table 6.9.3-1].	
phich-Resource	
Parameter: Ng, see TS 36.211 [21, 6.9]. Value oneSixth corresponds to 1/6, half corresponds to 1/2 and so on.	

PhysicalConfigDedicated

The IE PhysicalConfigDedicated is used to specify the UE specific physical channel configuration.

PhysicalConfigDedicated information element

ASN1START	
PhysicalConfigDedicated ::=	SEQUENCE {
pdsch-ConfigDedicated	PDSCH-ConfigDedicated OPTIONAL, Need ON
pucch-ConfigDedicated	PUCCH-ConfigDedicated OPTIONAL, Need ON
pusch-ConfigDedicated	PUSCH-ConfigDedicated OPTIONAL, Need ON
uplinkPowerControlDedicated	UplinkPowerControlDedicated OPTIONAL, Need ON
tpc-PDCCH-ConfigPUCCH	TPC-PDCCH-Config OPTIONAL, Need ON
tpc-PDCCH-ConfigPUSCH	TPC-PDCCH-Config OPTIONAL, Need ON
cqi-ReportConfig	CQI-ReportConfig OPTIONAL, Cond CQI-r8
soundingRS-UL-ConfigDedica	ted SoundingRS-UL-ConfigDedicated OPTIONAL, Need ON
antennaInfo	CHOICE {
explicitValue	AntennaInfoDedicated,
defaultValue	NULL
} OPTIONAL,	Cond AI-r8
schedulingRequestConfig	SchedulingRequestConfig OPTIONAL, Need ON
,	
[[cqi-ReportConfig-v920	CQI-ReportConfig-v920 OPTIONAL, Cond CQI-r8
antennaInfo-v920	AntennaInfoDedicated-v920 OPTIONAL Cond AI-r8
]],	
[[antennaInfo-r10	CHOICE {
explicitValue-r10	AntennaInfoDedicated-r10,
defaultValue	NULL
} OPTIONAL,	Cond AI-r10
antennaInfoUL-r10	AntennaInfoUL-r10 OPTIONAL, Need ON

```
cif-Presence-r10
                              BOOLEAN
                                                            OPTIONAL, -- Need ON
      cqi-ReportConfig-r10
                                 CQI-ReportConfig-r10
                                                            OPTIONAL,
                                                                          -- Cond CQI-r10
      csi-RS-Config-r10
                                 CSI-RS-Config-r10
                                                            OPTIONAL,
                                                                          -- Need ON
      pucch-ConfigDedicated-v1020
                                    PUCCH-ConfigDedicated-v1020
                                                                    OPTIONAL,
                                                                                   -- Need ON
      pusch-ConfigDedicated-v1020
                                   PUSCH-ConfigDedicated-v1020
                                                                    OPTIONAL,
                                                                                   -- Need ON
      schedulingRequestConfig-v1020 SchedulingRequestConfig-v1020 OPTIONAL,
      soundingRS-UL-ConfigDedicated-v1020
                        SoundingRS-UL-ConfigDedicated-v1020
                                                              OPTIONAL,
                                                                             -- Need ON
      soundingRS-UL-ConfigDedicatedAperiodic-r10
                        SoundingRS-UL-ConfigDedicatedAperiodic-r10 OPTIONAL, -- Need ON
      uplinkPowerControlDedicated-v1020 UplinkPowerControlDedicated-v1020 OPTIONAL -- Need ON
  ]],
   [[ additionalSpectrumEmissionCA-r10
                                             CHOICE {
         release
                                      NULL.
                                      SEQUENCE {
         setup
            additionalSpectrumEmissionPCell-r10 AdditionalSpectrumEmission
         }
               OPTIONAL -- Need ON
  ]],
   [[ -- DL configuration as well as configuration applicable for DL and UL
      csi-RS-ConfigNZPToReleaseList-r11 CSI-RS-ConfigNZPToReleaseList-r11 OPTIONAL, -- Need ON
      csi-RS-ConfigNZPToAddModList-r11CSI-RS-ConfigNZPToAddModList-r11 OPTIONAL, -- Need ON
      csi-RS-ConfigZPToReleaseList-r11 CSI-RS-ConfigZPToReleaseList-r11 OPTIONAL, -- Need ON
                                         CSI-RS-ConfigZPToAddModList-r11 OPTIONAL, -- Need ON
      csi-RS-ConfigZPToAddModList-r11
                                    EPDCCH-Config-r11
                                                                 OPTIONAL, -- Need ON
      epdcch-Config-r11
      pdsch-ConfigDedicated-v1130
                                       PDSCH-ConfigDedicated-v1130
                                                                       OPTIONAL, -- Need ON
   -- UL configuration
      cqi-ReportConfig-v1130
                                    CQI-ReportConfig-v1130
                                                                 OPTIONAL, -- Need ON
                                       PUCCH-ConfigDedicated-v1130
                                                                       OPTIONAL, -- Need ON
      pucch-ConfigDedicated-v1130
      pusch-ConfigDedicated-v1130
                                       PUSCH-ConfigDedicated-v1130
                                                                       OPTIONAL, -- Need ON
      uplinkPowerControlDedicated-v1130 UplinkPowerControlDedicated-v1130 OPTIONAL -- Need ON
   ]]
PhysicalConfigDedicatedSCell-r10 ::= SEQUENCE {
```

```
-- DL configuration as well as configuration applicable for DL and UL
nonUL-Configuration-r10
                                    SEQUENCE {
                                    AntennaInfoDedicated-r10 OPTIONAL, -- Need ON
   antennaInfo-r10
   crossCarrierSchedulingConfig-r10
                                    CrossCarrierSchedulingConfig-r10 OPTIONAL, -- Need ON
   csi-RS-Config-r10
                                    CSI-RS-Config-r10
                                                            OPTIONAL, -- Need ON
   pdsch-ConfigDedicated-r10
                                    PDSCH-ConfigDedicated
                                                               OPTIONAL -- Need ON
                                                OPTIONAL, -- Cond SCellAdd
}
-- UL configuration
ul-Configuration-r10
                              SEQUENCE {
   antennaInfoUL-r10
                                    AntennaInfoUL-r10
                                                            OPTIONAL, -- Need ON
   pusch-ConfigDedicatedSCell-r10
                                       PUSCH-ConfigDedicatedSCell-r10
                                                                           OPTIONAL, -- Need ON
   uplinkPowerControlDedicatedSCell-r10 UplinkPowerControlDedicatedSCell-r10 OPTIONAL, -- Need ON
   cqi-ReportConfigSCell-r10
                                    CQI-ReportConfigSCell-r10 OPTIONAL, -- Need ON
                                       SoundingRS-UL-ConfigDedicated OPTIONAL, -- Need ON
   soundingRS-UL-ConfigDedicated-r10
   soundingRS-UL-ConfigDedicated-v1020
                     SoundingRS-UL-ConfigDedicated-v1020 OPTIONAL,
                                                                        -- Need ON
   soundingRS-UL-ConfigDedicatedAperiodic-r10
                     SoundingRS-UL-ConfigDedicatedAperiodic-r10 OPTIONAL -- Need ON
}
                                                   OPTIONAL, -- Cond CommonUL
[[ -- DL configuration as well as configuration applicable for DL and UL
   csi-RS-ConfigNZPToReleaseList-r11 CSI-RS-ConfigNZPToReleaseList-r11OPTIONAL, -- Need ON
   csi-RS-ConfigNZPToAddModList-r11CSI-RS-ConfigNZPToAddModList-r11 OPTIONAL, -- Need ON
   csi-RS-ConfigZPToReleaseList-r11 CSI-RS-ConfigZPToReleaseList-r11 OPTIONAL, -- Need ON
                                       CSI-RS-ConfigZPToAddModList-r11 OPTIONAL, -- Need ON
   csi-RS-ConfigZPToAddModList-r11
   epdcch-Config-r11
                                 EPDCCH-Config-r11
                                                               OPTIONAL, -- Need ON
   pdsch-ConfigDedicated-v1130
                                    PDSCH-ConfigDedicated-v1130
                                                                     OPTIONAL, -- Need ON
-- UL configuration
   cqi-ReportConfig-v1130
                                 CQI-ReportConfig-v1130
                                                               OPTIONAL, -- Need ON
   pusch-ConfigDedicated-v1130
                                       PUSCH-ConfigDedicated-v1130 OPTIONAL, -- Need ON
   uplinkPowerControlDedicatedSCell-v1130 UplinkPowerControlDedicated-v1130 OPTIONAL -- Need ON
]]
```

 $CSI-RS-ConfigNZPToAddModList-r11 ::= \quad SEQUENCE \ (SIZE \ (1..maxCSI-RS-NZP-r11)) \ OF \ CSI-RS-ConfigNZP-r11$

CSI-RS-ConfigNZPToReleaseList-r11 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-r11)) OF CSI-RS-ConfigNZPId-r11

CSI-RS-ConfigZPToAddModList-r11 ::= SEQUENCE (SIZE (1..maxCSI-RS-ZP-r11)) OF CSI-RS-ConfigZP-r11

CSI-RS-ConfigZPToReleaseList-r11 ::= SEQUENCE (SIZE (1..maxCSI-RS-ZP-r11)) OF CSI-RS-ConfigZPId-r11

-- ASN1STOP

PhysicalConfigDedicated field descriptions

additionalSpectrumEmissionPCell

The UE requirements related to IE *AdditionalSpectrumEmissionPCell* are defined in TS 36.101 [42]. EUTRAN does not configure *AdditionalSpectrumEmissionPCell* if there are no other serving cells configured. E-UTRAN does not configure the field in case of contiguous intra-band carrier aggregation.

antennalnfo

A choice is used to indicate whether the *antennalnfo* is signalled explicitly or set to the default antenna configuration as specified in section 9.2.4.

csi-RS-Config

For a serving frequency E-UTRAN does not configure *csi-RS-Config* (includes *zeroTxPowerCSI-RS*) when transmission mode 10 is configured for the serving cell on this carrier frequency.

csi-RS-ConfigNZPToAddModList

For a serving frequency E-UTRAN configures one or more *CSI-RS-ConfigNZP* only when transmission mode 10 is configured for the serving cell on this carrier frequency. EUTRAN configures a maximum of one *CSI-RS-ConfigNZP* for a serving frequency on which the UE supports only one CSI process (i.e. *supportedCSI-Proc* is indicated as *n1*).

csi-RS-ConfigZPToAddModList

For a serving frequency E-UTRAN configures one or more *CSI-RS-ConfigZP* only when transmission mode 10 is configured for the serving cell on this carrier frequency.

epdcch-Config

indicates the *EPDCCH-Config* for the cell. E-UTRAN does not configure *EPDCCH-Config* for an SCell that is configured with value *other* for *schedulingCellInfo* in *CrossCarrierSchedulingConfig*.

pdsch-ConfigDedicated-v1130

For a serving frequency E-UTRAN configures *pdsch-ConfigDedicated-v1130* only when transmission mode 10 is configured for the serving cell on this carrier frequency.

tpc-PDCCH-ConfigPUCCH

PDCCH configuration for power control of PUCCH using format 3/3A, see TS 36.212 [22].

tpc-PDCCH-ConfiaPUSCH

PDCCH configuration for power control of PUSCH using format 3/3A, see TS 36.212 [22].

uplinkPowerControlDedicated

E-UTRAN configures *uplinkPowerControlDedicated-v1130* only if *uplinkPowerControlDedicated* (without suffix) is configured.

uplinkPowerControlDedicatedSCell

E-UTRAN configures *uplinkPowerControlDedicatedSCell-v1130* only if *uplinkPowerControlDedicatedSCell-r10* is configured for this serving cell.

Conditional presence	Explanation
AI-r8	The field is optionally present, need ON, if antennalnfoDedicated-r10 is absent. Otherwise
	the field is not present
AI-r10	The field is optionally present, need ON, if antennalnfoDedicated is absent. Otherwise the
	field is not present
CommonUL	The field is mandatory present if <i>ul-Configuration</i> of <i>RadioResourceConfigCommonSCell-</i>
	r10 is present; otherwise it is optional, need ON.
CQI-r8	The field is optionally present, need ON, if cqi-ReportConfig-r10 is absent. Otherwise the
	field is not present
CQI-r10	The field is optionally present, need ON, if cqi-ReportConfig is absent. Otherwise the field
	is not present
SCellAdd	The field is mandatory present if <i>cellIdentification</i> is present; otherwise it is optional, need
	ON.

NOTE 1: During handover, the UE performs a MAC reset, which involves reverting to the default CQI/ SRS/ SR configuration in accordance with subclause 5.3.13 and TS 36.321 [6, 5.9 & 5.2]. Hence, for these parts of the dedicated radio resource configuration, the default configuration (rather than the configuration used in the source PCell) is used as the basis for the delta signalling that is included in the message used to perform handover.

NOTE 2: Since delta signalling is not supported for the common SCell configuration, E-UTRAN can only add or release the uplink of an SCell by releasing and adding the concerned SCell.

P-Max

The IE P-Max is used to limit the UE's uplink transmission power on a carrier frequency and is used to calculate the parameter P-C or P-C or C or C

P-Max information element

```
-- ASN1START

P-Max ::= INTEGER (-30..33)

-- ASN1STOP
```

PRACH-Config

The IE *PRACH-ConfigSIB* and IE *PRACH-Config* are used to specify the PRACH configuration in the system information and in the mobility control information, respectively.

PRACH-Config information elements

```
-- ASN1START

PRACH-ConfigSIB ::= SEQUENCE {
  rootSequenceIndex INTEGER (0..837),
  prach-ConfigInfo PRACH-ConfigInfo
}
```

```
PRACH-Config ::=
                              SEQUENCE {
  rootSequenceIndex
                                 INTEGER (0..837),
                                                            OPTIONAL -- Need ON
   prach-ConfigInfo
                              PRACH-ConfigInfo
}
PRACH-ConfigSCell-r10 ::=
                                    SEQUENCE {
   prach-ConfigIndex-r10
                                    INTEGER (0..63)
}
PRACH-ConfigInfo ::=
                              SEQUENCE {
                                 INTEGER (0..63),
   prach-ConfigIndex
  highSpeedFlag
                                 BOOLEAN,
  zeroCorrelationZoneConfig
                                 INTEGER (0..15),
  prach-FreqOffset
                              INTEGER (0..94)
-- ASN1STOP
```

PRACH-Config field descriptions

highSpeedFlag

Parameter: High-speed-flag, see TS 36.211, [21, 5.7.2].TRUE corresponds to Restricted set and FALSE to Unrestricted set.

prach-ConfigIndex

Parameter: prach-ConfigurationIndex, see TS 36.211 [21, 5.7.1].

prach-FreqOffset

Parameter: prach-FrequencyOffset, see TS 36.211, [21, 5.7.1]. For TDD the value range is dependent on the value of prach-ConfigIndex.

rootSequenceIndex

Parameter: RACH_ROOT_SEQUENCE, see TS 36.211 [21, 5.7.1].

zeroCorrelationZoneConfig

Parameter: N_{CS} configuration, see TS 36.211, [21, 5.7.2: table 5.7.2-2] for preamble format 0..3 and TS 36.211, [21, 5.7.2: table 5.7.2-3] for preamble format 4.

PresenceAntennaPort1

The IE *PresenceAntennaPort1* is used to indicate whether all the neighbouring cells use Antenna Port 1. When set to *TRUE*, the UE may assume that at least two cell-specific antenna ports are used in all neighbouring cells.

PresenceAntennaPort1 information element

-- ASN1START PresenceAntennaPort1 ::= BOOLEAN

-- ASN1STOP

PUCCH-Config

The IE *PUCCH-ConfigCommon* and IE *PUCCH-ConfigDedicated* are used to specify the common and the UE specific PUCCH configuration respectively.

PUCCH-Config information elements

```
-- ASN1START
PUCCH-ConfigCommon ::=
                                  SEQUENCE {
                               ENUMERATED {ds1, ds2, ds3},
  deltaPUCCH-Shift
  nRB-CQI
                               INTEGER (0..98),
  nCS-AN
                               INTEGER (0..7),
  n1PUCCH-AN
                                  INTEGER (0..2047)
PUCCH-ConfigDedicated ::=
                               SEQUENCE {
   ackNackRepetition
                               CHOICE{
     release
                               NULL,
     setup
                               SEQUENCE {
        repetitionFactor
                                  ENUMERATED {n2, n4, n6, spare1},
        n1PUCCH-AN-Rep
                                        INTEGER (0..2047)
     }
   },
  tdd-AckNackFeedbackMode
                                     ENUMERATED {bundling, multiplexing} OPTIONAL -- Cond TDD
PUCCH-ConfigDedicated-v1020 ::=
                                  SEQUENCE {
  pucch-Format-r10
                               CHOICE {
     format3-r10
                                     SEQUENCE {
        n3PUCCH-AN-List-r10 SEQUENCE (SIZE (1..4)) OF INTEGER (0..549) OPTIONAL, -- Need ON
        twoAntennaPortActivatedPUCCH-Format3-r10
                                                    CHOICE {
           release
                                              NULL,
                                              SEQUENCE {
           setup
              n3PUCCH-AN-ListP1-r10 SEQUENCE (SIZE (1..4)) OF INTEGER (0..549)
```

```
OPTIONAL -- Need ON
     },
     channelSelection-r10
                             SEQUENCE {
        n1PUCCH-AN-CS-r10
                                      CHOICE {
                                   NULL,
          release
          setup
                                   SEQUENCE {
             n1PUCCH-AN-CS-List-r10
                                           SEQUENCE (SIZE (1..2)) OF N1PUCCH-AN-CS-r10
          }
                                                   OPTIONAL -- Need ON
     }
                                                   OPTIONAL, -- Need OR
  }
  twoAntennaPortActivatedPUCCH-Format1a1b-r10 ENUMERATED {true} OPTIONAL, -- Need OR
  simultaneousPUCCH-PUSCH-r10
                                         ENUMERATED {true} OPTIONAL, -- Need OR
  n1PUCCH-AN-RepP1-r10
                                       INTEGER (0..2047) OPTIONAL -- Need OR
PUCCH-ConfigDedicated-v1130 ::= SEQUENCE {
  n1PUCCH-AN-CS-v1130
                                   CHOICE {
     release
                             NULL,
                             SEQUENCE {
     setup
        n1PUCCH-AN-CS-ListP1-r11 SEQUENCE (SIZE (2..4)) OF INTEGER (0..2047)
     }
                                                   OPTIONAL, -- Need ON
  }
  nPUCCH-Param-r11
                             CHOICE {
                             NULL,
     release
                             SEQUENCE {
     setup
                                      INTEGER (0..503),
        nPUCCH-Identity-r11
       n1PUCCH-AN-r11
                                     INTEGER (0..2047)
     }
  }
                                                   OPTIONAL -- Need ON
N1PUCCH-AN-CS-r10 ::= SEQUENCE (SIZE (1..4)) OF INTEGER (0..2047)
-- ASN1STOP
```

PUCCH-Config field descriptions

ackNackRepetition

Parameter indicates whether ACK/NACK repetition is configured, see TS 36.213 [23, 10.1].

deltaPUCCH-Shift

Parameter: $\frac{\Delta^{PUCCH}_{shift}}{\Delta^{PUCCH}_{shift}}$, see 36.211 [21, 5.4.1], where ds1 corresponds to value 1 ds2 to 2 etc.

n1PUCCH-AN

Parameter: $N_{\it PUCCH}^{(1)}$, see TS 36.213 [23, 10.1].

n1PUCCH-AN-r11 indicates UE-specific PUCCH AN resource offset, see TS 36.213 [23, 10.1].

n1PUCCH-AN-CS-List

Parameter: $n_{\mathrm{PUCCH},j}^{(1)}$ for antenna port p_0 for PUCCH format 1b with channel selection, see TS 36.213 [23,

10.1.2.2.1, 10.1.3.2.1].

n1PUCCH-AN-CS-ListP1

Parameter: $n_{\text{PUCCH}, i}^{(1, \tilde{p}_1)}$ for antenna port p_1 for PUCCH format 1b with channel selection, see TS 36.213 [23, 10.1]. E-

UTRAN configures this field only when pucch-Format is set to channelSelection.

n1PUCCH-AN-Rep, n1PUCCH-AN-RepP1

Parameter: $n_{\text{PUCCH.ANRep}}^{(1,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23, 10.1].

n3PUCCH-AN-List. n3PUCCH-AN-ListP1

Parameter: $n_{\text{PLICCH}}^{(3,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23, 10.1].

nCS-An

Parameter: $N_{cs}^{(1)}$ see TS 36.211 [21, 5.4].

nPUCCH-Identity

Parameter: $n_{\mathrm{ID}}^{\mathrm{PUCCH}}$, see TS 36.211 [21, 5.5.1.5].

nRB-CQI

Parameter: $N_{RR}^{(2)}$, see TS 36.211 [21, 5.4].

pucch-Format

Parameter indicates one of the PUCCH formats for transmission of HARQ-ACK, see TS 36.213 [23, 10.1]. For TDD, if the UE is configured with PCell only, the channelSelection indicates the transmission of HARQ-ACK multiplexing as defined in Tables 10.1.3-5, 10.1.3-6, and 10.1.3-7 in TS 36.213 [23] for PUCCH, and in 7.3 in TS 36.213 [23] for PUSCH.

repetitionFactor

Parameter N_{ANRep} see TS 36.213 [23, 10.1] where n2 corresponds to repetition factor 2, n4 to 4.

simultaneousPUCCH-PUSCH

Parameter indicates whether simultaneous PUCCH and PUSCH transmissions is configured, see TS 36.213 [23, 10.1 and 5.1.1]. E-UTRAN configures this field, only when the nonContiguousUL-RA-WithinCC-Info is set to supported in the band on which PCell is configured.

tdd-AckNackFeedbackMode

Parameter indicates one of the TDD ACK/NACK feedback modes used, see TS 36.213 [23, 7.3 and 10.1.3]. The value bundling corresponds to use of ACK/NACK bundling whereas, the value multiplexing corresponds to ACK/NACK multiplexing as defined in Tables 10.1.3-2, 10.1.3-3, and 10.1.3-4 in TS 36.213 [23]. The same value applies to both ACK/NACK feedback modes on PUCCH as well as on PUSCH.

twoAntennaPortActivatedPUCCH-Format1a1b

Indicates whether two antenna ports are configured for PUCCH format 1a/1b for HARQ-ACK, see TS 36.213 [23, 10.1]. The field also applies for PUCCH format 1a/1b transmission when format3 is configured, see TS 36.213 [23, 10.1.2.2.2, 10.1.3.2.2].

twoAntennaPortActivatedPUCCH-Format3

Indicates whether two antenna ports are configured for PUCCH format 3 for HARQ-ACK, see TS 36.213 [23, 10.1].

Conditional presence	Explanation
TDD	The field is mandatory present for TDD if the <i>pucch-Format</i> is not present. If the <i>pucch-</i>
	Format is present, the field is not present and the UE shall delete any existing value for
	this field. It is not present for FDD and the UE shall delete any existing value for this field.

PUSCH-Config

The IE *PUSCH-ConfigCommon* is used to specify the common PUSCH configuration and the reference signal configuration for PUSCH and PUCCH. The IE *PUSCH-ConfigDedicated* is used to specify the UE specific PUSCH configuration.

PUSCH-Config information element

```
-- ASN1START
PUSCH-ConfigCommon ::=
                                   SEQUENCE {
  pusch-ConfigBasic
                                SEQUENCE {
     n-SB
                                INTEGER (1..4),
     hoppingMode
                                   ENUMERATED {interSubFrame, intraAndInterSubFrame},
     pusch-HoppingOffset
                                      INTEGER (0..98),
     enable64QAM
                                      BOOLEAN
   },
   ul-ReferenceSignalsPUSCH
                                UL-ReferenceSignalsPUSCH
PUSCH-ConfigDedicated ::=
                                SEQUENCE {
   betaOffset-ACK-Index
                                INTEGER (0..15),
  betaOffset-RI-Index
                                INTEGER (0..15),
  betaOffset-CQI-Index
                                INTEGER (0..15)
PUSCH-ConfigDedicated-v1020 ::=
                                   SEQUENCE {
   betaOffsetMC-r10
                                SEQUENCE {
     betaOffset-ACK-Index-MC-r10
                                      INTEGER (0..15),
     betaOffset-RI-Index-MC-r10
                                      INTEGER (0..15),
      betaOffset-CQI-Index-MC-r10
                                      INTEGER (0..15)
   }
                                                        OPTIONAL, -- Need OR
                                                                 OPTIONAL, -- Need OR
  groupHoppingDisabled-r10
                                ENUMERATED {true}
  dmrs-WithOCC-Activated-r10
                                   ENUMERATED {true}
                                                                    OPTIONAL -- Need OR
PUSCH-ConfigDedicated-v1130 ::=
                                   SEQUENCE {
  pusch-DMRS-r11
                                   CHOICE {
```

```
release
                                NULL,
                                SEQUENCE {
      setup
         nPUSCH-Identity-r11
                                         INTEGER (0..509),
        nDMRS-CSH-Identity-r11
                                         INTEGER (0..509)
      }
PUSCH-ConfigDedicatedSCell-r10 ::=
                                      SEQUENCE {
                                   ENUMERATED {true}
                                                                OPTIONAL, -- Need OR
  groupHoppingDisabled-r10
  dmrs-WithOCC-Activated-r10
                                      ENUMERATED {true}
                                                                   OPTIONAL -- Need OR
}
UL-ReferenceSignalsPUSCH ::=
                                SEQUENCE {
   group Hopping Enabled\\
                                   BOOLEAN,
  group Assignment PUSCH\\
                                   INTEGER (0..29),
  sequenceHoppingEnabled
                                   BOOLEAN,
                                INTEGER (0..7)
  cyclicShift
-- ASN1STOP
```

PUSCH-Config field descriptions

betaOffset-ACK-Index, betaOffset-ACK-Index-MC

Parameter: $I_{offset}^{HARQ-ACK}$, for single- and multiple-codeword respectively, see TS 36.213 [23, Table 8.6.3-1]. One value applies for all serving cells with an uplink (the associated functionality is common i.e. not performed independently for each cell).

betaOffset-CQI-Index, betaOffset-CQI-Index-MC

Parameter: I_{offset}^{CQI} , for single- and multiple-codeword respectively, see TS 36.213 [23, Table 8.6.3-3]. One value applies for all serving cells with an uplink (the associated functionality is common i.e. not performed independently for each cell).

betaOffset-RI-Index, betaOffset-RI-Index-MC

Parameter: I_{offset}^{RI} , for single- and multiple-codeword respectively, see TS 36.213 [23, Table 8.6.3-2]. One value applies for all serving cells with an uplink (the associated functionality is common i.e. not performed independently for each cell).

cyclicShift

Parameters: cyclicShift, see TS 36.211 [21, Table 5.5.2.1.1-2].

dmrs-WithOCC-Activated

Parameter: Activate-DMRS-with OCC, see TS 36.211 [21, 5.5.2.1].

enable64QAM

See TS 36.213 [23, 8.6.1]. TRUE indicates that 64QAM is allowed while FALSE indicates that 64QAM is not allowed.

groupAssignmentPUSCH

Parameter: △SS See TS 36.211 [21, 5.5.1.3].

groupHoppingDisabled

Parameter: Disable-sequence-group-hopping, see TS 36.211 [21, 5.5.1.3].

groupHoppingEnabled

Parameter: Group-hopping-enabled, see TS 36.211 [21, 5.5.1.3].

hoppingMode

Parameter: Hopping-mode, see TS 36.211 [21, 5.3.4].

nDMRS-CSH-Identity

Parameter: $N_{\mathrm{ID}}^{\mathrm{csh_DMRS}}$, see TS 36.211 [21, 5.5.2.1.1].

nPUSCH-Identity

Parameter: $n_{\mathrm{ID}}^{\mathrm{PUSCH}}$, see TS 36.211 [21, 5.5.1.5].

n-SB

Parameter: N_{sb} see TS 36.211 [21, 5.3.4].

pusch-hoppingOffset

Parameter: $N_{\mathrm{RB}}^{\mathrm{HO}}$, see TS 36.211 [21, 5.3.4].

sequenceHoppingEnabled

Parameter: Sequence-hopping-enabled, see TS 36.211 [21, 5.5.1.4].

ul- ReferenceSignalsPUSCH

Used to specify parameters needed for the transmission on PUSCH (or PUCCH).

RACH-ConfigCommon

The IE RACH-ConfigCommon is used to specify the generic random access parameters.

RACH-ConfigCommon information element


```
SEQUENCE {
      preambles Group A Config\\
         sizeOfRA-PreamblesGroupA
                                           ENUMERATED {
                                        n4, n8, n12, n16, n20, n24, n28,
                                        n32, n36, n40, n44, n48, n52, n56,
                                        n60},
         message Size Group A\\
                                        ENUMERATED {b56, b144, b208, b256},
         message Power Off set Group B\\
                                           ENUMERATED {
                                        minusinfinity, dB0, dB5, dB8, dB10, dB12,
                                        dB15, dB18},
               OPTIONAL
                                                                 -- Need OP
   },
  powerRampingParameters
                                     PowerRampingParameters,
  ra-SupervisionInfo
                                  SEQUENCE {
                                     PreambleTransMax,
      preambleTransMax
      ra-ResponseWindowSize
                                        ENUMERATED {
                                     sf2, sf3, sf4, sf5, sf6, sf7,
                                     sf8, sf10},
      mac-ContentionResolutionTimer
                                        ENUMERATED {
                                     sf8, sf16, sf24, sf32, sf40, sf48,
                                     sf56, sf64}
   },
  maxHARQ-Msg3Tx
                                     INTEGER (1..8),
RACH-ConfigCommonSCell-r11 ::=
                                     SEQUENCE {
   powerRampingParameters-r11
                                        PowerRampingParameters,
  ra-SupervisionInfo-r11
                                     SEQUENCE {
      preambleTransMax-r11
                                        PreambleTransMax
   },
                                  SEQUENCE {
PowerRampingParameters ::=
```

RACH-ConfigCommon field descriptions

mac-ContentionResolutionTimer

Timer for contention resolution in TS 36.321 [6]. Value in subframes. Value sf8 corresponds to 8 subframes, sf16 corresponds to 16 subframes and so on.

maxHARQ-Msg3Tx

Maximum number of Msg3 HARQ transmissions in TS 36.321 [6], used for contention based random access. Value is an integer.

messagePowerOffsetGroupB

Threshold for preamble selection in TS 36.321 [6]. Value in dB. Value minusinfinity corresponds to –infinity. Value dB0 corresponds to 0 dB, dB5 corresponds to 5 dB and so on.

messageSizeGroupA

Threshold for preamble selection in TS 36.321 [6]. Value in bits. Value b56 corresponds to 56 bits, b144 corresponds to 144 bits and so on.

numberOfRA-Preambles

Number of non-dedicated random access preambles in TS 36.321 [6]. Value is an integer. Value n4 corresponds to 4, n8 corresponds to 8 and so on.

powerRampingStep

Power ramping factor in TS 36.321 [6]. Value in dB. Value dB0 corresponds to 0 dB, dB2 corresponds to 2 dB and so on.

preambleInitialReceivedTargetPower

Initial preamble power in TS 36.321 [6]. Value in dBm. Value dBm-120 corresponds to -120 dBm, dBm-118 corresponds to -118 dBm and so on.

preamblesGroupAConfig

Provides the configuration for preamble grouping in TS 36.321 [6]. If the field is not signalled, the size of the random access preambles group A [6] is equal to *numberOfRA-Preambles*.

preambleTransMax

Maximum number of preamble transmission in TS 36.321 [6]. Value is an integer. Value n3 corresponds to 3, n4 corresponds to 4 and so on.

ra-ResponseWindowSize

Duration of the RA response window in TS 36.321 [6]. Value in subframes. Value sf2 corresponds to 2 subframes, sf3 corresponds to 3 subframes and so on. The same value applies for each serving cell (although the associated functionality is performed independently for each cell).

sizeOfRA-PreamblesGroupA

Size of the random access preambles group A in TS 36.321 [6]. Value is an integer. Value n4 corresponds to 4, n8 corresponds to 8 and so on.

RACH-ConfigDedicated

The IE RACH-ConfigDedicated is used to specify the dedicated random access parameters.

RACH-ConfigDedicated information element

```
-- ASN1START

RACH-ConfigDedicated ::= SEQUENCE {
    ra-PreambleIndex INTEGER (0..63),
    ra-PRACH-MaskIndex INTEGER (0..15)
}

-- ASN1STOP
```

RACH-ConfigDedicated field descriptions	
ra-PRACH-MaskIndex	
Explicitly signalled PRACH Mask Index for RA Resource selection in TS 36.321 [6].	
ra-PreambleIndex	
Explicitly signalled Random Access Preamble for RA Resource selection in TS 36.321 [6].	

RadioResourceConfigCommon

The IE *RadioResourceConfigCommonSIB* and IE *RadioResourceConfigCommon* are used to specify common radio resource configurations in the system information and in the mobility control information, respectively, e.g., the random access parameters and the static physical layer parameters.

RadioResourceConfigCommon information element

```
-- ASN1START
RadioResourceConfigCommonSIB ::=SEQUENCE {
  rach-ConfigCommon
                                  RACH-ConfigCommon,
  bcch-Config
                             BCCH-Config,
  pcch-Config
                             PCCH-Config,
  prach-Config
                             PRACH-ConfigSIB,
  pdsch-ConfigCommon
                                  PDSCH-ConfigCommon,
  pusch-ConfigCommon
                                  PUSCH-ConfigCommon,
  pucch-ConfigCommon
                                  PUCCH-ConfigCommon,
  soundingRS-UL-ConfigCommon
                                     SoundingRS-UL-ConfigCommon,
  uplinkPowerControlCommon
                                  UplinkPowerControlCommon,
  ul-CyclicPrefixLength
                               UL-CyclicPrefixLength,
```

```
OPTIONAL -- Need OR
  [[ uplinkPowerControlCommon-v1020 UplinkPowerControlCommon-v1020
  ]]
RadioResourceConfigCommon ::=
                                SEQUENCE {
  rach-ConfigCommon
                                   RACH-ConfigCommon
                                                                    OPTIONAL, -- Need ON
  prach-Config
                             PRACH-Config,
                                   PDSCH-ConfigCommon
                                                                       OPTIONAL, -- Need ON
  pdsch-ConfigCommon
  pusch-ConfigCommon
                                   PUSCH-ConfigCommon,
  phich-Config
                             PHICH-Config
                                                           OPTIONAL, -- Need ON
  pucch-ConfigCommon
                                   PUCCH-ConfigCommon
                                                                       OPTIONAL, -- Need ON
  soundingRS-UL-ConfigCommon
                                      SoundingRS-UL-ConfigCommon
                                                                          OPTIONAL, -- Need ON
  uplinkPowerControlCommon
                                   UplinkPowerControlCommon
                                                                    OPTIONAL, -- Need ON
                                AntennaInfoCommon
                                                           OPTIONAL, -- Need ON
  antennaInfoCommon
                             P-Max
                                                        OPTIONAL, -- Need OP
  p-Max
                                TDD-Config
                                                              OPTIONAL, -- Cond TDD
  tdd-Config
  ul-CyclicPrefixLength
                                UL-CyclicPrefixLength,
  [[ uplinkPowerControlCommon-v1020 UplinkPowerControlCommon-v1020
                                                                          OPTIONAL -- Need ON
  11,
                                TDD-Config-v1130
                                                           OPTIONAL -- Cond TDD3
   [[ tdd-Config-v1130
  ]]
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {
   -- DL configuration as well as configuration applicable for DL and UL
                                      SEQUENCE {
  nonUL-Configuration-r10
     -- 1: Cell characteristics
     dl-Bandwidth-r10
                                      ENUMERATED {n6, n15, n25, n50, n75, n100},
     -- 2: Physical configuration, general
      antennaInfoCommon-r10
                                         AntennaInfoCommon,
     mbsfn-SubframeConfigList-r10
                                      MBSFN-SubframeConfigList OPTIONAL, -- Need OR
     -- 3: Physical configuration, control
      phich-Config-r10
                                   PHICH-Config,
      -- 4: Physical configuration, physical channels
```

```
pdsch-ConfigCommon-r10
                                          PDSCH-ConfigCommon,
      tdd-Config-r10
                                       TDD-Config
                                                               OPTIONAL -- Cond TDDSCell
   },
   -- UL configuration
   ul-Configuration-r10
                                    SEQUENCE {
      ul-FreqInfo-r10
                                    SEQUENCE {
         ul-CarrierFreq-r10
                                       ARFCN-ValueEUTRA
                                                                  OPTIONAL, -- Need OP
         ul-Bandwidth-r10
                                       ENUMERATED {n6, n15,
                                       n25, n50, n75, n100}OPTIONAL, -- Need OP
         additionalSpectrumEmissionSCell-r10
                                            AdditionalSpectrumEmission
      },
                                                         OPTIONAL, -- Need OP
      p-Max-r10
                                    P-Max
      uplinkPowerControlCommonSCell-r10
                                             UplinkPowerControlCommonSCell-r10,
      -- A special version of IE UplinkPowerControlCommon may be introduced
      -- 3: Physical configuration, control
      soundingRS-UL-ConfigCommon-r10
                                          SoundingRS-UL-ConfigCommon,
      ul-CyclicPrefixLength-r10
                                    UL-CyclicPrefixLength,
      -- 4: Physical configuration, physical channels
      prach-ConfigSCell-r10
                                       PRACH-ConfigSCell-r10
                                                                  OPTIONAL, -- Cond TDD-OR-NoR11
      pusch-ConfigCommon-r10
                                       PUSCH-ConfigCommon
                                                      OPTIONAL, -- Need OR
   }
   [[ ul-CarrierFreq-v1090
                                    ARFCN-ValueEUTRA-v9e0
                                                                     OPTIONAL -- Need OP
  ]],
   [[ rach-ConfigCommonSCell-r11
                                       RACH-ConfigCommonSCell-r11
                                                                        OPTIONAL, -- Cond UL
      prach-ConfigSCell-r11
                                    PRACH-Config
                                                               OPTIONAL, -- Cond UL
      tdd-Config-v1130
                                    TDD-Config-v1130
                                                            OPTIONAL, -- Cond TDD2
      uplinkPowerControlCommonSCell-v1130
                        UplinkPowerControlCommonSCell-v1130 OPTIONAL -- Cond UL
  ]]
BCCH-Config ::=
                                 SEQUENCE {
   modificationPeriodCoeff
                                    ENUMERATED {n2, n4, n8, n16}
```

```
PCCH-Config ::= SEQUENCE {

defaultPagingCycle ENUMERATED {

rf32, rf64, rf128, rf256},

nB ENUMERATED {

fourT, twoT, oneT, halfT, quarterT, oneEighthT,

oneSixteenthT, oneThirtySecondT}
}

UL-CyclicPrefixLength ::= ENUMERATED {len1, len2}
```

RadioResourceConfigCommon field descriptions

additionalSpectrumEmissionSCell

The UE requirements related to IE Additional Spectrum Emission SCell are defined in TS 36.101 [42].

defaultPagingCycle

Default paging cycle, used to derive "T" in TS 36.304 [4]. Value rf32 corresponds to 32 radio frames, rf64 corresponds to 64 radio frames and so on.

modificationPeriodCoeff

Actual modification period, expressed in number of radio frames= *modificationPeriodCoeff* defaultPagingCycle.* n2 corresponds to value 2, n4 corresponds to value 4, n8 corresponds to value 8 and n16 corresponds to value 16.

nВ

Parameter: nB is used as one of parameters to derive the Paging Frame and Paging Occasion according to TS 36.304 [4]. Value in multiples of 'T' as defined in TS 36.304 [4]. A value of fourT corresponds to 4 * T, a value of twoT corresponds to 2 * T and so on.

p-Max

Pmax to be used in the target cell. If absent the UE applies the maximum power according to the UE capability.

ul-Bandwidth

Parameter: transmission bandwidth configuration, N_{RB}, in uplink, see TS 36.101 [42, table 5.6-1]. Value n6 corresponds to 6 resource blocks, n15 to 15 resource blocks and so on. If for FDD this parameter is absent, the uplink bandwidth is equal to the downlink bandwidth. For TDD this parameter is absent and it is equal to the downlink bandwidth.

ul-CarrierFreq

For FDD: If absent, the (default) value determined from the default TX-RX frequency separation defined in TS 36.101 [42, table 5.7.3-1] applies.

For TDD: This parameter is absent and it is equal to the downlink frequency.

UL-CyclicPrefixLength

Parameter: Uplink cyclic prefix length see 36.211 [21, 5.2.1] where len1 corresponds to normal cyclic prefix and len2 corresponds to extended cyclic prefix.

Conditional presence	Explanation
TDD	The field is optional for TDD, Need ON; it is not present for FDD and the UE shall delete
	any existing value for this field.
TDD2	If tdd-Config-r10 is present, the field is optional, Need OR. Otherwise the field is not
	present and the UE shall delete any existing value for this field.
TDD3	If tdd-Config is present, the field is optional, Need OR. Otherwise the field is not present
	and the UE shall delete any existing value for this field.
TDD-OR-NoR11	If prach-ConfigSCell-r11 is absent, the field is optional for TDD, Need OR. Otherwise the
	field is not present and the UE shall delete any existing value for this field.
TDDSCell	This field is mandatory present for TDD; it is not present for FDD and the UE shall delete
	any existing value for this field.
UL	If the SCell is part of the STAG and if <i>ul-Configuration</i> is included, the field is optional,
	Need OR. Otherwise the field is not present and the UE shall delete any existing value for
	this field.

RadioResourceConfigDedicated

The IE *RadioResourceConfigDedicated* is used to setup/modify/release RBs, to modify the MAC main configuration, to modify the SPS configuration and to modify dedicated physical configuration.

RadioResourceConfigDedicated information element

```
-- ASN1START
RadioResourceConfigDedicated ::=
                                                                                                                                    SEQUENCE {
                                                                                                                                                                                                                 OPTIONAL,
                                                                                                                                                                                                                                                                      -- Cond HO-Conn
           srb-ToAddModList
                                                                                                                         SRB-ToAddModList
           drb-ToAddModList
                                                                                                                         DRB-ToAddModList
                                                                                                                                                                                                                            OPTIONAL,
                                                                                                                                                                                                                                                                                  -- Cond HO-toEUTRA
           drb-ToReleaseList
                                                                                                                         DRB-ToReleaseList
                                                                                                                                                                                                                 OPTIONAL,
                                                                                                                                                                                                                                                                       -- Need ON
           mac-MainConfig
                                                                                                                        CHOICE {
                                 explicitValue
                                                                                                                        MAC-MainConfig,
                                 defaultValue
                                                                                                                         NULL
                                OPTIONAL,
                                                                                                                                                                                                                                                 -- Cond HO-toEUTRA2
           sps-Config
                                                                                                                         SPS-Config
                                                                                                                                                                                                                OPTIONAL,
                                                                                                                                                                                                                                                                       -- Need ON
           physicalConfigDedicated
                                                                                                                                    PhysicalConfigDedicated
                                                                                                                                                                                                                                       OPTIONAL,
                                                                                                                                                                                                                                                                                             -- Need ON
                                                                                                                         RLF-TimersAndConstants-r9
                                                                                                                                                                                                                                                 OPTIONAL -- Need ON
           [[ rlf-TimersAndConstants-r9
           ]],
           [[\ meas Subframe Pattern P Cell-r 10 Meas Subframe Pattern P Cell-r 10 Meas Subframe P attern P Cell-r 10 Meas Subfram
                                                                                                                                                                                                                                     OPTIONAL -- Need ON
          ]],
                                                                                                                                                                                                                                                 OPTIONAL -- Need ON
           [[ neighCellsCRS-Info-r11
                                                                                                                        NeighCellsCRS-Info-r11
          ]]
RadioResourceConfigDedicatedSCell-r10 ::= SEQUENCE {
```

```
-- UE specific configuration extensions applicable for an SCell
  physicalConfigDedicatedSCell-r10
                                   PhysicalConfigDedicatedSCell-r10OPTIONAL, -- Need ON
  ...,
                                                                   OPTIONAL -- Cond SCellAdd
  [[ mac-MainConfigSCell-r11
                                   MAC-MainConfigSCell-r11
  ]]
SRB-ToAddModList ::=
                             SEQUENCE (SIZE (1..2)) OF SRB-ToAddMod
SRB-ToAddMod ::= SEQUENCE {
  srb-Identity
                             INTEGER (1..2),
  rlc-Config
                             CHOICE {
     explicitValue
                                RLC-Config,
     defaultValue
                                NULL
         OPTIONAL,
                                                                 -- Cond Setup
  logicalChannelConfig
                                CHOICE {
     explicitValue
                                LogicalChannelConfig,
                                NULL
     defaultValue
   }
        OPTIONAL,
                                                                 -- Cond Setup
DRB-ToAddModList ::=
                                SEQUENCE (SIZE (1..maxDRB)) OF DRB-ToAddMod
DRB-ToAddMod ::=SEQUENCE {
  eps-BearerIdentity
                                INTEGER (0..15)
                                                        OPTIONAL,
                                                                      -- Cond DRB-Setup
  drb-Identity
                             DRB-Identity,
  pdcp-Config
                                PDCP-Config
                                                     OPTIONAL,
                                                                   -- Cond PDCP
  rlc-Config
                             RLC-Config
                                                                -- Cond Setup
                                                  OPTIONAL,
  logicalChannelIdentity
                                INTEGER (3..10)
                                                        OPTIONAL,
                                                                      -- Cond DRB-Setup
  logicalChannelConfig
                                LogicalChannelConfig OPTIONAL, -- Cond Setup
                             SEQUENCE (SIZE (1..maxDRB)) OF DRB-Identity
DRB-ToReleaseList ::=
```

```
MeasSubframePatternPCell-r10 ::= CHOICE {
   release
                              NULL,
   setup
                           MeasSubframePattern-r10
NeighCellsCRS-Info-r11 ::=
                              CHOICE {
   release
                           NULL,
                           CRS-AssistanceInfoList-r11
   setup
}
CRS-AssistanceInfoList-r11 ::=SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r11
CRS-AssistanceInfo-r11 ::= SEQUENCE {
   physCellId-r11
                                 PhysCellId,
   antennaPortsCount-r11
                                 ENUMERATED {an1, an2, an4, spare1},
   mbsfn-SubframeConfigList-r11 MBSFN-SubframeConfigList,
-- ASN1STOP
```

RadioResourceConfigDedicated field descriptions

logicalChannelConfig

For SRBs a choice is used to indicate whether the logical channel configuration is signalled explicitly or set to the default logical channel configuration for SRB1 as specified in 9.2.1.1 or for SRB2 as specified in 9.2.1.2.

logicalChannelIdentity

The logical channel identity for both UL and DL.

mac-MainConfig

Although the ASN.1 includes a choice that is used to indicate whether the mac-MainConfig is signalled explicitly or set to the default MAC main configuration as specified in 9.2.2, EUTRAN does not apply "defaultValue".

measSubframePatternPCell

Time domain measurement resource restriction pattern for the PCell measurements (RSRP, RSRQ and the radio link monitoring).

neighCellsCRS-Info

This field contains assistance information, concerning the primary frequency, used by the UE to mitigate interference from CRS while performing RRM/RLM/CSI measurement or data demodulation. When the received CRS assistance information is for a cell with CRS colliding with that of the CRS of the cell to measure, the UE may use the CRS assistance information to mitigate CRS interference (as specified in TS 36.101 [42]) on the subframes indicated by measSubframePatternPCell, measSubframePatternConfigNeigh and csi-MeasSubframeSet1.Furthermore, the UE may use CRS assistance information to mitigate CRS interference from the cells in the IE for the demodulation purpose as specified in TS 36.101 [42].

physicalConfigDedicated

The default dedicated physical configuration is specified in 9.2.4.

rlc-Config

For SRBs a choice is used to indicate whether the RLC configuration is signalled explicitly or set to the values defined in the default RLC configuration for SRB1 in 9.2.1.1 or for SRB2 in 9.2.1.2. RLC AM is the only applicable RLC mode for SRB1 and SRB2. E-UTRAN does not reconfigure the RLC mode of DRBs except when a full configuration option is used, and may reconfigure the UM RLC SN field size only upon handover within E-UTRA or upon the first reconfiguration after RRC connection re-establishment.

sps-Config

The default SPS configuration is specified in 9.2.3. Except for handover or releasing SPS, E-UTRAN does not reconfigure *sps-Config* when there is a configured downlink assignment or a configured uplink grant (see 36.321 [6]).

srb-Identity

Value 1 is applicable for SRB1 only.

Value 2 is applicable for SRB2 only.

Conditional presence	Explanation
DRB-Setup	The field is mandatory present if the corresponding DRB is being set up; otherwise it is not present.
HO-Conn	The field is mandatory present in case of handover to E-UTRA or when the fullConfig is
	included in the RRCConnectionReconfiguration message or in case of RRC connection
	establishment; otherwise the field is optionally present, need ON. Upon connection establishment/ re-establishment only SRB1 is applicable.
HO-toEUTRA	The field is mandatory present in case of handover to E-UTRA or when the fullConfig is
	included in the RRCConnectionReconfiguration message; In case of RRC connection
	establishment and RRC connection re-establishment the field is not present; otherwise
	the field is optionally present, need ON.
HO-toEUTRA2	The field is mandatory present in case of handover to E-UTRA or when the fullConfig is
	included in the <i>RRCConnectionReconfiguration</i> message; otherwise the field is optionally
	present, need ON.
PDCP	The field is mandatory present if the corresponding DRB is being setup; the field is
	optionally present, need ON, upon handover within E-UTRA and upon the first
	reconfiguration after re-establishment but in both these cases only when fullConfig is not
	included in the RRCConnectionReconfiguration message; otherwise it is not present.
SCellAdd	The field is optionally present, need ON, upon SCell addition; otherwise it is not present.
Setup	The field is mandatory present if the corresponding SRB/DRB is being setup; otherwise the field is optionally present, need ON.

RLC-Confia

The IE *RLC-Config* is used to specify the RLC configuration of SRBs and DRBs.

RLC-Config information element

-- ASN1START

```
RLC-Config ::=
                      CHOICE {
                            SEQUENCE {
   am
     ul-AM-RLC
                                  UL-AM-RLC,
     dl-AM-RLC
                                  DL-AM-RLC
   },
  um-Bi-Directional
                               SEQUENCE {
     ul-UM-RLC
                                  UL-UM-RLC,
     dl-UM-RLC
                                  DL-UM-RLC
   },
   um-Uni-Directional-UL
                               SEQUENCE {
     ul-UM-RLC
                                  UL-UM-RLC
   },
   um-Uni-Directional-DL
                               SEQUENCE {
     dl-UM-RLC
                                  DL-UM-RLC
   },
UL-AM-RLC ::=
                            SEQUENCE {
  t-PollRetransmit
                            T-PollRetransmit,
  pollPDU
                               PollPDU,
  pollByte
                            PollByte,
  maxRetxThreshold
                               ENUMERATED {
                               t1, t2, t3, t4, t6, t8, t16, t32}
DL-AM-RLC ::=
                            SEQUENCE {
  t-Reordering
                            T-Reordering,
  t-StatusProhibit
                            T-StatusProhibit
UL-UM-RLC ::=
                            SEQUENCE {
  sn-FieldLength
                               SN-FieldLength
}
```

```
DL-UM-RLC ::=
                               SEQUENCE {
   sn-FieldLength
                                  SN-FieldLength,
  t-Reordering
                               T-Reordering
SN-FieldLength ::=
                               ENUMERATED {size5, size10}
T-PollRetransmit ::=
                            ENUMERATED {
                               ms5, ms10, ms15, ms20, ms25, ms30, ms35,
                               ms40, ms45, ms50, ms55, ms60, ms65, ms70,
                               ms75, ms80, ms85, ms90, ms95, ms100, ms105,
                               ms110, ms115, ms120, ms125, ms130, ms135,
                               ms140, ms145, ms150, ms155, ms160, ms165,
                               ms170, ms175, ms180, ms185, ms190, ms195,
                               ms200, ms205, ms210, ms215, ms220, ms225,
                               ms230, ms235, ms240, ms245, ms250, ms300,
                               ms350, ms400, ms450, ms500, spare9, spare8,
                               spare7, spare6, spare5, spare4, spare3,
                               spare2, spare1}
PollPDU ::=
                               ENUMERATED {
                               p4, p8, p16, p32, p64, p128, p256, pInfinity}
PollByte ::=
                            ENUMERATED {
                               kB25, kB50, kB75, kB100, kB125, kB250, kB375,
                               kB500, kB750, kB1000, kB1250, kB1500, kB2000,
                               kB3000, kBinfinity, spare1}
T-Reordering ::=
                            ENUMERATED {
                               ms0, ms5, ms10, ms15, ms20, ms25, ms30, ms35,
                               ms40, ms45, ms50, ms55, ms60, ms65, ms70,
                               ms75, ms80, ms85, ms90, ms95, ms100, ms110,
                               ms120, ms130, ms140, ms150, ms160, ms170,
                               ms180, ms190, ms200, spare1}
```

```
T-StatusProhibit ::=

ENUMERATED {

ms0, ms5, ms10, ms15, ms20, ms25, ms30, ms35,

ms40, ms45, ms50, ms55, ms60, ms65, ms70,

ms75, ms80, ms85, ms90, ms95, ms100, ms105,

ms110, ms115, ms120, ms125, ms130, ms135,

ms140, ms145, ms150, ms155, ms160, ms165,

ms170, ms175, ms180, ms185, ms190, ms195,

ms200, ms205, ms210, ms215, ms220, ms225,

ms230, ms235, ms240, ms245, ms250, ms300,

ms350, ms400, ms450, ms500, spare8, spare7,

spare6, spare5, spare4, spare3, spare2,

spare1}

-- ASNISTOP
```

RLC-Config field descriptions

maxRetxThreshold

Parameter for RLC AM in TS 36.322 [7]. Value t1 corresponds to 1 retransmission, t2 to 2 retransmissions and so on.

pollByte

Parameter for RLC AM in TS 36.322 [7]. Value kB25 corresponds to 25 kBytes, kB50 to 50 kBytes and so on. kBInfinity corresponds to an infinite amount of kBytes.

pollPDU

Parameter for RLC AM in TS 36.322 [7]. Value p4 corresponds to 4 PDUs, p8 to 8 PDUs and so on. pInfinity corresponds to an infinite number of PDUs.

sn-FieldLength

Indicates the UM RLC SN field size, see TS 36.322 [7], in bits. Value size5 means 5 bits, size10 means 10 bits.

t-PollRetransmit

Timer for RLC AM in TS 36.322 [7], in milliseconds. Value ms5 means 5ms, ms10 means 10ms and so on.

t-Reordering

Timer for reordering in TS 36.322 [7], in milliseconds. Value ms0 means 0ms, ms5 means 5ms and so on.

t-StatusProhibit

Timer for status reporting in TS 36.322 [7], in milliseconds. Value ms0 means 0ms, ms5 means 5ms and so on.

RLF-TimersAndConstants

The IE *RLF-TimersAndConstants* contains UE specific timers and constants applicable for UEs in RRC_CONNECTED.

RLF-TimersAndConstants information element

-- ASN1START RLF-TimersAndConstants-r9 ::= CHOICE { release NULL, setup SEQUENCE {

```
t301-r9
                                    ENUMERATED {
                                    ms100, ms200, ms300, ms400, ms600, ms1000, ms1500,
                                    ms2000},
      t310-r9
                                    ENUMERATED {
                                    ms0, ms50, ms100, ms200, ms500, ms1000, ms2000},
      n310-r9
                                    ENUMERATED {
                                    n1, n2, n3, n4, n6, n8, n10, n20},
      t311-r9
                                    ENUMERATED {
                                    ms1000, ms3000, ms5000, ms10000, ms15000,
                                    ms20000, ms30000},
      n311-r9
                                    ENUMERATED {
                                    n1, n2, n3, n4, n5, n6, n8, n10},
-- ASN1STOP
```

RLF-TimersAndConstants field descriptions	
n3xy	
Constants are described in section 7.4. n1 corresponds with 1, n2 corresponds with 2 and so on.	
t3xy	
Timers are described in section 7.3. Value ms0 corresponds with 0 ms, ms50 corresponds with 50 ms and so on.	

RN-SubframeConfig

The IE RN-SubframeConfig is used to specify the subframe configuration for an RN.

RN-SubframeConfig information element

```
resourceBlockAssignment-r10
                               CHOICE {
   type01-r10
                               CHOICE {
     nrb6-r10
                               BIT STRING (SIZE(6)),
     nrb15-r10
                               BIT STRING (SIZE(8)),
     nrb25-r10
                               BIT STRING (SIZE(13)),
     nrb50-r10
                               BIT STRING (SIZE(17)),
                               BIT STRING (SIZE(19)),
     nrb75-r10
     nrb100-r10
                                  BIT STRING (SIZE(25))
   },
   type2-r10
                            CHOICE {
     nrb6-r10
                               BIT STRING (SIZE(5)),
     nrb15-r10
                               BIT STRING (SIZE(7)),
     nrb25-r10
                               BIT STRING (SIZE(9)),
     nrb50-r10
                               BIT STRING (SIZE(11)),
     nrb75-r10
                               BIT STRING (SIZE(12)),
     nrb100-r10
                                  BIT STRING (SIZE(13))
   },
},
demodulationRS-r10
                         CHOICE {
  interleaving-r10
                         ENUMERATED {crs},
   noInterleaving-r10
                            ENUMERATED {crs, dmrs}
},
pdsch-Start-r10
                         INTEGER (1..3),
pucch-Config-r10
                         CHOICE {
   tdd
                         CHOICE {
     n1PUCCH-AN-List-r10
                                  SEQUENCE (SIZE (1..4)) OF INTEGER (0..2047)
     },
     fallbackForFormat3
                               SEQUENCE {
        n1PUCCH-AN-P0-r10
                                     INTEGER (0..2047),
        n1PUCCH-AN-P1-r10
                                     INTEGER (0..2047)
                                                        OPTIONAL -- Need OR
     }
   },
   fdd
                         SEQUENCE {
```

```
n1PUCCH-AN-P0-r10 INTEGER (0..2047),
n1PUCCH-AN-P1-r10 INTEGER (0..2047) OPTIONAL -- Need OR
}
, ...
OPTIONAL, -- Need ON
...
...
```

RN-SubframeConfig field descriptions

demodulationRS

Indicates which reference signals are used for R-PDCCH demodulation according to TS 36.216 [55, 7.4.1]. Value interleaving corresponds to cross-interleaving and value noInterleaving corresponds to no cross-interleaving according to TS 36.216 [55, 7.4.2 and 7.4.3].

n1PUCCH-AN-List

Parameter: $n_{\text{PUCCH},t}^{(1)}$, see TS 36.216, [55, 7.5.1]. This parameter is only applicable for TDD. Configures PUCCH HARQ-ACK resources if the RN is configured to use HARQ-ACK channel selection, HARQ-ACK multiplexing or HARQ-ACK bundling.

n1PUCCH-AN-P0, n1PUCCH-AN-P1

Parameter: $n_{\text{PUCCH}}^{(1,p)}$, for antenna port P0 and for antenna port P1 respectively, see TS 36.216, [55, 7.5.1] for FDD and [55, 7.5.2] for TDD.

pdsch-Start

Parameter: DL-StartSymbol, see TS 36.216 [55, Table 5.4-1].

resourceAllocationType

Represents the resource allocation used: type 0, type 1 or type 2 according to TS 36.213 [23, 7.1.6]. Value type0 corresponds to type 0, value type1 corresponds to type 1, value type2Localized corresponds to type 2 with localized virtual resource blocks and type2Distributed corresponds to type 2 with distributed virtual resource blocks.

resourceBlockAssignment

Indicates the resource block assignment bits according to TS 36.213 [23, 7.1.6]. Value type01 corresponds to type 0 and type 1, and the value type2 corresponds to type 2. Value nrb6 corresponds to a downlink system bandwidth of 6 resource blocks, value nrb15 corresponds to a downlink system bandwidth of 15 resource blocks, and so on.

subframeConfigPatternFDD

Parameter: SubframeConfigurationFDD, see TS 36.216 [55, Table 5.2-1]. Defines the DL subframe configuration for eNB-to-RN transmission, i.e. those subframes in which the eNB may indicate downlink assignments for the RN. The radio frame in which the pattern starts (i.e. the radio frame in which the first bit of the subframeConfigPatternFDD corresponds to subframe #0) occurs when SFN mod 4 = 0.

subframeConfigPatternTDD

Parameter: SubframeConfigurationTDD, see TS 36.216 [55, Table 5.2-2]. Defines the DL and UL subframe configuration for eNB-RN transmission.

SchedulingRequestConfig

The IE Scheduling Request Config is used to specify the Scheduling Request related parameters

SchedulingRequestConfig information element

```
-- ASN1START
```

```
SchedulingRequestConfig ::=
                              CHOICE {
                              NULL,
   release
                              SEQUENCE {
   setup
      sr-PUCCH-ResourceIndex
                                       INTEGER (0..2047),
      sr-ConfigIndex
                                    INTEGER (0..157),
      dsr-TransMax
                                 ENUMERATED {
                                    n4, n8, n16, n32, n64, spare3, spare2, spare1}
   }
SchedulingRequestConfig-v1020 ::= SEQUENCE {
   sr-PUCCH-ResourceIndexP1-r10
                                    INTEGER (0..2047)
                                                            OPTIONAL
                                                                           -- Need OR
}
-- ASN1STOP
```

SchedulingRequestConfig field descriptions

dsr-TransMax

Parameter for SR transmission in TS 36.321 [6, 5.4.4]. The value n4 corresponds to 4 transmissions, n8 corresponds to 8 transmissions and so on.

sr-ConfigIndex

Parameter I_{SR} . See TS 36.213 [23,10.1]. The values 156 and 157 are not applicable for Release 8.

sr-PUCCH-ResourceIndex, sr-PUCCH-ResourceIndexP1

Parameter: $n_{\text{PUCCH,SRI}}^{(1,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23, 10.1]. E-UTRAN configures sr-PUCCH-ResourceIndexP1 only if sr-PUCCHResourceIndex is configured.

SoundingRS-UL-Config

The IE *SoundingRS-UL-Config* is used to specify the uplink Sounding RS configuration for periodic and aperiodic sounding.

SoundingRS-UL-Config information element

```
-- ASN1START

SoundingRS-UL-ConfigCommon ::= CHOICE {

release NULL,

setup SEQUENCE {

srs-BandwidthConfig ENUMERATED {bw0, bw1, bw2, bw3, bw4, bw5, bw6, bw7},

srs-SubframeConfig ENUMERATED {

sc0, sc1, sc2, sc3, sc4, sc5, sc6, sc7,
```

```
sc8, sc9, sc10, sc11, sc12, sc13, sc14, sc15},
      ackNackSRS-SimultaneousTransmission BOOLEAN,
                                                                OPTIONAL -- Cond TDD
      srs-MaxUpPts
                                    ENUMERATED {true}
   }
Sounding RS-UL-Config Dedicated ::= CHOICE \{
                              NULL,
  release
                              SEQUENCE {
   setup
      srs-Bandwidth
                                    ENUMERATED {bw0, bw1, bw2, bw3},
      srs-HoppingBandwidth
                                    ENUMERATED {hbw0, hbw1, hbw2, hbw3},
      freqDomainPosition
                                    INTEGER (0..23),
      duration
                                 BOOLEAN,
      srs\hbox{-}ConfigIndex
                                    INTEGER (0..1023),
      transmissionComb
                                    INTEGER (0..1),
      cyclicShift
                                    ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7}
   }
SoundingRS-UL-ConfigDedicated-v1020 ::= SEQUENCE {
   srs-AntennaPort-r10
                                 SRS-AntennaPort
}
SoundingRS-UL-ConfigDedicatedAperiodic-r10 ::= CHOICE{
                              NULL,
   release
                              SEQUENCE {
   setup
      srs-ConfigIndexAp-r10
                                    INTEGER (0..31),
      srs-ConfigApDCI-Format4-r10
                                       SEQUENCE (SIZE (1..3)) OF SRS-ConfigAp-r10 OPTIONAL,--Need
ON
      srs-ActivateAp-r10
                                    CHOICE {
            release
                                    NULL,
                                    SEQUENCE {
            setup
               srs-ConfigApDCI-Format0-r10
                                                SRS-ConfigAp-r10,
               srs-ConfigApDCI-Format1a2b2c-r10
                                                    SRS-ConfigAp-r10,
```

```
}
                                                         OPTIONAL -- Need ON
      }
SRS-ConfigAp-r10 ::= SEQUENCE {
   srs-AntennaPortAp-r10
                                SRS-AntennaPort,
   srs-BandwidthAp-r10
                                    ENUMERATED {bw0, bw1, bw2, bw3},
   freqDomainPositionAp-r10
                                 INTEGER (0..23),
   transmissionCombAp-r10
                                    INTEGER (0..1),
   cyclicShiftAp-r10
                                 ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7}
SRS-AntennaPort ::=
                                 ENUMERATED {an1, an2, an4, spare1}
-- ASN1STOP
```

SoundingRS-UL-Config field descriptions

ackNackSRS-SimultaneousTransmission

Parameter: Simultaneous-AN-and-SRS, see TS 36.213 [23, 8.2]. For SCells this field is not applicable and the UE shall ignore the value.

cyclicShift, cyclicShiftAp

Parameter: n_SRS for periodic and aperiodic sounding reference signal transmission respectively. See TS 36.211 [21, 5.5.3.1], where cs0 corresponds to 0 etc.

duration

Parameter: Duration for periodic sounding reference signal transmission. See TS 36.213 [21, 8.2]. FALSE corresponds to 'single' and value TRUE to 'indefinite'.

freqDomainPosition, freqDomainPositionAp

Parameter: n_{RRC} for periodic and aperiodic sounding reference signal transmission respectively, see TS 36.211 [21, 5.5.3.2].

srs-AntennaPort, srs-AntennaPortAp

Indicates the number of antenna ports used for periodic and aperiodic sounding reference signal transmission respectively, see TS 36.211 [21, 5.5.3]. UE shall release *srs-AntennaPort* if *SoundingRS-UL-ConfigDedicated* is released.

srs-Bandwidth, srs-BandwidthAp

Parameter: $B_{\rm SRS}$ for periodic and aperiodic sounding reference signal transmission respectively, see TS 36.211 [21, tables 5.5.3.2-1, 5.5.3.2-2, 5.5.3.2-3 and 5.5.3.2-4].

srs-BandwidthConfig

Parameter: SRS Bandwidth Configuration. See TS 36.211, [21, table 5.5.3.2-1, 5.5.3.2-2, 5.5.3.2-3 and 5.5.3.2-4]. Actual configuration depends on UL bandwidth. bw0 corresponds to value 0, bw1 to value 1 and so on.

srs-ConfigApDCI-Format0 / srs-ConfigApDCI-Format1a2b2c / srs-ConfigApDCI-Format4

Parameters indicate the resource configurations for aperiodic sounding reference signal transmissions triggered by DCI formats 0, 1A, 2B, 2C, 4. See TS 36.213 [23, 8.2].

srs-ConfigIndex, srs-ConfigIndexAp

Parameter: I_{SRS} for periodic and aperiodic sounding reference signal transmission respectively. See TS 36.213 [23, table 8.2-1 and table 8.2-2] for periodic and TS 36.213 [23, table 8.2-4 and table 8.2-5] for aperiodic SRS transmission.

srs-HoppingBandwidth

Parameter: SRS hopping bandwidth $b_{hop} \in \{0,1,2,3\}$ for periodic sounding reference signal transmission, see TS 36.211 [21, 5.5.3.2] where hbw0 corresponds to value 0, hbw1 to value 1 and so on.

srs-MaxUpPts

Parameter: srsMaxUpPts, see TS 36.211 [21, 5.5.3.2]. If this field is present, reconfiguration of $m_{\rm SRS,0}^{\rm max}$ applies for UpPts, otherwise reconfiguration does not apply.

srs-SubframeConfig

Parameter: SRS SubframeConfiguration. See TS 36.211, [21, table 5.5.3.3-1] applies for FDD whereas TS 36.211, [21, table 5.5.3.3-2] applies for TDD. sc0 corresponds to value 0, sc1 to value 1 and so on.

transmissionComb, transmissionCombAp

Parameter: $k_{\text{TC}} \in \{0,1\}$ for periodic and aperiodic sounding reference signal transmission respectively, see TS 36.211 [21, 5.5.3.2].

Conditional presence	Explanation
TDD	This field is optional present for TDD, need OR; it is not present for FDD and the UE shall
	delete any existing value for this field.

SPS-Config

The IE SPS-Config is used to specify the semi-persistent scheduling configuration.

SPS-Config information element

-- ASN1START

SPS-Config ::= SEQUENCE {

semiPersistSchedC-RNTI C-RNTI OPTIONAL, -- Need OR

```
SPS-ConfigDL
                                                                        -- Need ON
   sps-ConfigDL
                                                     OPTIONAL,
  sps-ConfigUL
                               SPS-ConfigUL
                                                     OPTIONAL
                                                                        -- Need ON
SPS-ConfigDL ::= CHOICE{
   release
                            NULL,
                            SEQUENCE {
   setup
      semiPersistSchedIntervalDL
                                        ENUMERATED {
                                     sf10, sf20, sf32, sf40, sf64, sf80,
                                     sf128, sf160, sf320, sf640, spare6,
                                     spare5, spare4, spare3, spare2,
                                     spare1},
      numberOfConfSPS-Processes
                                        INTEGER (1..8),
                                        N1PUCCH-AN-PersistentList,
      n1PUCCH-AN-PersistentList
      [[ twoAntennaPortActivated-r10
                                        CHOICE {
            release
                                     NULL,
                                     SEQUENCE {
            setup
               n1PUCCH-AN-PersistentListP1-r10 N1PUCCH-AN-PersistentList
                                                           OPTIONAL -- Need ON
      ]]
SPS-ConfigUL ::= CHOICE {
                            NULL,
   release
                            SEQUENCE {
   setup
      semiPersistSchedIntervalUL
                                        ENUMERATED {
                                     sf10, sf20, sf32, sf40, sf64, sf80,
                                     sf128, sf160, sf320, sf640, spare6,
                                     spare5, spare4, spare3, spare2,
                                     spare1},
      implicit Release After \\
                                  ENUMERATED {e2, e3, e4, e8},
      p0-Persistent
                                  SEQUENCE {
```

```
p0-NominalPUSCH-Persistent INTEGER (-126..24),
p0-UE-PUSCH-Persistent INTEGER (-8..7)
} OPTIONAL, -- Need OP
twoIntervalsConfig ENUMERATED {true} OPTIONAL, -- Cond TDD
...
}

N1PUCCH-AN-PersistentList ::= SEQUENCE (SIZE (1..4)) OF INTEGER (0..2047)

-- ASN1STOP
```

SPS-Config field descriptions

implicitReleaseAfter

Number of empty transmissions before implicit release, see TS 36.321 [6, 5.10.2]. Value e2 corresponds to 2 transmissions, e3 corresponds to 3 transmissions and so on.

n1PUCCH-AN-PersistentList, n1PUCCH-AN-PersistentListP1

List of parameter: $n_{\rm PUCCH}^{(1,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23, 10.1]. Field n1-PUCCH-AN-PersistentListP1 is applicable only if the twoAntennaPortActivatedPUCCH-Format1a1b in PUCCH-ConfigDedicated-v1020 is set to true. Otherwise the field is not configured.

numberOfConfSPS-Processes

The number of configured HARQ processes for Semi-Persistent Scheduling, see TS 36.321 [6].

p0-NominalPUSCH-Persistent

Parameter: $P_{\text{O_NOMINAL_PUSCH}}(0)$. See TS 36.213 [23, 5.1.1.1], unit dBm step 1. This field is applicable for persistent scheduling, only. If choice setup is used and p0-Persistent is absent, apply the value of p0-NominalPUSCH for p0-NominalPUSCH-Persistent.

p0-UE-PUSCH-Persistent

Parameter: $P_{\text{O_UE_PUSCH}}(0)$. See TS 36.213 [23, 5.1.1.1], unit dB. This field is applicable for persistent scheduling, only. If choice setup is used and p0-Persistent is absent, apply the value of p0-UE-PUSCH for p0-UE-PUSCH-Persistent.

semiPersistSchedC-RNTI

Semi-persistent Scheduling C-RNTI, see TS 36.321 [6].

semiPersistSchedIntervalDL

Semi-persistent scheduling interval in downlink, see TS 36.321 [6]. Value in number of sub-frames. Value sf10 corresponds to 10 sub-frames, sf20 corresponds to 20 sub-frames and so on. For TDD, the UE shall round this parameter down to the nearest integer (of 10 sub-frames), e.g. sf10 corresponds to 10 sub-frames, sf32 corresponds to 30 sub-frames, sf128 corresponds to 120 sub-frames.

semiPersistSchedIntervalUL

Semi-persistent scheduling interval in uplink, see TS 36.321 [6]. Value in number of sub-frames. Value sf10 corresponds to 10 sub-frames, sf20 corresponds to 20 sub-frames and so on. For TDD, the UE shall round this parameter down to the nearest integer (of 10 sub-frames), e.g. sf10 corresponds to 10 sub-frames, sf32 corresponds to 30 sub-frames, sf128 corresponds to 120 sub-frames.

twoIntervalsConfig

Trigger of two-intervals-Semi-Persistent Scheduling in uplink. See TS 36.321 [6, 5.10]. If this field is present, two-intervals-SPS is enabled for uplink. Otherwise, two-intervals-SPS is disabled.

Conditional presence	Explanation
TDD	This field is optional present for TDD, need OR; it is not present for FDD and the UE shall
	delete any existing value for this field.

TDD-Config

The IE TDD-Config is used to specify the TDD specific physical channel configuration.

TDD-Config information element

```
TDD-Config ::= SEQUENCE {

subframeAssignment ENUMERATED {

sa0, sa1, sa2, sa3, sa4, sa5, sa6},

specialSubframePatterns ENUMERATED {

ssp0, ssp1, ssp2, ssp3, ssp4,ssp5, ssp6, ssp7,

ssp8}
}

TDD-Config-v1130 ::= SEQUENCE {

specialSubframePatterns-v1130 ENUMERATED {ssp7,ssp9}
}
```

TDD-Config field descriptions

specialSubframePatterns

Indicates Configuration as in TS 36.211 [21, table 4.2-1] where ssp0 points to Configuration 0, ssp1 to Configuration 1 etc. Value ssp7 points to Configuration 7 for extended cyclic prefix and value ssp9 points to Configuration 9 for normal cyclic prefix. E-UTRAN signals ssp7 only when setting specialSubframePatterns (without suffix i.e. the version defined in REL-8) to ssp4. E-UTRAN signals value ssp9 only when setting specialSubframePatterns (without suffix) to ssp5. If specialSubframePatterns-v1130 is present, the UE shall ignore specialSubframePatterns (without suffix).

subframeAssignment

Indicates DL/UL subframe configuration where sa0 point to Configuration 0, sa1 to Configuration 1 etc. as specified in TS 36.211 [21, table 4.2-2]. E-UTRAN configures the same value for serving cells residing on same frequency band.

TimeAlignmentTimer

The IE *TimeAlignmentTimer* is used to control how long the UE considers the serving cells belonging to the associated TAG to be uplink time aligned. Corresponds to the Timer for time alignment in TS 36.321 [6]. Value in number of subframes. Value sf500 corresponds to 500 sub-frames, sf750 corresponds to 750 sub-frames and so on.

TimeAlignmentTimer information element

-- ASN1STOP

TPC-PDCCH-Config

The IE *TPC-PDCCH-Config* is used to specify the RNTIs and indexes for PUCCH and PUSCH power control according to TS 36.212 [22]. The power control function can either be setup or released with the IE.

TPC-PDCCH-Config information element

```
-- ASN1START
TPC-PDCCH-Config ::=
                                    CHOICE {
                              NULL,
   release
                              SEQUENCE {
   setup
                                 BIT STRING (SIZE (16)),
      tpc-RNTI
      tpc-Index
                                 TPC-Index
   }
TPC-Index ::=
                                 CHOICE {
   indexOfFormat3
                                    INTEGER (1..15),
  indexOfFormat3A
                                       INTEGER (1..31)
-- ASN1STOP
```

Index OfFormat3 Index of N when DCI format 3 is used. See TS 36.212 [22, 5.3.3.1.6]. Index OfFormat3A Index of M when DCI format 3A is used. See TS 36.212 [22, 5.3.3.1.7]. Index Of N or M, see TS 36.212 [22, 5.3.3.1.7], where N or M is dependent on the used DCI format (i.e. format 3 or 3a). Index Of N or M, see TS 36.212 [22, 5.3.3.1.6 and 5.3.3.1.7], where N or M is dependent on the used DCI format (i.e. format 3 or 3a). Index Of N or M, see TS 36.212 [22, 5.3.3.1.6 and 5.3.3.1.7], where N or M is dependent on the used DCI format (i.e. format 3 or 3a). Index Of N or M, see TS 36.212 [22, 5.3.3.1.6 and 5.3.3.1.7], where N or M is dependent on the used DCI format (i.e. format 3 or 3a).

UplinkPowerControl

The IE *UplinkPowerControlCommon* and IE *UplinkPowerControlDedicated* are used to specify parameters for uplink power control in the system information and in the dedicated signalling, respectively.

UplinkPowerControl information elements

-- ASN1START

```
UplinkPowerControlCommon ::=
                                SEQUENCE {
  p0-NominalPUSCH
                                   INTEGER (-126..24),
  alpha
                             ENUMERATED {al0, al04, al05, al06, al07, al08, al09, al1},
  p0-NominalPUCCH
                                   INTEGER (-127..-96),
  deltaFList-PUCCH
                                DeltaFList-PUCCH,
  deltaPreambleMsg3
                                INTEGER (-1..6)
UplinkPowerControlCommon-v1020 ::= SEQUENCE {
  deltaF-PUCCH-Format3-r10
                                      ENUMERATED {deltaF-1, deltaF0, deltaF1, deltaF2,
                                         deltaF3, deltaF4, deltaF5, deltaF6},
  deltaF-PUCCH-Format1bCS-r10
                                         ENUMERATED {deltaF1, deltaF2, spare2, spare1}
UplinkPowerControlCommonSCell-r10 ::= SEQUENCE {
  p0-NominalPUSCH-r10
                                   INTEGER (-126..24),
  alpha-r10
                            ENUMERATED {al0, al04, al05, al06, al07, al08, al09, al1}
UplinkPowerControlCommonSCell-v1130 ::= SEQUENCE {
  deltaPreambleMsg3-r11 INTEGER (-1..6)
UplinkPowerControlDedicated ::=
                                SEQUENCE {
  p0-UE-PUSCH
                                   INTEGER (-8..7),
  deltaMCS-Enabled
                                ENUMERATED {en0, en1},
  accumulationEnabled
                                   BOOLEAN,
  p0-UE-PUCCH
                                   INTEGER (-8..7),
  pSRS-Offset
                                INTEGER (0..15),
  filterCoefficient
                             FilterCoefficient
                                                       DEFAULT fc4
UplinkPowerControlDedicated-v1020 ::= SEQUENCE {
  deltaTxD-OffsetListPUCCH-r10 DeltaTxD-OffsetListPUCCH-r10 OPTIONAL, -- Need OR
```

```
OPTIONAL
                                                                           -- Need OR
   pSRS-OffsetAp-r10
                               INTEGER (0..15)
}
UplinkPowerControlDedicated-v1130 ::=
                                     SEQUENCE {
  pSRS-Offset-v1130
                                  INTEGER (16..31)
                                                          OPTIONAL,
                                                                        -- Need OR
  pSRS-OffsetAp-v1130
                                     INTEGER (16..31)
                                                             OPTIONAL,
                                                                           -- Need OR
  deltaTxD-OffsetListPUCCH-v1130
                                        DeltaTxD-OffsetListPUCCH-v1130 OPTIONAL -- Need OR
UplinkPowerControlDedicatedSCell-r10 ::=
                                        SEQUENCE {
  p0-UE-PUSCH-r10
                                  INTEGER (-8..7),
  deltaMCS-Enabled-r10
                                   ENUMERATED {en0, en1},
  accumulationEnabled-r10
                                   BOOLEAN,
  pSRS-Offset-r10
                               INTEGER (0..15),
  pSRS-OffsetAp-r10
                               INTEGER (0..15)
                                                             OPTIONAL, -- Need OR
  filterCoefficient-r10
                             FilterCoefficient
                                                       DEFAULT fc4,
  pathlossReferenceLinking-r10
                               ENUMERATED {pCell, sCell}
DeltaFList-PUCCH ::=
                             SEQUENCE {
  deltaF-PUCCH-Format1
                                ENUMERATED {deltaF-2, deltaF0, deltaF2},
  deltaF-PUCCH-Format1b
                                   ENUMERATED {deltaF1, deltaF3, deltaF5},
  deltaF-PUCCH-Format2
                                ENUMERATED {deltaF-2, deltaF0, deltaF1, deltaF2},
  deltaF-PUCCH-Format2a
                                   ENUMERATED {deltaF-2, deltaF0, deltaF2},
  deltaF-PUCCH-Format2b
                                   ENUMERATED {deltaF-2, deltaF0, deltaF2}
DeltaTxD-OffsetListPUCCH-r10 ::= SEQUENCE {
  deltaTxD-OffsetPUCCH-Format1-r10
                                    ENUMERATED {dB0, dB-2},
  deltaTxD-OffsetPUCCH-Format1a1b-r10
                                        ENUMERATED {dB0, dB-2},
  deltaTxD-OffsetPUCCH-Format22a2b-r10 ENUMERATED {dB0, dB-2},
  deltaTxD-OffsetPUCCH-Format3-r10 ENUMERATED {dB0, dB-2},
```

```
DeltaTxD-OffsetListPUCCH-v1130 ::= SEQUENCE {
    deltaTxD-OffsetPUCCH-Format1bCS-r11 ENUMERATED {dB0, dB-1}
}
-- ASN1STOP
```

UplinkPowerControl field descriptions

accumulationEnabled

Parameter: Accumulation-enabled, see TS 36.213 [23, 5.1.1.1]. TRUE corresponds to 'enabled' whereas FALSE corresponds to 'disabled'.

alpha

Parameter: α See TS 36.213 [23, 5.1.1.1] where all corresponds to 0, all04 corresponds to value 0.4, all05 to 0.5, all06 to 0.6, all07 to 0.7, all08 to 0.8, all09 to 0.9 and all1 corresponds to 1.

deltaF-PUCCH-FormatX

Parameter: $\Delta_{F_PUCCH}(F)$ for the PUCCH formats 1, 1b, 2, 2a, 2b, 3 and 1b with channel selection. See TS 36.213 [23, 5.1.2] where deltaF-2 corresponds to -2 dB, deltaF0 corresponds to 0 dB and so on.

deltaMCS-Enabled

Parameter: Ks See TS 36.213 [23, 5.1.1.1]. en0 corresponds to value 0 corresponding to state 'disabled'. en1 corresponds to value 1.25 corresponding to 'enabled'.

deltaPreambleMsg3

Parameter: $\Delta_{PREAMBLE-Msg3}$ see TS 36.213 [23, 5.1.1.1]. Actual value = IE value * 2 [dB].

deltaTxD-OffsetPUCCH-FormatX

Parameter: $\Delta_{TxD}(F')$ for the PUCCH formats 1, 1a/1b, 1b with channel selection, 2/2a/2b and 3 when two antenna ports are configured for PUCCH transmission. See TS 36.213 [23, 5.1.2.1] where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. EUTRAN configures the field deltaTxD-OffsetPUCCH-Format1bCS-r11 for the PCell only.

filterCoefficient

Specifies the filtering coefficient for RSRP measurements used to calculate path loss, as specified in TS 36.213 [23, 5.1.1.1]. The same filtering mechanism applies as for *quantityConfig* described in 5.5.3.2.

p0-NominalPUCCH

Parameter: $P_{
m O\ NOMINAL\ PUCCH}$ See TS 36.213, 5.1.2.1, unit dBm.

p0-NominalPUSCH

Parameter: $P_{\text{O_NOMINAL_PUSCH}}(1)$ See TS 36.213, 5.1.1.1, unit dBm. This field is applicable for non-persistent scheduling, only.

p0-UE-PUCCH

Parameter: $P_{
m O\ UE\ PUCCH}$ See TS 36.213 [23, 5.1.2.1]. Unit dB

p0-UE-PUSCH

Parameter: $P_{\text{O_UE_PUSCH}}(1)$ See TS 36.213 [23, 5.1.1.1], unit dB. This field is applicable for non-persistent scheduling, only.

pathlossReferenceLinking

Indicates whether the UE shall apply as pathloss reference either the downlink of the PCell or of the SCell that corresponds with this uplink (i.e. according to the *cellIdentification* within the field *sCellToAddMod*). For SCells part of an STAG E-UTRAN sets the value to sCell.

pSRS-Offset, pSRS-OffsetAp

Parameter: P_{SRS_OFFSET} for periodic and aperiodic sounding reference signal transmission repectively. See TS 36.213 [23, 5.1.3.1]. For Ks=1.25, the actual parameter value is pSRS-Offset value – 3. For Ks=0, the actual parameter value is -10.5 + 1.5*pSRS-Offset value.

If *pSRS-Offset-v1130* is included, the UE ignores *pSRS-Offset* (i.e., without suffix). Likewise, if *pSRS-OffsetAp-v1130* is included, the UE ignores *pSRS-OffsetAp-r10*. For Ks=0, E-UTRAN does not set values larger than 26.

6.3.3 Security control information elements

NextHopChainingCount

The IE NextHopChainingCount is used to update the K_{eNB} key and corresponds to parameter NCC: See TS 33.401 [32, 7.2.8.4].

NextHopChainingCount information element

```
-- ASN1START

NextHopChainingCount ::= INTEGER (0..7)

-- ASN1STOP
```

SecurityAlgorithmConfig

The IE *SecurityAlgorithmConfig* is used to configure AS integrity protection algorithm (SRBs) and AS ciphering algorithm (SRBs and DRBs). For RNs, the IE *SecurityAlgorithmConfig* is also used to configure AS integrity protection algorithm for DRBs between the RN and the E-UTRAN.

SecurityAlgorithmConfig information element

SecurityAlgorithmConfig field descriptions

ciphering Algorithm

Indicates the ciphering algorithm to be used for SRBs and DRBs, as specified in TS 33.401 [32, 5.1.3.2].

integrityProtAlgorithm

Indicates the integrity protection algorithm to be used for SRBs, as specified in TS 33.401 [32, 5.1.4.2]. For RNs, also indicates the integrity protection algorithm to be used for integrity protection-enabled DRB(s).

ShortMAC-I

The IE *ShortMAC-I* is used to identify and verify the UE at RRC connection re-establishment. The 16 least significant bits of the MAC-I calculated using the security configuration of the source PCell, as specified in 5.3.7.4.

ShortMAC-I information element

ASN1START		
ShortMAC-I ::=	BIT STRING (SIZE (16))	
ASN1STOP		

6.3.4 Mobility control information elements

AdditionalSpectrumEmission

Additional Spectrum Emission information element

ASN1START			
AdditionalSpectrumEmission ::=	INTEGER (132)		
ASN1STOP			

ARFCN-ValueCDMA2000

The IE *ARFCN-ValueCDMA2000* used to indicate the CDMA2000 carrier frequency within a CDMA2000 band, see C.S0002 [12].

ARFCN-ValueCDMA2000 information element

ASN1START			
ARFCN-ValueCDMA2000 ::=	INTEGER (02047)		
ASN1STOP			

ARFCN-ValueEUTRA

The IE *ARFCN-ValueEUTRA* is used to indicate the ARFCN applicable for a downlink, uplink or bi-directional (TDD) E-UTRA carrier frequency, as defined in TS 36.101 [42]. If an extension is signalled using the extended value range (as defined by IE *ARFCN-ValueEUTRA-v9e0*), the UE shall only consider this extension (and hence ignore the corresponding original field, using the value range as defined by IE *ARFCN-ValueEUTRA* i.e. without suffix, if signalled). In dedicated signalling, E-UTRAN only provides an EARFCN corresponding to an E-UTRA band supported by the UE.

ARFCN-ValueEUTRA information element

ASN1START	
ARFCN-ValueEUTRA ::=	INTEGER (0maxEARFCN)
ARFCN-ValueEUTRA-v9e0 ::=	INTEGER (maxEARFCN-Plus1maxEARFCN2)
ARFCN-ValueEUTRA-r9 ::=	INTEGER (0maxEARFCN2)
ASN1STOP	

NOTE: For fields using the original value range, as defined by IE *ARFCN-ValueEUTRA* i.e. without suffix, value *maxEARFCN* indicates that the E-UTRA carrier frequency is indicated by means of an extension. In such a case, UEs not supporting the extension consider the field to be set to a not supported value.

ARFCN-ValueGERAN

The IE ARFCN-ValueGERAN is used to specify the ARFCN value applicable for a GERAN BCCH carrier frequency, see TS 45.005 [20].

ARFCN-ValueGERAN information element

ASN1START	
ARFCN-ValueGERAN ::=	INTEGER (01023)
ASN1STOP	

ARFCN-ValueUTRA

The IE *ARFCN-ValueUTRA* is used to indicate the ARFCN applicable for a downlink (Nd, FDD) or bi-directional (Nt, TDD) UTRA carrier frequency, as defined in TS 25.331 [19].

ARFCN-ValueUTRA information element

ASN1START	
ARFCN-ValueUTRA ::=	INTEGER (016383)
ASN1STOP	

BandclassCDMA2000

The IE *BandclassCDMA2000* is used to define the CDMA2000 band in which the CDMA2000 carrier frequency can be found, as defined in C.S0057 [24, table 1.5-1].

BandclassCDMA2000 information element

-- ASN1START

BandclassCDMA2000 ::=

ENUMERATED {

bc0, bc1, bc2, bc3, bc4, bc5, bc6, bc7, bc8,

bc9, bc10, bc11, bc12, bc13, bc14, bc15, bc16,

bc17, bc18-v9a0, bc19-v9a0, bc20-v9a0, bc21-v9a0,

spare10, spare9, spare8, spare7, spare6, spare5, spare4,

spare3, spare2, spare1, ...}

BandIndicatorGERAN

The IE *BandIndicatorGERAN* indicates how to interpret an associated GERAN carrier ARFCN, see TS 45.005 [20]. More specifically, the IE indicates the GERAN frequency band in case the ARFCN value can concern either a DCS 1800 or a PCS 1900 carrier frequency. For ARFCN values not associated with one of these bands, the indicator has no meaning.

BandIndicatorGERAN information element

-- ASN1START

BandIndicatorGERAN ::= ENUMERATED {dcs1800, pcs1900}

-- ASN1STOP

CarrierFreqCDMA2000

The IE CarrierFreqCDMA2000 used to provide the CDMA2000 carrier information.

CarrierFreqCDMA2000 information element

-- ASN1START

CarrierFreqCDMA2000 ::= SEQUENCE {
 bandClass BandclassCDMA2000,
 arfcn ARFCN-ValueCDMA2000

```
-- ASN1STOP
```

CarrierFreqGERAN

The IE CarrierFreqGERAN is used to provide an unambiguous carrier frequency description of a GERAN cell.

CarrierFreqGERAN information element

```
-- ASN1START

CarrierFreqGERAN ::= SEQUENCE {
    arfcn ARFCN-ValueGERAN,
    bandIndicator BandIndicatorGERAN
}

-- ASN1STOP
```

CarrierFreqGERAN field descriptions	
arfcn	
GERAN ARFCN of BCCH carrier.	
bandIndicator	
Indicates how to interpret the ARFCN of the BCCH carrier.	

CarrierFreqsGERAN

The IE *CarrierFreqListGERAN* is used to provide one or more GERAN ARFCN values, as defined in TS 44.005 [43], which represents a list of GERAN BCCH carrier frequencies.

CarrierFreqsGERAN information element

```
-- ASN1START
CarrierFreqsGERAN ::=
                          SEQUENCE {
   startingARFCN
                                 ARFCN-ValueGERAN,
   bandIndicator
                              BandIndicatorGERAN,
  followingARFCNs
                                    CHOICE {
      explicitListOfARFCNs\\
                                    ExplicitListOfARFCNs,
      equallySpacedARFCNs
                                      SEQUENCE {
         arfcn-Spacing
                                    INTEGER (1..8),
         number Of Following ARFCNs\\
                                            INTEGER (0..31)
```

```
variableBitMapOfARFCNs OCTET STRING (SIZE (1..16))
}

ExplicitListOfARFCNs ::= SEQUENCE (SIZE (0..31)) OF ARFCN-ValueGERAN

-- ASN1STOP
```

CarrierFreqsGERAN field descriptions

arfcn-Spacing

Space, d, between a set of equally spaced ARFCN values.

bandIndicator

Indicates how to interpret the ARFCN of the BCCH carrier.

explicitListOfARFCNs

The remaining ARFCN values in the set are explicitly listed one by one.

followingARFCNs

Field containing a representation of the remaining ARFCN values in the set.

numberOfFollowingARFCNs

The number, n, of the remaining equally spaced ARFCN values in the set. The complete set of (n+1) ARFCN values is defined as: $\{s, ((s+d) \mod 1024), ((s+2*d) \mod 1024), ... ((s+n*d) \mod 1024)\}$.

startingARFCN

The first ARFCN value, s, in the set.

variableBitMapOfARFCNs

Bitmap field representing the remaining ARFCN values in the set. The leading bit of the first octet in the bitmap corresponds to the ARFCN = ((s + 1) mod 1024), the next bit to the ARFCN = ((s + 2) mod 1024), and so on. If the bitmap consist of N octets, the trailing bit of octet N corresponds to ARFCN = ((s + 8*N) mod 1024). The complete set of ARFCN values consists of ARFCN = s and the ARFCN values, where the corresponding bit in the bitmap is set to "1".

CarrierFreqListMBMS

The IE *CarrierFreqListMBMS* is used to indicate the E-UTRA ARFCN values of the one or more MBMS frequencies the UE is interested to receive.

CarrierFreqListMBMS information element

```
-- ASN1START

CarrierFreqListMBMS-r11 ::= SEQUENCE (SIZE (1..maxFreqMBMS-r11)) OF ARFCN-ValueEUTRA-r9

-- ASN1STOP
```

CDMA2000-Type

The IE CDMA2000-Type is used to describe the type of CDMA2000 network.

CDMA2000-Type information element

```
-- ASN1START
```

CDMA2000-Type ::=	ENUMERATED {type1XRTT, typeHRPD}
ASN1STOP	

CellIdentity

The IE CellIdentity is used to unambiguously identify a cell within a PLMN.

CellIdentity information element

ASN1START	
CellIdentity ::=	BIT STRING (SIZE (28))
ASN1STOP	

CellIndexList

The IE CellIndexList concerns a list of cell indices, which may be used for different purposes.

CellIndexList information element

ASN1START	
CellIndexList ::=	SEQUENCE (SIZE (1maxCellMeas)) OF CellIndex
CellIndex ::=	INTEGER (1maxCellMeas)
ASN1STOP	

CellReselectionPriority

The IE *CellReselectionPriority* concerns the absolute priority of the concerned carrier frequency/ set of frequencies (GERAN)/ bandclass (CDMA2000), as used by the cell reselection procedure. Corresponds with parameter "priority" in TS 36.304 [4]. Value 0 means: lowest priority. The UE behaviour for the case the field is absent, if applicable, is specified in TS 36.304 [4].

CellReselectionPriority information element

ASN1START	
CellReselectionPriority ::=	INTEGER (07)

-- ASN1STOP

CSFB-RegistrationParam1XRTT

The IE *CSFB-RegistrationParam1XRTT* is used to indicate whether or not the UE shall perform a CDMA2000 1xRTT pre-registration if the UE does not have a valid / current pre-registration.

```
-- ASN1START
CSFB-RegistrationParam1XRTT ::=
                                   SEQUENCE {
  sid
                             BIT STRING (SIZE (15)),
                             BIT STRING (SIZE (16)),
  nid
  multipleSID
                                BOOLEAN,
  multipleNID
                                BOOLEAN,
  homeReg
                                BOOLEAN,
  foreignSIDReg
                                BOOLEAN,
  foreignNIDReg
                                BOOLEAN,
  parameterReg
                             BOOLEAN,
                                BOOLEAN,
  powerUpReg
  registrationPeriod
                                BIT STRING (SIZE (7)),
  registrationZone
                             BIT STRING (SIZE (12)),
  totalZone
                             BIT STRING (SIZE (3)),
  zoneTimer
                                BIT STRING (SIZE (3))
CSFB-RegistrationParam1XRTT-v920 ::=SEQUENCE {
  powerDownReg-r9
                                   ENUMERATED {true}
-- ASN1STOP
```

CSFB-RegistrationParam1XRTT field descriptions

foreignNIDReg

The CDMA2000 1xRTT NID roamer registration indicator.

foreignSIDReg

The CDMA2000 1xRTT SID roamer registration indicator.

homeReg

The CDMA2000 1xRTT Home registration indicator.

multipleNID

The CDMA2000 1xRTT Multiple NID storage indicator.

multipleSID

The CDMA2000 1xRTT Multiple SID storage indicator.

nid

Used along with the *sid* as a pair to control when the UE should Register or Re-Register with the CDMA2000 1xRTT network.

parameterReg

The CDMA2000 1xRTT Parameter-change registration indicator.

powerDownReg

The CDMA2000 1xRTT Power-down registration indicator. If set to TRUE, the UE that has a valid / current CDMA2000 1xRTT pre-registration will perform a CDMA2000 1xRTT power down registration when it is switched off.

powerUpReg

The CDMA2000 1xRTT Power-up registration indicator.

registrationPeriod

The CDMA2000 1xRTT Registration period.

registrationZone

The CDMA2000 1xRTT Registration zone.

sid

Used along with the *nid* as a pair to control when the UE should Register or Re-Register with the CDMA2000 1xRTT network.

totalZone

The CDMA2000 1xRTT Number of registration zones to be retained.

zoneTimer

The CDMA2000 1xRTT Zone timer length.

CellGlobalIdEUTRA

The IE *CellGlobalIdEUTRA* specifies the Evolved Cell Global Identifier (ECGI), the globally unique identity of a cell in E-UTRA.

CellGlobalIdEUTRA information element

```
-- ASN1START

CellGlobalIdEUTRA ::= SEQUENCE {
    plmn-Identity PLMN-Identity,
    cellIdentity CellIdentity
}
```

CellGlobalIdEUTRA field descriptions

cellidentity

Identity of the cell within the context of the PLMN.

plmn-Identity

Identifies the PLMN of the cell as given by the first PLMN entry in the *plmn-IdentityList* in *SystemInformationBlockType1*.

CellGlobalIdUTRA

The IE CellGlobalIdUTRA specifies the global UTRAN Cell Identifier, the globally unique identity of a cell in UTRA.

CellGloballdUTRA information element

```
-- ASN1START

CellGlobalIdUTRA ::= SEQUENCE {
   plmn-Identity PLMN-Identity,
   cellIdentity BIT STRING (SIZE (28))
}

-- ASN1STOP
```

CellGloballdUTRA field descriptions

cellidentity

UTRA Cell Identifier which is unique within the context of the identified PLMN as defined in TS 25.331 [19].

plmn-Identity

Identifies the PLMN of the cell as given by the common PLMN broadcast in the MIB, as defined in TS 25.331 [19].

CellGlobalIdGERAN

The IE *CellGlobalIdGERAN* specifies the Cell Global Identification (CGI), the globally unique identity of a cell in GERAN.

CellGloballdGERAN information element

```
-- ASN1START

CellGlobalIdGERAN ::= SEQUENCE {
   plmn-Identity PLMN-Identity,
   locationAreaCode BIT STRING (SIZE (16)),
   cellIdentity BIT STRING (SIZE (16))
}

-- ASN1STOP
```

CellGlobalIdGERAN field descriptions

cellIdentity

Cell Identifier which is unique within the context of the GERAN location area as defined in TS 23.003 [27].

IocationAreaCode

A fixed length code identifying the location area within a PLMN as defined in TS 23.003 [27].

plmn-Identity

Identifies the PLMN of the cell, as defined in TS 23.003 [27]..

CellGlobalIdCDMA2000

The IE *CellGlobalIdCDMA2000* specifies the Cell Global Identification (CGI), the globally unique identity of a cell in CDMA2000.

CellGlobalIdCDMA2000 information element

```
-- ASN1START

CellGlobalIdCDMA2000 ::= CHOICE {
    cellGlobalId1XRTT BIT STRING (SIZE (47)),
    cellGlobalIdHRPD BIT STRING (SIZE (128))
}

-- ASN1STOP
```

CellGlobalIdCDMA2000 field descriptions

cellGloballd1XRTT

Unique identifier for a CDMA2000 1xRTT cell, corresponds to BASEID, SID and NID parameters (in that order) defined in C.S0005 [25].

cellGloballdHRPD

Unique identifier for a CDMA2000 HRPD cell, corresponds to SECTOR ID parameter defined in C.S0024 [26, 14.9].

CSG-Identity

The IE CSG-Identity is used to identify a Closed Subscriber Group.

CSG-Identity information element

```
-- ASN1START

CSG-Identity ::= BIT STRING (SIZE (27))

-- ASN1STOP
```

FreqBandIndicator

The IE *FreqBandIndicator* indicates the E-UTRA operating band as defined in TS 36.101 [42, table 5.5-1]. If an extension is signalled using the extended value range (as defined by IE *FreqBandIndicator-v9e0*), the UE shall only consider this extension (and hence ignore the corresponding original field, using the value range as defined by IE *FreqBandIndicator* i.e. without suffix, if signalled).

FreqBandIndicator information element

```
-- ASN1START

FreqBandIndicator ::= INTEGER (1..maxFBI)
```

```
FreqBandIndicator-v9e0 ::= INTEGER (maxFBI-Plus1..maxFBI2)

FreqBandIndicator-r11 ::= INTEGER (1..maxFBI2)

-- ASN1STOP
```

NOTE: For fields using the original value range, as defined by IE *FreqBandIndicator* i.e. without suffix, value *maxFBI* indicates that the frequency band is indicated by means of an extension. In such a case, UEs not supporting the extension consider the field to be set to a not supported value.

MobilityControlInfo

The IE Mobility Controllnfo includes parameters relevant for network controlled mobility to/within E-UTRA.

MobilityControlInfo information element

```
-- ASN1START
MobilityControlInfo ::=
                       SEQUENCE {
   targetPhysCellId
                              PhysCellId,
                                 CarrierFreqEUTRA
                                                              OPTIONAL, -- Cond HO-toEUTRA2
  carrierFreq
                                                              OPTIONAL, -- Cond HO-toEUTRA
   carrierBandwidth
                              CarrierBandwidthEUTRA
  additionalSpectrumEmission
                                    AdditionalSpectrumEmission
                                                                     OPTIONAL, -- Cond HO-toEUTRA
   t304
                              ENUMERATED {
                                 ms50, ms100, ms150, ms200, ms500, ms1000,
                                 ms2000, spare1},
  newUE-Identity
                                 C-RNTI,
  radio Resource Config Common \\
                                    RadioResourceConfigCommon,
  rach-ConfigDedicated
                                 RACH-ConfigDedicated
                                                                  OPTIONAL, -- Need OP
                                                              OPTIONAL -- Need ON
   [[ carrierFreq-v9e0
                             CarrierFreqEUTRA-v9e0
   ]],
   [[ drb-ContinueROHC-r11
                                ENUMERATED {true}
                                                                  OPTIONAL -- Cond HO
   ]]
CarrierBandwidthEUTRA ::=
                                SEQUENCE {
```

```
dl-Bandwidth
                               ENUMERATED {
                                     n6, n15, n25, n50, n75, n100, spare10,
                                     spare9, spare8, spare7, spare6, spare5,
                                     spare4, spare3, spare2, spare1},
   ul-Bandwidth
                               ENUMERATED {
                                     n6, n15, n25, n50, n75, n100, spare10,
                                     spare9, spare8, spare7, spare6, spare5,
                                     spare4, spare3, spare2, spare1} OPTIONAL -- Need OP
CarrierFreqEUTRA ::=
                              SEQUENCE {
   dl-CarrierFreq
                                  ARFCN-ValueEUTRA,
   ul-CarrierFreq
                                  ARFCN-ValueEUTRA
                                                                 OPTIONAL -- Cond FDD
CarrierFreqEUTRA-v9e0 ::=
                                  SEQUENCE {
   dl-CarrierFreq-v9e0
                                  ARFCN-ValueEUTRA-r9.
                                                                 OPTIONAL -- Cond FDD
   ul-CarrierFreq-v9e0
                                  ARFCN-ValueEUTRA-r9
-- ASN1STOP
```

${\it Mobility Control Info}\ field\ descriptions$

additionalSpectrumEmission

The UE requirements related to IE Additional Spectrum Emission are defined in TS 36.101 [42, table 6.2.4.1].

carrierBandwidth

Provides the parameters Downlink bandwidth, and Uplink bandwidth, see TS 36.101 [42].

carrierFreq

Provides the EARFCN to be used by the UE in the target cell.

dl-Bandwidth

Parameter: Downlink bandwidth, see TS 36.101 [42].

drb-ContinueROHC

This field indicates whether to continue or reset, for this handover, the header compression protocol context for the RLC UM bearers configured with the header compression protocol. Presence of the field indicates that the header compression protocol context continues while absence indicates that the header compression protocol context is reset. E-UTRAN includes the field only in case of a handover within the same eNB.

rach-ConfigDedicated

The dedicated random access parameters. If absent the UE applies contention based random access as specified in TS 36.321 [6].

t304

Timer T304 as described in section 7.3. ms50 corresponds with 50 ms, ms100 corresponds with 100 ms and so on.

ul-Bandwidth

Parameter: *Uplink bandwidth*, see TS 36.101 [42, table 5.6-1]. For TDD, the parameter is absent and it is equal to downlink bandwidth. If absent for FDD, apply the same value as applies for the downlink bandwidth.

Conditional presence	Explanation
FDD	The field is mandatory with default value (the default duplex distance defined for the
	concerned band, as specified in TS 36.101 [42]) in case of 'FDD'; otherwise the field is
	not present.
НО	This field is optionally present, need OP, in case of handover within E-UTRA when the
	fullConfig is not included; otherwise the field is not present.
HO-toEUTRA	The field is mandatory present in case of inter-RAT handover to E-UTRA; otherwise the
	field is optionally present, need ON.
HO-toEUTRA2	The field is absent if <i>carrierFreq-v9e0</i> is present. Otherwise it is mandatory present in
	case of inter-RAT handover to E-UTRA and optionally present, need ON, in all other
	cases.

MobilityParametersCDMA2000 (1xRTT)

The *MobilityParametersCDMA2000* contains the parameters provided to the UE for handover and (enhanced) CSFB to 1xRTT support, as defined in C.S0097 [53].

MobilityParametersCDMA2000 information element

ASN1START	
MobilityParametersCDMA2000 ::=	OCTET STRING
ASN1STOP	

MobilityStateParameters

The IE *MobilityStateParameters* contains parameters to determine UE mobility state.

MobilityStateParameters information element

MobilityStateParameters field descriptions

n-CellChangeHigh

The number of cell changes to enter high mobility state. Corresponds to N_{CR H} in TS 36.304 [4].

n-CellChangeMedium

The number of cell changes to enter medium mobility state. Corresponds to N_{CR M} in TS 36.304 [4].

t-Evaluation

The duration for evaluating criteria to enter mobility states. Corresponds to T_{CRmax} in TS 36.304 [4]. Value in seconds, s30 corresponds to 30 s and so on.

t-HystNormal

The additional duration for evaluating criteria to enter normal mobility state. Corresponds to T_{CRmaxHyst} in TS 36.304 [4]. Value in seconds, s30 corresponds to 30 s and so on.

MultiBandInfoList

MultiBandInfoList information element

– PhysCellId

The IE *PhysCellId* is used to indicate the physical layer identity of the cell, as defined in TS 36.211 [21].

PhysCellId information element



PhysCellIdRange

The IE *PhysCellIdRange* is used to encode either a single or a range of physical cell identities. The range is encoded by using a *start* value and by indicating the number of consecutive physical cell identities (including *start*) in the range. For fields comprising multiple occurrences of *PhysCellIdRange*, E-UTRAN may configure overlapping ranges of physical cell identities.

PhysCellIdRange information element

PhysCellIdRange field descriptions

range

Indicates the number of physical cell identities in the range (including *start*). Value n4 corresponds with 4, n8 corresponds with 8 and so on. The UE shall apply value 1 in case the field is absent, in which case only the physical cell identity value indicated by *start* applies.

start

Indicates the lowest physical cell identity in the range.

PhysCellIdRangeUTRA-FDDList

The IE *PhysCellIdRangeUTRA-FDDList* is used to encode one or more of *PhysCellIdRangeUTRA-FDD*. While the IE *PhysCellIdRangeUTRA-FDD* is used to encode either a single physical layer identity or a range of physical layer identities, i.e. primary scrambling codes. Each range is encoded by using a *start* value and by indicating the number of consecutive physical cell identities (including *start*) in the range.

PhysCellIdRangeUTRA-FDDList information element

```
-- ASN1START

PhysCellIdRangeUTRA-FDDList-r9::= SEQUENCE (SIZE (1..maxPhysCellIdRange-r9)) OF

PhysCellIdRangeUTRA-FDD-r9

PhysCellIdRangeUTRA-FDD-r9 ::= SEQUENCE {

start-r9 PhysCellIdUTRA-FDD,

range-r9 INTEGER (2..512) OPTIONAL -- Need OP
```

```
-- ASN1STOP
```

PhysCellIdRangeUTRA-FDDList field descriptions

range

Indicates the number of primary scrambling codes in the range (including *start*). The UE shall apply value 1 in case the field is absent, in which case only the primary scrambling code value indicated by *start* applies.

start

Indicates the lowest primary scrambling code in the range.

PhysCellIdCDMA2000

The IE *PhysCellIdCDMA2000* identifies the PNOffset that represents the "Physical cell identity" in CDMA2000.

PhysCellIdCDMA2000 information element

```
-- ASN1START

PhysCellIdCDMA2000 ::= INTEGER (0..maxPNOffset)

-- ASN1STOP
```

– PhysCellIdGERAN

The IE *PhysCellIdGERAN* contains the Base Station Identity Code (BSIC).

PhysCellIdGERAN information element

```
-- ASN1START

PhysCellIdGERAN ::= SEQUENCE {
    networkColourCode BIT STRING (SIZE (3)),
    baseStationColourCode BIT STRING (SIZE (3))
}

-- ASN1STOP
```

PhysCellIdGERAN field descriptions	
baseStationColourCode	
Base station Colour Code as defined in TS 23.003 [27].	
networkColourCode	
Network Colour Code as defined in TS 23.003 [27].	

PhysCellIdUTRA-FDD

The IE *PhysCellIdUTRA-FDD* is used to indicate the physical layer identity of the cell, i.e. the primary scrambling code, as defined in TS 25.331 [19].

PhysCellIdUTRA-FDD information element

ASN1START		
PhysCellIdUTRA-FDD ::=	INTEGER (0511)	
ASN1STOP		

PhysCellIdUTRA-TDD

The IE *PhysCellIdUTRA-TDD* is used to indicate the physical layer identity of the cell, i.e. the cell parameters ID (TDD), as specified in TS 25.331 [19]. Also corresponds to the Initial Cell Parameter Assignment in TS 25.223 [46].

PhysCellIdUTRA-TDD information element

```
-- ASN1START

PhysCellIdUTRA-TDD ::= INTEGER (0..127)

-- ASN1STOP
```

PLMN-Identity

The IE *PLMN-Identity* identifies a Public Land Mobile Network. Further information regarding how to set the IE are specified in TS 23.003 [27].

PLMN-Identity information element

	MCC-MNC-Digit
MCC-MNC-Digit ::=	INTEGER (09)
L GLY GTTOP	
ASN1STOP	

PLMN-Identity field descriptions mcc The first element contains the first MCC digit, the second element the second MCC digit and so on. If the field is absent, it takes the same value as the mcc of the immediately preceding IE PLMN-Identity. See TS 23.003 [27]. mnc The first element contains the first MNC digit, the second element the second MNC digit and so on. See TS 23.003 [27].

Conditional presence	Explanation
MCC	This IE is mandatory when PLMN-Identity is included in CellGlobalIdEUTRA, in
	CellGloballdUTRA, in CellGloballdGERAN or in RegisteredMME. This IE is also
	mandatory in the first occurrence of the IE PLMN-Identity within the IE PLMN-IdentityList.
	Otherwise it is optional, need OP.

PLMN-IdentityList3

Includes a list of PLMN identities.

PLMN-IdentityList3 information element

-- ASN1START

PLMN-IdentityList3-r11 ::= SEQUENCE (SIZE (1..16)) OF PLMN-Identity

-- ASN1STOP

PreRegistrationInfoHRPD

```
-- ASN1START

PreRegistrationInfoHRPD ::= SEQUENCE {
    preRegistrationAllowed BOOLEAN,
    preRegistrationZoneId PreRegistrationZoneIdHRPD OPTIONAL, -- cond PreRegAllowed secondaryPreRegistrationZoneIdList SecondaryPreRegistrationZoneIdListHRPD OPTIONAL -- Need OR }

SecondaryPreRegistrationZoneIdListHRPD ::= SEQUENCE (SIZE (1..2)) OF PreRegistrationZoneIdHRPD
```

PreRegistrationZoneIdHRPD ::= INTEGER (0..255)
-- ASN1STOP

PreRegistrationInfoHRPD field descriptions

preRegistrationAllowed

TRUE indicates that a UE shall perform a CDMA2000 HRPD pre-registration if the UE does not have a valid / current pre-registration. FALSE indicates that the UE is not allowed to perform CDMA2000 HRPD pre-registration in the current cell.

preRegistrationZoneID

ColorCode (see C.S0024 [26], C.S0087 [44]) of the CDMA2000 Reference Cell corresponding to the HRPD sector under the HRPD AN that is configured for this LTE cell. It is used to control when the UE should register or re-register.

secondaryPreRegistrationZoneldList

List of SecondaryColorCodes (see C.S0024 [26], C.S0087 [44]) of the CDMA2000 Reference Cell corresponding to the HRPD sector under the HRPD AN that is configured for this LTE cell. They are used to control when the UE should re-register.

Conditional presence	Explanation
PreRegAllowed	The field is mandatory in case the preRegistrationAllowed is set to true. Otherwise the
	field is not present and the UE shall delete any existing value for this field.

Q-QualMin

The IE *Q-QualMin* is used to indicate for cell selection/re-selection the required minimum received RSRQ level in the (E-UTRA) cell. Corresponds to parameter $Q_{qualmin}$ in 36.304 [4]. Actual value $Q_{qualmin}$ = IE value [dB].

Q-QualMin information element

-- ASN1START

Q-QualMin-r9 ::= INTEGER (-34..-3)

-- ASN1STOP

Q-RxLevMin

The IE Q-RxLevMin is used to indicate for cell selection/re-selection the required minimum received RSRP level in the (E-UTRA) cell. Corresponds to parameter $Q_{rxlevmin}$ in 36.304 [4]. Actual value $Q_{rxlevmin}$ = IE value * 2 [dBm].

Q-RxLevMin information element

ASN1START		
Q-RxLevMin ::=	INTEGER (-7022)	
ASN1STOP		

Q-OffsetRange

The IE *Q-OffsetRange* is used to indicate a cell or frequency specific offset to be applied when evaluating candidates for cell re-selection or when evaluating triggering conditions for measurement reporting. The value in dB. Value dB-24 corresponds to -24 dB, dB-22 corresponds to -22 dB and so on.

Q- OffsetRange information element

ASN1START	
Q-OffsetRange ::=	ENUMERATED {
	dB-24, dB-22, dB-20, dB-18, dB-16, dB-14,
	dB-12, dB-10, dB-8, dB-6, dB-5, dB-4, dB-3,
	dB-2, dB-1, dB0, dB1, dB2, dB3, dB4, dB5,
	dB6, dB8, dB10, dB12, dB14, dB16, dB18,
	dB20, dB22, dB24}
ASN1STOP	

Q-OffsetRangeInterRAT

The IE *Q-OffsetRangeInterRAT* is used to indicate a frequency specific offset to be applied when evaluating triggering conditions for measurement reporting. The value in dB.

Q-OffsetRangeInterRAT information element

ASN1START	
Q-OffsetRangeInterRAT ::=	INTEGER (-1515)
ASN1STOP	

ReselectionThreshold

The IE *ReselectionThreshold* is used to indicate an Rx level threshold for cell reselection. Actual value of threshold = IE value * 2 [dB].

ReselectionThreshold information element

ASN1START	
ReselectionThreshold ::=	INTEGER (031)
ASN1STOP	

ReselectionThresholdQ

The IE ReselectionThresholdQ is used to indicate a quality level threshold for cell reselection. Actual value of threshold = IE value [dB].

ReselectionThresholdQ information element

ASN1START	
ReselectionThresholdQ-r9 ::=	INTEGER (031)
ASN1STOP	

SCellIndex

The IE SCellIndex concerns a short identity, used to identify an SCell.

SCellIndex information element

ASN1START	
SCellIndex-r10 ::=	INTEGER (17)
ASN1STOP	

ServCellIndex

The IE *ServCellIndex* concerns a short identity, used to identify a serving cell (i.e. the PCell or an SCell). Value 0 applies for the PCell, while the *SCellIndex* that has previously been assigned applies for SCells.

ServCellIndex information element

ASN1START	
ServCellIndex-r10 ::=	INTEGER (07)
ASN1STOP	

SpeedStateScaleFactors

The IE *SpeedStateScaleFactors* concerns factors, to be applied when the UE is in medium or high speed state, used for scaling a mobility control related parameter.

SpeedStateScaleFactors information element

ASN1START	
SpeedStateScaleFactors ::=	SEQUENCE {
sf-Medium	ENUMERATED {oDot25, oDot5, oDot75, lDot0},
sf-High	ENUMERATED {oDot25, oDot5, oDot75, lDot0}
}	
ASN1STOP	

SpeedStateScaleFactors field descriptions

sf-High

The concerned mobility control related parameter is multiplied with this factor if the UE is in High Mobility state as defined in TS 36.304 [4]. Value oDot25 corresponds to 0.25, oDot5 corresponds to 0.5, oDot75 corresponds to 0.75 and so on.

sf-Medium

The concerned mobility control related parameter is multiplied with this factor if the UE is in Medium Mobility state as defined in TS 36.304 [4]. Value oDot25 corresponds to 0.25, oDot5 corresponds to 0.5, oDot75 corresponds to 0.75 and so on.

SystemInfoListGERAN

The IE SystemInfoListGERAN contains system information of a GERAN cell.

SystemInfoListGERAN information element

-- ASN1START

SystemInfoListGERAN ::= SEQUENCE (SIZE (1..maxGERAN-SI)) OF

OCTET STRING (SIZE (1..23))

-- ASN1STOP

SystemInfoListGERAN field descriptions

SystemInfoListGERAN

Each OCTET STRING contains one System Information (SI) message as defined in TS 44.018 [45, table 9.1.1] excluding the L2 Pseudo Length, the RR management Protocol Discriminator and the Skip Indicator or a complete Packet System Information (PSI) message as defined in TS 44.060 [36, table 11.2.1].

SystemTimeInfoCDMA2000

The IE *SystemTimeInfoCDMA2000* informs the UE about the absolute time in the current cell. The UE uses this absolute time knowledge to derive the CDMA2000 Physical cell identity, expressed as PNOffset, of neighbour CDMA2000 cells.

NOTE: The UE needs the CDMA2000 system time with a certain level of accuracy for performing measurements as well as for communicating with the CDMA2000 network (HRPD or 1xRTT).

SystemTimeInfoCDMA2000 information element

```
-- ASN1START

SystemTimeInfoCDMA2000 ::= SEQUENCE {
    cdma-EUTRA-Synchronisation BOOLEAN,
    cdma-SystemTime CHOICE {
        synchronousSystemTime BIT STRING (SIZE (39)),
        asynchronousSystemTime BIT STRING (SIZE (49))
    }
}

-- ASN1STOP
```

SystemTimeInfoCDMA2000 field descriptions

asynchronousSystemTime

The CDMA2000 system time corresponding to the SFN boundary at or after the ending boundary of the SI-Window in which *SystemInformationBlockType8* is transmitted. E-UTRAN includes this field if the E-UTRA frame boundary is not aligned to the start of CDMA2000 system time. This field size is 49 bits and the unit is 8 CDMA chips based on 1.2288 Mcps.

cdma-EUTRA-Synchronisation

TRUE indicates that there is no drift in the timing between E-UTRA and CDMA2000. FALSE indicates that the timing between E-UTRA and CDMA2000 can drift. NOTE 1

synchronousSystemTime

CDMA2000 system time corresponding to the SFN boundary at or after the ending boundary of the SI-window in which *SystemInformationBlockType8* is transmitted. E-UTRAN includes this field if the E-UTRA frame boundary is aligned to the start of CDMA2000 system time. This field size is 39 bits and the unit is 10 ms based on a 1.2288 Mcps chip rate.

NOTE 1: The following table shows the recommended combinations of the *cdma-EUTRA-Synchronisation* field and the choice of cdma-SystemTime included by E-UTRAN for FDD and TDD:

FDD/TDD	cdma-EUTRA-Synchronisation	synchronousSystemTime	asynchronousSystemTime
FDD	FALSE	Not Recommended	Recommended
FDD	TRUE	Recommended	Not Recommended
TDD	FALSE	Not Recommended	Recommended
TDD	TRUE	Recommended	Recommended

TrackingAreaCode

The IE TrackingAreaCode is used to identify a tracking area within the scope of a PLMN, see TS 24.301 [35].

TrackingAreaCode information element

```
-- ASN1START

TrackingAreaCode ::= BIT STRING (SIZE (16))
```

-- ASN1STOP

T-Reselection

The IE *T-Reselection* concerns the cell reselection timer Treselection_{RAT} for E-UTRA, UTRA, GERAN or CDMA2000. Value in seconds.

T-Reselection information element

ASN1START			
T-Reselection ::=	INTEGER (07)		
ASN1STOP			

6.3.5 Measurement information elements

AllowedMeasBandwidth

The IE *AllowedMeasBandwidth* is used to indicate the maximum allowed measurement bandwidth on a carrier frequency as defined by the parameter Transmission Bandwidth Configuration "N_{RB}" TS 36.104 [47]. The values mbw6, mbw15, mbw25, mbw50, mbw75, mbw100 indicate 6, 15, 25, 50, 75 and 100 resource blocks respectively.

AllowedMeasBandwidth information element

ASN1START	
AllowedMeasBandwidth ::=	ENUMERATED {mbw6, mbw15, mbw25, mbw50, mbw75, mbw100}
ASN1STOP	

Hysteresis

The IE *Hysteresis* is a parameter used within the entry and leave condition of an event triggered reporting condition. The actual value is IE value * 0.5 dB.

Hysteresis information element

ASN1START		
Hysteresis ::=	INTEGER (030)	
ASN1STOP		

LocationInfo

The IE *LocationInfo* is used to transfer detailed location information available at the UE to correlate measurements and UE position information.

LocationInfo information element

```
-- ASN1START
LocationInfo-r10 ::= SEQUENCE {
   locationCoordinates-r10
                                     CHOICE {
      ellipsoid-Point-r10
                                        OCTET STRING,
      ellipsoid Point With Altitude \hbox{-} r10
                                        OCTET STRING,
      ellipsoidPointWithUncertaintyCircle-r11
                                                       OCTET STRING,
      ellipsoidPointWithUncertaintyEllipse-r11
                                                    OCTET STRING,
      ellipsoidPointWithAltitudeAndUncertaintyEllipsoid-r11 OCTET STRING,
      ellipsoidArc-r11
                                                 OCTET STRING,
      polygon-r11
                                                    OCTET STRING
   },
   horizontalVelocity-r10
                                     OCTET STRING
                                                              OPTIONAL,
   gnss-TOD-msec-r10
                                     OCTET STRING
                                                              OPTIONAL,
-- ASN1STOP
```

LocationInfo field descriptions

ellipsoidArc

Parameter *EllipsoidArc* defined in TS36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit. *ellipsoid-Point*

Parameter *Ellipsoid-Point* defined in TS36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit.

ellipsoidPointWithAltitude

Parameter *EllipsoidPointWithAltitude* defined in TS36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit.

ellipsoidPointWithAltitudeAndUncertaintyEllipsoid

Parameter *EllipsoidPointWithAltitudeAndUncertaintyEllipsoid* defined in TS36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit.

ellipsoidPointWithUncertaintyCircle

Parameter *Ellipsoid-PointWithUncertaintyCircle* defined in TS36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit.

ellipsoidPointWithUncertaintyEllipse

Parameter *EllipsoidPointWithUncertaintyEllipse* defined in TS36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit.

gnss-TOD-msec

Parameter *Gnss-TOD-msec* defined in TS36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit.

horizontalVelocity

Parameter *HorizontalVelocity* defined in TS36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit.

polygon

Parameter Polygon defined in TS36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit.

MeasConfig

The IE *MeasConfig* specifies measurements to be performed by the UE, and covers intra-frequency, inter-frequency and inter-RAT mobility as well as configuration of measurement gaps.

MeasConfig information element

	_	
ASN1START		
MeasConfig ::=	SEQUENCE {	
Measurement objects		
measObjectToRemoveList	MeasObjectToRemoveList	OPTIONAL, Need ON
meas Object To Add Mod List	MeasObjectToAddModList	OPTIONAL, Need ON
Reporting configurations		
reportConfigToRemoveList	ReportConfigToRemoveList	OPTIONAL, Need ON
report Config To Add Mod List	ReportConfigToAddModList	OPTIONAL, Need ON
Measurement identities		
measIdToRemoveList	MeasIdToRemoveList	OPTIONAL, Need ON
measIdToAddModList	MeasIdToAddModList	OPTIONAL, Need ON
Other parameters		
quantityConfig	QuantityConfig	OPTIONAL, Need ON
measGapConfig	MeasGapConfig	OPTIONAL, Need ON
s-Measure	RSRP-Range	OPTIONAL, Need ON

```
PreRegistrationInfoHRPD
   preRegistrationInfoHRPD
                                                                       OPTIONAL, -- Need OP
   speedStatePars
                        CHOICE {
      release
                                 NULL,
                                 SEQUENCE {
      setup
         mobilityStateParameters
                                       MobilityStateParameters,
         timeToTrigger-SF
                                        SpeedStateScaleFactors
                                                          OPTIONAL, -- Need ON
   ...,
   [[ measObjectToAddModList-v9e0
                                           MeasObjectToAddModList-v9e0
                                                                             OPTIONAL -- Need ON
  ]],
                                                                       OPTIONAL -- Need ON
   \prod
         allowInterruptions-r11
                                     BOOLEAN
   ]]
MeasIdToRemoveList ::=
                                 SEQUENCE (SIZE (1..maxMeasId)) OF MeasId
                                 SEQUENCE (SIZE (1..maxObjectId)) OF MeasObjectId
MeasObjectToRemoveList ::=
ReportConfigToRemoveList ::=
                                 SEQUENCE (SIZE (1..maxReportConfigId)) OF ReportConfigId
-- ASN1STOP
```

MeasConfig field descriptions

allowInterruptions

Value TRUE indicates that the UE is allowed to cause interruptions to serving cells when performing measurements of deactivated SCell carriers for *measCycleSCell* of less than 640ms, as specified in TS 36.133 [16]. E-UTRAN enables this field only when an SCell is configured.

measGapConfig

Used to setup and release measurement gaps.

measObjectToAddModList

If E-UTRAN includes *measObjectToAddModList-v9e0* it includes the same number of entries, and listed in the same order, as in *measObjectToAddModList* (i.e. without suffix).

measIdToRemoveList

List of measurement identities to remove.

measObjectToRemoveList

List of measurement objects to remove.

PreRegistrationInfoHRPD

The CDMA2000 HRPD Pre-Registration Information tells the UE if it should pre-register with the CDMA2000 HRPD network and identifies the Pre-registration zone to the UE.

MeasConfig field descriptions

reportConfigToRemoveList

List of measurement reporting configurations to remove.

s-Measure

PCell quality threshold controlling whether or not the UE is required to perform measurements of intra-frequency, inter-frequency and inter-RAT neighbouring cells. Value '0' indicates to disable *s-Measure*.

timeToTrigger-SF

The timeToTrigger in ReportConfigEUTRA and in ReportConfigInterRAT are multiplied with the scaling factor applicable for the UE"s speed state.

MeasGapConfig

The IE *MeasGapConfig* specifies the measurement gap configuration and controls setup/ release of measurement gaps.

MeasGapConfig information element

MeasGapConfig field descriptions

gapOffset

Value *gapOffset* of *gp0* corresponds to gap offset of Gap Pattern Id '0' with MGRP = 40ms, *gapOffset* of *gp1* corresponds to gap offset of Gap Pattern Id '1' with MGRP = 80ms. Also used to specify the measurement gap pattern to be applied, as defined in TS 36.133 [16].

Measld

The IE *MeasId* is used to identify a measurement configuration, i.e., linking of a measurement object and a reporting configuration.

MeasId information element

```
-- ASN1START

MeasId ::= INTEGER (1..maxMeasId)
```

MeasIdToAddModList

The IE *MeasIdToAddModList* concerns a list of measurement identities to add or modify, with for each entry the *measId*, the associated *measObjectId* and the associated *reportConfigId*.

MeasIdToAddModList information element

MeasObjectCDMA2000

The IE MeasObjectCDMA2000 specifies information applicable for inter-RAT CDMA2000 neighbouring cells.

MeasObjectCDMA2000 information element

```
-- ASN1START
MeasObjectCDMA2000 ::=
                                SEQUENCE {
                                CDMA2000-Type,
  cdma2000-Type
  carrierFreq
                                CarrierFreqCDMA2000,
  search Window Size \\
                                INTEGER (0..15)
                                                                OPTIONAL, -- Need ON
                             Q-OffsetRangeInterRAT
  offsetFreq
                                                             DEFAULT 0,
                                                          OPTIONAL, -- Need ON
  cellsToRemoveList
                                CellIndexList
  cellsToAddModList
                                CellsToAddModListCDMA2000
                                                                   OPTIONAL, -- Need ON
                                                                   OPTIONAL, -- Need ON
  cellForWhichToReportCGI
                                   PhysCellIdCDMA2000
```

MeasObjectCDMA2000 field descriptions
carrierInfo
Identifies CDMA2000 carrier frequency for which this configuration is valid.
cdma2000-Type
The type of CDMA2000 network: CDMA2000 1xRTT or CDMA2000 HRPD.
cellIndex
Entry index in the neighbouring cell list.
cellsToAddModList
List of cells to add/ modify in the neighbouring cell list.
cellsToRemoveList
List of cells to remove from the neighbouring cell list.
physCellId
CDMA2000 Physical cell identity of a cell in neighbouring cell list expressed as PNOffset.
searchWindowSize
Provides the search window size to be used by the UE for the neighbouring pilot, see C.S0005 [25].

MeasObjectEUTRA

 $The IE \textit{MeasObjectEUTRA} \ specifies \ information \ applicable \ for \ intra-frequency \ or \ inter-frequency \ E-UTRA \ cells.$

MeasObjectEUTRA information element

ASN1START			
MeasObjectEUTRA ::=	SEQUENCE {		
carrierFreq	ARFCN-ValueEUTRA	,	
allowedMeasBandwidth	AllowedMeasBandwid	th,	
presenceAntennaPort1	PresenceAntennaPort1		
neighCellConfig	NeighCellConfig,		
offsetFreq	Q-OffsetRange	DEFAULT dB0,	
Cell list			
cellsToRemoveList	CellIndexList	OPTIONAL, Need ON	
cellsToAddModList	CellsToAddModList	OPTIONAL, Need ON	
Black list			

```
blackCellsToRemoveList
                                   CellIndexList
                                                       OPTIONAL, -- Need ON
  blackCellsToAddModList
                                   Black Cells To Add Mod List \\
                                                              OPTIONAL,
                                                                            -- Need ON
  cellForWhichToReportCGI
                                   PhysCellId
                                                           OPTIONAL,
                                                                         -- Need ON
  [[measCycleSCell-r10
                                MeasCycleSCell-r10 OPTIONAL,
                                                                   -- Need ON
     measSubframePatternConfigNeigh-r10 MeasSubframePatternConfigNeigh-r10 OPTIONAL
         -- Need ON
  ]],
  [[widebandRSRQ-Meas-r11
                                   BOOLEAN OPTIONAL
                                                             -- Cond WB-RSRQ
  11
MeasObjectEUTRA-v9e0 ::=
                                SEQUENCE {
  carrierFreq-v9e0
                           ARFCN-ValueEUTRA-v9e0
}
CellsToAddModList ::=
                             SEQUENCE (SIZE (1..maxCellMeas)) OF CellsToAddMod
CellsToAddMod ::= SEQUENCE {
  cellIndex
                             INTEGER (1..maxCellMeas),
  physCellId
                                PhysCellId,
  cellIndividualOffset
                             Q-OffsetRange
BlackCellsToAddModList ::=
                                SEQUENCE (SIZE (1..maxCellMeas)) OF BlackCellsToAddMod
BlackCellsToAddMod ::= SEQUENCE {
  cellIndex
                             INTEGER (1..maxCellMeas),
  physCellIdRange
                                PhysCellIdRange
MeasCycleSCell-r10 ::=
                           ENUMERATED {sf160, sf256, sf320, sf512,
                                      sf640, sf1024, sf1280, spare1}
MeasSubframePatternConfigNeigh-r10 ::= CHOICE {
```

MeasObjectEUTRA field descriptions

blackCellsToAddModList

List of cells to add/ modify in the black list of cells.

blackCellsToRemoveList

List of cells to remove from the black list of cells.

carrierFreq

Identifies E-UTRA carrier frequency for which this configuration is valid. E-UTRAN does not configure more than one measurement object for the same physical frequency regardless of the E-ARFCN used to indicate this.

cellIndex

Entry index in the cell list. An entry may concern a range of cells, in which case this value applies to the entire range.

cellIndividualOffset

Cell individual offset applicable to a specific cell. Value dB-24 corresponds to -24 dB, dB-22 corresponds to -22 dB and so on.

cellsToAddModList

List of cells to add/ modify in the cell list.

cellsToRemoveList

List of cells to remove from the cell list.

measCycleSCell

The parameter is used only when an SCell is configured on the frequency indicated by the *measObject* and is in deactivated state, see TS 36.133 [16, 8.3.3]. E-UTRAN configures the parameter whenever an SCell is configured on the frequency indicated by the *measObject*, but the field may also be signalled when an SCell is not configured. Value *sf160* corresponds to 160 sub-frames, *sf256* corresponds to 256 sub-frames and so on.

measSubframeCellList

List of cells for which measSubframePatternNeigh is applied.

measSubframePatternNeigh

Time domain measurement resource restriction pattern applicable to neighbour cell RSRP and RSRQ measurements on the carrier frequency indicated by *carrierFreq*. For cells in *measSubframeCellList* the UE shall assume that the subframes indicated by *measSubframePatternNeigh* are non-MBSFN subframes, and have the same special subframe configuration as PCell.

offsetFreq

Offset value applicable to the carrier frequency. Value dB-24 corresponds to -24 dB, dB-22 corresponds to -22 dB and so on.

physCellId

Physical cell identity of a cell in the cell list.

physCellIdRange

Physical cell identity or a range of physical cell identities of cells in the black list.

widebandRSRQ-Meas

If this field is set to *TRUE*, the UE shall, when performing RSRQ measurements, use a wider bandwidth in accordance with TS 36.133 [16].

Conditional presence	Explanation
always	The field is mandatory present.
WB-RSRQ	The field is optionally present, need ON, if the measurement bandwidth indicated by allowedMeasBandwidth is 50 resource blocks or larger; otherwise it is not present and the
	UE shall delete any existing value for this field, if configured.

MeasObjectGERAN

The IE MeasObjectGERAN specifies information applicable for inter-RAT GERAN neighbouring frequencies.

MeasObjectGERAN information element

ASN1START			
MeasObjectGERAN ::=	SEQUENCE {		
carrierFreqs	CarrierFreqsGERAN,		
offsetFreq	Q-OffsetRangeInterRAT	DEFAULT 0,	
ncc-Permitted	BIT STRING(SIZE (8))	DEFAULT '11111111'B,	
cellForWhichToReportCGI	PhysCellIdGERAN	OPTIONAL, Need ON	
}			
ASN1STOP			

MeasObjectGERAN field descriptions

ncc-Permitted

Field encoded as a bit map, where bit N is set to "0" if a BCCH carrier with NCC = N-1 is not permitted for monitoring and set to "1" if a BCCH carrier with NCC = N-1 is permitted for monitoring; N = 1 to 8; bit 1 of the bitmap is the leading bit of the bit string.

carrierFreqs

If E-UTRAN includes cellForWhichToReportCGI, it includes only one GERAN ARFCN value in carrierFreqs.

MeasObjectId

The IE MeasObjectId used to identify a measurement object configuration.

MeasObjectId information element

ASN1START	
MeasObjectId ::=	INTEGER (1maxObjectId)
ASN1STOP	

MeasObjectToAddModList

The IE MeasObjectToAddModList concerns a list of measurement objects to add or modify

MeasObjectToAddModList information element

```
-- ASN1START
MeasObjectToAddModList ::=
                              SEQUENCE (SIZE (1..maxObjectId)) OF MeasObjectToAddMod
MeasObjectToAddModList-v9e0 ::=
                                 SEQUENCE (SIZE (1..maxObjectId)) OF MeasObjectToAddMod-v9e0
MeasObjectToAddMod ::= SEQUENCE {
  measObjectId
                            MeasObjectId,
  measObject
                               CHOICE {
     measObjectEUTRA
                                    MeasObjectEUTRA,
     measObjectUTRA
                                    MeasObjectUTRA,
     measObjectGERAN
                                    MeasObjectGERAN,
     measObjectCDMA2000
                                    MeasObjectCDMA2000,
MeasObjectToAddMod-v9e0 ::= SEQUENCE {
  measObjectEUTRA-v9e0
                                                           OPTIONAL -- Cond eutra
                                  MeasObjectEUTRA-v9e0
-- ASN1STOP
```

Conditional presence	Explanation
eutra	The field is optional present, need OR, if for the corresponding entry in
	MeasObjectToAddModList field measObject is set to measObjectEUTRA and its sub-field
	carrierFreq is set to maxEARFCN. Otherwise the field is not present and the UE shall
	delete any existing value for this field.

MeasObjectUTRA

The IE MeasObjectUTRA specifies information applicable for inter-RAT UTRA neighbouring cells.

MeasObjectUTRA information element

-- ASN1START

```
MeasObjectUTRA ::=
                              SEQUENCE {
  carrierFreq
                              ARFCN-ValueUTRA,
                          Q-OffsetRangeInterRAT
  offsetFreq
                                                    DEFAULT 0,
                              CellIndexList
  cellsToRemoveList
                                                  OPTIONAL,
                                                                  -- Need ON
  cellsToAddModList
                              CHOICE {
     cellsToAddModListUTRA-FDD
                                      CellsToAddModListUTRA-FDD,
     cellsToAddModListUTRA-TDD
                                      CellsToAddModListUTRA-TDD
                                               OPTIONAL,
                                                               -- Need ON
  cellForWhichToReportCGI
                                 CHOICE {
     utra-FDD
                              PhysCellIdUTRA-FDD,
     utra-TDD
                              PhysCellIdUTRA-TDD
  }
                                               OPTIONAL, -- Need ON
  [[ csg-allowedReportingCells-v930
                                      CSG-AllowedReportingCells-r9 OPTIONAL
                                                                                -- Need ON
  11
CellsToAddModListUTRA-FDD ::=
                                 SEQUENCE (SIZE (1..maxCellMeas)) OF CellsToAddModUTRA-FDD
CellsToAddModUTRA-FDD ::= SEQUENCE {
  cellIndex
                           INTEGER (1..maxCellMeas),
  physCellId
                              PhysCellIdUTRA-FDD
CellsToAddModListUTRA-TDD ::=
                                 SEQUENCE (SIZE (1..maxCellMeas)) OF CellsToAddModUTRA-TDD
CellsToAddModUTRA-TDD ::= SEQUENCE {
  cellIndex
                           INTEGER (1..maxCellMeas),
  physCellId
                              PhysCellIdUTRA-TDD
CSG-AllowedReportingCells-r9 ::=
                                 SEQUENCE {
  physCellIdRangeUTRA-FDDList-r9
                                      PhysCellIdRangeUTRA-FDDList-r9 OPTIONAL -- Need OR
}
```

MeasObjectUTRA field descriptions

carrierFreq

Identifies UTRA carrier frequency for which this configuration is valid. E-UTRAN does not configure more than one measurement object for the same physical frequency regardless of the ARFCN used to indicate this.

cellIndex

Entry index in the neighbouring cell list.

cellsToAddModListUTRA-FDD

List of UTRA FDD cells to add/ modify in the neighbouring cell list.

cellsToAddModListUTRA-TDD

List of UTRA TDD cells to add/modify in the neighbouring cell list.

cellsToRemoveList

List of cells to remove from the neighbouring cell list.

csg-allowedReportingCells

One or more ranges of physical cell identities for which UTRA-FDD reporting is allowed.

MeasResults

The IE MeasResults covers measured results for intra-frequency, inter-frequency and inter- RAT mobility.

MeasResults information element

```
-- ASN1START
MeasResults ::=
                              SEQUENCE {
   measId
                                 MeasId,
   measResultPCell
                              SEQUENCE {
      rsrpResult
                                 RSRP-Range,
      rsrqResult
                                 RSRQ-Range
   },
  measResultNeighCells
                                 CHOICE {
      measResultListEUTRA
                                       MeasResultListEUTRA,
      measResultListUTRA
                                       MeasResultListUTRA,
      measResultListGERAN
                                       MeasResultListGERAN,
      measResultsCDMA2000
                                          MeasResultsCDMA2000,
                                                         OPTIONAL,
   }
   [[ measResultForECID-r9
                                    MeasResultForECID-r9
                                                               OPTIONAL
  ]],
   [[ locationInfo-r10
                                 LocationInfo-r10
                                                         OPTIONAL,
      measResultServFreqList-r10
                                       MeasResultServFreqList-r10
                                                                     OPTIONAL
  ]]
```

```
}
                                  SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA
MeasResultListEUTRA ::=
MeasResultEUTRA ::= SEQUENCE {
   physCellId
                                  PhysCellId,
  cgi-Info
                              SEQUENCE {
      cellGlobalId
                                  CellGlobalIdEUTRA,
      trackingAreaCode
                                     TrackingAreaCode,
      plmn-IdentityList
                                  PLMN-IdentityList2
                                                                 OPTIONAL
   }
                                                 OPTIONAL,
  measResult
                                  SEQUENCE {
      rsrpResult
                                  RSRP-Range
                                                             OPTIONAL,
      rsrqResult
                                  RSRQ-Range
                                                             OPTIONAL,
      [[ additionalSI-Info-r9
                                     Additional SI-Info-r9
                                                                 OPTIONAL
      ]]
MeasResultServFreqList-r10 ::= SEQUENCE (SIZE (1..maxServCell-r10)) OF MeasResultServFreq-r10
MeasResultServFreq-r10 ::=
                                  SEQUENCE {
  servFreqId-r10
                                  ServCellIndex-r10,
  measResultSCell-r10
                                  SEQUENCE {
      rsrpResultSCell-r10
                                     RSRP-Range,
      rsrqResultSCell-r10
                                     RSRQ-Range
                                                 OPTIONAL,
   }
   meas Result Best Neigh Cell-r 10\\
                                     SEQUENCE {
      physCellId-r10
                                     PhysCellId,
      rsrpResultNCell\hbox{-} r10
                                     RSRP-Range,
      rsrqResultNCell-r10
                                     RSRQ-Range
                                                 OPTIONAL,
   }
```

```
MeasResultListUTRA ::=
                                SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultUTRA
MeasResultUTRA ::= SEQUENCE {
   physCellId
                                 CHOICE {
      fdd
                                 PhysCellIdUTRA-FDD,
      tdd
                                 PhysCellIdUTRA-TDD
   },
   cgi-Info
                              SEQUENCE {
      cellGlobalId
                                CellGlobalIdUTRA,
      locationAreaCode
                                    BIT STRING (SIZE (16))
                                                                  OPTIONAL,
                                    BIT STRING (SIZE (8))
                                                               OPTIONAL,
      routingAreaCode
      plmn-IdentityList
                                PLMN-IdentityList2
                                                               OPTIONAL
                                                OPTIONAL,
   }
   measResult
                                SEQUENCE {
      utra-RSCP
                                    INTEGER (-5..91)
                                                               OPTIONAL,
      utra-EcN0
                                INTEGER (0..49)
                                                               OPTIONAL,
      ...,
      [[ additionalSI-Info-r9
                                    Additional SI-Info-r9
                                                               OPTIONAL
      11
MeasResultListGERAN ::=
                                SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultGERAN
MeasResultGERAN ::= SEQUENCE {
  carrierFreq
                                CarrierFreqGERAN,
  physCellId
                                PhysCellIdGERAN,
   cgi-Info
                              SEQUENCE {
      cellGlobalId
                                CellGlobalIdGERAN,
      routing Area Code \\
                                    BIT STRING (SIZE (8))
                                                               OPTIONAL
   }
                                                         OPTIONAL,
   measResult
                                SEQUENCE {
                             INTEGER (0..63),
      rssi
```

```
MeasResultsCDMA2000 ::=
                                  SEQUENCE {
  preRegistrationStatusHRPD
                               BOOLEAN,
  measResultListCDMA2000
                                  MeasResultListCDMA2000
}
MeasResultListCDMA2000 ::=
                               SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultCDMA2000
MeasResultCDMA2000 ::= SEQUENCE {
  physCellId
                                PhysCellIdCDMA2000,
  cgi-Info
                             CellGlobalIdCDMA2000
                                                             OPTIONAL,
  measResult
                               SEQUENCE {
     pilotPnPhase
                               INTEGER (0..32767)
                                                             OPTIONAL,
     pilotStrength
                               INTEGER (0..63),
MeasResultForECID-r9 ::=
                         SEQUENCE {
  ue-RxTxTimeDiffResult-r9
                                  INTEGER (0..4095),
  currentSFN-r9
                                   BIT STRING (SIZE (10))
}
PLMN-IdentityList2 ::=
                            SEQUENCE (SIZE (1..5)) OF PLMN-Identity
AdditionalSI-Info-r9 ::=
                         SEQUENCE {
  csg-MemberStatus-r9
                               ENUMERATED {member}
                                                                   OPTIONAL,
  csg-Identity-r9
                               CSG-Identity
                                                          OPTIONAL
-- ASN1STOP
```

MeasResults field descriptions

csq-MemberStatus

Indicates whether or not the UE is a member of the CSG of the neighbour cell.

currentSFN

Indicates the current system frame number when receiving the UE Rx-Tx time difference measurement results from lower layer.

IocationAreaCode

A fixed length code identifying the location area within a PLMN, as defined in TS 23.003 [27].

measId

Identifies the measurement identity for which the reporting is being performed.

measResult

Measured result of an E-UTRA cell;

Measured result of a UTRA cell;

Measured result of a GERAN cell or frequency; or

Measured result of a CDMA2000 cell.

Measured result of UE Rx-Tx time difference.

measResultListCDMA2000

List of measured results for the maximum number of reported best cells for a CDMA2000 measurement identity.

measResultListEUTRA

List of measured results for the maximum number of reported best cells for an E-UTRA measurement identity.

measResultListGERAN

List of measured results for the maximum number of reported best cells or frequencies for a GERAN measurement identity.

measResultListUTRA

List of measured results for the maximum number of reported best cells for a UTRA measurement identity.

measResultPCell

Measured result of the PCell.

measResultsCDMA2000

Contains the CDMA2000 HRPD pre-registration status and the list of CDMA2000 measurements.

MeasResultServFreqList

Measured results of the serving frequencies: the measurement result of each SCell, if any, and of the best neighbouring cell on each serving frequency.

pilotPnPhase

Indicates the arrival time of a CDMA2000 pilot, measured relative to the UE"s time reference in units of PN chips, see C.S0005 [25]. This information is used in either SRVCC handover or enhanced 1xRTT CS fallback procedure to CDMA2000 1xRTT.

pilotStrength

CDMA2000 Pilot Strength, the ratio of pilot power to total power in the signal bandwidth of a CDMA2000 Forward Channel. See C.S0005 [25] for CDMA2000 1xRTT and C.S0024 [26] for CDMA2000 HRPD.

plmn-IdentityList

The list of PLMN Identity read from broadcast information when the multiple PLMN Identities are broadcast. This field contains the list of identities starting from the second entry of PLMN Identities in the broadcast information.

preRegistrationStatusHRPD

Set to TRUE if the UE is currently pre-registered with CDMA2000 HRPD. Otherwise set to FALSE. This can be ignored by the eNB for CDMA2000 1xRTT.

routingAreaCode

The RAC identity read from broadcast information, as defined in TS 23.003 [27].

rsrpResult

Measured RSRP result of an E-UTRA cell.

The rsrpResult is only reported if configured by the eNB.

rsraResult

Measured RSRQ result of an E-UTRA cell.

The rsrqResult is only reported if configured by the eNB.

rssi

GERAN Carrier RSSI. RXLEV is mapped to a value between 0 and 63, TS 45.008 [28]. When mapping the RXLEV value to the RSSI bit string, the first/leftmost bit of the bit string contains the most significant bit.

ue-RxTxTimeDiffResult

UE Rx-Tx time difference measurement result of the PCell, provided by lower layers. According to UE Rx-Tx time difference report mapping in TS 36.133 [16].

utra-EcN0

According to CPICH Ec/No in TS 25.133 [29] for FDD. Fourteen spare values. The field is not present for TDD.

utra-RSCP

According to CPICH_RSCP in TS 25.133 [29] for FDD and P-CCPCH_RSCP in TS 25.123 [30] for TDD. Thirty-one spare values.

QuantityConfig

The IE *QuantityConfig* specifies the measurement quantities and layer 3 filtering coefficients for E-UTRA and inter-RAT measurements.

QuantityConfig information element

```
-- ASN1START
QuantityConfig ::=
                             SEQUENCE {
  quantityConfigEUTRA
                                   QuantityConfigEUTRA
                                                                    OPTIONAL, -- Need ON
  quantityConfigUTRA
                                   QuantityConfigUTRA
                                                                    OPTIONAL, -- Need ON
  quantityConfigGERAN
                                   QuantityConfigGERAN
                                                                    OPTIONAL, -- Need ON
  quantityConfigCDMA2000
                                   QuantityConfigCDMA2000
                                                                    OPTIONAL, -- Need ON
  [[ quantityConfigUTRA-v1020
                                   QuantityConfigUTRA-v1020
                                                                    OPTIONAL -- Need ON
  ]]
QuantityConfigEUTRA ::=
                                SEQUENCE {
  filterCoefficientRSRP
                                FilterCoefficient
                                                           DEFAULT fc4,
  filterCoefficientRSRQ
                                FilterCoefficient
                                                           DEFAULT fc4
}
QuantityConfigUTRA ::=
                                SEQUENCE {
                                   ENUMERATED {cpich-RSCP, cpich-EcN0},
  measQuantityUTRA-FDD
  measQuantityUTRA-TDD
                                   ENUMERATED {pccpch-RSCP},
  filterCoefficient
                             FilterCoefficient
                                                        DEFAULT fc4
QuantityConfigUTRA-v1020 ::=
                                SEQUENCE {
  filterCoefficient2-FDD-r10
                                FilterCoefficient
                                                           DEFAULT fc4
QuantityConfigGERAN ::=
                                SEQUENCE {
  measQuantityGERAN
                                   ENUMERATED {rssi},
  filterCoefficient
                             FilterCoefficient
                                                        DEFAULT fc2
```

```
QuantityConfigCDMA2000 ::= SEQUENCE {
    measQuantityCDMA2000 ENUMERATED {pilotStrength, pilotPnPhaseAndPilotStrength}}
}
-- ASN1STOP
```

QuantityConfig field descriptions

filterCoefficient2-FDD

Specifies the filtering coefficient used for the UTRAN FDD measurement quantity, which is not included in measQuantityUTRA-FDD, when reportQuantityUTRA-FDD is present in ReportConfigInterRAT.

filterCoefficientRSRP

Specifies the filtering coefficient used for RSRP.

filterCoefficientRSRQ

Specifies the filtering coefficient used for RSRQ.

measQuantityCDMA2000

Measurement quantity used for CDMA2000 measurements. *pilotPnPhaseAndPilotStrength* is only applicable for *MeasObjectCDMA2000* of *cdma2000-Type* = *type1XRTT*.

measQuantityGERAN

Measurement quantity used for GERAN measurements.

measQuantityUTRA

Measurement quantity used for UTRA measurements.

quantityConfigCDMA2000

Specifies quantity configurations for CDMA2000 measurements.

quantityConfigEUTRA

Specifies filter configurations for E-UTRA measurements.

quantityConfigGERAN

Specifies quantity and filter configurations for GERAN measurements.

quantityConfigUTRA

Specifies quantity and filter configurations for UTRA measurements. Field *quantityConfigUTRA-v1020* is applicable only when reportQuantityUTRA-FDD is configured.

ReportConfigEUTRA

The IE *ReportConfigEUTRA* specifies criteria for triggering of an E-UTRA measurement reporting event. The E-UTRA measurement reporting events are labelled AN with N equal to 1, 2 and so on.

Event A1: Serving becomes better than absolute threshold;

Event A2: Serving becomes worse than absolute threshold;

Event A3: Neighbour becomes amount of offset better than PCell;

Event A4: Neighbour becomes better than absolute threshold;

Event A5: PCell becomes worse than absolute threshold1 AND Neighbour becomes better than another absolute

threshold2.

Event A6: Neighbour becomes amount of offset better than SCell.

ReportConfigEUTRA information element

```
-- ASN1START

ReportConfigEUTRA ::= SEQUENCE {

triggerType CHOICE {
```

```
SEQUENCE {
   event
      eventId
                                    CHOICE {
         eventA1
                                       SEQUENCE {
            a1-Threshold
                                       ThresholdEUTRA
         },
         eventA2
                                       SEQUENCE {
            a2-Threshold
                                       ThresholdEUTRA
         },
         eventA3
                                       SEQUENCE {
           a3-Offset
                                       INTEGER (-30..30),
           reportOnLeave
                                          BOOLEAN
         },
         eventA4
                                       SEQUENCE {
            a4-Threshold
                                       ThresholdEUTRA
         },
         eventA5
                                       SEQUENCE {
           a5-Threshold1
                                          ThresholdEUTRA,
           a5-Threshold2
                                          ThresholdEUTRA
         },
         eventA6-r10
                                       SEQUENCE {
           a6-Offset-r10
                                       INTEGER (-30..30),
                                          BOOLEAN
           a6-ReportOnLeave-r10
         }
      },
                                 Hysteresis,
      hysteresis
      timeToTrigger
                                    TimeToTrigger
   },
   periodical
                                 SEQUENCE {
      purpose
                                       ENUMERATED {
                                       reportStrongestCells, reportCGI}
},
triggerQuantity
                              ENUMERATED {rsrp, rsrq},
reportQuantity
                              ENUMERATED {sameAsTriggerQuantity, both},
```

```
maxReportCells \\
                                 INTEGER (1..maxCellReport),
   reportInterval\\
                              ReportInterval,
   reportAmount
                              ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},
   [[ si-RequestForHO-r9
                                    ENUMERATED {setup}
                                                               OPTIONAL, -- Cond reportCGI
      ue-RxTxTimeDiffPeriodical-r9
                                                               OPTIONAL -- Need OR
                                    ENUMERATED {setup}
   ]],
   [[ includeLocationInfo-r10
                                    ENUMERATED {true}
                                                            OPTIONAL, -- Need OR
      reportAddNeighMeas-r10
                                                                  OPTIONAL -- Need OR
                                       ENUMERATED {setup}
   ]]
ThresholdEUTRA ::= \\
                                 CHOICE{
   threshold-RSRP
                                 RSRP-Range,
   threshold-RSRQ
                                 RSRQ-Range
}
-- ASN1STOP
```

ReportConfigEUTRA field descriptions

a3-Offset/a6-Offset

Offset value to be used in EUTRA measurement report triggering condition for event a3/ a6. The actual value is IE value * 0.5 dB.

aN-ThresholdM

Threshold to be used in EUTRA measurement report triggering condition for event number aN. If multiple thresholds are defined for event number aN, the thresholds are differentiated by M.

eventld

Choice of E-UTRA event triggered reporting criteria.

maxReportCells

Max number of cells, excluding the serving cell, to include in the measurement report.

reportAmount

Number of measurement reports applicable for *triggerType event* as well as for *triggerType periodical*. In case *purpose* is set to *reportCGI* only value 1 applies.

reportOnLeave/ a6-ReportOnLeave

Indicates whether or not the UE shall initiate the measurement reporting procedure when the leaving condition is met for a cell in *cellsTriggeredList*, as specified in 5.5.4.1.

reportQuantity

The quantities to be included in the measurement report. The value both means that both the rsrp and rsrq quantities are to be included in the measurement report.

si-RequestForHO

The field applies to the *reportCGI* functionality, and when the field is included, the UE is allowed to use autonomous gaps in acquiring system information from the neighbour cell, applies a different value for T321, and includes different fields in the measurement report.

ThresholdEUTRA

For RSRP: RSRP based threshold for event evaluation. The actual value is IE value – 140 dBm.

For RSRQ: RSRQ based threshold for event evaluation. The actual value is (IE value - 40)/2 dB.

EUTRAN configures the same threshold quantity for all the thresholds of an event.

timeToTrigger

Time during which specific criteria for the event needs to be met in order to trigger a measurement report.

triggerQuantity

The quantity used to evaluate the triggering condition for the event. EUTRAN sets the value according to the quantity of the *ThresholdEUTRA* for this event. The values rsrp and rsrq correspond to Reference Signal Received Power (RSRP) and Reference Signal Received Quality (RSRQ), see TS 36.214 [48].

ue-RxTxTimeDiffPeriodical

If this field is present, the UE shall perform UE Rx-Tx time difference measurement reporting and ignore the fields triggerQuantity, reportQuantity and maxReportCells. If the field is present, the only applicable values for the corresponding triggerType and purpose are periodical and reportStrongestCells respectively.

Conditional presence	Explanation
reportCGI	The field is optional, need OR, in case <i>purpose</i> is included and set to <i>reportCGI</i> ;
-	otherwise the field is not present and the UE shall delete any existing value for this field.

ReportConfigld

The IE ReportConfigId is used to identify a measurement reporting configuration.

ReportConfigId information element

ASN1START	
ReportConfigId ::=	INTEGER (1maxReportConfigId)
ASN1STOP	

ReportConfigInterRAT

The IE *ReportConfigInterRAT* specifies criteria for triggering of an inter-RAT measurement reporting event. The inter-RAT measurement reporting events are labelled BN with N equal to 1, 2 and so on.

Event B1: Neighbour becomes better than absolute threshold;

Event B2: PCell becomes worse than absolute threshold1 AND Neighbour becomes better than another absolute

threshold2.

The b1 and b2 event thresholds for CDMA2000 are the CDMA2000 pilot detection thresholds are expressed as an unsigned binary number equal to $[-2 \times 10 \log 10 \ E_c/I_o]$ in units of 0.5dB, see C.S0005 [25] for details.

ReportConfigInterRAT information element

```
-- ASN1START
ReportConfigInterRAT ::=
                             SEQUENCE {
  triggerType
                                CHOICE {
                                SEQUENCE {
     event
         eventId
                                      CHOICE {
           eventB1
                                         SEQUENCE {
              b1-Threshold
                                         CHOICE {
                 b1-ThresholdUTRA
                                               ThresholdUTRA,
                 b1-ThresholdGERAN
                                                  ThresholdGERAN,
                 b1-ThresholdCDMA2000
                                                  ThresholdCDMA2000
            },
            eventB2
                                         SEQUENCE {
              b2-Threshold1
                                            ThresholdEUTRA,
              b2-Threshold2
                                            CHOICE {
                 b2-Threshold2UTRA
                                                  ThresholdUTRA,
                 b2-Threshold2GERAN
                                                  ThresholdGERAN,
                 b2-Threshold2CDMA2000
                                                  ThresholdCDMA2000
            },
         },
         hysteresis
                                Hysteresis,
         timeToTrigger
                                   TimeToTrigger
     periodical
                                   SEQUENCE {
```

```
ENUMERATED {
         purpose
                                          reportStrongestCells,
                                          reportStrongestCellsForSON,
                                          reportCGI}
      }
   },
  maxReportCells\\
                                 INTEGER (1..maxCellReport),
  reportInterval
                              ReportInterval,
                              ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},
  reportAmount
  [[ si-RequestForHO-r9
                                    ENUMERATED {setup}
                                                               OPTIONAL -- Cond reportCGI
  ]],
  [[ reportQuantityUTRA-FDD-r10
                                      ENUMERATED {both}
                                                               OPTIONAL -- Need OR
  ]],
                                                            OPTIONAL -- Need ON
  [[ includeLocationInfo-r11
                                    BOOLEAN
  ]]
                              CHOICE{
ThresholdUTRA ::=
   utra-RSCP
                                 INTEGER (-5..91),
  utra-EcN0
                              INTEGER (0..49)
}
ThresholdGERAN ::=
                              INTEGER (0..63)
ThresholdCDMA2000 ::=
                              INTEGER (0..63)
-- ASN1STOP
```

ReportConfigInterRAT field descriptions

bN-ThresholdM

Threshold to be used in inter RAT measurement report triggering condition for event number bN. If multiple thresholds are defined for event number bN, the thresholds are differentiated by M.

eventId

Choice of inter-RAT event triggered reporting criteria.

maxReportCells

Max number of cells, excluding the serving cell, to include in the measurement report. In case *purpose* is set to *reportStrongestCellsForSON* only value 1 applies.

Purpose

reportStrongestCellsForSON applies only in case reportConfig is linked to a measObject set to measObjectUTRA or measObjectCDMA2000.

reportAmount

Number of measurement reports applicable for *triggerType event* as well as for *triggerType periodical*. In case *purpose* is set to *reportCGI* or reportStrongestCellsForSON only value 1 applies.

reportQuantityUTRA-FDD

The quantities to be included in the UTRA measurement report. The value *both* means that both the cpich RSCP and cpich EcN0 quantities are to be included in the measurement report.

si-RequestForHO

The field applies to the *reportCGI* functionality, and when the field is included, the UE is allowed to use autonomous gaps in acquiring system information from the neighbour cell, applies a different value for T321, and includes different fields in the measurement report.

ThresholdGERAN

The actual value is IE value - 110 dBm.

ThresholdUTRA

utra-RSCP corresponds to CPICH_RSCP in TS 25.133 [29] for FDD and P-CCPCH_RSCP in TS 25.123 [30] for TDD. *utra-EcN0* corresponds to CPICH_Ec/No in TS 25.133 [29] for FDD, and is not applicable for TDD.

For *utra-RSCP*: The actual value is IE value – 115 dBm.

For utra-EcN0: The actual value is (IE value – 49)/2 dB.

timeToTrigger

Time during which specific criteria for the event needs to be met in order to trigger a measurement report.

Conditional presence	Explanation
reportCGI	The field is optional, need OR, in case <i>purpose</i> is included and set to <i>reportCGI</i> ;
	otherwise the field is not present and the UE shall delete any existing value for this field.

ReportConfigToAddModList

The IE ReportConfigToAddModList concerns a list of reporting configurations to add or modify

ReportConfigToAddModList information element

```
-- ASN1START

ReportConfigToAddModList ::= SEQUENCE (SIZE (1..maxReportConfigId)) OF ReportConfigToAddMod

ReportConfigToAddMod ::= SEQUENCE {
    reportConfigId ReportConfigId,
    reportConfig CHOICE {
        reportConfigEUTRA ReportConfigEUTRA,
        reportConfigInterRAT ReportConfigInterRAT
    }
}
```

ReportInterval

The *ReportInterval* indicates the interval between periodical reports. The *ReportInterval* is applicable if the UE performs periodical reporting (i.e. when *reportAmount* exceeds 1), for *triggerType event* as well as for *triggerType periodical*. Value ms120 corresponds with 120 ms, ms240 corresponds with 240 ms and so on, while value min1 corresponds with 1 min, min6 corresponds with 6 min and so on.

ReportInterval information element

ASN1START	
ReportInterval ::=	ENUMERATED { ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240, min1, min6, min12, min30, min60, spare3, spare2, spare1}
ASN1STOP	

RSRP-Range

The IE *RSRP-Range* specifies the value range used in RSRP measurements and thresholds. Integer value for RSRP measurements according to mapping table in TS 36.133 [16].

RSRP-Range information element

ASN1START	
RSRP-Range ::=	INTEGER(097)
ASN1STOP	

RSRQ-Range

The IE *RSRQ-Range* specifies the value range used in RSRQ measurements and thresholds. Integer value for RSRQ measurements according to mapping table in TS 36.133 [16].

RSRQ-Range information element

ASN1START	
RSRQ-Range ::=	INTEGER(034)

TimeToTrigger

The IE *TimeToTrigger* specifies the value range used for time to trigger parameter, which concerns the time during which specific criteria for the event needs to be met in order to trigger a measurement report. Value ms0 corresponds to 0 ms, ms40 corresponds to 40 ms, and so on.

TimeToTrigger information element

ASN1START	
TimeToTrigger ::=	ENUMERATED {
	ms0, ms40, ms64, ms80, ms100, ms128, ms160, ms256,
	ms320, ms480, ms512, ms640, ms1024, ms1280, ms2560,
	ms5120}
ASN1STOP	

6.3.6 Other information elements

AbsoluteTimeInfo

The IE *AbsoluteTimeInfo* indicates an absolute time in a format YY-MM-DD HH:MM:SS and using BCD encoding. The first/ leftmost bit of the bit string contains the most significant bit of the most significant digit of the year and so on.

AbsoluteTimeInfo information element

ASN1START	
AbsoluteTimeInfo-r10 ::=	BIT STRING (SIZE (48))
ASN1STOP	

AreaConfiguration

The AreaConfiguration indicates area for which UE is requested to perform measurement logging. If not configured, measurement logging is not restricted to specific cells or tracking areas but applies as long as the RPLMN is contained in plmn-IdentityList stored in VarLogMeasReport.

AreaConfiguration information element

```
-- ASN1START

AreaConfiguration-r10 ::= CHOICE {
```

```
cellGlobalIdList-r10
                            CellGlobalIdList-r10,
  trackingAreaCodeList-r10
                               TrackingAreaCodeList-r10
AreaConfiguration-v1130 ::=
                               SEQUENCE {
   trackingAreaCodeList-v1130
                                  TrackingAreaCodeList-v1130
}
CellGlobalIdList-r10 ::=
                               SEQUENCE (SIZE (1..32)) OF CellGlobalIdEUTRA
TrackingAreaCodeList-r10 ::=
                                  SEQUENCE (SIZE (1..8)) OF TrackingAreaCode
TrackingAreaCodeList-v1130 ::= SEQUENCE {
  plmn-Identity-perTAC-List-r11
                                     SEQUENCE (SIZE (1..8)) OF PLMN-Identity
-- ASN1STOP
```

AreaConfiguration field descriptions

plmn-Identity-perTAC-List

Includes the PLMN identity for each of the TA codes included in *trackingAreaCodeList*. The PLMN identity listed first in *plmn-Identity-perTAC-List* corresponds with the TA code listed first in *trackingAreaCodeList* and so on.

C-RNTI

The IE C-RNTI identifies a UE having a RRC connection within a cell.

C-RNTI information element

```
-- ASN1START

C-RNTI ::= BIT STRING (SIZE (16))

-- ASN1STOP
```

DedicatedInfoCDMA2000

The *DedicatedInfoCDMA2000* is used to transfer UE specific CDMA2000 information between the network and the UE. The RRC layer is transparent for this information.

DedicatedInfoCDMA2000 information element

ASN1START		
DedicatedInfoCDMA2000 ::=	OCTET STRING	
ASN1STOP		

DedicatedInfoNAS

The IE *DedicatedInfoNAS* is used to transfer UE specific NAS layer information between the network and the UE. The RRC layer is transparent for this information.

DedicatedInfoNAS information element

ASN1START	
DedicatedInfoNAS ::=	OCTET STRING
ASN1STOP	

FilterCoefficient

The IE *FilterCoefficient* specifies the measurement filtering coefficient. Value fc0 corresponds to k = 0, fc1 corresponds to k = 1, and so on.

FilterCoefficient information element

ASN1START		
FilterCoefficient ::=	ENUMERATED {	
	fc0, fc1, fc2, fc3, fc4, fc5,	
	fc6, fc7, fc8, fc9, fc11, fc13,	
	fc15, fc17, fc19, spare1,}	
ASN1STOP		

LoggingDuration

The *LoggingDuration* indicates the duration for which UE is requested to perform measurement logging. Value min10 corresponds to 10 minutes, value min20 corresponds to 20 minutes and so on.

LoggingDuration information element

```
-- ASN1START

LoggingDuration-r10 ::= ENUMERATED {
    min10, min20, min40, min60, min90, min120, spare2, spare1}

-- ASN1STOP
```

LoggingInterval

The *LoggingInterval* indicates the periodicity for logging measurement results. Value ms1280 corresponds to 1.28s, value ms2560 corresponds to 2.56s and so on.

LoggingInterval information element

MeasSubframePattern

The IE MeasSubframePattern is used to specify a subframe pattern. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where SFN is that of PCell and x is the size of the bit string divided by 10. "1" denotes that the corresponding subframe is used.

MeasSubframePattern information element

```
--- ASN1START

MeasSubframePattern-r10 ::= CHOICE {

subframePatternFDD-r10 BIT STRING (SIZE (40)),

subframePatternTDD-r10 CHOICE {

subframeConfig1-5-r10 BIT STRING (SIZE (20)),

subframeConfig0-r10 BIT STRING (SIZE (70)),
```

```
subframeConfig6-r10 BIT STRING (SIZE (60)),
...
},
...
}
-- ASN1STOP
```

MMEC

The IE MMEC identifies an MME within the scope of an MME Group within a PLMN, see TS 23.003 [27].

MMEC information element

```
--- ASN1START

MMEC ::= BIT STRING (SIZE (8))

--- ASN1STOP
```

NeighCellConfig

The IE NeighCellConfig is used to provide the information related to MBSFN and TDD UL/DL configuration of neighbour cells.

NeighCellConfig information element

```
-- ASN1START

NeighCellConfig ::= BIT STRING (SIZE (2))

-- ASN1STOP
```

NeighCellConfig field descriptions

neighCellConfig

Provides information related to MBSFN and TDD UL/DL configuration of neighbour cells of this frequency

- 00: Not all neighbour cells have the same MBSFN subframe allocation as the serving cell on this frequency, if configured, and as the PCell otherwise
- 10: The MBSFN subframe allocations of all neighbour cells are identical to or subsets of that in the serving cell on this frequency, if configured, and of that in the PCell otherwise
- 01: No MBSFN subframes are present in all neighbour cells
- 11: Different UL/DL allocation in neighbouring cells for TDD compared to the serving cell on this frequency, if configured, and compared to the PCell otherwise

For TDD, 00, 10 and 01 are only used for same UL/DL allocation in neighbouring cells compared to the serving cell on this frequency, if configured, and compared to the PCell otherwise.

OtherConfig

The IE OtherConfig contains configuration related to other configuration

OtherConfig information element

```
-- ASN1START
OtherConfig-r9 ::= SEQUENCE {
   reportProximityConfig-r9
                                 ReportProximityConfig-r9
                                                             OPTIONAL, -- Need ON
   [[ idc-Config-r11
                                 IDC-Config-r11
                                                             OPTIONAL, -- Need ON
      powerPrefIndicationConfig-r11PowerPrefIndicationConfig-r11OPTIONAL, -- Need ON
                                                             OPTIONAL -- Need ON
      obtainLocationConfig-r11
                                 ObtainLocationConfig-r11
  ]]
IDC-Config-r11 ::=
                           SEQUENCE {
   idc-Indication-r11
                                 ENUMERATED {setup}
                                                             OPTIONAL,
                                                                            -- Need OR
   autonomousDenialParameters-r11
                                    SEQUENCE {
         autonomousDenialSubframes-r11
                                              ENUMERATED {n2, n5, n10, n15,
                                          n20, n30, spare2, spare1},
         autonomousDenialValidity-r11
                                          ENUMERATED {
                                          sf200, sf500, sf1000, sf2000,
                                           spare4, spare3, spare2, spare1}
         OPTIONAL.
                        -- Need OR
ObtainLocationConfig-r11 ::= SEQUENCE {
```

```
obtainLocation-r11
                              ENUMERATED {setup}
                                                                OPTIONAL
                                                                               -- Need OR
}
PowerPrefIndicationConfig-r11 ::= CHOICE{
                     NULL,
   release
   setup
                     SEQUENCE{
      powerPrefIndicationTimer-r11
                                    ENUMERATED {s0, s0dot5, s1, s2, s5, s10, s20,
                                 s30, s60, s90, s120, s300, s600, spare3,
                                 spare2, spare1}
   }
ReportProximityConfig-r9 ::= SEQUENCE {
   proximityIndicationEUTRA-r9
                                 ENUMERATED {enabled}
                                                                OPTIONAL,
                                                                               -- Need OR
   proximityIndicationUTRA-r9
                                 ENUMERATED {enabled}
                                                                OPTIONAL
                                                                               -- Need OR
-- ASN1STOP
```

OtherConfig field descriptions

autonomous Denial Subframes

Indicates the maximum number of the UL subframes for which the UE is allowed to deny any UL transmission. Value n2 corresponds to 2 subframes, n5 to 5 subframes and so on.

autonomous Denial Validity

Indicates the validity period over which the UL autonomous denial subframes shall be counted. Value sf200 corresponds to 200 subframes, sf500 corresponds to 500 subframes and so on.

idc-Indication

The field is used to indicate whether the UE is configured to initiate transmission of the *InDeviceCoexIndication* message to the network.

obtainLocation

Requests the UE to attempt to have detailed location information available using GNSS. E-UTRAN configures the field only if *includeLocationInfo* is configured for one or more measurements.

powerPrefIndicationTimer

Prohibit timer for Power Preference Indication reporting. Value in seconds. Value s0 means prohibit timer is set to 0 second or not set, value s0dot5 means prohibit timer is set to 0.5 second, value s1 means prohibit timer is set to 1 second and so on.

reportProximityConfig

Indicates, for each of the applicable RATs (EUTRA, UTRA), whether or not proximity indication is enabled for CSG member cell(s) of the concerned RAT. Note.

NOTE: Enabling/ disabling of proximity indication includes enabling/ disabling of the related functionality e.g. autonomous search in connected mode.

RAND-CDMA2000 (1xRTT)

The RAND-CDMA2000 concerns a random value, generated by the eNB, to be passed to the CDMA2000 upper layers.

RAND-CDMA2000 information element

ASN1START	
RAND-CDMA2000 ::=	BIT STRING (SIZE (32))
ASN1STOP	

– RAT-Type

The IE *RAT-Type* is used to indicate the radio access technology (RAT), including E-UTRA, of the requested/transferred UE capabilities.

RAT-Type information element

ASN1START	
RAT-Type ::=	ENUMERATED { eutra, utra, geran-cs, geran-ps, cdma2000-1XRTT, spare3, spare2, spare1,}
ASN1STOP	

RRC-TransactionIdentifier

The IE *RRC-TransactionIdentifier* is used, together with the message type, for the identification of an RRC procedure (transaction).

RRC-TransactionIdentifier information element



S-TMSI

The IE *S-TMSI* contains an S-Temporary Mobile Subscriber Identity, a temporary UE identity provided by the EPC which uniquely identifies the UE within the tracking area, see TS 23.003 [27].

S-TMSI information element

-- ASN1START

```
S-TMSI ::= SEQUENCE {
mmec MMEC,
m-TMSI BIT STRING (SIZE (32))
}
-- ASN1STOP
```

S-TMSI field descriptions

m-TMSI

The first/leftmost bit of the bit string contains the most significant bit of the M-TMSI.

TraceReference

The TraceReference contains parameter Trace Reference as defined in TS 32.422 [58].

TraceReference information element

```
-- ASN1START

TraceReference-r10 ::= SEQUENCE {
    plmn-Identity-r10 PLMN-Identity,
    traceId-r10 OCTET STRING (SIZE (3))
}

-- ASN1STOP
```

UE-CapabilityRAT-ContainerList

The IE *UE-CapabilityRAT-ContainerList* contains list of containers, one for each RAT for which UE capabilities are transferred, if any.

UE-CapabilityRAT-ContainerList information element

UECapabilityRAT-ContainerList field descriptions

ueCapabilityRAT-Container

Container for the UE capabilities of the indicated RAT. The encoding is defined in the specification of each RAT: For E-UTRA: the encoding of UE capabilities is defined in IE *UE-EUTRA-Capability*.

For UTRA: the octet string contains the INTER RAT HANDOVER INFO message defined in TS 25.331 [19]. For GERAN CS: the octet string contains the concatenated string of the Mobile Station Classmark 2 and Mobile Station Classmark 3. The first 5 octets correspond to Mobile Station Classmark 2 and the following octets correspond to Mobile Station Classmark 3. The Mobile Station Classmark 2 is formatted as 'TLV' and is coded in the same way as the *Mobile Station Classmark 2* information element in TS 24.008 [49]. The first octet is the *Mobile station classmark 2* IEI and its value shall be set to 33H. The second octet is the *Length of mobile Station Classmark 2* and its value shall be set to 3. The octet 3 contains the first octet of the value part of the *Mobile Station Classmark 2* information element, the octet 4 contains the second octet of the value part of the *Mobile Station Classmark 2* information element and so on. For each of these octets, the first/ leftmost/ most significant bit of the octet contains b8 of the corresponding octet of the Mobile Station Classmark 2. The Mobile Station Classmark 3 is formatted as 'V' and is coded in the same way as the value part in the *Mobile station classmark 3* information element in TS 24.008 [49]. The sixth octet of this octet string contains octet 1 of the value part of *Mobile station classmark 3* and so on. Note.

For GERAN PS: the encoding of UE capabilities is formatted as 'V' and is coded in the same way as the value part in the MS Radio Access Capability information element in TS 24.008 [49].

For CDMA2000-1XRTT: the octet string contains the A21 Mobile Subscription Information and the encoding of this is defined in A.S0008 [33]. The A21 Mobile Subscription Information contains the supported CDMA2000 1xRTT band class and band sub-class information.

NOTE: The value part is specified by means of CSN.1, which encoding results in a bit string, to which final padding may be appended up to the next octet boundary TS 24.008 [49]. The first/ leftmost bit of the CSN.1 bit string is placed in the first/ leftmost/ most significant bit of the first octet. This continues until the last bit of the CSN.1 bit string, which is placed in the last/ rightmost/ least significant bit of the last octet.

UE-EUTRA-Capability

The IE *UE-EUTRA-Capability* is used to convey the E-UTRA UE Radio Access Capability Parameters, see TS 36.306 [5], and the Feature Group Indicators for mandatory features (defined in Annexes B.1 and C.1) to the network. The IE *UE-EUTRA-Capability* is transferred in E-UTRA or in another RAT.

UE-EUTRA-Capability information element

-- ASN1START UE-EUTRA-Capability ::= SEQUENCE { accessStratumRelease AccessStratumRelease, INTEGER (1..5), ue-Category pdcp-Parameters PDCP-Parameters, phyLayerParameters PhyLayerParameters, rf-Parameters RF-Parameters, measParameters MeasParameters, featureGroupIndicators BIT STRING (SIZE (32)) OPTIONAL, interRAT-Parameters SEQUENCE { utraFDD IRAT-ParametersUTRA-FDD OPTIONAL, utraTDD128 IRAT-ParametersUTRA-TDD128 OPTIONAL.

```
utraTDD384
                                   IRAT-ParametersUTRA-TDD384
                                                                        OPTIONAL,
     utraTDD768
                                   IRAT-ParametersUTRA-TDD768
                                                                        OPTIONAL,
                                IRAT-ParametersGERAN
     geran
                                                                   OPTIONAL.
     cdma2000-HRPD
                                     IRAT-ParametersCDMA2000-HRPD
                                                                           OPTIONAL,
     cdma2000-1xRTT
                                     IRAT-ParametersCDMA2000-1XRTT
                                                                           OPTIONAL
   },
  nonCriticalExtension
                             UE-EUTRA-Capability-v920-IEs
                                                             OPTIONAL
-- Late non critical extensions
UE-EUTRA-Capability-v9a0-IEs ::= SEQUENCE {
  featureGroupIndRel9Add-r9
                                   BIT STRING (SIZE (32))
                                                                   OPTIONAL,
  fdd-Add-UE-EUTRA-Capabilities-r9 UE-EUTRA-CapabilityAddXDD-Mode-r9
  tdd-Add-UE-EUTRA-Capabilities-r9 UE-EUTRA-CapabilityAddXDD-Mode-r9 OPTIONAL,
  nonCriticalExtension
                             UE-EUTRA-Capability-v9c0-IEs
                                                             OPTIONAL
UE-EUTRA-Capability-v9c0-IEs ::=
                                  SEQUENCE {
  interRAT-ParametersUTRA-v9c0
                                   IRAT-ParametersUTRA-v9c0
                                                                OPTIONAL,
  nonCriticalExtension
                             UE-EUTRA-Capability-v9d0-IEs OPTIONAL
UE-EUTRA-Capability-v9d0-IEs ::=
                                  SEQUENCE {
  phyLayerParameters-v9d0
                                   PhyLayerParameters-v9d0
                                                                OPTIONAL,
                             UE-EUTRA-Capability-v9e0-IEs OPTIONAL
  nonCriticalExtension
UE-EUTRA-Capability-v9e0-IEs ::= SEQUENCE {
  rf-Parameters-v9e0
                                                                OPTIONAL,
                               RF-Parameters-v9e0
  nonCriticalExtension
                             UE-EUTRA-Capability-v9h0-IEs
                                                                OPTIONAL
UE-EUTRA-Capability-v9h0-IEs ::= SEQUENCE {
  interRAT-ParametersUTRA-v9h0
                                  IRAT-ParametersUTRA-v9h0
                                                                   OPTIONAL,
  -- Following field is only to be used for late REL-9 extensions
```

```
lateNonCriticalExtension
                                 OCTET STRING
                                                                  OPTIONAL,
  nonCriticalExtension
                              UE-EUTRA-Capability-v10c0-IEs
                                                                  OPTIONAL
UE-EUTRA-Capability-v10c0-IEs ::= SEQUENCE {
   otdoa-PositioningCapabilities-r10 OTDOA-PositioningCapabilities-r10
                                                                     OPTIONAL,
   nonCriticalExtension
                              UE-EUTRA-Capability-v10f0-IEs
                                                                  OPTIONAL
UE-EUTRA-Capability-v10f0-IEs ::= SEQUENCE {
   rf-Parameters-v10f0
                                 RF-Parameters-v10f0
                                                                     OPTIONAL,
   -- Following field is only to be used for late REL-10 extensions
   nonCriticalExtension
                           SEQUENCE {}
                                                               OPTIONAL
-- Regular non critical extensions
UE-EUTRA-Capability-v920-IEs ::=
                                    SEQUENCE {
   phyLayerParameters-v920
                                    PhyLayerParameters-v920,
  interRAT-ParametersGERAN-v920
                                          IRAT-ParametersGERAN-v920,
   interRAT-ParametersUTRA-v920
                                       IRAT-ParametersUTRA-v920
                                                                        OPTIONAL,
  interRAT-ParametersCDMA2000-v920
                                          IRAT-ParametersCDMA2000-1XRTT-v920 OPTIONAL,
  deviceType-r9
                                    ENUMERATED {noBenFromBatConsumpOpt} OPTIONAL,
   csg-ProximityIndicationParameters-r9 CSG-ProximityIndicationParameters-r9,
   neighCellSI-AcquisitionParameters-r9 NeighCellSI-AcquisitionParameters-r9,
   son-Parameters-r9
                                    SON-Parameters-r9,
   nonCriticalExtension
                                 UE-EUTRA-Capability-v940-IEs
                                                                  OPTIONAL
UE-EUTRA-Capability-v940-IEs ::= SEQUENCE {
   lateNonCriticalExtension
                                 OCTET STRING (CONTAINING UE-EUTRA-Capability-v9a0-IEs)
                                                         OPTIONAL,
   nonCriticalExtension
                              UE-EUTRA-Capability-v1020-IEs
                                                               OPTIONAL
UE-EUTRA-Capability-v1020-IEs ::= SEQUENCE {
```

```
ue-Category-v1020
                                INTEGER (6..8)
                                                                OPTIONAL,
  phyLayerParameters-v1020
                                PhyLayerParameters-v1020
                                                                OPTIONAL,
  rf-Parameters-v1020
                                RF-Parameters-v1020
                                                                   OPTIONAL,
  measParameters-v1020
                                MeasParameters-v1020
                                                                OPTIONAL,
                                BIT STRING (SIZE (32))
  featureGroupIndRel10-r10
                                                                   OPTIONAL,
  interRAT-ParametersCDMA2000-v1020 IRAT-ParametersCDMA2000-1XRTT-v1020
                                                                               OPTIONAL,
  ue-BasedNetwPerfMeasParameters-r10 UE-BasedNetwPerfMeasParameters-r10
                                                                            OPTIONAL,
  interRAT-ParametersUTRA-TDD-v1020 IRAT-ParametersUTRA-TDD-v1020
                                                                            OPTIONAL,
  nonCriticalExtension
                             UE-EUTRA-Capability-v1060-IEs
                                                                OPTIONAL
}
UE-EUTRA-Capability-v1060-IEs ::= SEQUENCE {
  fdd-Add-UE-EUTRA-Capabilities-v1060 UE-EUTRA-CapabilityAddXDD-Mode-v1060 OPTIONAL,
   tdd-Add-UE-EUTRA-Capabilities-v1060 UE-EUTRA-CapabilityAddXDD-Mode-v1060 OPTIONAL,
  rf-Parameters-v1060
                                RF-Parameters-v1060
                                                                   OPTIONAL,
  nonCriticalExtension
                             UE-EUTRA-Capability-v1090-IEs
                                                                OPTIONAL
UE-EUTRA-Capability-v1090-IEs ::= SEQUENCE {
   rf-Parameters-v1090
                                RF-Parameters-v1090
                                                                   OPTIONAL,
  nonCriticalExtension
                             UE-EUTRA-Capability-v1130-IEs
                                                                OPTIONAL
}
UE-EUTRA-Capability-v1130-IEs ::= SEQUENCE {
  pdcp-Parameters-v1130
                                PDCP-Parameters-v1130,
  phyLayerParameters-v1130
                                PhyLayerParameters-v1130
                                                                OPTIONAL,
   rf-Parameters-v1130
                                RF-Parameters-v1130,
  measParameters-v1130
                                MeasParameters-v1130,
  interRAT-ParametersCDMA2000-v1130 IRAT-ParametersCDMA2000-v1130,
  otherParameters-r11
                                Other-Parameters-r11,
  fdd-Add-UE-EUTRA-Capabilities-v1130 UE-EUTRA-CapabilityAddXDD-Mode-v1130 OPTIONAL,
   tdd-Add-UE-EUTRA-Capabilities-v1130 UE-EUTRA-CapabilityAddXDD-Mode-v1130 OPTIONAL,
   nonCriticalExtension
                             UE-EUTRA-Capability-v1170-IEs
                                                                OPTIONAL
```

```
UE-EUTRA-Capability-v1170-IEs ::= SEQUENCE {
  phyLayerParameters-v1170
                               PhyLayerParameters-v1170
                                                                OPTIONAL,
   ue-Category-v1170
                                INTEGER (9..10)
                                                                   OPTIONAL,
  nonCriticalExtension
                             UE-EUTRA-Capability-v1180-IEs
                                                                OPTIONAL
UE-EUTRA-Capability-v1180-IEs ::= SEQUENCE {
  rf-Parameters-v1180
                               RF-Parameters-v1180
                                                                   OPTIONAL,
   mbms-Parameters-r11
                                   MBMS-Parameters-r11
                                                                   OPTIONAL,
  fdd-Add-UE-EUTRA-Capabilities-v1180 UE-EUTRA-CapabilityAddXDD-Mode-v1180 OPTIONAL,
  tdd-Add-UE-EUTRA-Capabilities-v1180 UE-EUTRA-CapabilityAddXDD-Mode-v1180 OPTIONAL,
  nonCriticalExtension
                             UE-EUTRA-Capability-v11a0-IEs
                                                                OPTIONAL
UE-EUTRA-Capability-v11a0-IEs ::= SEQUENCE {
   ue-Category-v11a0
                               INTEGER (11..12)
                                                                OPTIONAL,
  measParameters-v11a0
                               MeasParameters-v11a0
                                                                OPTIONAL.
                                                                OPTIONAL
  nonCriticalExtension
                             SEQUENCE {}
UE-EUTRA-CapabilityAddXDD-Mode-r9 ::= SEQUENCE {
   phyLayerParameters-r9
                               PhyLayerParameters
                                                             OPTIONAL,
  featureGroupIndicators-r9
                               BIT STRING (SIZE (32))
                                                                OPTIONAL,
  featureGroupIndRel9Add-r9
                                   BIT STRING (SIZE (32))
                                                                   OPTIONAL,
  interRAT-ParametersGERAN-r9
                                     IRAT-ParametersGERAN
                                                                     OPTIONAL,
  interRAT-ParametersUTRA-r9
                                  IRAT-ParametersUTRA-v920
                                                                   OPTIONAL,
  interRAT-ParametersCDMA2000-r9
                                     IRAT-ParametersCDMA2000-1XRTT-v920 OPTIONAL,
  neighCellSI-AcquisitionParameters-r9 NeighCellSI-AcquisitionParameters-r9OPTIONAL,
UE-EUTRA-CapabilityAddXDD-Mode-v1060 ::= SEQUENCE {
  phyLayerParameters-v1060
                                PhyLayerParameters-v1020
                                                             OPTIONAL,
  featureGroupIndRel10-v1060
                                   BIT STRING (SIZE (32))
                                                                   OPTIONAL.
```

```
interRAT-ParametersCDMA2000-v1060 IRAT-ParametersCDMA2000-1XRTT-v1020OPTIONAL,
  inter RAT-Parameters UTRA-TDD-v1060\ IRAT-Parameters UTRA-TDD-v1020
                                                                          OPTIONAL,
   ...,
  [[ otdoa-PositioningCapabilities-r10 OTDOA-PositioningCapabilities-r10 OPTIONAL
  ]]
UE-EUTRA-CapabilityAddXDD-Mode-v1130 ::= SEQUENCE {
  phyLayerParameters-v1130
                                PhyLayerParameters-v1130
                                                              OPTIONAL,
  measParameters-v1130
                                MeasParameters-v1130
                                                              OPTIONAL,
  otherParameters-r11
                                Other-Parameters-r11
                                                              OPTIONAL.
UE-EUTRA-CapabilityAddXDD-Mode-v1180 ::= SEQUENCE {
                                MBMS-Parameters-r11
  mbms-Parameters-r11
}
AccessStratumRelease ::=
                             ENUMERATED {
                             rel8, rel9, rel10, rel11, spare4, spare3,
                              spare2, spare1, ...}
PDCP-Parameters ::=
                             SEQUENCE {
  supported ROHC\text{-}Profiles
                                   SEQUENCE {
     profile0x0001
                                BOOLEAN,
     profile0x0002
                                BOOLEAN,
                                BOOLEAN,
     profile0x0003
     profile0x0004
                                BOOLEAN,
                                BOOLEAN,
     profile0x0006
     profile0x0101
                                BOOLEAN,
     profile0x0102
                                BOOLEAN,
      profile0x0103
                                BOOLEAN,
     profile0x0104
                                BOOLEAN
   },
  maxNumberROHC-ContextSessions
                                      ENUMERATED {
```

```
cs2, cs4, cs8, cs12, cs16, cs24, cs32,
                               cs48, cs64, cs128, cs256, cs512, cs1024,
                               cs16384, spare2, spare1}
                                                               DEFAULT cs16,
PDCP-Parameters-v1130 ::=
                            SEQUENCE {
                                  ENUMERATED {supported}
  pdcp-SN-Extension-r11
                                                                  OPTIONAL,
  supportRohcContextContinue-r11
                                     ENUMERATED {supported}
                                                                     OPTIONAL
}
PhyLayerParameters ::=
                            SEQUENCE {
  ue-TxAntennaSelectionSupported
                                  BOOLEAN,
  ue-SpecificRefSigsSupported
                               BOOLEAN
PhyLayerParameters-v920 ::=
                            SEQUENCE {
  enhancedDualLayerFDD-r9
                               ENUMERATED {supported}
                                                               OPTIONAL,
  enhancedDualLayerTDD-r9
                               ENUMERATED {supported}
                                                               OPTIONAL
PhyLayerParameters-v9d0 ::=
                               SEQUENCE {
   tm5-FDD-r9
                            ENUMERATED {supported}
                                                            OPTIONAL,
  tm5-TDD-r9
                            ENUMERATED {supported}
                                                            OPTIONAL
PhyLayerParameters-v1020 ::=
                               SEQUENCE {
   twoAntennaPortsForPUCCH-r10
                                        ENUMERATED {supported}
                                                                             OPTIONAL,
  tm9-With-8Tx-FDD-r10
                                  ENUMERATED {supported}
                                                                        OPTIONAL,
  pmi-Disabling-r10
                                  ENUMERATED {supported}
                                                                        OPTIONAL,
  crossCarrierScheduling-r10
                                  ENUMERATED {supported}
                                                                        OPTIONAL,
   simultaneousPUCCH-PUSCH-r10
                                        ENUMERATED {supported}
                                                                             OPTIONAL,
  multiClusterPUSCH-WithinCC-r10
                                        ENUMERATED {supported}
                                                                             OPTIONAL,
  nonContiguousUL-RA-WithinCC-List-r10
                                        NonContiguousUL-RA-WithinCC-List-r10 OPTIONAL
```

```
PhyLayerParameters-v1130 ::=
                                SEQUENCE {
                                   ENUMERATED {supported}
   crs-InterfHandl-r11
                                                                         OPTIONAL,
  ePDCCH-r11
                                   ENUMERATED {supported}
                                                                         OPTIONAL,
                                                                           OPTIONAL,
  multiACK-CSI-Reporting-r11
                                     ENUMERATED {supported}
  ss-CCH-InterfHandl-r11
                                   ENUMERATED {supported}
                                                                         OPTIONAL,
  tdd-SpecialSubframe-r11
                                      ENUMERATED {supported}
                                                                            OPTIONAL,
                                                                           OPTIONAL,
  txDiv-PUCCH1b-ChSelect-r11
                                     ENUMERATED {supported}
  ul-CoMP-r11
                                   ENUMERATED {supported}
                                                                         OPTIONAL
}
PhyLayerParameters-v1170 ::=
                                SEQUENCE {
  interBandTDD-CA-WithDifferentConfig-r11 BIT STRING (SIZE (2))
                                                                   OPTIONAL
}
NonContiguousUL-RA-WithinCC-List-r10 ::= SEQUENCE (SIZE (1..maxBands)) OF NonContiguousUL-RA-
WithinCC-r10
NonContiguousUL-RA-WithinCC-r10 ::=
                                     SEQUENCE {
  nonContiguousUL-RA-WithinCC-Info-r10 ENUMERATED {supported}
                                                                              OPTIONAL
}
RF-Parameters ::=
                             SEQUENCE {
  supported Band List EUTRA\\
                                   Supported Band List EUTRA\\
}
RF-Parameters-v9e0 ::=
                                SEQUENCE {
   supportedBandListEUTRA-v9e0
                                        SupportedBandListEUTRA-v9e0
                                                                              OPTIONAL
}
RF-Parameters-v1020 ::=
                                SEQUENCE {
  supportedBandCombination-r10
                                     SupportedBandCombination-r10
}
RF-Parameters-v1060 ::=
                                SEQUENCE {
```

```
supportedBandCombinationExt-r10
                                          SupportedBandCombinationExt-r10
}
RF-Parameters-v1090 ::=
                                    SEQUENCE {
                                       SupportedBandCombination-v1090
                                                                              OPTIONAL
   supportedBandCombination-v1090
}
RF-Parameters-v10f0 ::=
                                    SEQUENCE {
   modifiedMPR-Behavior-r10
                                          BIT STRING (SIZE (32))
                                                                           OPTIONAL
}
RF-Parameters-v1130 ::=
                                 SEQUENCE {
   supportedBandCombination-v1130
                                       SupportedBandCombination-v1130
                                                                              OPTIONAL
}
RF-Parameters-v1180 ::=
                                 SEQUENCE {
                                                                     OPTIONAL.
   freqBandRetrieval-r11
                                    ENUMERATED {supported}
   requestedBands-r11
                                    SEQUENCE (SIZE (1.. maxBands)) OF FreqBandIndicator-r11
        OPTIONAL,
   supportedBandCombinationAdd-r11
                                          SupportedBandCombinationAdd-r11
                                                                              OPTIONAL
SupportedBandCombination-r10 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-r10
SupportedBandCombinationExt-r10 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF
BandCombinationParametersExt-r10
SupportedBandCombination-v1090 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-
v1090
SupportedBandCombination-v1130 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-
v1130
SupportedBandCombinationAdd-r11 ::= SEQUENCE (SIZE (1..maxBandComb-r11)) OF
BandCombinationParameters-r11
BandCombinationParameters-r10 ::= SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF BandParameters-r10
```

```
BandCombinationParametersExt-r10 ::= SEQUENCE {
  supportedBandwidthCombinationSet-r10 SupportedBandwidthCombinationSet-r10 OPTIONAL
}
BandCombinationParameters-v1090 ::= SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF BandParameters-
v1090
BandCombinationParameters-v1130 ::= SEQUENCE {
  multipleTimingAdvance-r11
                                ENUMERATED {supported}
                                                                       OPTIONAL,
  simultaneousRx-Tx-r11
                             ENUMERATED {supported}
                                                                    OPTIONAL,
  bandParameterList-r11
                             SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF BandParameters-v1130
  OPTIONAL,
   ...
BandCombinationParameters-r11 ::= SEQUENCE {
   bandParameterList-r11
                             SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF
         BandParameters-r11,
  supportedBandwidthCombinationSet-r11 SupportedBandwidthCombinationSet-r10 OPTIONAL,
  multipleTimingAdvance-r11
                                ENUMERATED {supported}
                                                                       OPTIONAL,
                                                                    OPTIONAL,
   simultaneousRx-Tx-r11
                             ENUMERATED {supported}
  bandInfoEUTRA-r11
                                BandInfoEUTRA,
Supported Bandwidth Combination Set-r10 ::= BIT\ STRING\ (SIZE\ (1..maxBandwidth Comb Set-r10))
BandParameters-r10 ::= SEQUENCE {
  bandEUTRA-r10
                             FreqBandIndicator,
  bandParametersUL-r10
                             BandParametersUL-r10
                                                              OPTIONAL,
  bandParametersDL-r10
                             BandParametersDL-r10
                                                              OPTIONAL
BandParameters-v1090 ::= SEQUENCE {
  bandEUTRA-v1090
                                FreqBandIndicator-v9e0
                                                                 OPTIONAL,
```

```
BandParameters-v1130 ::= SEQUENCE {
  supportedCSI-Proc-r11
                             ENUMERATED {n1, n3, n4}
}
BandParameters-r11 ::= SEQUENCE {
   bandEUTRA-r11
                             FreqBandIndicator-r11,
   bandParametersUL-r11
                             BandParametersUL-r10
                                                             OPTIONAL,
  bandParametersDL-r11
                             BandParametersDL-r10
                                                             OPTIONAL.
                                                                   OPTIONAL
  supportedCSI-Proc-r11
                             ENUMERATED {n1, n3, n4}
}
BandParametersUL-r10 ::= SEQUENCE (SIZE (1..maxBandwidthClass-r10)) OF CA-MIMO-ParametersUL-r10
CA-MIMO-ParametersUL-r10 ::= SEQUENCE {
  ca-BandwidthClassUL-r10
                                   CA-BandwidthClass-r10,
  supportedMIMO-CapabilityUL-r10
                                      MIMO-CapabilityUL-r10
                                                                      OPTIONAL
BandParametersDL-r10 ::= SEQUENCE (SIZE (1..maxBandwidthClass-r10)) OF CA-MIMO-ParametersDL-r10
CA-MIMO-ParametersDL-r10 ::= SEQUENCE {
  ca-BandwidthClassDL-r10
                                   CA-BandwidthClass-r10,
  supportedMIMO-CapabilityDL-r10
                                      MIMO-CapabilityDL-r10
                                                                      OPTIONAL
}
CA-BandwidthClass-r10 ::= ENUMERATED {a, b, c, d, e, f, ...}
MIMO-CapabilityUL-r10 ::= ENUMERATED {twoLayers, fourLayers}
MIMO-CapabilityDL-r10 ::= ENUMERATED {twoLayers, fourLayers, eightLayers}
                                SEQUENCE (SIZE (1..maxBands)) OF SupportedBandEUTRA
SupportedBandListEUTRA ::=
```

```
SupportedBandListEUTRA-v9e0::=
                                     SEQUENCE (SIZE (1..maxBands)) OF SupportedBandEUTRA-v9e0
SupportedBandEUTRA ::=
                               SEQUENCE {
  bandEUTRA
                                FreqBandIndicator,
  halfDuplex
                                BOOLEAN
}
SupportedBandEUTRA-v9e0 ::=
                               SEQUENCE {
   bandEUTRA-v9e0
                                  FreqBandIndicator-v9e0
                                                         OPTIONAL
}
MeasParameters ::=
                            SEQUENCE {
  bandListEUTRA\\
                                BandListEUTRA
MeasParameters-v1020 ::=
                            SEQUENCE {
  bandCombinationListEUTRA-r10
                                     BandCombinationListEUTRA-r10
}
MeasParameters-v1130 ::=
                            SEQUENCE {
  rsrqMeasWideband-r11
                             ENUMERATED {supported}
                                                                  OPTIONAL
MeasParameters-v11a0 ::=
                             SEQUENCE {
  benefitsFromInterruption-r11
                                  ENUMERATED {true}
                                                               OPTIONAL
}
BandListEUTRA ::=
                            SEQUENCE (SIZE (1..maxBands)) OF BandInfoEUTRA
BandCombinationListEUTRA-r10 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandInfoEUTRA
BandInfoEUTRA ::=
                             SEQUENCE {
  inter Freq Band List \\
                               InterFreqBandList,
  interRAT-BandList
                               InterRAT-BandList
                                                    OPTIONAL
```

```
}
InterFreqBandList ::=
                           SEQUENCE (SIZE (1..maxBands)) OF InterFreqBandInfo
InterFreqBandInfo ::=
                           SEQUENCE {
  interFreqNeedForGaps
                              BOOLEAN
}
InterRAT-BandList ::=
                            SEQUENCE (SIZE (1..maxBands)) OF InterRAT-BandInfo
InterRAT-BandInfo ::=
                            SEQUENCE {
                              BOOLEAN
  interRAT-NeedForGaps
}
IRAT-ParametersUTRA-FDD ::=
                              SEQUENCE {
  supportedBandListUTRA-FDD
                                 SupportedBandListUTRA-FDD
}
IRAT-ParametersUTRA-v920 ::=
                              SEQUENCE {
  e-RedirectionUTRA-r9
                              ENUMERATED {supported}
}
IRAT-ParametersUTRA-v9c0 ::=
                              SEQUENCE {
  voiceOverPS-HS-UTRA-FDD-r9
                                            ENUMERATED {supported}
                                                                        OPTIONAL,
  voiceOverPS-HS-UTRA-TDD128-r9
                                            ENUMERATED {supported}
                                                                        OPTIONAL,
                                               ENUMERATED {supported}
  srvcc-FromUTRA-FDD-ToUTRA-FDD-r9
                                                                           OPTIONAL,
  srvcc-FromUTRA-FDD-ToGERAN-r9
                                               ENUMERATED {supported}
                                                                           OPTIONAL,
  srvcc-FromUTRA-TDD128-ToUTRA-TDD128-r9
                                                  ENUMERATED {supported}
                                                                              OPTIONAL,
  srvcc-FromUTRA-TDD128-ToGERAN-r9
                                               ENUMERATED {supported}
                                                                           OPTIONAL
IRAT-ParametersUTRA-v9h0 ::=
                              SEQUENCE {
  mfbi-UTRA-r9
                              ENUMERATED {supported}
```

```
SEQUENCE (SIZE (1..maxBands)) OF SupportedBandUTRA-FDD
SupportedBandListUTRA-FDD ::=
SupportedBandUTRA-FDD ::=
                                 ENUMERATED {
                              bandI, bandII, bandIV, bandV, bandVI,
                              bandVII, bandVIII, bandIX, bandX, bandXI,
                              bandXII, bandXIII, bandXIV, bandXV, bandXVI, ...,
                              bandXVII-8a0, bandXVIII-8a0, bandXIX-8a0, bandXX-8a0,
                              bandXXI-8a0, bandXXII-8a0, bandXXIII-8a0, bandXXIV-8a0,
                              bandXXV-8a0, bandXXVI-8a0, bandXXVII-8a0, bandXXVIII-8a0,
                              bandXXIX-8a0, bandXXX-8a0, bandXXXII-8a0, bandXXXII-8a0}
IRAT-ParametersUTRA-TDD128 ::=
                                    SEQUENCE {
   supported Band List UTRA-TDD 128\\
                                      Supported Band List UTRA-TDD 128\\
}
SupportedBandListUTRA-TDD128 ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandUTRA-TDD128
SupportedBandUTRA-TDD128 ::=
                                   ENUMERATED {
                              a, b, c, d, e, f, g, h, i, j, k, l, m, n,
                              o, p, ...}
IRAT-ParametersUTRA-TDD384 ::=
                                    SEQUENCE {
   supportedBandListUTRA-TDD384
                                      SupportedBandListUTRA-TDD384
}
SupportedBandListUTRA-TDD384 ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandUTRA-TDD384
SupportedBandUTRA-TDD384 ::=
                                   ENUMERATED {
                                 a, b, c, d, e, f, g, h, i, j, k, l, m, n,
                                 o, p, ...}
IRAT-ParametersUTRA-TDD768 ::=
                                    SEQUENCE {
   supported Band List UTRA-TDD 768\\
                                       SupportedBandListUTRA-TDD768
```

```
SupportedBandListUTRA-TDD768 ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandUTRA-TDD768
SupportedBandUTRA-TDD768 ::=
                                  ENUMERATED {
                             a, b, c, d, e, f, g, h, i, j, k, l, m, n,
                             o, p, ...}
IRAT-ParametersUTRA-TDD-v1020 ::=
                                     SEQUENCE {
  e-RedirectionUTRA-TDD-r10
                                     ENUMERATED {supported}
}
IRAT-ParametersGERAN ::=
                               SEQUENCE {
  supportedBandListGERAN
                                   SupportedBandListGERAN,
  interRAT-PS-HO-ToGERAN
                                     BOOLEAN
IRAT-ParametersGERAN-v920 ::=
                                   SEQUENCE {
  dtm-r9
                             ENUMERATED {supported}
                                                             OPTIONAL,
                                                                   OPTIONAL
  e-RedirectionGERAN-r9
                                   ENUMERATED {supported}
SupportedBandListGERAN ::=
                               SEQUENCE (SIZE (1..maxBands)) OF SupportedBandGERAN
SupportedBandGERAN ::=
                               ENUMERATED {
                             gsm450, gsm480, gsm710, gsm750, gsm810, gsm850,
                             gsm900P, gsm900E, gsm900R, gsm1800, gsm1900,
                             spare5, spare4, spare3, spare2, spare1, ...}
IRAT-ParametersCDMA2000-HRPD ::= SEQUENCE {
   supported Band List HRPD\\
                                   SupportedBandListHRPD,
  tx-ConfigHRPD
                               ENUMERATED {single, dual},
  rx-ConfigHRPD
                                ENUMERATED {single, dual}
SupportedBandListHRPD ::=
                               SEQUENCE (SIZE (1..maxCDMA-BandClass)) OF BandclassCDMA2000
```

```
IRAT-ParametersCDMA2000-1XRTT ::= SEQUENCE {
  supportedBandList1XRTT
                                  SupportedBandList1XRTT,
  tx-Config1XRTT
                               ENUMERATED {single, dual},
  rx-Config1XRTT
                               ENUMERATED {single, dual}
IRAT-ParametersCDMA2000-1XRTT-v920 ::= SEQUENCE {
  e-CSFB-1XRTT-r9
                                 ENUMERATED {supported},
  e-CSFB-ConcPS-Mob1XRTT-r9
                                    ENUMERATED {supported}
                                                                    OPTIONAL
}
IRAT-ParametersCDMA2000-1XRTT-v1020 ::= SEQUENCE {
  e-CSFB-dual-1XRTT-r10
                                  ENUMERATED {supported}
}
IRAT-ParametersCDMA2000-v1130 ::=
                                    SEQUENCE {
  cdma2000-NW-Sharing-r11
                                    ENUMERATED {supported}
                                                                 OPTIONAL
}
SupportedBandList1XRTT ::=
                               SEQUENCE (SIZE (1..maxCDMA-BandClass)) OF BandclassCDMA2000
CSG-ProximityIndicationParameters-r9 ::= SEQUENCE {
  intraFreqProximityIndication-r9 ENUMERATED {supported}
                                                              OPTIONAL,
  interFreqProximityIndication-r9 ENUMERATED {supported}
                                                              OPTIONAL,
  utran-ProximityIndication-r9
                               ENUMERATED {supported}
                                                              OPTIONAL
NeighCellSI-AcquisitionParameters-r9 ::= SEQUENCE {
  intraFreqSI-AcquisitionForHO-r9 ENUMERATED {supported}
                                                              OPTIONAL,
  interFreqSI-AcquisitionForHO-r9 ENUMERATED {supported}
                                                              OPTIONAL,
  utran-SI-AcquisitionForHO-r9 ENUMERATED {supported}
                                                              OPTIONAL
SON-Parameters-r9 ::=
                            SEQUENCE {
  rach-Report-r9
                               ENUMERATED {supported}
                                                              OPTIONAL
```

```
}
UE-BasedNetwPerfMeasParameters-r10 ::= SEQUENCE {
  loggedMeasurementsIdle-r10
                                    ENUMERATED {supported}
                                                                OPTIONAL,
  standaloneGNSS-Location-r10
                                    ENUMERATED {supported}
                                                                OPTIONAL
OTDOA-PositioningCapabilities-r10 ::= SEQUENCE {
  otdoa-UE-Assisted-r10
                                 ENUMERATED {supported},
  interFreqRSTD-Measurement-r10
                                    ENUMERATED {supported}
                                                                OPTIONAL
}
Other-Parameters-r11 ::=
                               SEQUENCE {
  inDeviceCoexInd-r11
                                    ENUMERATED {supported}
                                                                OPTIONAL,
  powerPrefInd-r11
                                 ENUMERATED {supported}
                                                             OPTIONAL,
  ue-Rx-TxTimeDiffMeasurements-r11
                                    ENUMERATED {supported}
                                                                OPTIONAL
MBMS-Parameters-r11 ::=
                               SEQUENCE {
  mbms-SCell-r11
                                 ENUMERATED {supported}
                                                             OPTIONAL,
                                                                OPTIONAL
  mbms-NonServingCell-r11
                                    ENUMERATED {supported}
-- ASN1STOP
```

UE-EUTRA-Capability field descriptions	FDD/ TDD dif
accessStratumRelease	-
Set to rel11 in this version of the specification.	
bandCombinationListEUTRA One entry corresponding to each supported band combination listed in the same order as in	-
supportedBandCombination. BandCombinationParameters-v1090	
If included, the UE shall include the same number of entries, and listed in the same order, as in	-
BandCombinationParameters-r10.	
BandCombinationParameters-v1130	
The field is applicable to each supported CA bandwidth class combination (i.e. CA configuration in TS 36.101 [42, Section 5.6A.1]) indicated in the corresponding band combination. If included, the UE shall include the same number of entries, and listed in the same order, as in BandCombinationParameters-r10.	
bandEUTRA	-
E-UTRA band as defined in TS 36.101 [42]. In case the UE includes bandEUTRA-v9e0 or	
bandEUTRA-v1090, the UE shall set the corresponding entry of bandEUTRA (i.e. without	
suffix) or bandEUTRA-r10 respectively to maxFBI.	
bandListEUTRA	-
One entry corresponding to each supported E-UTRA band listed in the same order as in supportedBandListEUTRA.	
benefitsFromInterruption	No
Indicates whether the UE power consumption would benefit from being allowed to cause interruptions to serving cells when performing measurements of deactivated SCell carriers for measCycleSCell of less than 640ms, as specified in TS 36.133 [16].	
CA-BandwidthClass	-
The CA bandwidth class supported by the UE as defined in TS 36.101 [42, Table 5.6A-1].	
The UE explicitly includes all the supported CA bandwidth class combinations in the band	
combination signalling. Support for one CA bandwidth class does not implicitly indicate support	
for another CA bandwidth class.	
cdma2000-NW-Sharing	
Indicates whether the UE supports network sharing for CDMA2000.	-
crossCarrierScheduling	Yes
crs-InterfHandl	No
Indicates whether the UE supports CRS interference handling. deviceType	
UE may set the value to 'noBenFromBatConsumpOpt' when it does not foresee to particularly	-
benefit from NW-based battery consumption optimisation. Absence of this value means that the	
device does benefit from NW-based battery consumption optimisation.	
dtm	-
Indicates whether the UE supports DTM in GERAN.	
e-CSFB-1XRTT	Yes
Indicates whether the UE supports enhanced CS fallback to CDMA2000 1xRTT or not.	
e-CSFB-ConcPS-Mob1XRTT Indicates whether the UE supports concurrent enhanced CS fallback to CDMA2000 1xRTT and PS handover/ redirection to CDMA2000 HRPD.	Yes
e-CSFB-dual-1XRTT	Yes
Indicates whether the UE supports enhanced CS fallback to CDMA2000 1xRTT for dual Rx/Tx configuration. This bit can only be set to supported if <i>tx-Config1XRTT</i> and <i>rx-Config1XRTT</i> are both set to dual.	
enhancedDualLayerTDD Indicates whether the UE supports enhanced dual layer (PDSCH transmission mode 8) for TDD or not.	-
ט ווטני ט ט ווטני	Yes
APDCCH	168
Indicates whether the UE can receive DCI on UE specific search space on Enhanced PDCCH.	YAC
Indicates whether the UE can receive DCI on UE specific search space on Enhanced PDCCH. e-RedirectionUTRA	Yes
Indicates whether the UE can receive DCI on UE specific search space on Enhanced PDCCH. e-RedirectionUTRA e-RedirectionUTRA-TDD Indicates whether the UE supports enhanced redirection to UTRA TDD to multiple carrier frequencies both with and without using related SIB provided by RRCConnectionRelease or	Yes Yes
Indicates whether the UE can receive DCI on UE specific search space on Enhanced PDCCH. e-RedirectionUTRA e-RedirectionUTRA-TDD Indicates whether the UE supports enhanced redirection to UTRA TDD to multiple carrier frequencies both with and without using related SIB provided by RRCConnectionRelease or not.	Yes
Indicates whether the UE can receive DCI on UE specific search space on Enhanced PDCCH. e-RedirectionUTRA e-RedirectionUTRA-TDD Indicates whether the UE supports enhanced redirection to UTRA TDD to multiple carrier frequencies both with and without using related SIB provided by RRCConnectionRelease or not. featureGroupIndicators, featureGroupIndRel9Add, featureGroupIndRel10 The definitions of the bits in the bit string are described in Annex B.1 (for featureGroupIndicators and featureGroupIndRel9Add) and in Annex C.1.(for featureGroupIndRel4(1))	
Indicates whether the UE can receive DCI on UE specific search space on Enhanced PDCCH. e-RedirectionUTRA e-RedirectionUTRA-TDD Indicates whether the UE supports enhanced redirection to UTRA TDD to multiple carrier frequencies both with and without using related SIB provided by RRCConnectionRelease or not. featureGroupIndicators, featureGroupIndRel9Add, featureGroupIndRel10 The definitions of the bits in the bit string are described in Annex B.1 (for	Yes

UE-EUTRA-Capability field descriptions	FDD/ TDD dif
halfDuplex If halfDuplex is set to true, only half duplex operation is supported for the band, otherwise full duplex operation is supported.	-
inDeviceCoexInd Indicates whether the UE supports in-device coexistence indication as well as autonomous denial functionality.	Yes
interBandTDD-CA-WithDifferentConfig Indicates whether the UE supports inter-band TDD carrier aggregation with different UL/DL configuration combinations. The first bit indicates UE supports the configuration combination of SCell DL subframes are a subset of PCell by SIB1 configuration and the configuration combination of SCell DL subframes are a superset of PCell by SIB1 configuration; the second bit indicates UE supports the configuration combination of SCell DL subframes are neither superset nor subset of PCell by SIB1 configuration. This field is included only if UE supports inter-band TDD carrier aggregation.	-
interFreqBandList One entry corresponding to each supported E-UTRA band listed in the same order as in supportedBandListEUTRA.	-
interFreqNeedForGaps Indicates need for measurement gaps when operating on the E-UTRA band given by the entry in bandListEUTRA or on the E-UTRA band combination given by the entry in bandCombinationListEUTRA and measuring on the E-UTRA band given by the entry in interFreqBandList.	-
interFreqProximityIndication Indicates whether the UE supports proximity indication for inter-frequency E-UTRAN CSG member cells.	-
interFreqRSTD-Measurement Indicates whether the UE supports inter-frequency RSTD measurements for OTDOA positioning [54].	Yes
interFreqSI-AcquisitionForHO Indicates whether the UE supports, upon configuration of si-RequestForHO by the network, acquisition and reporting of relevant information using autonomous gaps by reading the SI from a neighbouring inter-frequency cell.	Yes
interRAT-BandList One entry corresponding to each supported band of another RAT listed in the same order as in the interRAT-Parameters.	-
interRAT-NeedForGaps Indicates need for DL measurement gaps when operating on the E-UTRA band given by the entry in bandListEUTRA or on the E-UTRA band combination given by the entry in bandCombinationListEUTRA and measuring on the inter-RAT band given by the entry in the interRAT-BandList.	-
interRAT-PS-HO-ToGERAN Indicates whether the UE supports inter-RAT PS handover to GERAN or not.	Yes
intraFreqProximityIndication Indicates whether the UE supports proximity indication for intra-frequency E-UTRAN CSG member cells.	-
intraFreqSI-AcquisitionForHO Indicates whether the UE supports, upon configuration of si-RequestForHO by the network, acquisition and reporting of relevant information using autonomous gaps by reading the SI from a neighbouring intra-frequency cell.	Yes
loggedMeasurementsIdle Indicates whether the UE supports logged measurements in Idle mode.	-
maxNumberROHC-ContextSessions Set to the maximum number of concurrently active ROHC contexts supported by the UE, excluding context sessions that leave all headers uncompressed. cs2 corresponds with 2 (context sessions), cs4 corresponds with 4 and so on. The network ignores this field if the UE supports none of the ROHC profiles in supportedROHC-Profiles.	-
mbms-SCell Indicates whether the UE in RRC_CONNECTED supports MBMS reception on a frequency indicated in an MBMSInterestIndication message, when an SCell is configured on that frequency (regardless of whether the SCell is activated or deactivated).	Yes
mbms-NonServingCell Indicates whether the UE in RRC_CONNECTED supports MBMS reception on a frequency indicated in an MBMSInterestIndication message, where (according to supportedBandCombination and to network synchronization properties) a serving cell may be additionally configured. If this field is included, the UE shall also include the mbms-SCell field.	Yes

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
mfbi-UTRA	-
It indicates if the UE supports the signalling requirements of multiple radio frequency bands in a UTRA FDD cell, as defined in TS 25.307 [65].	
MIMO-CapabilityDL The number of supported layers for spatial multiplexing in DL.	-
MIMO-CapabilityUL The number of supported layers for spatial multiplexing in UL. Absence of the field means that	-
the number of supported layers is 1. modifiedMPR-Behavior	-
Field encoded as a bit map, where at least one bit N is set to "1" if UE supports modified MPR/A-MPR behaviour N, see TS 36.101 [42]. All remaining bits of the field are set to '0'. The leading / leftmost bit (bit 0) corresponds to modified MPR/A-MPR behaviour 0, the next bit corresponds to modified MPR/A-MPR behaviour 1 and so on. Absence of this field means that UE does not support any modified MPR/A-MPR behaviour.	
multiACK-CSIreporting Indicates whether the UE supports multi-cell HARQ ACK and periodic CSI reporting and SR on PUCCH format 3.	Yes
multiClusterPUSCH-WithinCC	Yes
multipleTimingAdvance Indicates whether the UE supports multiple timing advances for each band combination listed in supportedBandCombination. If the band combination comprised of more than one band entry (i.e., inter-band or intra-band non-contiguous band combination), the field indicates that the same or different timing advances on different band entries are supported. If the band combination comprised of one band entry (i.e., intra-band contiguous band combination), the field indicates that the same or different timing advances across component carriers of the band entry are supported.	-
NonContiguousUL-RA-WithinCC-List One entry corresponding to each supported E-UTRA band listed in the same order as in supportedBandListEUTRA.	No
otdoa-UE-Assisted Indicates whether the UE supports UE-assisted OTDOA positioning [54].	Yes
pdcp-SN-Extension Indicates whether the UE supports 15 bit length of PDCP sequence number.	-
pmi-Disabling	Yes
powerPrefInd Indicates whether the UE supports power preference indication.	No
rach-Report Indicates whether the UE supports delivery of rachReport.	-
requestedBands Indicates the frequency bands requested by E-UTRAN.	-
rsrqMeasWideband	Yes
Indicates whether the UE can perform RSRQ measurements with wider bandwidth.	
simultaneousPUCCH-PUSCH	Yes
simultaneousRx-Tx Indicates whether the UE supports simultaneous reception and transmission on different bands for each band combination listed in supportedBandCombination. This field is only applicable for inter-band TDD carrier aggregation.	-
srvcc-FromUTRA-FDD-ToGERAN Indicates whether UE supports SRVCC handover from UTRA FDD PS HS to GERAN CS.	-
srvcc-FromUTRA-FDD-ToUTRA-FDD	-
Indicates whether UE supports SRVCC handover from UTRA FDD PS HS to UTRA FDD CS. srvcc-FromUTRA-TDD128-ToGERAN Indicates whether UE supports SRVCC handover from UTRA TDD 1.28Mcps PS HS to	-
GERAN CS. srvcc-FromUTRA-TDD128-ToUTRA-TDD128	-
Indicates whether UE supports SRVCC handover from UTRA TDD 1.28Mcps PS HS to UTRA TDD 1.28Mcps CS.	
ss-CCH-InterfHandI Indicates whether the UE supports synchronisation signal and common channel interference	Yes
handling. standaloneGNSS-Location	-
Indicates whether the UE is equipped with a standalone GNSS receiver that may be used to provide detailed location information in RRC measurement report and logged measurements.	
supportedBandCombination Includes the supported CA band combinations, if any, and may include all the supported non-	-

UE-EUTRA-Capability field descriptions	FDD/ TDD dif
CA bands.	
supportedBandCombinationAdd Includes additional supported CA band combinations in case maximum number of CA band combinations of supportedBandCombination is exceeded.	-
SupportedBandCombination-v1130 SupportedBandCombination-v1090,	-
If included, the UE shall include the same number of entries, and listed in the same order, as in	
supportedBandCombination-r10. SupportedBandGERAN	No
GERAN band as defined in TS 45.005 [20]. SupportedBandList1XRTT	-
One entry corresponding to each supported CDMA2000 1xRTT band class. SupportedBandListEUTRA	
Includes the supported E-UTRA bands. This field shall include all bands which are indicated in BandCombinationParameters.	
SupportedBandListEUTRA-v9e0	-
If included, the UE shall include the same number of entries, and listed in the same order, as in supportedListEUTRA (i.e. without suffix).	
SupportedBandListGERAN	No
SupportedBandListHRPD One optry corresponding to each supported CDMA2000 HPPD band class	-
One entry corresponding to each supported CDMA2000 HRPD band class. SupportedBandUTRA-FDD	_
UTRA band as defined in TS 25.101 [17].	
SupportedBandUTRA-TDD128 UTRA band as defined in TS 25.102 [18].	-
SupportedBandUTRA-TDD384 UTRA band as defined in TS 25.102 [18].	-
SupportedBandUTRA-TDD768	-
JTRA band as defined in TS 25.102 [18]. supportedBandwidthCombinationSet	-
The supportedBandwidthCombinationSet indicated for a band combination is applicable to all bandwidth classes indicated by the UE in this band combination. Field encoded as a bit map, where bit N is set to "1" if UE support Bandwidth Combination Set N for this band combination, see 36.101 [42]. The leading / leftmost bit (bit 0) corresponds to the Bandwidth Combination Set 0, the next bit corresponds to the Bandwidth Combination Set 1 and so on. The UE shall neither include the field for a non-CA band combination, nor for a CA band combination for which the UE only supports Bandwidth Combination Set 0.	
Indicates the maximum number of CSI processes supported on a component carrier within a pand. Value n1 corresponds to 1 CSI process, value n3 corresponds to 3 CSI processes, and value n4 corresponds to 4 CSI processes. If this field is included, the UE shall include the same number of entries listed in the same order as in <i>BandParameters</i> . If the UE supports at least 1 CSI process on any component carrier, then the UE shall include this field in all bands in all band combinations.	-
supportRohcContextContinue Indicates whether the UE supports ROHC context continuation operation where the UE does The operation of the current ROHC context upon handover.	-
tdd-SpecialSubframe Indicates whether the UE supports TDD special subframe defined in TS 36.211 [21].	No
tm5-FDD ndicates whether the UE supports the PDSCH transmission mode 5 in FDD.	-
tm5-TDD ndicates whether the UE supports the PDSCH transmission mode 5 in TDD.	-
tmalcates whether the OE supports the FD3CH transmission mode 3 in TDD.	No
twoAntennaPortsForPUCCH	No
txDiv-PUCCH1b-ChSelect Indicates whether the UE supports transmit diversity for PUCCH format 1b with channel	Yes
selection. ue-Category JE category as defined in TS 36.306 [5]. Set to values 1 to 12 in this version of the specification.	-
ue-Rx-TxTimeDiffMeasurements	No
Indicates whether the UE supports Rx - Tx time difference measurements. ue-SpecificRefSigsSupported	No

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
ue-TxAntennaSelectionSupported	Yes
TRUE indicates that the UE is capable of supporting UE transmit antenna selection as	
described in TS 36.213 [23, 8.7].	
ul-CoMP	No
Indicates whether the UE supports UL Coordinated Multi-Point operation.	
utran-ProximityIndication	-
Indicates whether the UE supports proximity indication for UTRAN CSG member cells.	
utran-SI-AcquisitionForHO	Yes
Indicates whether the UE supports, upon configuration of si-RequestForHO by the network,	
acquisition and reporting of relevant information using autonomous gaps by reading the SI from	
a neighbouring UMTS cell.	
voiceOverPS-HS-UTRA-FDD	-
Indicates whether UE supports IMS voice according to GSMA IR.58 profile in UTRA FDD.	
voiceOverPS-HS-UTRA-TDD128	-
Indicates whether UE supports IMS voice in UTRA TDD 1.28Mcps.	

- NOTE 1: The IE *UE-EUTRA-Capability* does not include AS security capability information, since these are the same as the security capabilities that are signalled by NAS. Consequently AS need not provide "man-in-the-middle" protection for the security capabilities.
- NOTE 2: The column FDD/ TDD diff indicates if the UE is allowed to signal, as part of the additional capabilities for an XDD mode i.e. within *UE-EUTRA-CapabilityAddXDD-Mode-xNM*, a different value compared to the value signalled elsewhere within *UE-EUTRA-Capability* (i.e. the common value, supported for both XDD modes). A '-' is used to indicate that it is not possible to signal different values (used for fields for which the field description is provided for other reasons).
- NOTE 3: All the combinations of *CA-MIMO-ParametersUL* and *CA-MIMO-ParametersDL* for one band and across all the bands in each *BandCombinationParameters* are supported by the UE and have the same measurement gap requirement (i.e. the same *BandInfoEUTRA* applies). The *BandCombinationParameters* for the same band combination can be included more than once.
- NOTE 4: UE CA and measurement capabilities indicate the combinations of frequencies that can be configured as serving frequencies.

UE-TimersAndConstants

The IE $\it UE-TimersAndConstants$ contains timers and constants used by the UE in either RRC_CONNECTED or RRC_IDLE.

UE-TimersAndConstants information element

ASN1START	
UE-TimersAndConstants ::=	SEQUENCE {
t300	ENUMERATED {
	ms100, ms200, ms300, ms400, ms600, ms1000, ms1500,
	ms2000},
t301	ENUMERATED {
	ms100, ms200, ms300, ms400, ms600, ms1000, ms1500,
	ms2000},
t310	ENUMERATED {
	ms0, ms50, ms100, ms200, ms500, ms1000, ms2000},

UE-TimersAndConstants field descriptions			
n3xy			
Constants are described in section 7.4. n1 corresponds with 1, n2 corresponds with 2 and so on.			
t3xy			
Timers are described in section 7.3. Value ms0 corresponds with 0 ms, ms50 corresponds with 50 ms and so on.			

6.3.7 MBMS information elements

MBMS-NotificationConfig

The IE *MBMS-NotificationConfig* specifies the MBMS notification related configuration parameters, that are applicable for all MBSFN areas.

MBMS-NotificationConfig information element

MBMS-NotificationConfig field descriptions

notificationOffset

Indicates, together with the *notificationRepetitionCoeff*, the radio frames in which the MCCH information change notification is scheduled i.e. the MCCH information change notification is scheduled in radio frames for which: SFN mod notification repetition period = *notificationOffset*.

notificationRepetitionCoeff

Actual change notification repetition period common for all MCCHs that are configured= shortest modification period/ notificationRepetitionCoeff. The "shortest modification period" corresponds with the lowest value of mcch-ModificationPeriod of all MCCHs that are configured. Value n2 corresponds to coefficient 2, and so on.

notificationSF-Index

Indicates the subframe used to transmit MCCH change notifications on PDCCH.

FDD: Value 1, 2, 3, 4, 5 and 6 correspond with subframe #1, #2, #3 #6, #7, and #8 respectively.

TDD: Value 1, 2, 3, 4, and 5 correspond with subframe #3, #4, #7, #8, and #9 respectively.

MBSFN-AreaInfoList

The IE *MBSFN-AreaInfoList* contains the information required to acquire the MBMS control information associated with one or more MBSFN areas.

MBSFN-AreaInfoList information element

```
-- ASN1START
MBSFN-AreaInfoList-r9 ::=
                                 SEQUENCE (SIZE(1..maxMBSFN-Area)) OF MBSFN-AreaInfo-r9
MBSFN-AreaInfo-r9 ::=
                              SEQUENCE {
   mbsfn-AreaId-r9
                                 INTEGER (0..255),
   non-MBSFNregionLength
                                    ENUMERATED {s1, s2},
   notificationIndicator-r9
                                 INTEGER (0..7),
  mcch-Config-r9
                                 SEQUENCE {
      mcch-RepetitionPeriod-r9
                                    ENUMERATED {rf32, rf64, rf128, rf256},
      mcch-Offset-r9
                                    INTEGER (0..10),
      mcch-ModificationPeriod-r9
                                       ENUMERATED {rf512, rf1024},
      sf-AllocInfo-r9
                                    BIT STRING (SIZE(6)),
      signallingMCS-r9
                                    ENUMERATED {n2, n7, n13, n19}
   },
-- ASN1STOP
```

MBSFN-AreaInfoList field descriptions

mbsfn-Areald

Indicates the MBSFN area ID, parameter $N_{\rm ID}^{\rm MBSFN}$ in TS 36.211 [21, 6.10.2.1].

mcch-ModificationPeriod

Defines periodically appearing boundaries, i.e. radio frames for which SFN mod *mcch-ModificationPeriod* = 0. The contents of different transmissions of MCCH information can only be different if there is at least one such boundary inbetween them.

mcch-Offset

Indicates, together with the *mcch-RepetitionPeriod*, the radio frames in which MCCH is scheduled i.e. MCCH is scheduled in radio frames for which: SFN mod *mcch-RepetitionPeriod* = *mcch-Offset*.

mcch-RepetitionPeriod

Defines the interval between transmissions of MCCH information, in radio frames, Value rf32 corresponds to 32 radio frames, rf64 corresponds to 64 radio frames and so on.

non-MBSFNregionLength

Indicates how many symbols from the beginning of the subframe constitute the non-MBSFN region. This value applies in all subframes of the MBSFN area used for PMCH transmissions as indicated in the MSI. The values s1 and s2 correspond with 1 and 2 symbols, respectively: see TS 36.211 [21, Table 6.7-1].

notificationIndicator

Indicates which PDCCH bit is used to notify the UE about change of the MCCH applicable for this MBSFN area. Value 0 corresponds with the least significant bit as defined in TS 36.212 [22, Section 5.3.3.1] and so on.

sf-AllocInfo

Indicates the subframes of the radio frames indicated by the *mcch-RepetitionPeriod* and the *mcch-Offset*, that may carry MCCH. Value '1' indicates that the corresponding subframe is allocated. The following mapping applies: FDD: The first/ leftmost bit defines the allocation for subframe #1 of the radio frame indicated by *mcch-RepetitionPeriod* and *mcch-Offset*, the second bit for #2, the third bit for #3, the fourth bit for #6, the fifth bit for #7 and the sixth bit for #8.

TDD: The first/leftmost bit defines the allocation for subframe #3 of the radio frame indicated by *mcch-RepetitionPeriod* and *mcch-Offset*, the second bit for #4, third bit for #7, fourth bit for #8, fifth bit for #9. Uplink subframes are not allocated. The last bit is not used.

signallingMCS

Indicates the Modulation and Coding Scheme (MCS) applicable for the subframes indicated by the field *sf-AllocInfo* and for each (P)MCH that is configured for this MBSFN area, for the first subframe allocated to the (P)MCH within each MCH scheduling period (which may contain the MCH scheduling information provided by MAC). Value n2

corresponds with the value 2 for parameter $I_{\rm MCS}$ in TS 36.213 [23, Table 7.1.7.1-1], and so on.

MBSFN-SubframeConfig

The IE MBSFN-SubframeConfig defines subframes that are reserved for MBSFN in downlink.

MBSFN-SubframeConfig information element

```
-- ASN1START

MBSFN-SubframeConfig ::= SEQUENCE {
    radioframeAllocationPeriod ENUMERATED {n1, n2, n4, n8, n16, n32},
    radioframeAllocationOffset INTEGER (0..7),
    subframeAllocation CHOICE {
        oneFrame BIT STRING (SIZE(6)),
        fourFrames BIT STRING (SIZE(24))
    }
}
-- ASN1STOP
```

MBSFN-SubframeConfig field descriptions

fourFrames

A bit-map indicating MBSFN subframe allocation in four consecutive radio frames, '1' denotes that the corresponding subframe is allocated for MBSFN. The bitmap is interpreted as follows:

FDD: Starting from the first radioframe and from the first/leftmost bit in the bitmap, the allocation applies to subframes #1, #2, #3, #6, #7, and #8 in the sequence of the four radio-frames.

TDD: Starting from the first radioframe and from the first/leftmost bit in the bitmap, the allocation applies to subframes #3, #4, #7, #8, and #9 in the sequence of the four radio-frames. The last four bits are not used. Uplink subframes are not allocated.

oneFrame

'1' denotes that the corresponding subframe is allocated for MBSFN. The following mapping applies:

FDD: The first/leftmost bit defines the MBSFN allocation for subframe #1, the second bit for #2, third bit for #3, fourth bit for #6, fifth bit for #7, sixth bit for #8.

TDD: The first/leftmost bit defines the allocation for subframe #3, the second bit for #4, third bit for #7, fourth bit for #8, fifth bit for #9. Uplink subframes are not allocated. The last bit is not used.

radioFrameAllocationPeriod, radioFrameAllocationOffset

Radio-frames that contain MBSFN subframes occur when equation *SFN* mod *radioFrameAllocationPeriod* = *radioFrameAllocationOffset* is satisfied. Value n1 for *radioframeAllocationPeriod* denotes value 1, n2 denotes value 2, and so on. When *fourFrames* is used for *subframeAllocation*, the equation defines the first radio frame referred to in the description below. Values *n*1 and *n*2 are not applicable when *fourFrames* is used.

subframeAllocation

Defines the subframes that are allocated for MBSFN within the radio frame allocation period defined by the radioFrameAllocationPeriod and the radioFrameAllocationOffset.

– PMCH-InfoList

The IE *PMCH-InfoList* specifies configuration of all PMCHs of an MBSFN area. The information provided for an individual PMCH includes the configuration parameters of the sessions that are carried by the concerned PMCH.

PMCH-InfoList information element

```
-- ASN1START
PMCH-InfoList-r9 ::=
                              SEQUENCE (SIZE (0..maxPMCH-PerMBSFN)) OF PMCH-Info-r9
PMCH-Info-r9 ::=
                              SEQUENCE {
   pmch-Config-r9
                                 PMCH-Config-r9,
   mbms-SessionInfoList-r9
                                 MBMS-SessionInfoList-r9,
MBMS-SessionInfoList-r9 ::=
                              SEQUENCE (SIZE (0..maxSessionPerPMCH)) OF MBMS-SessionInfo-r9
MBMS-SessionInfo-r9 ::=
                              SEQUENCE {
   tmgi-r9
                                 TMGI-r9.
                                                            OPTIONAL, -- Need OR
   sessionId-r9
                              OCTET STRING (SIZE (1))
   logicalChannelIdentity-r9
                                 INTEGER (0..maxSessionPerPMCH-1),
```

```
PMCH-Config-r9 ::=
                               SEQUENCE {
   sf-AllocEnd-r9
                                  INTEGER (0..1535),
   dataMCS-r9
                                  INTEGER (0..28),
  mch-SchedulingPeriod-r9
                                  ENUMERATED {
                               rf8, rf16, rf32, rf64, rf128, rf256, rf512, rf1024},
TMGI-r9 ::=
                            SEQUENCE {
   plmn-Id-r9
                                  CHOICE {
      plmn-Index-r9
                                     INTEGER (1..maxPLMN-r11),
      explicitValue-r9
                                  PLMN-Identity
   },
   serviceId-r9
                               OCTET STRING (SIZE (3))
-- ASN1STOP
```

PMCH-InfoList field descriptions

dataMCS

Indicates the value for parameter $I_{\rm MCS}$ in TS 36.213 [23, Table 7.1.7.1-1], which defines the Modulation and Coding Scheme (MCS) applicable for the subframes of this (P)MCH as indicated by the field commonSF-Alloc. The MCS does however neither apply to the subframes that may carry MCCH i.e. the subframes indicated by the field sf-AllocInfo within SystemInformationBlockType13 nor for the first subframe allocated to this (P)MCH within each MCH scheduling period (which may contain the MCH scheduling information provided by MAC).

mch-SchedulingPeriod

Indicates the MCH scheduling period i.e. the periodicity used for providing MCH scheduling information at lower layers (MAC) applicable for an MCH. Value rf8 corresponds to 8 radio frames, rf16 corresponds to 16 radio frames and so on. The *mch-SchedulingPeriod* starts in the radio frames for which: SFN mod *mch-SchedulingPeriod* = 0. E-UTRAN configures *mch-SchedulingPeriod* of the (P)MCH listed first in *PMCH-InfoList* to be smaller than or equal to *mcch-RepetitionPeriod*.

plmn-Index

Index of the entry in field *plmn-IdentityList* within *SystemInformationBlockType1*.

sessionId

Indicates the optional MBMS Session Identity, which together with TMGI identifies a transmission or a possible retransmission of a specific MBMS session: see TS 29.061 [51, Sections 20.5, 17.7.11, 17.7.15]. The field is included whenever upper layers have assigned a session identity i.e. one is available for the MBMS session in E-UTRAN.

serviceld

Uniquely identifies the identity of an MBMS service within a PLMN. The field contains octet 3- 5 of the IE Temporary Mobile Group Identity (TMGI) as defined in TS 24.008 [49]. The first octet contains the third octet of the TMGI, the second octet contains the fourth octet of the TMGI and so on.

sf-AllocEnd

Indicates the last subframe allocated to this (P)MCH within a period identified by field *commonSF-AllocPeriod*. The subframes allocated to (P)MCH corresponding with the nth entry in *pmch-InfoList* are the subsequent subframes starting from either the next subframe after the subframe identified by *sf-AllocEnd* of the (n-1)th listed (P)MCH or, for n=1, the first subframe defined by field *commonSF-Alloc*, through the subframe identified by *sf-AllocEnd* of the nth listed (P)MCH. Value 0 corresponds with the first subframe defined by field *commonSF-Alloc*.

6.4 RRC multiplicity and type constraint values

Multiplicity and type constraint definitions

ASN1START
maxBandComb-r10 INTEGER ::=128 Maximum number of band combinations.
maxBandComb-r11 INTEGER ::=256 Maximum number of additional band combinations.
maxBands INTEGER ::= 64 Maximum number of bands listed in EUTRA UE caps
maxBandwidthClass-r10 INTEGER ::=16 Maximum number of supported CA BW classes per band
maxBandwidthCombSet-r10 INTEGER ::=32 Maximum number of bandwidth combination sets per
supported band combination
maxCDMA-BandClass INTEGER ::= 32 Maximum value of the CDMA band classes
maxCellBlack INTEGER ::= 16 Maximum number of blacklisted physical cell identity
ranges listed in SIB type 4 and 5
maxCellInfoGERAN-r9 INTEGER ::=32 Maximum number of GERAN cells for which system in-
formation can be provided as redirection assistance
maxCellInfoUTRA-r9 INTEGER ::=16 Maximum number of UTRA cells for which system
information can be provided as redirection
assistance
maxCSI-IM-r11 INTEGER ::= 3 Maximum number of CSI-IM configurations
(per carrier frequency)
maxCSI-Proc-r11 INTEGER ::= 4 Maximum number of CSI RS processes (per carrier
frequency)
maxCSI-RS-NZP-r11 INTEGER ::= 3 Maximum number of CSI RS resource
configurations using non-zero Tx power
(per carrier frequency)
maxCSI-RS-ZP-r11 INTEGER ::= 4 Maximum number of CSI RS resource
configurations using zero Tx power(per carrier
frequency)
maxCQI-ProcExt-r11 INTEGER ::= 3 Maximum number of additional periodic CQI
configurations (per carrier frequency)
maxFreqUTRA-TDD-r10 INTEGER ::=6 Maximum number of UTRA TDD carrier frequencies for
which system information can be provided as
redirection assistance
maxCellInter INTEGER ::= 16 Maximum number of neighbouring inter-frequency

-- cells listed in SIB type 5 maxCellIntra INTEGER ::= 16 -- Maximum number of neighbouring intra-frequency -- cells listed in SIB type 4 maxCellListGERAN INTEGER ::= 3 -- Maximum number of lists of GERAN cells INTEGER ::= 32 -- Maximum number of entries in each of the maxCellMeas -- cell lists in a measurement object maxCellReport INTEGER ::= 8 -- Maximum number of reported cells maxDRB INTEGER ::= 11 -- Maximum number of Data Radio Bearers maxEARFCN INTEGER ::= 65535 -- Maximum value of EUTRA carrier frequency maxEARFCN-Plus1 INTEGER ::= 65536-- Lowest value extended EARFCN range maxEARFCN2 INTEGER ::= 262143 -- Highest value extended EARFCN range maxEPDCCH-Set-r11 INTEGER ::= 2 -- Maximum number of EPDCCH sets maxFBI INTEGER ::= 64 -- Maximum value of fequency band indicator maxFBI-Plus1 INTEGER ::= 65 -- Lowest value extended FBI range maxFBI2 INTEGER ::= 256 -- Highest value extended FBI range INTEGER ::= 8 -- Maximum number of carrier frequencies maxFreq maxFreqIDC-r11 INTEGER ::= 32 -- Maximum number of carrier frequencies that are -- affected by the IDC problems maxFreqMBMS-r11 INTEGER ::= 5 -- Maximum number of carrier frequencies for which an -- MBMS capable UE may indicate an interest maxGERAN-SI INTEGER ::= 10 -- Maximum number of GERAN SI blocks that can be -- provided as part of NACC information maxGNFG INTEGER ::= 16 -- Maximum number of GERAN neighbour freq groups maxLogMeasReport-r10 INTEGER ::= 520 -- Maximum number of logged measurement entries -- that can be reported by the UE in one message maxMBSFN-Allocations INTEGER ::= 8 -- Maximum number of MBSFN frame allocations with -- different offset maxMBSFN-Area INTEGER ::= 8 maxMBSFN-Area-1 INTEGER ::= 7 maxMeasId INTEGER ::= 32 maxMultiBands INTEGER ::= 8 -- Maximum number of additional frequency bands -- that a cell belongs to maxObjectId INTEGER ::= 32 maxPageRec INTEGER ::= 16 --

maxPhysCellIdRange-r9 INTEGER ::= 4 -- Maximum number of physical cell identity ranges maxPLMN-r11 INTEGER ::=6 -- Maximum number of PLMNs maxPNOffset INTEGER ::=511 -- Maximum number of CDMA2000 PNOffsets maxPMCH-PerMBSFN INTEGER ::= 15 maxRAT-Capabilities INTEGER ::= 8 -- Maximum number of interworking RATs (incl EUTRA) INTEGER ::= 4 -- Maximum number of PDSCH RE Mapping configurations maxRE-MapQCL-r11 -- (per carrier frequency) maxReportConfigId INTEGER ::= 32 maxRSTD-Freq-r10 INTEGER ::= 3 -- Maximum number of frequency layers for RSTD -- measurement maxSAI-MBMS-r11 INTEGER ::= 64 -- Maximum number of MBMS service area identities -- broadcast per carrier frequency maxSCell-r10 INTEGER ::= 4 -- Maximum number of SCells maxSTAG-r11 INTEGER ::= 3 -- Maximum number of STAGs maxServCell-r10 INTEGER ::= 5 -- Maximum number of Serving cells maxServiceCount INTEGER ::= 16 -- Maximum number of MBMS services that can be included -- in an MBMS counting request and response maxServiceCount-1 INTEGER ::= 15 maxSessionPerPMCH INTEGER ::= 29 maxSessionPerPMCH-1 INTEGER ::= 28 maxSIB INTEGER ::= 32 -- Maximum number of SIBs maxSIB-1 INTEGER ::= 31 maxSI-Message INTEGER ::= 32 -- Maximum number of SI messages maxSimultaneousBands-r10INTEGER ::= 64 -- Maximum number of simultaneously aggregated bands maxSubframePatternIDC-r11 INTEGER ::= 8 -- Maximum number of subframe reservation patterns -- that the UE can simultaneously recommend to the -- E-UTRAN for use. maxUTRA-FDD-Carrier INTEGER ::= 16 -- Maximum number of UTRA FDD carrier frequencies maxUTRA-TDD-Carrier INTEGER ::= 16 -- Maximum number of UTRA TDD carrier frequencies -- ASN1STOP

NOTE: The value of maxDRB aligns with SA2.

End of EUTRA-RRC-Definitions

-- ASN1START

Е	ND				
	ASN1STOP				

7 Variables and constants

7.1 UE variables

NOTE: To facilitate the spec

To facilitate the specification of the UE behavioural requirements, UE variables are represented using ASN.1. Unless explicitly specified otherwise, it is however up to UE implementation how to store the variables. The optionality of the IEs in ASN.1 is used only to indicate that the values may not always be available.

EUTRA-UE-Variables

This ASN.1 segment is the start of the E-UTRA UE variable definitions.

ASN1START
EUTRA-UE-Variables DEFINITIONS AUTOMATIC TAGS ::=
BEGIN
IMPORTS
AbsoluteTimeInfo-r10,
AreaConfiguration-r10,
AreaConfiguration-v1130,
CarrierFreqGERAN,
CellIdentity,
ConnEstFailReport-r11,
SpeedStateScaleFactors,
C-RNTI,
LoggingDuration-r10,
LoggingInterval-r10,
LogMeasInfo-r10,
MeasId,
MeasIdToAddModList,
MeasObjectToAddModList,

```
MeasObjectToAddModList-v9e0,
  MobilityStateParameters,
  NeighCellConfig,
  PhysCellId,
  PhysCellIdCDMA2000,
  PhysCellIdGERAN,
  PhysCellIdUTRA-FDD,
  PhysCellIdUTRA-TDD,
  PLMN-Identity,
  PLMN-IdentityList3-r11,
   QuantityConfig,
  ReportConfigToAddModList,
  RLF-Report-r9,
  RSRP-Range,
  TraceReference-r10,
  maxCellMeas,
   maxMeasId
FROM EUTRA-RRC-Definitions;
-- ASN1STOP
```

VarConnEstFailReport

The UE variable VarConnEstFailReport includes the connection establishment failure information.

VarConnEstFailReport UE variable

```
-- ASN1START

VarConnEstFailReport-r11 ::= SEQUENCE {
  connEstFailReport-r11 ConnEstFailReport-r11,
  plmn-Identity-r11 PLMN-Identity
}

-- ASN1STOP
```

VarLogMeasConfig

The UE variable *VarLogMeasConfig* includes the configuration of the logging of measurements to be performed by the UE while in RRC_IDLE, covering intra-frequency, inter-frequency and inter-RAT mobility related measurements.

VarLogMeasConfig UE variable

```
-- ASN1START
VarLogMeasConfig-r10 ::=
                                  SEQUENCE {
   areaConfiguration-r10
                                                        OPTIONAL.
                               AreaConfiguration-r10
   loggingDuration-r10
                               LoggingDuration-r10,
   loggingInterval-r10
                               LoggingInterval-r10
}
VarLogMeasConfig-r11 ::=
                            SEQUENCE {
   areaConfiguration-r10
                               AreaConfiguration-r10
                                                        OPTIONAL,
   areaConfiguration-v1130
                                  AreaConfiguration-v1130
                                                               OPTIONAL,
   loggingDuration-r10
                               LoggingDuration-r10,
   loggingInterval-r10
                               LoggingInterval-r10
-- ASN1STOP
```

VarLogMeasReport

The UE variable VarLogMeasReport includes the logged measurements information.

VarLogMeasReport UE variable

```
-- ASN1START

VarLogMeasReport-r10 ::= SEQUENCE {
    traceReference-r10 TraceReference-r10,
    traceRecordingSessionRef-r10 OCTET STRING (SIZE (2)),
    tce-Id-r10 OCTET STRING (SIZE (1)),
    plmn-Identity-r10 PLMN-Identity,
    absoluteTimeInfo-r10 AbsoluteTimeInfo-r10,
    logMeasInfoList-r10 LogMeasInfoList2-r10
}
```

```
VarLogMeasReport-r11 ::=
                               SEQUENCE {
   traceReference-r10
                                  TraceReference-r10,
   traceRecordingSessionRef-r10
                                  OCTET STRING (SIZE (2)),
   tce-Id-r10
                               OCTET STRING (SIZE (1)),
   plmn-IdentityList-r11
                                  PLMN-IdentityList3-r11,
   absoluteTimeInfo-r10
                                  AbsoluteTimeInfo-r10,
  logMeasInfoList-r10
                                  LogMeasInfoList2-r10
LogMeasInfoList2-r10 ::=
                                  SEQUENCE (SIZE (1..maxLogMeas-r10)) OF LogMeasInfo-r10
-- ASN1STOP
```

VarMeasConfig

The UE variable *VarMeasConfig* includes the accumulated configuration of the measurements to be performed by the UE, covering intra-frequency, inter-frequency and inter-RAT mobility related measurements.

NOTE: The amount of measurement configuration information, which a UE is required to store, is specified in subclause 11.1. If the number of frequencies configured for a particular RAT exceeds the minimum performance requirements specified in [16], it is up to UE implementation which frequencies of that RAT are measured. If the total number of frequencies for all RATs provided to the UE in the measurement configuration exceeds the minimum performance requirements specified in [16], it is up to UE implementation which frequencies/RATs are measured.

VarMeasConfig UE variable

ASN1START		
VarMeasConfig ::=	SEQUENCE {	
Measurement identities		
measIdList	MeasIdToAddModList	OPTIONAL,
Measurement objects		
measObjectList	MeasObjectToAddModList	OPTIONAL,
measObjectList-v9i0	MeasObjectToAddModList-v9e0	OPTIONAL,
Reporting configurations		
reportConfigList	Report Config To Add Mod List	OPTIONAL,
Other parameters		
quantityConfig	QuantityConfig	OPTIONAL,
s-Measure	INTEGER (-14044)	OPTIONAL,

```
CHOICE {
   speedStatePars\\
      release
                                   NULL,
                                   SEQUENCE {
      setup
         mobility State Parameters\\
                                         MobilityStateParameters,
         timeToTrigger-SF
                                         SpeedStateScaleFactors
                                                            OPTIONAL,
   }
   allowInterruptions-r11
                                                                     OPTIONAL
                                  BOOLEAN
-- ASN1STOP
```

VarMeasReportList

The UE variable *VarMeasReportList* includes information about the measurements for which the triggering conditions have been met.

VarMeasReportList UE variable

```
-- ASN1START
                               SEQUENCE (SIZE (1..maxMeasId)) OF VarMeasReport
VarMeasReportList ::=
                               SEQUENCE {
VarMeasReport ::=
   -- List of measurement that have been triggered
  measId
                                  MeasId,
  cells Triggered List\\
                                  Cells Triggered List \\
                                                              OPTIONAL,
  number Of Reports Sent \\
                                     INTEGER
CellsTriggeredList ::=
                               SEQUENCE (SIZE (1..maxCellMeas)) OF CHOICE {
   physCellIdEUTRA
                                        PhysCellId,
   physCellIdUTRA
                                        CHOICE {
      fdd
                                     PhysCellIdUTRA-FDD,
      tdd
                                     PhysCellIdUTRA-TDD
   },
   physCellIdGERAN
                                        SEQUENCE {
      carrierFreq
                                        CarrierFreqGERAN,
```

```
physCellId PhysCellIdGERAN

},
physCellIdCDMA2000 PhysCellIdCDMA2000

}
-- ASN1STOP
```

VarRLF-Report

The UE variable *VarRLF-Report* includes the radio link failure information or handover failure information.

VarRLF-Report UE variable

```
-- ASN1START

VarRLF-Report-r10 ::= SEQUENCE {
    rlf-Report-r10 RLF-Report-r9,
    plmn-Identity-r10 PLMN-Identity
}

VarRLF-Report-r11 ::= SEQUENCE {
    rlf-Report-r10 RLF-Report-r9,
    plmn-IdentityList-r11 PLMN-IdentityList3-r11
}
```

VarShortMAC-Input

The UE variable VarShortMAC-Input specifies the input used to generate the shortMAC-I.

VarShortMAC-Input UE variable

```
-- ASN1START

VarShortMAC-Input ::= SEQUENCE {
  cellIdentity CellIdentity,
  physCellId PhysCellId,
  c-RNTI C-RNTI
}

-- ASN1STOP
```

VarShortMAC-Input field descriptions				
cellidentity				
Set to CellIdentity of the current cell.				
c-RNTI				
Set to C-RNTI that the UE had in the PCell it was connected to prior to the failure.				
physCellId				
Set to the physical cell identity of the PCell the UE was connected to prior to the failure.				

Multiplicity and type constraint definitions

This section includes multiplicity and type constraints applicable (only) for UE variables.

ASN1START	
maxLogMeas-r10	INTEGER ::= 4060 Maximum number of logged measurement entries
	that can be stored by the UE
ASN1STOP	

End of EUTRA-UE-Variables

ASN1START		
END		
END		
ASN1STOP		

7.2 Counters

Counter	Reset	Incremented	When reaching max value

7.3 Timers (Informative)

Timer	Start	Stop	At expiry
T300	Transmission of RRCConnectionRequest	Reception of RRCConnectionSetup or RRCConnectionReject message, cell re-selection and upon abortion of connection establishment by upper layers	Perform the actions as specified in 5.3.3.6
T301	Transmission of RRCConnectionReestabil shmentRequest	Reception of RRCConnectionReestablishmen t or RRCConnectionReestablishmen tReject message as well as when the selected cell becomes unsuitable	Go to RRC_IDLE
T302	Reception of RRCConnectionReject while performing RRC connection establishment	Upon entering RRC_CONNECTED and upon cell re-selection	Inform upper layers about barring alleviation as specified in 5.3.3.7
T303	Access barred while performing RRC connection establishment for mobile originating calls	Upon entering RRC_CONNECTED and upon cell re-selection	Inform upper layers about barring alleviation as specified in 5.3.3.7
T304	Reception of RRCConnectionReconfig uration message including the MobilityControl Info or reception of MobilityFromEUTRACom mand message including CellChangeOrder	Criterion for successful completion of handover within E-UTRA, handover to E-UTRA or cell change order is met (the criterion is specified in the target RAT in case of inter-RAT)	In case of cell change order from E-UTRA or intra E-UTRA handover, initiate the RRC connection re-establishment procedure; In case of handover to E-UTRA, perform the actions defined in the specifications applicable for the source RAT.
T305	Access barred while performing RRC connection establishment for mobile originating signalling	Upon entering RRC_CONNECTED and upon cell re-selection	Inform upper layers about barring alleviation as specified in 5.3.3.7
T306	Access barred while performing RRC connection establishment for mobile originating CS fallback.	Upon entering RRC_CONNECTED and upon cell re-selection	Inform upper layers about barring alleviation as specified in 5.3.3.7
T310	Upon detecting physical layer problems i.e. upon receiving N310 consecutive out-of-sync indications from lower layers	Upon receiving N311 consecutive in-sync indications from lower layers, upon triggering the handover procedure and upon initiating the connection re-establishment procedure	If security is not activated: go to RRC_IDLE else: initiate the connection re-establishment procedure
T311	Upon initiating the RRC connection re-establishment procedure	Selection of a suitable E-UTRA cell or a cell using another RAT.	Enter RRC_IDLE
T320	Upon receiving t320 or upon cell (re)selection to E-UTRA from another RAT with validity time configured for dedicated priorities (in which case the remaining validity time is applied).	Upon entering RRC_CONNECTED, when PLMN selection is performed on request by NAS, or upon cell (re)selection to another RAT (in which case the timer is carried on to the other RAT).	Discard the cell reselection priority information provided by dedicated signalling.

Timer	Start	Stop	At expiry
T321	Upon receiving measConfig including a reportConfig with the purpose set to reportCGI	Upon acquiring the information needed to set all fields of cellGloballd for the requested cell, upon receiving measConfig that includes removal of the reportConfig with the purpose set to reportCGI	Initiate the measurement reporting procedure, stop performing the related measurements and remove the corresponding <i>measld</i>
T325	Timer (re)started upon receiving RRCConnectionReject message with deprioritisationTimer.		Stop deprioritisation of all frequencies or E-UTRA signalled by RRCConnectionReject.
T330	Upon receiving LoggedMeasurementCon figuration message	Upon log volume exceeding the suitable UE memory, upon initiating the release of LoggedMeasurementConfiguration procedure	Perform the actions specified in 5.6.6.4
T340	Upon transmitting UEAssistanceInformation message with powerPrefIndication set to normal	Upon initiating the connection re-establishment procedure	No action.

7.4 Constants

Constant	Usage	
N310	Maximum number of consecutive "out-of-sync" indications received from lower layers	
N311	Maximum number of consecutive "in-sync" indications received from lower layers	

8 Protocol data unit abstract syntax

8.1 General

The RRC PDU contents in clause 6 and clause 10 are described using abstract syntax notation one (ASN.1) as specified in ITU-T Rec. X.680 [13] and X.681 [14]. Transfer syntax for RRC PDUs is derived from their ASN.1 definitions by use of Packed Encoding Rules, unaligned as specified in ITU-T Rec. X.691 [15].

The following encoding rules apply in addition to what has been specified in X.691:

- When a bit string value is placed in a bit-field as specified in 15.6 to 15.11 in X.691, the leading bit of the bit string value shall be placed in the leading bit of the bit-field, and the trailing bit of the bit string value shall be placed in the trailing bit of the bit-field.

NOTE: The terms 'leading bit' and 'trailing bit' are defined in ITU-T Rec. X.680. When using the 'bstring' notation, the leading bit of the bit string value is on the left, and the trailing bit of the bit string value is on the right.

- When decoding types constrained with the ASN.1 Contents Constraint ("CONTAINING"), automatic decoding of the contained type should not be performed because errors in the decoding of the contained type should not cause the decoding of the entire RRC message PDU to fail. It is recommended that the decoder first decodes the outer PDU type that contains the OCTET STRING or BIT STRING with the Contents Constraint, and then decodes the contained type that is nested within the OCTET STRING or BIT STRING as a separate step.
- When decoding a) RRC message PDUs, b) BIT STRING constrained with a Contents Constraint, or c) OCTET STRING constrained with a Contents Constraint, PER decoders are required to never report an error if there are extraneous zero or non-zero bits at the end of the encoded RRC message PDU, BIT STRING or OCTET STRING.

8.2 Structure of encoded RRC messages

An RRC PDU, which is the bit string that is exchanged between peer entities/ across the radio interface contains the basic production as defined in X.691.

RRC PDUs shall be mapped to and from PDCP SDUs (in case of DCCH) or RLC SDUs (in case of PCCH, BCCH, CCCH or MCCH) upon transmission and reception as follows:

- when delivering an RRC PDU as an PDCP SDU to the PDCP layer for transmission, the first bit of the RRC PDU shall be represented as the first bit in the PDCP SDU and onwards; and
- when delivering an RRC PDU as an RLC SDU to the RLC layer for transmission, the first bit of the RRC PDU shall be represented as the first bit in the RLC SDU and onwards; and
- upon reception of an PDCP SDU from the PDCP layer, the first bit of the PDCP SDU shall represent the first bit of the RRC PDU and onwards; and
- upon reception of an RLC SDU from the RLC layer, the first bit of the RLC SDU shall represent the first bit of the RRC PDU and onwards.

8.3 Basic production

The 'basic production' is obtained by applying UNALIGNED PER to the abstract syntax value (the ASN.1 description) as specified in X.691. It always contains a multiple of 8 bits.

8.4 Extension

The following rules apply with respect to the use of protocol extensions:

- A transmitter compliant with this version of the specification shall, unless explicitly indicated otherwise on a PDU type basis, set the extension part empty. Transmitters compliant with a later version may send non-empty extensions:
- A transmitter compliant with this version of the specification shall set spare bits to zero;

8.5 Padding

If the encoded RRC message does not fill a transport block, the RRC layer shall add padding bits. This applies to PCCH and BCCH.

Padding bits shall be set to 0 and the number of padding bits is a multiple of 8.

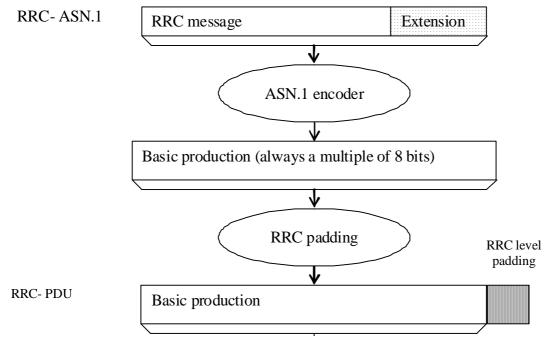


Figure 8.5-1: RRC level padding

9 Specified and default radio configurations

Specified and default configurations are configurations of which the details are specified in the standard. Specified configurations are fixed while default configurations can be modified using dedicated signalling.

9.1 Specified configurations

9.1.1 Logical channel configurations

9.1.1.1 BCCH configuration

Parameters

Name	Value	Semantics description	Ver
PDCP configuration	N/A		
RLC configuration	TM		
MAC configuration	TM		

NOTE: RRC will perform padding, if required due to the granularity of the TF signalling, as defined in 8.5.

9.1.1.2 CCCH configuration

Parameters

Name	Value	Semantics description	Ver
PDCP configuration	N/A		
RLC configuration	TM		
MAC configuration		Normal MAC headers are used	
Logical channel configuration			
priority	1	Highest priority	
prioritisedBitRate	infinity		
bucketSizeDuration	N/A		
logicalChannelGroup	0		

Name	Value	Semantics description	Ver
logicalChannelSR-Mask-r9	release		v920

9.1.1.3 PCCH configuration

Parameters

Name	Value	Semantics description	Ver
PDCP configuration	N/A		
RLC configuration	TM		
MAC configuration	TM		

NOTE: RRC will perform padding, if required due to the granularity of the TF signalling, as defined in 8.5.

9.1.1.4 MCCH and MTCH configuration

Parameters

Name	Value	Semantics description	Ver
PDCP configuration	N/A		
RLC configuration	UM		
Sn-FieldLength	size5		
t-Reordering	0		

9.1.2 SRB configurations

9.1.2.1 SRB1

Parameters

Name	Value	Semantics description	Ver
RLC configuration			
logicalChannelIdentity	1		

9.1.2.2 SRB2

Parameters

Name	Value	Semantics description	Ver
RLC configuration			
logicalChannelIdentity	2		

9.2 Default radio configurations

The following sections only list default values for REL-8 parameters included in protocol version v8.5.0. For all fields introduced in a later protocol version, the default value is "released" unless explicitly specified otherwise. If UE is to apply default configuration while it is configured with some critically extended fields, the UE shall apply the original version with only default values. For the following fields, introduced in a protocol version later than v8.5.0, the default corresponds with "value not applicable":

- codeBookSubsetRestriction-v920;
- pmi-RI-Report;

- NOTE 1: Value "N/A" indicates that the UE does not apply a specific value (i.e. upon switching to a default configuration, E-UTRAN can not assume the UE keeps the previously configured value). This implies that E-UTRAN needs to configure a value before invoking the related functionality.
- NOTE 2: In general, the signalling should preferably support a "release" option for fields introduced after v8.5.0. The "value not applicable" should be used restrictively, mainly limited to for fields which value is relevant only if another field is set to a value other than its default.

9.2.1 SRB configurations

9.2.1.1 SRB1

Parameters

Name	Value	Semantics description	Ver
RLC configuration CHOICE	am		
ul-RLC-Config			
>t-PollRetransmit	ms45		
>polIPDU	infinity		
>pollByte	infinity		
>maxRetxThreshold	t4		
dl-RLC-Config			
>t-Reordering	ms35		
>t-StatusProhibit	ms0		
Logical channel configuration			
priority	1	Highest priority	
prioritisedBitRate	infinity		
bucketSizeDuration	N/A		
IogicalChannelGroup	0		

9.2.1.2 SRB2

Parameters

Name	Value	Semantics description	Ver
RLC configuration CHOICE	am		
ul-RLC-Config			
>t-PollRetransmit	ms45		
>polIPDU	infinity		
>pollByte	infinity		
>maxRetxThreshold	t4		
dl-RLC-Config			
>t-Reordering	ms35		
>t-StatusProhibit	ms0		
Logical channel configuration			
priority	3		
prioritisedBitRate	infinity		
bucketSizeDuration	N/A		
logicalChannelGroup	0		

9.2.2 Default MAC main configuration

Parameters

Name	Value	Semantics description	Ver
MAC main configuration			
maxHARQ-tx	n5		
periodicBSR-Timer	infinity		
retxBSR-Timer	sf2560		
ttiBundling	FALSE		
drx-Config	release		

Name	Value	Semantics description	Ver
phr-Config	release		

9.2.3 Default semi-persistent scheduling configuration

SPS-Config		
>sps-ConfigDL	release	
>sps-ConfigUL	release	

9.2.4 Default physical channel configuration

Parameters

Name	Value	Semantics description	Ver
PDSCH-ConfigDedicated			
>p-a	dB0		
PUCCH-ConfigDedicated			
> tdd-AckNackFeedbackMode	bundling	Only valid for TDD mode	
>ackNackRepetition	release		
PUSCH-ConfigDedicated			
>betaOffset-ACK-Index	10		
>betaOffset-RI-Index	12		
>betaOffset-CQI-Index	15		
UplinkPowerControlDedicated			
>p0-UE-PUSCH	0		
>deltaMCS-Enabled	en0 (disabled)		
>accumulationEnabled	TRUE		
>p0-UE-PUCCH	0		
>pSRS-Offset	7		
> filterCoefficient	fc4		
tpc-pdcch-ConfigPUCCH	release		
tpc-pdcch-ConfigPUSCH	release		
CQI-ReportConfig			
> CQI-ReportPeriodic	release		
> cqi-ReportModeAperiodic	N/A		
> nomPDSCH-RS-EPRE-Offset	N/A		
SoundingRS-UL-ConfigDedicated	release		
AntennaInfoDedicated			
>transmissionMode	tm1, tm2	If the number of PBCH antenna ports is	
		one, tm1 is used as default; otherwise	
		tm2 is used as default	
>codebookSubsetRestriction	N/A		
>ue-TransmitAntennaSelection	release		
SchedulingRequestConfig	release		

9.2.5 Default values timers and constants

Parameters

Name	Value	Semantics description	Ver
t310	ms1000		
n310	n1		
t311	ms1000		
n311	n1		

10 Radio information related interactions between network nodes

10.1 General

This section specifies RRC messages that are transferred between network nodes. These RRC messages may be transferred to or from the UE via another Radio Access Technology. Consequently, these messages have similar characteristics as the RRC messages that are transferred across the E-UTRA radio interface, i.e. the same transfer syntax and protocol extension mechanisms apply.

10.2 Inter-node RRC messages

10.2.1 General

This section specifies RRC messages that are sent either across the X2- or the S1-interface, either to or from the eNB, i.e. a single 'logical channel' is used for all RRC messages transferred across network nodes. The information could originate from or be destined for another RAT.

EUTRA-InterNodeDefinitions

This ASN.1 segment is the start of the E-UTRA inter-node PDU definitions.

ASN1START
EUTRA-InterNodeDefinitions DEFINITIONS AUTOMATIC TAGS ::=
BEGIN
IMPORTS
AntennaInfoCommon,
ARFCN-ValueEUTRA,
ARFCN-ValueEUTRA-v9e0,
CellIdentity,
C-RNTI,
DL-DCCH-Message,
InDeviceCoexIndication-r11,
MasterInformationBlock,
maxFreq,
MBMSInterestIndication-r11,
MeasConfig,
OtherConfig-r9,
PhysCellId.

```
RadioResourceConfigDedicated,
RSRP-Range,
RSRQ-Range,
SCellToAddModList-r10,
SecurityAlgorithmConfig,
ShortMAC-I,
SystemInformationBlockType1,
SystemInformationBlockType1-v890-IEs,
SystemInformationBlockType2,
UEAssistanceInformation-r11,
UECapabilityInformation,
UE-CapabilityRAT-ContainerList
FROM EUTRA-RRC-Definitions;
```

10.2.2 Message definitions

HandoverCommand

This message is used to transfer the handover command generated by the target eNB.

Direction: target eNB to source eNB/ source RAN

HandoverCommand message

```
-- ASN1START

HandoverCommand ::= SEQUENCE {
    criticalExtensions CHOICE {
        c1 CHOICE {
            handoverCommand-r8 HandoverCommand-r8-IEs,
            spare7 NULL,
            spare6 NULL, spare5 NULL, spare4 NULL,
            spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture SEQUENCE {}
}
```

```
HandoverCommand-r8-IEs ::= SEQUENCE {
   handoverCommandMessage OCTET STRING (CONTAINING DL-DCCH-Message),
   nonCriticalExtension SEQUENCE {} OPTIONAL
}
-- ASN1STOP
```

HandoverCommand field descriptions

handoverCommandMessage

Contains the entire DL-DCCH-Message including the *RRCConnectionReconfiguration* message used to perform handover within E-UTRAN or handover to E-UTRAN, generated (entirely) by the target eNB.

NOTE: The source BSC, in case of inter-RAT handover from GERAN to E-UTRAN, expects that the HandoverCommand message includes DL-DCCH-Message only. Thus, criticalExtensionsFuture, spare1-spare7 and nonCriticalExtension should not be used regardless whether the source RAT is E-UTRAN, UTRAN or GERAN.

HandoverPreparationInformation

This message is used to transfer the E-UTRA RRC information used by the target eNB during handover preparation, including UE capability information.

Direction: source eNB/ source RAN to target eNB

HandoverPreparationInformation message

```
ue-RadioAccessCapabilityInfo
                                 UE-CapabilityRAT-ContainerList,
  as-Config
                              AS-Config
                                                       OPTIONAL,
                                                                       -- Cond HO
   rrm-Config
                                  RRM-Config
                                                          OPTIONAL,
   as-Context
                                  AS-Context
                                                       OPTIONAL,
                                                                      -- Cond HO
  non Critical Extension \\
                              HandoverPreparationInformation-v920-IEs
                                                                          OPTIONAL
HandoverPreparationInformation-v920-IEs ::= SEQUENCE {
   ue-ConfigRelease-r9
                                  ENUMERATED {
                              rel9, rel10, rel11, spare5, spare4, spare3,
                               spare2, spare1, ...}
                                                       OPTIONAL, -- Cond HO2
  nonCriticalExtension
                              HandoverPreparationInformation-v9d0-IEs
                                                                          OPTIONAL
}
HandoverPreparationInformation-v9d0-IEs ::= SEQUENCE {
   lateNonCriticalExtension
                                 OCTET STRING
                                                                          OPTIONAL,
   nonCriticalExtension
                              HandoverPreparationInformation-v9e0-IEs
                                                                             OPTIONAL
HandoverPreparationInformation-v9e0-IEs ::= SEQUENCE {
   as-Config-v9e0
                                 AS-Config-v9e0
                                                             OPTIONAL, -- Cond HO2
   non Critical Extension \\
                              HandoverPreparationInformation-v1130-IEs
                                                                          OPTIONAL
HandoverPreparationInformation-v1130-IEs ::= SEQUENCE {
   as-Context-v1130
                                                             OPTIONAL, -- Cond HO2
                                  AS-Context-v1130
  nonCriticalExtension
                              SEQUENCE {}
                                                             OPTIONAL
-- ASN1STOP
```

HandoverPreparationInformation field descriptions

as-Config

The radio resource configuration. Applicable in case of intra-E-UTRA handover. If the target receives an incomplete *MeasConfig* and *RadioResourceConfigDedicated* in the *as-Config*, the target eNB may decide to apply the full configuration option based on the *ue-ConfigRelease*.

as-Context

Local E-UTRAN context required by the target eNB.

rrm-Config

Local E-UTRAN context used depending on the target node"s implementation, which is mainly used for the RRM purpose.

ue-ConfigRelease

Indicates the RRC protocol release applicable for the current UE configuration. This could be used by target eNB to decide if the full configuration approach should be used. If this field is not present, the target assumes that the current UE configuration is based on the release 8 version of RRC protocol. NOTE 1.

ue-RadioAccessCapabilityInfo

NOTE 2

NOTE 1: The source typically sets the *ue-ConfigRelease* to the release corresponding with the current dedicated radio configuration. The source may however also consider the common radio resource configuration e.g. in case interoperability problems would appear if the UE temporary continues extensions of this part of the configuration in a target PCell not supporting them.

NOTE 2: The following table indicates per source RAT whether RAT capabilities are included or not.

Source RAT	E-UTRA capabilites	UTRA capabilities	GERAN capabilities
UTRAN	Included	May be included, ignored by	May be included
		eNB if received	
GERAN CS	Excluded	May be included, ignored by	Included
		eNB if received	
GERAN PS	Excluded	May be included, ignored by	Included
		eNB if received	
E-UTRAN	Included	May be included	May be included

Conditional presence	Explanation
НО	The field is mandatory present in case of handover within E-UTRA; otherwise the field is
	not present.
HO2	The field is optional present in case of handover within E-UTRA; otherwise the field is not
	present.

UERadioAccessCapabilityInformation

This message is used to transfer UE radio access capability information, covering both upload to and download from the EPC.

Direction: eNB to/ from EPC

UERadioAccessCapabilityInformation message

```
-- ASN1START
UERadioAccessCapabilityInformation ::= SEQUENCE {
   criticalExtensions
                                  CHOICE {
                                  CHOICE{
      c1
         ueRadioAccessCapabilityInformation-r8
                                     UERadioAccessCapabilityInformation-r8-IEs,
         spare7 NULL,
         spare6 NULL, spare5 NULL, spare4 NULL,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                 SEQUENCE {}
UERadioAccessCapabilityInformation-r8-IEs ::= SEQUENCE {
   ue-RadioAccessCapabilityInfo
                                 OCTET STRING (CONTAINING UECapabilityInformation),
   nonCriticalExtension
                               SEQUENCE {}
                                                                OPTIONAL
-- ASN1STOP
```

UERadioAccessCapabilityInformation field descriptions

ue-RadioAccessCapabilityInfo

Including E-UTRA, GERAN, and CDMA2000-1xRTT Bandclass radio access capabilities (separated). UTRA radio access capabilities are not included.

10.3 Inter-node RRC information element definitions

AS-Config

The AS-Config IE contains information about RRC configuration information in the source eNB which can be utilized by target eNB to determine the need to change the RRC configuration during the handover preparation phase. The

information can also be used after the handover is successfully performed or during the RRC connection reestablishment.

AS-Config information element

```
-- ASN1START
AS-Config ::=
                        SEQUENCE {
   sourceMeasConfig
                                  MeasConfig,
   sourceRadioResourceConfig
                                     RadioResourceConfigDedicated,
   sourceSecurityAlgorithmConfig
                                     SecurityAlgorithmConfig,
   sourceUE-Identity
                                  C-RNTI,
   sourceMasterInformationBlock
                                  MasterInformationBlock.
   sourceSystemInformationBlockType1 SystemInformationBlockType1(WITH COMPONENTS
                                  {..., nonCriticalExtension ABSENT}),
   sourceSystemInformationBlockType2 SystemInformationBlockType2,
   antennaInfoCommon
                                  AntennaInfoCommon,
   sourceDl-CarrierFreq
                                  ARFCN-ValueEUTRA,
   [[ sourceSystemInformationBlockType1Ext OCTET STRING (CONTAINING
                                     SystemInformationBlockType1-v890-IEs)OPTIONAL,
      sourceOtherConfig-r9
                                     OtherConfig-r9
   -- sourceOtherConfig-r9 should have been optional. A target eNB compliant with this transfer
  -- syntax should support receiving an AS-Config not including this extension addition group
   -- e.g. from a legacy source eNB
  ]],
   [[ sourceSCellConfigList-r10
                                     SCellToAddModList-r10
                                                                    OPTIONAL
   ]]
AS-Config-v9e0 ::=
                            SEQUENCE {
   sourceDl-CarrierFreq-v9e0
                               ARFCN-ValueEUTRA-v9e0
-- ASN1STOP
```

NOTE: The AS-Config re-uses information elements primarily created to cover the radio interface signalling requirements. Consequently, the information elements may include some parameters that are not relevant for the target eNB e.g. the SFN as included in the MasterInformationBlock.

AS-Config field descriptions

antennalnfoCommon

This field provides information about the number of antenna ports in the source PCell.

sourceDL-CarrierFreq

Provides the parameter Downlink EARFCN in the source PCell, see TS 36.101 [42]. If the source eNB provides AS-Config-v9e0, it sets sourceDI-CarrierFreq (i.e. without suffix) to maxEARFCN.

sourceOtherConfig

Provides other configuration in the source PCell.

sourceMasterInformationBlock

MasterInformationBlock transmitted in the source PCell.

sourceMeasConfig

Measurement configuration in the source cell. The measurement configuration for all measurements existing in the source eNB when handover is triggered shall be included. See 10.5.

sourceRadioResourceConfig

Radio configuration in the source PCell. The radio resource configuration for all radio bearers existing in the source PCell when handover is triggered shall be included. See 10.5.

sourceSCellConfigList

Radio resource configuration (common and dedicated) of the SCells configured in the source eNB.

sourceSecurityAlgorithmConfig

This field provides the AS integrity protection (SRBs) and AS ciphering (SRBs and DRBs) algorithm configuration used in the source PCell.

sourceSystemInformationBlockType1

SystemInformationBlockType1 transmitted in the source PCell.

sourceSystemInformationBlockType2

SystemInformationBlockType2 transmitted in the source PCell.

AS-Context

The IE AS-Context is used to transfer local E-UTRAN context required by the target eNB.

AS-Context information element

```
-- ASN1START
AS-Context ::=
                                SEQUENCE {
  reestablishmentInfo
                                   ReestablishmentInfo
                                                           OPTIONAL -- Cond HO
}
AS-Context-v1130 ::=
                                SEQUENCE {
  idc-Indication-r11
                                   OCTET STRING (CONTAINING
                                InDeviceCoexIndication-r11) OPTIONAL, -- Cond HO2
  mbmsInterestIndication-r11
                                   OCTET STRING (CONTAINING
                                MBMSInterestIndication-r11) OPTIONAL, -- Cond HO2
  powerPrefIndication-r11
                                   OCTET STRING (CONTAINING
                                UEAssistanceInformation-r11) OPTIONAL, -- Cond HO2
```

-- ASN1STOP

AS-Context field descriptions	
idc-Indication	
Including information used for handling the IDC problems.	
reestablishmentInfo	
Including information needed for the RRC connection re-establishment.	

Conditional presence	Explanation
НО	The field is mandatory present in case of handover within E-UTRA; otherwise the field is
	not present.
HO2	The field is optional present in case of handover within E-UTRA; otherwise the field is not
	present.

ReestablishmentInfo

The ReestablishmentInfo IE contains information needed for the RRC connection re-establishment.

ReestablishmentInfo information element

```
-- ASN1START
ReestablishmentInfo ::=
                                SEQUENCE {
   sourcePhysCellId
                                PhysCellId,
   target Cell Short MAC\text{-}I
                                   ShortMAC-I,
   additional Reestab In fo List\\
                                   Additional Reestab Info List\\
                                                                       OPTIONAL,
AdditionalReestabInfoList ::=
                                SEQUENCE (SIZE (1..maxReestabInfo)) OF AdditionalReestabInfo
AdditionalReestabInfo ::= SEQUENCE{
   cellIdentity
                                CellIdentity,
   key-eNodeB-Star
                                Key-eNodeB-Star,
   shortMAC-I
                                   ShortMAC-I
                                   BIT STRING (SIZE (256))
Key-eNodeB-Star ::=
-- ASN1STOP
```

ReestablishmentInfo field descriptions

additionalReestabInfoList

Contains a list of shortMAC-I and KeNB* for cells under control of the target eNB, required for potential reestablishment by the UE in these cells to succeed.

Key-eNodeB-Star

Parameter KeNB*: See TS 33.401 [32, 7.2.8.4]. If the cell identified by *cellIdentity* belongs to multiple frequency bands, the source eNB selects the DL-EARFCN for the KeNB* calculation using the same logic as UE uses when selecting the DL-EARFCN in IDLE as defined in section 6.2.2. This parameter is only used for X2 handover, and for S1 handover, it shall be ignored by target eNB.

sourcePhyCellId

The physical cell identity of the source PCell, used to determine the UE context in the target eNB at re-establishment.

targetCellShortMAC-I

The ShortMAC-I for the handover target PCell, in order for potential re-establishment to succeed.

RRM-Config

The *RRM-Config* IE contains information about UE specific RRM information before the handover which can be utilized by target eNB.

RRM-Config information element

```
-- ASN1START
RRM-Config ::=
                          SEQUENCE {
   ue-InactiveTime
                             ENUMERATED {
                             s1, s2, s3, s5, s7, s10, s15, s20,
                             s25, s30, s40, s50, min1, min1s20c, min1s40,
                             min2, min2s30, min3, min3s30, min4, min5, min6,
                             min7, min8, min9, min10, min12, min14, min17, min20,
                             min24, min28, min33, min38, min44, min50, hr1,
                             hr1min30, hr2, hr2min30, hr3, hr3min30, hr4, hr5, hr6,
                             hr8, hr10, hr13, hr16, hr20, day1, day1hr12, day2,
                             day2hr12, day3, day4, day5, day7, day10, day14, day19,
                             day24, day30, dayMoreThan30}
                                                                 OPTIONAL,
   [[ candidateCellInfoList-r10 CandidateCellInfoList-r10
                                                              OPTIONAL
   ]]
CandidateCellInfoList-r10 ::= SEQUENCE (SIZE (1..maxFreq)) OF CandidateCellInfo-r10
CandidateCellInfo-r10 ::=
                             SEQUENCE {
   -- cellIdentification
   physCellId-r10
                                 PhysCellId,
```

```
dl-CarrierFreq-r10 ARFCN-ValueEUTRA,
-- available measurement results
rsrpResult-r10 RSRP-Range OPTIONAL,
rsrqResult-r10 RSRQ-Range OPTIONAL,
...,
[[ dl-CarrierFreq-v1090 ARFCN-ValueEUTRA-v9e0 OPTIONAL ]]
}
```

RRM-Config field descriptions

candidateCellInfoList

A list of the best cells on each frequency for which measurement information was available, in order of decreasing RSRP.

dl-CarrierFreq

The source includes dl-CarrierFreq-v1090 if and only if dl-CarrierFreq-r10 is set to maxEARFCN.

ue-InactiveTime

Duration while UE has not received or transmitted any user data. Thus the timer is still running in case e.g., UE measures the neighbour cells for the HO purpose. Value s1 corresponds to 1 second, s2 corresponds to 2 seconds and so on. Value min1 corresponds to 1 minute, value min1s20 corresponds to 1 minute and 20 seconds, value min1s40 corresponds to 1 minute and 40 seconds and so on. Value hr1 corresponds to 1 hour, hr1min30 corresponds to 1 hour and 30 minutes and so on.

10.4 Inter-node RRC multiplicity and type constraint values

Multiplicity and type constraints definitions

```
-- ASN1START

maxReestabInfo INTEGER ::= 32 -- Maximum number of KeNB* and shortMAC-I forwarded

-- at handover for re-establishment preparation

-- ASN1STOP
```

End of EUTRA-InterNodeDefinitions

```
-- ASN1START

END

-- ASN1STOP
```

10.5 Mandatory information in AS-Config

The AS-Config transferred between source eNB and target-eNB shall include all IEs necessary to describe the AS context. The conditional presence in section 6 is only applicable for eNB to UE communication.

The "need" or "cond" statements are not applied in case of sending the IEs from source eNB to target eNB. Some information elements shall be included regardless of the "need" or "cond" e.g. *discardTimer*. The *AS-Config* re-uses information elements primarily created to cover the radio interface signalling requirements. The information elements may include some parameters that are not relevant for the target eNB e.g. the SFN as included in the *MasterInformationBlock*.

All the fields in the AS-Config as defined in 10.3 that are introduced after v9.2.0 and that are optional for eNB to UE communication shall be included, if the functionality is configured. The fields in the AS-Config that are defined before and including v9.2.0 shall be included as specified in the following.

Within the *sourceRadioResourceConfig, sourceMeasConfig* and *sourceOtherConfig*, the source eNB shall include fields that are optional for eNB to UE communication, if the functionality is configured unless explicitly specified otherwise in the following:

- in accordance with a condition that is explicitly stated to be applicable; or
- a default value is defined for the concerned field; and the configured value is the same as the default value that is defined; or
- the need of the field is OP and the current UE configuration corresponds with the behaviour defined for absence of the field;

The following fields, if the functionality is configured, are not mandatory for the source eNB to include in the *AS-Config* since delta signalling by the target eNB for these fields is not supported:

- semiPersistSchedC-RNTI
- measGapConfig

For the measurement configuration, a corresponding operation as 5.5.6.1 and 5.5.2.2a is executed by target eNB.

11 UE capability related constraints and performance requirements

11.1 UE capability related constraints

The following table lists constraints regarding the UE capabilities that E-UTRAN is assumed to take into account.

Parameter	Parameter Description			
#DRBs	The number of DRBs that a UE shall support	8		
#RLC-AM	The number of RLC AM entities that a UE shall support	10		
#minCellperMeasObject	The minimum number of neighbour cells (excluding black list	32		
EUTRA	cells) that a UE shall be able to store within a			
	MeasObjectEUTRA. NOTE.			
#minBlackCellRangesp	The minimum number of blacklist cell PCI ranges that a UE	32		
erMeasObjectEUTRA	shall be able to store within a MeasObjectEUTRA			
#minCellperMeasObject	The minimum number of neighbour cells that a UE shall be able	32		
UTRA	to store within a MeasObjectUTRA. NOTE.			
#minCellperMeasObject	The minimum number of neighbour cells that a UE shall be able	32		
GERAN	to store within a measObjectGERAN. NOTE.			
#minCellperMeasObject	The minimum number of neighbour cells that a UE shall be able	32		
CDMA2000	to store within a measObjectCDMA2000. NOTE.			
#minCellTotal	The minimum number of neighbour cells (excluding black list	256		
	cells) that UE shall be able to store in total in all measurement			
	objects configured			
NOTE: In case of CGI reporting, the limit regarding the cells E-UTRAN can configure includes the cell for				
	s requested to report CGI i.e. the amount of neighbour cells that ca			
	most (# minCellperMeasObjectRAT - 1), where RAT represents EUTRA/UTRA/GERAN/CDMA2000			
respectively.				

11.2 Processing delay requirements for RRC procedures

The UE performance requirements for RRC procedures are specified in the following table, by means of a value N:

N = the number of 1ms subframes from the end of reception of the E-UTRAN -> UE message on the UE physical layer up to when the UE shall be ready for the reception of uplink grant for the UE -> E-UTRAN response message with no access delay other than the TTI-alignment (e.g. excluding delays caused by scheduling, the random access procedure or physical layer synchronisation).

NOTE: No processing delay requirements are specified for RN-specific procedures.

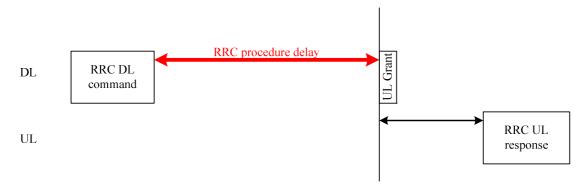


Figure 11.2-1: Illustration of RRC procedure delay

Procedure title:	E-UTRAN -> UE	UE -> E-UTRAN	N	Notes

Procedure title:	E-UTRAN -> UE	UE -> E-UTRAN	N	Notes
RRC Connection Contr	ol Procedures			
RRC connection establishment	RRCConnectionSetu p	RRCConnectionSetupCo mplete	15	
RRC connection release	RRCConnectionRele ase		NA	
RRC connection re- configuration (radio resource configuration)	RRCConnectionReco nfiguration	RRCConnectionReconfigu rationComplete	15	
RRC connection re- configuration (measurement configuration)	RRCConnectionReco nfiguration	RRCConnectionReconfigu rationComplete	15	
RRC connection re- configuration (intra- LTE mobility)	RRCConnectionReco nfiguration	RRCConnectionReconfigu rationComplete	15	
RRC connection reconfiguration (SCell addition/release)	RRCConnectionReco nfiguration	RRCConnectionReconfigu rationComplete	20	
RRC connection re- establishment	RRCConnectionRees tablishment	RRCConnectionReestabli shmentComplete	15	
Initial security activation	SecurityModeComma nd	SecurityModeCommandC omplete/SecurityModeCo mmandFailure	10	
Initial security activation + RRC connection re- configuration (RB establishment)	SecurityModeComma nd, RRCConnectionReco nfiguration	RRCConnectionReconfigu rationComplete	20	The two DL messages are transmitted in the same TTI
Paging	Paging		NA	
Inter RAT mobility				
Handover to E-UTRA	RRCConnectionReco nfiguration (sent by other RAT)	RRCConnectionReconfigu rationComplete	NA	The performance of this procedure is specified in [50] in case of handover from GSM and [29], [30] in case of handover from UTRA.
Handover from E- UTRA	MobilityFromEUTRA Command		NA	The performance of this procedure is specified in [16]
Handover from E- UTRA to CDMA2000	HandoverFromEUTR APreparationRequest (CDMA2000)		NA	Used to trigger the handover preparation procedure with a CDMA2000 RAT. The performance of this procedure is specified in [16]
Measurement procedure Measurement	res	MeasurementReport	NA	<u> </u>
Reporting		ocociomona toport	. */ \	
Other procedures	Lu=0	I	T	
UE capability transfer	UECapabilityEnquiry	UECapabilityInformation	10	_
Counter check	CounterCheck	CounterCheckResponse	10	
Proximity indication UE information	UEInformationReque	ProximityIndication UEInformationResponse	NA 15	_
MBMS counting	st MBMSCountingRequ est	MBMSCountingResponse	NA	
MBMS interest indication		MBMSInterestIndication	NA	

Procedure title:	E-UTRAN -> UE	UE -> E-UTRAN	N	Notes
In-device coexistence indication		InDeviceCoexIndication	NA	
UE assistance information		UEAssistanceInformation	NA	

11.3 Void

Annex A (informative): Guidelines, mainly on use of ASN.1

Editor's note No agreements have been reached concerning the extension of RRC PDUs so far. Any statements in this section about the protocol extension mechanism should be considered as FFS.

A.1 Introduction

The following clauses contain guidelines for the specification of RRC protocol data units (PDUs) with ASN.1.

A.2 Procedural specification

A.2.1 General principles

The procedural specification provides an overall high level description regarding the UE behaviour in a particular scenario.

It should be noted that most of the UE behaviour associated with the reception of a particular field is covered by the applicable parts of the PDU specification. The procedural specification may also include specific details of the UE behaviour upon reception of a field, but typically this should be done only for cases that are not easy to capture in the PDU section e.g. general actions, more complicated actions depending on the value of multiple fields.

Likewise, the procedural specification need not specify the UE requirements regarding the setting of fields within the messages that are send to E-UTRAN i.e. this may also be covered by the PDU specification.

A.2.2 More detailed aspects

The following more detailed conventions should be used:

- Bullets:
 - Capitals should be used in the same manner as in other parts of the procedural text i.e. in most cases no capital applies since the bullets are part of the sentence starting with 'The UE shall:'
 - All bullets, including the last one in a sub-clause, should end with a semi-colon i.e. an ';'
- Conditions
 - Whenever multiple conditions apply, a semi-colon should be used at the end of each conditions with the exception of the last one, i.e. as in 'if cond1; or cond2:

A.3 PDU specification

A.3.1 General principles

A.3.1.1 ASN.1 sections

The RRC PDU contents are formally and completely described using abstract syntax notation (ASN.1), see X.680 [13], X.681 (02/2002) [14].

The complete ASN.1 code is divided into a number of ASN.1 sections in the specifications. In order to facilitate the extraction of the complete ASN.1 code from the specification, each ASN.1 section begins with a text paragraph consisting entirely of an *ASN.1 start tag*, which consists of a double hyphen followed by a single space and the text string "ASN1START" (in all upper case letters). Each ASN.1 section ends with a text paragraph consisting entirely of an *ASN.1 stop tag*, which consists of a double hyphen followed by a single space and the text "ASN1STOP" (in all upper case letters):

-- ASN1START

-- ASN1STOP

The text paragraphs containing the ASN.1 start and stop tags should not contain any ASN.1 code significant for the complete description of the RRC PDU contents. The complete ASN.1 code may be extracted by copying all the text paragraphs between an ASN.1 start tag and the following ASN.1 stop tag in the order they appear, throughout the specification.

NOTE: A typical procedure for extraction of the complete ASN.1 code consists of a first step where the entire RRC PDU contents description (ultimately the entire specification) is saved into a plain text (ASCII) file format, followed by a second step where the actual extraction takes place, based on the occurrence of the ASN.1 start and stop tags.

A.3.1.2 ASN.1 identifier naming conventions

The naming of identifiers (i.e., the ASN.1 field and type identifiers) should be based on the following guidelines:

- Message (PDU) identifiers should be ordinary mixed case without hyphenation. These identifiers, *e.g.*, the *RRCConnectionModificationCommand*, should be used for reference in the procedure text. Abbreviated forms of these identifiers should not be used.
- Type identifiers other than PDU identifiers should be ordinary mixed case, with hyphenation used to set off acronyms only where an adjacent letter is a capital, *e.g.*, *EstablishmentCause*, *SelectedPLMN* (not *Selected-PLMN*, since the "d" in "Selected" is lowercase), *InitialUE-Identity* and *MeasSFN-SFN-TimeDifference*.
- Field identifiers shall start with a lowercase letter and use mixed case thereafter, *e.g.*, *establishmentCause*. If a field identifier begins with an acronym (which would normally be in upper case), the entire acronym is lowercase (*plmn-Identity*, not *pLMN-Identity*). The acronym is set off with a hyphen (*ue-Identity*, not *ueIdentity*), in order to facilitate a consistent search pattern with corresponding type identifiers.
- Identifiers that are likely to be keywords of some language, especially widely used languages, such as C++ or Java, should be avoided to the extent possible.
- Identifiers, other than PDU identifiers, longer than 25 characters should be avoided where possible. It is recommended to use abbreviations, which should be done in a consistent manner i.e. use 'Meas' instead of 'Measurement' for all occurrences. Examples of typical abbreviations are given in table A.3.1.2.1-1 below.
- For future extension: When an extension is introduced a suffix is added to the identifier of the concerned ASN.1 field and/ or type. A suffix of the form "-rX" is used, with X indicating the release, for ASN.1 fields or types introduced in a later release (i.e. a release later than the original/ first release of the protocol) as well as for ASN.1 fields or types for which a revision is introduced in a later release replacing a previous version, e.g., Foor9 for the Rel-9 version of the ASN.1 type Foo. A suffix of the form "-vXYZ" is used for ASN.1 fields or types that only are an extension of a corresponding earlier field or type (see sub-clause A.4), e.g., AnElement-v10b0 for the extension of the ASN.1 type AnElement introduced in version 10.11.0 of the specification. A number 0...9, 10, 11, etc. is used to represent the first part of the version number, indicating the release of the protocol. Lower case letters a, b, c, etc. are used to represent the second (and third) part of the version number if they are greater than 9. In the procedural specification, in field descriptions as well as in headings suffices are not used, unless there is a clear need to distinguish the extension from the original field.
- More generally, in case there is a need to distinguish different variants of an ASN.1 field or IE, a suffix should be added at the end of the identifiers e.g. *MeasObjectUTRA*, *ConfigCommon*. When there is no particular need to distinguish the fields (e.g. because the field is included in different IEs), a common field identifier name may be used. This may be attractive e.g. in case the procedural specification is the same for the different variants.

Abbreviation Abbreviated word Conf Confirmation Config Configuration DL Downlink Extension Ext Freq Frequency ld Identity Ind Indication Info Information Meas Measurement Neigh Neighbour(ing) Param(s) Parameter(s) Persist Persistent Phys Physical Proc **Process** Reestab Reestablishment Request Req Scheduling Sched Thresh Threshold Transm Transmission UL Uplink

Table A.3.1.2-1: Examples of typical abbreviations used in ASN.1 identifiers

NOTE: The table A.3.1.2.1-1 is not exhaustive. Additional abbreviations may be used in ASN.1 identifiers when needed.

A.3.1.3 Text references using ASN.1 identifiers

A text reference into the RRC PDU contents description from other parts of the specification is made using the ASN.1 field or type identifier of the referenced element. The ASN.1 field and type identifiers used in text references should be in the *italic font style*. The "do not check spelling and grammar" attribute in Word should be set. Quotation marks (i.e., " ") should not be used around the ASN.1 field or type identifier.

A reference to an RRC PDU type should be made using the corresponding ASN.1 type identifier followed by the word "message", e.g., a reference to the *RRCConnectionRelease* message.

A reference to a specific part of an RRC PDU, or to a specific part of any other ASN.1 type, should be made using the corresponding ASN.1 field identifier followed by the word "field", e.g., a reference to the *prioritisedBitRate* field in the example below.

```
--- /example/ ASN1START

LogicalChannelConfig ::= SEQUENCE {
    ul-SpecificParameters SEQUENCE {
        priority Priority,
        prioritisedBitRate PrioritisedBitRate,
        bucketSizeDuration BucketSizeDuration,
        logicalChannelGroup INTEGER (0..3)
    } OPTIONAL
}
```

NOTE: All the ASN.1 start tags in the ASN.1 sections, used as examples in this annex to the specification, are deliberately distorted, in order not to include them when the ASN.1 description of the RRC PDU contents is extracted from the specification.

A reference to a specific type of information element should be made using the corresponding ASN.1 type identifier preceded by the acronym "IE", e.g., a reference to the IE *LogicalChannelConfig* in the example above.

References to a specific type of information element should only be used when those are generic, i.e., without regard to the particular context wherein the specific type of information element is used. If the reference is related to a particular context, e.g., an RRC PDU type (message) wherein the information element is used, the corresponding field identifier in that context should be used in the text reference.

A reference to a specific value of an ASN.1 field should be made using the corresponding ASN.1 value without using quotation marks around the ASN.1 value, e.g., 'if the *status* field is set to value *true*'.

A.3.2 High-level message structure

Within each logical channel type, the associated RRC PDU (message) types are alternatives within a CHOICE, as shown in the example below.

```
-- /example/ ASN1START
DL-DCCH-Message ::= SEQUENCE {
                       DL-DCCH-MessageType
   message
DL-DCCH-MessageType ::= CHOICE {
                     CHOICE {
      dlInformationTransfer
                                       DLInformationTransfer,
      handoverFromEUTRAPreparationRequest
                                                HandoverFromEUTRAPreparationRequest,
      mobilityFromEUTRACommand
                                             MobilityFromEUTRACommand,
                                       RRCConnectionReconfiguration,
      rrcConnectionReconfiguration
      rrcConnectionRelease
                                       RRCConnectionRelease,
      securityModeCommand
                                          SecurityModeCommand,
      ueCapabilityEnquiry
                                       UECapabilityEnquiry,
      spare1 NULL
   },
   messageClassExtension SEQUENCE {}
-- ASN1STOP
```

A nested two-level CHOICE structure is used, where the alternative PDU types are alternatives within the inner level *c1* CHOICE.

Spare alternatives (i.e., *spare1* in this case) may be included within the *c1* CHOICE to facilitate future extension. The number of such spare alternatives should not extend the total number of alternatives beyond an integer-power-of-two number of alternatives (i.e., eight in this case).

Further extension of the number of alternative PDU types is facilitated using the *messageClassExtension* alternative in the outer level CHOICE.

A.3.3 Message definition

Each PDU (message) type is specified in an ASN.1 section similar to the one shown in the example below.

```
-- /example/ ASN1START
RRCConnectionReconfiguration ::= SEQUENCE {
   rrc-TransactionIdentifier
                               RRC-TransactionIdentifier,
   criticalExtensions
                                   CHOICE {
                                   CHOICE{
      c1
         rrcConnectionReconfiguration-r8
                                            RRCConnectionReconfiguration-r8-IEs,
         spare3 NULL, spare2 NULL, spare1 NULL
      },
      criticalExtensionsFuture
                                   SEQUENCE {}
   }
RRCConnectionReconfiguration-r8-IEs ::= SEQUENCE {
   -- Enter the IEs here.
-- ASN1STOP
```

Hooks for *critical* and *non-critical* extension should normally be included in the PDU type specification. How these hooks are used is further described in sub-clause A.4.

Critical extensions are characterised by a redefinition of the PDU contents and need to be governed by a mechanism for protocol version agreement between the encoder and the decoder of the PDU, such that the encoder is prevented from sending a critically extended version of the PDU type, which is not comprehended by the decoder.

Critical extension of a PDU type is facilitated by a two-level CHOICE structure, where the alternative PDU contents are alternatives within the inner level *c1* CHOICE. Spare alternatives (i.e., *spare3* down to *spare1* in this case) may be included within the *c1* CHOICE. The number of spare alternatives to be included in the original PDU specification should be decided case by case, based on the expected rate of critical extension in the future releases of the protocol.

Further critical extension, when the spare alternatives from the original specifications are used up, is facilitated using the *criticalExtensionsFuture* in the outer level CHOICE.

In PDU types where critical extension is not expected in the future releases of the protocol, the inner level *c1* CHOICE and the spare alternatives may be excluded, as shown in the example below.

Non-critical extensions are characterised by the addition of new information to the original specification of the PDU type. If not comprehended, a non-critical extension may be skipped by the decoder, whilst the decoder is still able to complete the decoding of the comprehended parts of the PDU contents.

Non-critical extensions at locations other than the end of the message or other than at the end of a field contained in a BIT or OCTET STRING are facilitated by use of the ASN.1 extension marker "...". The original specification of a PDU type should normally include the extension marker at the end of the sequence of information elements contained.

Non-critical extensions at the end of the message or at the end of a field that is contained in a BIT or OCTET STRING are facilitated by use of an empty sequence that is marked OPTIONAL e.g. as shown in the following example:

```
--- /example/ ASN1START

RRCMessage-r8-IEs ::= SEQUENCE {
field1 InformationElement1,
field2 InformationElement2,
nonCriticalExtension SEQUENCE {} OPTIONAL
}

--- ASN1STOP
```

The ASN.1 section specifying the contents of a PDU type may be followed by a *field description* table where a further description of, e.g., the semantic properties of the fields may be included. The general format of this table is shown in the example below. The field description table is absent in case there are no fields for which further description needs to be provided e.g. because the PDU does not include any fields, or because an IE is defined for each field while there is nothing specific regarding the use of this IE that needs to be specified.

	%PDU-Typeldentifier% field descriptions	
%field identifier%		
Field description.		
%field identifier%		
Field description.		

The field description table has one column. The header row shall contain the ASN.1 type identifier of the PDU type.

The following rows are used to provide field descriptions. Each row shall include a first paragraph with a *field identifier* (in *bold and italic* font style) referring to the part of the PDU to which it applies. The following paragraphs at the same row may include (in regular font style), e.g., semantic description, references to other specifications and/ or specification of value units, which are relevant for the particular part of the PDU.

The parts of the PDU contents that do not require a field description shall be omitted from the field description table.

A.3.4 Information elements

Each IE (information element) type is specified in an ASN.1 section similar to the one shown in the example below.

```
-- /example/ ASN1START
PRACH-ConfigSIB ::=
                                SEQUENCE {
  rootSequenceIndex
                                INTEGER (0..1023),
  prach-ConfigInfo
                             PRACH-ConfigInfo
PRACH-Config ::=
                             SEQUENCE {
  rootSequenceIndex
                                INTEGER (0..1023),
  prach-ConfigInfo
                             PRACH-ConfigInfo
                                                           OPTIONAL -- Need ON
PRACH-ConfigInfo ::=
                             SEQUENCE {
  prach-ConfigIndex
                                ENUMERATED {ffs},
  highSpeedFlag
                                ENUMERATED {ffs},
  zeroCorrelationZoneConfig
                                ENUMERATED (ffs)
-- ASN1STOP
```

IEs should be introduced whenever there are multiple fields for which the same set of values apply. IEs may also be defined for other reasons e.g. to break down a ASN.1 definition in to smaller pieces.

A group of closely related IE type definitions, like the IEs *PRACH-ConfigSIB* and *PRACH-Config* in this example, are preferably placed together in a common ASN.1 section. The IE type identifiers should in this case have a common base, defined as the *generic type identifier*. It may be complemented by a suffix to distinguish the different variants. The "*PRACH-Config*" is the generic type identifier in this example, and the "*SIB*" suffix is added to distinguish the variant. The sub-clause heading and generic references to a group of closely related IEs defined in this way should use the generic type identifier.

The same principle should apply if a new version, or an extension version, of an existing IE is created for *critical* or *non-critical* extension of the protocol (see sub-clause A.4). The new version, or the extension version, of the IE is included in the same ASN.1 section defining the original. A suffix is added to the type identifier, using the naming conventions defined in sub-clause A.3.1.2, indicating the release or version of the where the new version, or extension version, was introduced.

Local IE type definitions, like the IE *PRACH-ConfigInfo* in the example above, may be included in the ASN.1 section and be referenced in the other IE types defined in the same ASN.1 section. The use of locally defined IE types should be encouraged, as a tool to break up large and complex IE type definitions. It can improve the readability of the code. There may also be a benefit for the software implementation of the protocol end-points, as these IE types are typically provided by the ASN.1 compiler as independent data elements, to be used in the software implementation.

An IE type defined in a local context, like the IE *PRACH-ConfigInfo*, should not be referenced directly from other ASN.1 sections in the RRC specification. An IE type which is referenced in more than one ASN.1 section should be defined in a separate sub-clause, with a separate heading and a separate ASN.1 section (possibly as one in a set of closely related IE types, like the IEs *PRACH-ConfigSIB* and *PRACH-Config* in the example above). Such IE types are also referred to as 'global IEs'.

NOTE: Referring to an IE type, that is defined as a local IE type in the context of another ASN.1 section, does not generate an ASN.1 compilation error. Nevertheless, using a locally defined IE type in that way makes the IE type definition difficult to find, as it would not be visible at an outline level of the specification. It should be avoided.

The ASN.1 section specifying the contents of one or more IE types, like in the example above, may be followed by a *field description* table, where a further description of, e.g., the semantic properties of the fields of the information elements may be included. This table may be absent, similar as indicated in sub-clause A.3.3 for the specification of the PDU type. The general format of the *field description* table is the same as shown in sub-clause A.3.3 for the specification of the PDU type.

A.3.5 Fields with optional presence

A field with optional presence may be declared with the keyword DEFAULT. It identifies a default value to be assumed, if the sender does not include a value for that field in the encoding:

```
--- /example/ ASN1START

PreambleInfo ::= SEQUENCE {
    numberOfRA-Preambles INTEGER (1..64) DEFAULT 1,
    ...
}

--- ASN1STOP
```

Alternatively, a field with optional presence may be declared with the keyword OPTIONAL. It identifies a field for which a value can be omitted. The omission carries semantics, which is different from any normal value of the field:

```
--- /example/ ASN1START

PRACH-Config ::= SEQUENCE {
    rootSequenceIndex INTEGER (0..1023),
    prach-ConfigInfo PRACH-ConfigInfo OPTIONAL -- Need ON
}

--- ASN1STOP
```

The semantics of an optionally present field, in the case it is omitted, should be indicated at the end of the paragraph including the keyword OPTIONAL, using a short comment text with a need statement. The need statement includes the keyword "Need", followed by one of the predefined semantics tags (OP, ON or OR) defined in sub-clause 6.1. If the semantics tag OP is used, the semantics of the absent field are further specified either in the field description table following the ASN.1 section, or in procedure text.

A.3.6 Fields with conditional presence

A field with conditional presence is declared with the keyword OPTIONAL. In addition, a short comment text shall be included at the end of the paragraph including the keyword OPTIONAL. The comment text includes the keyword "Cond", followed by a condition tag associated with the field ("UL" in this example):

```
-- /example/ ASN1START

LogicalChannelConfig ::= SEQUENCE {
   ul-SpecificParameters SEQUENCE {
    priority INTEGER (0),
    ...
   } OPTIONAL -- Cond UL
}
```

When conditionally present fields are included in an ASN.1 section, the field description table after the ASN.1 section shall be followed by a *conditional presence* table. The conditional presence table specifies the conditions for including the fields with conditional presence in the particular ASN.1 section.

Conditional presence	Explanation		
UL	Specification of the conditions for including the field associated with the condition		
	tag = "UL". Semantics in case of optional presence under certain conditions may		
	also be specified.		

The conditional presence table has two columns. The first column (heading: "Conditional presence") contains the condition tag (in *italic* font style), which links the fields with a condition tag in the ASN.1 section to an entry in the table. The second column (heading: "Explanation") contains a text specification of the conditions and requirements for

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the presence of the field. The second column may also include semantics, in case of an optional presence of the field, under certain conditions i.e. using the same predefined tags as defined for optional fields in A.3.5.

Conditional presence should primarily be used when presence of a field despends on the presence and/ or value of other fields within the same message. If the presence of a field depends on whether another feature/ function has been configured, while this function can be configured indepedently e.g. by another message and/ or at another point in time, the relation is best reflected by means of a statement in the field description table.

If the ASN.1 section does not include any fields with conditional presence, the conditional presence table shall not be included.

Whenever a field is only applicable in specific cases e.g. TDD, use of conditional presence should be considered.

A.3.7 Guidelines on use of lists with elements of SEQUENCE type

Where an information element has the form of a list (the SEQUENCE OF construct in ASN.1) with the type of the list elements being a SEQUENCE data type, an information element shall be defined for the list elements even if it would not otherwise be needed.

For example, a list of PLMN identities with reservation flags is defined as in the following example:

```
-- /example/ ASN1START

PLMN-IdentityInfoList ::= SEQUENCE (SIZE (1..6)) OF PLMN-IdentityInfo

PLMN-IdentityInfo ::= SEQUENCE {
   plmn-Identity PLMN-Identity,
   cellReservedForOperatorUse ENUMERATED {reserved, notReserved}
}
```

rather than as in the following (bad) example, which may cause generated code to contain types with unpredictable names:

```
-- /bad example/ ASN1START

PLMN-IdentityList ::= SEQUENCE (SIZE (1..6)) OF SEQUENCE {
   plmn-Identity PLMN-Identity,
   cellReservedForOperatorUse ENUMERATED {reserved, notReserved}
}

-- ASN1STOP
```

A.4 Extension of the PDU specifications

A.4.1 General principles to ensure compatibility

It is essential that extension of the protocol does not affect interoperability i.e. it is essential that implementations based on different versions of the RRC protocol are able to interoperate. In particular, this requirement applies for the following kind of protocol extensions:

- Introduction of new PDU types (i.e. these should not cause unexpected behaviour or damage).
- Introduction of additional fields in an extensible PDUs (i.e. it should be possible to ignore uncomprehended extensions without affecting the handling of the other parts of the message).
- Introduction of additional values of an extensible field of PDUs. If used, the behaviour upon reception of an uncomprehended value should be defined.

It should be noted that the PDU extension mechanism may depend on the logical channel used to transfer the message e.g. for some PDUs an implementation may be aware of the protocol version of the peer in which case selective ignoring of extensions may not be required.

The non-critical extension mechanism is the primary mechanism for introducing protocol extensions i.e. the critical extension mechanism is used merely when there is a need to introduce a 'clean' message version. Such a need appears when the last message version includes a large number of non-critical extensions, which results in issues like readability, overhead associated with the extension markers. The critical extension mechanism may also be considered when it is complicated to accommodate the extensions by means of non-critical extension mechanisms.

A.4.2 Critical extension of messages

The mechanisms to critically extend a message are defined in A.3.3. There are both "outer branch" and "inner branch" mechanisms available. The "outer branch" consists of a CHOICE having the name *criticalExtensions*, with two values, *c1* and *criticalExtensionsFuture*. The *criticalExtensionsFuture* branch consists of an empty SEQUENCE, while the c1 branch contains the "inner branch" mechanism.

The "inner branch" structure is a CHOICE with values of the form "MessageName-rX-IEs" (e.g., "RRCConnectionReconfiguration-r8-IEs") or "spareX", with the spare values having type NULL. The "-rX-IEs" structures contain the complete structure of the message IEs for the appropriate release; i.e., the critical extension branch for the Rel-10 version of a message includes all Rel-8 and Rel-9 fields (that are not obviated in the later version), rather than containing only the additional Rel-10 fields.

The following guidelines may be used when deciding which mechanism to introduce for a particular message, i.e. only an 'outer branch', or an 'outer branch' in combination with an 'inner branch' including a certain number of spares:

- For certain messages, e.g. initial uplink messages, messages transmitted on a broadcast channel, critical extension may not be applicable.
- An outer branch may be sufficient for messages not including any fields.
- The number of spares within inner branch should reflect the likelihood that the message will be critically extended in future releases (since each release with a critical extension for the message consumes one of the spare values). The estimation of the critical extension likelyhood may be based on the number, size and changeability of the fields included in the message.
- In messages where an inner branch extension mechanism is available, all spare values of the inner branch should be used before any critical extensions are added using the outer branch.

The following example illustrates the use of the critical extension mechanism by showing the ASN.1 of the original and of a later release

/example/ ASN1START	Original release	
RRCMessage ::=	SEQUENCE {	

```
rrc-TransactionIdentifier RRC-TransactionIdentifier,
criticalExtensions CHOICE {
    c1 CHOICE {
        rrcMessage-r8 RRCMessage-r8-IEs,
        spare3 NULL, spare2 NULL, spare1 NULL
    },
    criticalExtensionsFuture SEQUENCE {}
}

-- ASN1STOP
```

```
-- /example/ ASN1START
                                     -- Later release
RRCMessage ::=
                                  SEQUENCE {
  rrc-TransactionIdentifier
                                  RRC-TransactionIdentifier,
  criticalExtensions
                                  CHOICE {
                                  CHOICE{
      c1
         rrcMessage-r8
                                        RRCMessage-r8-IEs,
         rrcMessage-r10
                                        RRCMessage-r10-IEs,
         rrcMessage-r11
                                        RRCMessage-r11-IEs,
         rrcMessage-r14
                                        RRCMessage-r14-IEs
      },
                               CHOICE {
      later
         c2
                                     CHOICE{
            rrcMessage-r16
                                           RRCMessage-r16-IEs,
            spare7 NULL, spare6 NULL, spare5 NULL, spare4 NULL,
            spare3 NULL, spare2 NULL, spare1 NULL
         },
         criticalExtensionsFuture
                                        SEQUENCE {}
-- ASN1STOP
```

A.4.3 Non-critical extension of messages

A.4.3.1 General principles

The mechanisms to extend a message in a non-critical manner are defined in A.3.3. W.r.t. the use of extension markers, the following additional guidelines apply:

- When further non-critical extensions are added to a message that has been critically extended, the inclusion of these non-critical extensions in earlier critical branches of the message should be avoided when possible.
- The extension marker ("...") is the primary non-critical extension mechanism that is used unless a length determinant is not required. Examples of cases where a length determinant is not required:
 - at the end of a message,
 - at the end of a structure contained in a BIT STRING or OCTET STRING
- When an extension marker is available, non-critical extensions are preferably placed at the location (e.g. the IE) where the concerned parameter belongs from a logical/ functional perspective (referred to as the 'default extension location')
- It is desirable to aggregate extensions of the same release or version of the specification into a group, which should be placed at the lowest possible level.
- In specific cases it may be preferrable to place extensions elsewhere (referred to as the 'actual extension location') e.g. when it is possible to aggregate several extensions in a group. In such a case, the group should be placed at the lowest suitable level in the message. <TBD: ref to seperate example>
- In case placement at the default extension location affects earlier critical branches of the message, locating the extension at a following higher level in the message should be considered.
- In case an extension is not placed at the default extension location, an IE should be defined. The IE's ASN.1 definition should be placed in the same ASN.1 section as the default extension location. In case there are intermediate levels in-between the actual and the default extension location, an IE may be defined for each level. Intermediate levels are primarily introduced for readability and overview. Hence intermediate levels need not allways be introduced e.g. they may not be needed when the default and the actual extension location are within the same ASN.1 section. <TBD: ref to seperate example>

A.4.3.2 Further guidelines

Further to the general principles defined in the previous section, the following additional guidelines apply regarding the use of extension markers:

- Extension markers within SEQUENCE
 - Extension markers are primarily, but not exclusively, introduced at the higher nesting levels
 - Extension markers are introduced for a SEQUENCE comprising several fields as well as for information elements whose extension would result in complex structures without it (e.g. re-introducing another list)
 - Extension markers are introduced to make it possible to maintain important information structures e.g. parameters relevant for one particular RAT
 - Extension markers are also used for size critical messages (i.e. messages on BCCH, PCCH and CCCH), although introduced somewhat more carefully
 - The extension fields introduced (or frozen) in a specific version of the specification are grouped together using double brackets.
- Extension markers within ENUMERATED

- 429
- Spare values are used until the number of values reaches the next power of 2, while the extension marker caters for extension beyond that limit
- A suffix of the form "vXYZ" is used for the identifier of each new value, e.g. "value-vXYZ".
- Extension markers within CHOICE:
 - Extension markers are introduced when extension is foreseen and when comprehension is not required by the receiver i.e. behaviour is defined for the case where the receiver cannot comprehend the extended value (e.g. ignoring an optional CHOICE field). It should be noted that defining the behaviour of a receiver upon receiving a not comprehended choice value is not required if the sender is aware whether or not the receiver supports the extended value.
 - A suffix of the form "vXYZ" is used for the identifier of each new choice value, e.g. "choice-vXYZ".

Non-critical extensions at the end of a message/ of a field contained in an OCTET or BIT STRING:

- When a nonCriticalExtension is actually used, a "Need" statement should not be provided for the field, which always is a group including at least one extension and a field facilitating further possible extensions. For simplicity, it is recommended not to provide a "Need" statement when the field is not actually used either.

Further, more general, guidelines:

- In case a need statement is not provided for a group, a "Need" statement is provided for all individual extension fields within the group i.e. including for fields that are not marked as OPTIONAL. The latter is to clarify the action upon absence of the whole group.

A.4.3.3 Typical example of evolution of IE with local extensions

The following example illustrates the use of the extension marker for a number of elementary cases (sequence, enumerated, choice). The example also illustrates how the IE may be revised in case the critical extension mechanism is used.

NOTE In case there is a need to support further extensions of release n while the ASN.1 of release (n+1) has been frozen, without requiring the release n receiver to support decoding of release (n+1) extensions, more advanced mechanisms are needed e.g. including multiple extension markers.

```
-- /example/ ASN1START
InformationElement1 ::=
                                SEQUENCE {
   field1
                                ENUMERATED {
                                    value1, value2, value3, value4-v880,
                                    ..., value5-v960 },
   field2
                                CHOICE {
      field2a
                                   BOOLEAN,
      field2b
                                   InformationElement2b,
                                    InformationElement2c-r9
      field2c-v960
   },
   [[ field3-r9
                                   InformationElement3-r9
                                                                              -- Need OR
                                                             OPTIONAL
   ]],
```

```
[[ field3-v9a0
                                      InformationElement3-v9a0 OPTIONAL,
                                                                               -- Need OR
      field4-r9
                                   InformationElement4
                                                               OPTIONAL
                                                                               -- Need OR
   11
InformationElement1-r10 ::=
                                   SEQUENCE {
   field1
                                ENUMERATED {
                                   value1, value2, value3, value4-v880,
                                   value5-v960, value6-v1170, spare2, spare1, ... },
   field2
                                CHOICE {
      field2a
                                   BOOLEAN.
      field2b
                                   InformationElement2b,
      field2c-v960
                                   InformationElement2c-r9,
      field2d-v12b0
                                   INTEGER (0..63)
   },
   field3-r9
                                InformationElement3-r10
                                                               OPTIONAL, -- Need OR
                                                               OPTIONAL, -- Need OR
   field4-r9
                                InformationElement4
   field5-r10
                                BOOLEAN,
   field6-r10
                                InformationElement6-r10
                                                               OPTIONAL, -- Need OR
   [[ field3-v1170
                                   InformationElement3-v1170
                                                                   OPTIONAL -- Need OR
   11
-- ASN1STOP
```

Some remarks regarding the extensions of *InformationElement1* as shown in the above example:

- The InformationElement1 is initially extended with a number of non-critical extensions. In release 10 however, a critical extension is introduced for the message using this IE. Consequently, a new version of the IE InformationElement1 (i.e. InformationElement1-r10) is defined in which the earlier non-critical extensions are incorporated by means of a revision of the original field.
- The *value4-v880* is replacing a spare value defined in the original protocol version for *field1*. Likewise *value6-v1170* replaces *spare3* that was originally defined in the r10 version of *field1*
- Within the critically extended release 10 version of *InformationElement1*, the names of the original fields/ IEs are not changed, unless there is a real need to distinguish them from other fields/ IEs. E.g. the *field1* and *InformationElement4* were defined in the original protocol version (release 8) and hence not tagged. Moreover,

the *field3-r9* is introduced in release 9 and not re-tagged; although, the *InformationElement3* is also critically extended and therefore tagged *InformationElement3-r10* in the release 10 version of InformationElement1.

A.4.3.4 Typical examples of non critical extension at the end of a message

The following example illustrates the use of non-critical extensions at the end of the message or at the end of a field that is contained in a BIT or OCTET STRING i.e. when an empty sequence is used.

```
-- /example/ ASN1START
RRCMessage-r8-IEs ::=
                           SEQUENCE {
   field1
                           InformationElement1,
   field2
                           InformationElement2,
                           InformationElement3
  field3
                                                            OPTIONAL, -- Need ON
   nonCriticalExtension
                           RRCMessage-v860-IEs
                                                            OPTIONAL
RRCMessage-v860-IEs ::=
                              SEQUENCE {
   field4-v860
                              InformationElement4
                                                               OPTIONAL, -- Need OP
                              BOOLEAN
                                                                  OPTIONAL, -- Cond C54
   field5-v860
   nonCriticalExtension
                           RRCMessage-v940-IEs
                                                            OPTIONAL
}
RRCMessage-v940-IEs ::=
                              SEQUENCE {
   field6-v940
                              InformationElement6-r9
                                                               OPTIONAL, -- Need OR
   nonCriticalExtensions
                              SEQUENCE {}
                                                                  OPTIONAL
-- ASN1STOP
```

Some remarks regarding the extensions shown in the above example:

- The *InformationElement4* is introduced in the original version of the protocol (release 8) and hence no suffix is used.

A.4.3.5 Examples of non-critical extensions not placed at the default extension location

The following example illustrates the use of non-critical extensions in case an extension is not placed at the default extension location.

ParentIE-WithEM

The IE *ParentIE-WithEM* is an example of a high level IE including the extension marker (EM). The root encoding of this IE includes two lower level IEs *ChildIE1-WithoutEM* and *ChildIE2-WithoutEM* which not include the extension marker. Consequently, non-critical extensions of the Child-IEs have to be included at the level of the Parent-IE.

The example illustrates how the two extension IEs *ChildIE1-WithoutEM-vNx0* and *ChildIE2-WithoutEM-vNx0* (both in release N) are used to connect non-critical extensions with a default extension location in the lower level IEs to the actual extension location in this IE.

ParentlE-WithEM information element

```
-- /example/ ASN1START
ParentIE-WithEM ::=
                                 SEQUENCE {
   -- Root encoding, including:
   childIE1-WithoutEM
                                    ChildIE1-WithoutEM
                                                                  OPTIONAL,
                                                                                 -- Need ON
   childIE2-WithoutEM
                                    ChildIE2-WithoutEM
                                                                  OPTIONAL,
                                                                                 -- Need ON
   [[ childIE1-WithoutEM-vNx0
                                       ChildIE1-WithoutEM-vNx0
                                                                  OPTIONAL,
                                                                                 -- Need ON
      childIE2-WithoutEM-vNx0
                                       ChildIE2-WithoutEM-vNx0
                                                                  OPTIONAL
                                                                                 -- Need ON
   ]]
-- ASN1STOP
```

Some remarks regarding the extensions shown in the above example:

- The fields *childIEx-WithoutEM-vNx0* may not really need to be optional (depends on what is defined at the next lower level).
- In general, especially when there are several nesting levels, fields should be marked as optional only when there
 is a clear reason.

ChildIE1-WithoutEM

The IE *ChildIE1-WithoutEM* is an example of a lower level IE, used to control certain radio configurations including a configurable feature which can be setup or released using the local IE *ChIE1-ConfigurableFeature*. The example illustrates how the new field *chIE1-NewField* is added in release N to the configuration of the configurable feature. The example is based on the following assumptions:

- when initially configuring as well as when modifying the new field, the original fields of the configurable feature have to be provided also i.e. as if the extended ones were present within the setup branch of this feature.
- when the configurable feature is released, the new field should be released also.
- when omitting the original fields of the configurable feature the UE continues using the existing values (which is used to optimise the signalling for features that typically continue unchanged upon handover).

when omitting the new field of the configurable feature the UE releases the existing values and discontinues the
associated functionality (which may be used to support release of unsupported functionality upon handover to an
eNB supporting an earlier protocol version).

The above assumptions, which affect the use of conditions and need codes, may not always apply. Hence, the example should not be re-used blindly.

ChildIE1-WithoutEM information elements

```
-- /example/ ASN1START
ChildIE1-WithoutEM ::=
                                 SEQUENCE {
  -- Root encoding, including:
  chIE1-ConfigurableFeature
                                 ChIE1-ConfigurableFeature
                                                             OPTIONAL
                                                                             -- Need ON
}
ChildIE1-WithoutEM-vNx0 ::=
                              SEQUENCE {
  chIE1-ConfigurableFeature-vNx0
                                    ChIE1-ConfigurableFeature-vNx0 OPTIONAL -- Cond ConfigF
}
ChIE1-ConfigurableFeature ::=
                              CHOICE {
   release
                              NULL,
                              SEQUENCE {
   setup
      -- Root encoding
   }
ChIE1-ConfigurableFeature-vNx0 ::= SEQUENCE {
  chIE1-NewField-rN
                                 INTEGER (0..31)
}
-- ASN1STOP
```

Conditional presence	Explanation
ConfigF	The field is optional present, need OR, in case of chIE1-ConfigurableFeature is included
	and set to "setup"; otherwise the field is not present and the UE shall delete any existing
	value for this field.

ChildIE2-WithoutEM

The IE *ChildIE2-WithoutEM* is an example of a lower level IE, typically used to control certain radio configurations. The example illustrates how the new field *chIE1-NewField* is added in release N to the configuration of the configurable feature.

ChildIE2-WithoutEM information element

```
-- /example/ ASN1START

ChildIE2-WithoutEM ::= CHOICE {
    release NULL,
    setup SEQUENCE {
     -- Root encoding
    }
}

ChildIE2-WithoutEM-vNx0 ::= SEQUENCE {
    chIE2-NewField-rN INTEGER (0..31) OPTIONAL -- Cond ConfigF
}
```

Conditional presence	Explanation
ConfigF	The field is optional present, need OR, in case of chIE2-ConfigurableFeature is included
	and set to "setup"; otherwise the field is not present and the UE shall delete any existing
	value for this field.

A.5 Guidelines regarding inclusion of transaction identifiers in RRC messages

The following rules provide guidance on which messages should include a Transaction identifier

- 1: DL messages on CCCH that move UE to RRC-Idle should not include the RRC transaction identifier.
- 2: All network initiated DL messages by default should include the RRC transaction identifier.
- 3: All UL messages that are direct response to a DL message with an RRC Transaction identifier should include the RRC Transaction identifier.
- 4: All UL messages that require a direct DL response message should include an RRC transaction identifier.
- 5: All UL messages that are not in response to a DL message nor require a corresponding response from the network should not include the RRC Transaction identifier.

A.6 Protection of RRC messages (informative)

The following list provides information which messages can be sent (unprotected) prior to security activation and which messages can be sent unprotected after security activation.

- P...Messages that can be sent (unprotected) prior to security activation
- A I...Messages that can be sent without integrity protection after security activation
- A C...Messages that can be sent unciphered after security activation
- NA... Message can never be sent after security activation

Message	Р	A-I	A-C	Comment
CSFBParametersRequestCDMA20 00	+	-	-	
CSFBParametersResponseCDMA 2000	+	-	-	
CounterCheck	_	-	-	
CounterCheckResponse	-	-	-	
DLInformationTransfer	+	-	1-	
HandoverFromEUTRAPreparation	-	-	-	
Request (CDMA2000)				
InDeviceCoexIndication	-	-	-	
InterFreqRSTDMeasurementIndica tion	-	-	-	
LoggedMeasurementsConfiguratio n	-	-	-	
MasterInformationBlock	+	+	+	
MBMSCountingRequest	+	+	+	
MBMSCountingResponse	-	-	-	
MBMSInterestIndication	+	-	-	
MBSFNAreaConfiguration	+	+	+	
MeasurementReport	+	-	-	Justification for case 'P': RAN2 agreed that measurement configuration may be sent
Mobility From ELITD A Comment				prior to security activation
MobilityFromEUTRACommand	-	-	-	
Paging Province to the disease of the second	+	+	+	
ProximityIndication	-	-	-	
RNReconfiguration	-	-	-	
RNReconfigurationComplete	-	-	-	
RRCConnectionReconfiguration	+	-	-	The message shall not be sent unprotected before security activation if it is used to perform handover or to establish SRB2 and DRBs
RRCConnectionReconfigurationComplete	+	-	-	Unprotected, if sent as response to RRCConnectionReconfiguration which was sent before security activation
RRCConnectionReestablishment	-	+	+	This message is not protected by PDCP operation.
RRCConnectionReestablishmentC omplete	-	-	-	
RRCConnectionReestablishmentR eject	-	+	+	One reason to send this may be that the security context has been lost, therefore sent as unprotected.
RRCConnectionReestablishmentR equest	-	-	+	This message is not protected by PDCP operation. However a short MAC-I is included.
RRCConnectionReject	+	NA	NA	
RRCConnectionRelease	+	-	-	Justification for P: If the RRC connection only for signalling not requiring DRBs or ciphered messages, or the signalling connection has to be released prematurely, this message is sent as unprotected.
RRCConnectionRequest	+	NA	NA	
RRCConnectionSetup	+	NA	NA	
RRCConnectionSetupComplete	+	NA	NA	
SecurityModeCommand	+	NA	NA	Integrity protection applied, but no ciphering (integrity verification done after the message received by RRC)
SecurityModeComplete	-	NA	NA	Integrity protection applied, but no ciphering. Ciphering is applied after completing the procedure.
SecurityModeFailure	+	NA	NA	Neither integrity protection nor ciphering applied.
SystemInformation	+	+	+	
SystemInformationBlockType1	+	+	+	
UEAssistanceInformation	-	-	-	
	1			
UECapabilityEnquiry UECapabilityInformation	+	-	-	

Message	Р	A-I	A-C	Comment
UEInformationRequest	-	-	-	
UEInformationResponse	-	-	-	
ULHandoverPreparationTransfer	-	-	-	This message should follow
(CDMA2000)				HandoverFromEUTRAPreparationRequest
ULInformationTransfer	+	-	-	

A.7 Miscellaneous

The following miscellaneous conventions should be used:

- References: Whenever another specification is referenced, the specification number and optionally the relevant subclause, table or figure, should be indicated in addition to the pointer to the References section e.g. as follows: 'see TS 36.212 [22, 5.3.3.1.6]'.

Annex B (normative): Release 8 and 9 AS feature handling

B.1 Feature group indicators

subband CQI with single PMI

- 5bit RLC UM SN

- Short DRX cycle

- 7bit PDCP SN

3

This annex contains the definitions of the bits in fields *featureGroupIndicators* (in Table B.1-1) and *featureGroupIndRel9Add* (in Table B.1-1a).

In this release of the protocol, the UE shall include the fields *featureGroupIndicators* in the IE *UE-EUTRA-Capability* and *featureGroupIndRel9Add* in the IE *UE-EUTRA-Capability-v9a0*. All the functionalities defined within the field *featureGroupIndicators* defined in Table B.1-1 or Table B.1-1a are mandatory for the UE, if the related capability (frequency band, RAT, SR-VCC or Inter-RAT ANR) is also supported. For a specific indicator, if all functionalities for a feature group listed in Table B.1-1 have been implemented and tested, the UE shall set the indicator as one (1), else (i.e. if any one of the functionalities in a feature group listed in Table B.1-1 or Table B.1-1a, which have not been implemented or tested), the UE shall set the indicator as zero (0).

The UE shall set all indicators that correspond to RATs not supported by the UE as zero (0).

The UE shall set all indicators, which do not have a definition in Table B.1-1 or Table B.1-1a, as zero (0).

If the optional fields *featureGroupIndicators* or *featureGroupIndRel9Add* are not included by a UE of a future release, the network may assume that all features pertaining to the RATs supported by the UE, respectively listed in Table B.1-1 or Table B.1-1a and deployed in the network, have been implemented and tested by the UE.

In Table B.1-1, a 'VoLTE capable UE' corresponds to a UE which is IMS voice capable.

The indexing in Table B.1-1a starts from index 33, which is the leftmost bit in the field featureGroupIndRel9Add.

Index of Definition Notes If indicated "Yes" the FDD/ indicator TDD diff (description of the supported feature shall be functionality, if indicator set to one) implemented and (bit successfully tested for number) this version of the specification - Intra-subframe frequency hopping for Yes (leftmost PUSCH scheduled by UL grant bit) - DCI format 3a (TPC commands for PUCCH and PUSCH with single bit power adjustments) - Aperiodic CQI/PMI/RI reporting on PUSCH: Mode 2-0 - UE selected subband CQI without PMI - Aperiodic CQI/PMI/RI reporting on PUSCH: Mode 2-2 - UE selected subband CQI with multiple PMI - Simultaneous CQI and ACK/NACK on 2 Yes PUCCH, i.e. PUCCH format 2a and 2b - Absolute TPC command for PUSCH - Resource allocation type 1 for PDSCH - Periodic CQI/PMI/RI reporting on PUCCH: Mode 2-0 - UE selected subband CQI without PMI - Periodic CQI/PMI/RI reporting on PUCCH: Mode 2-1 - UE selected

Table B.1-1: Definitions of feature group indicators

- can only be set to 1 if

- can only be set to 1 if

the UE has set bit

number 7 to 1.

Yes, if UE supports

Yes, if UE supports SRVCC to EUTRAN from

VoLTE.

GERAN.

No

Yes

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-			
		the UE has set bit	
	ļ	number 5 to 1.	

5	- Long DRX cycle - DRX command MAC control element		Yes	No
6	- Prioritised bit rate		Yes	No
7	- RLC UM	- can only be set to 0 if the UE does not support VoLTE	Yes, if UE supports VoLTE. Yes, if UE supports SRVCC to EUTRAN from GERAN.	No
8	- EUTRA RRC_CONNECTED to UTRA FDD or UTRA TDD CELL_DCH PS handover, if the UE supports either only UTRAN FDD or only UTRAN TDD - EUTRA RRC_CONNECTED to UTRA FDD CELL_DCH PS handover, if the UE supports both UTRAN FDD and UTRAN TDD	- can only be set to 1 if the UE has set bit number 22 to 1	Yes for FDD, if UE supports UTRA FDD	Yes
9	- EUTRA RRC_CONNECTED to GERAN GSM_Dedicated handover	- related to SR-VCC - can only be set to 1 if the UE has set bit number 23 to 1	Yes, if UE supports SRVCC to EUTRAN from GERAN.	Yes
10	- EUTRA RRC_CONNECTED to GERAN (Packet_) Idle by Cell Change Order - EUTRA RRC_CONNECTED to GERAN (Packet_) Idle by Cell Change Order with NACC (Network Assisted Cell Change)			Yes
11	- EUTRA RRC_CONNECTED to CDMA2000 1xRTT CS Active handover	- related to SR-VCC - can only be set to 1 if the UE has sets bit number 24 to 1		Yes
12	- EUTRA RRC_CONNECTED to CDMA2000 HRPD Active handover	- can only be set to 1 if the UE has set bit number 26 to 1		Yes
13	Inter-frequency handover (within FDD or TDD)	- can only be set to 1 if the UE has set bit number 25 to 1	Yes, unless UE only supports band 13	No
14	 Measurement reporting event: Event A4 Neighbour > threshold Measurement reporting event: Event A5 Serving < threshold1 & Neighbour > threshold2 		Yes	No
15	- Measurement reporting event: Event B1 - Neighbour > threshold for UTRAN FDD or UTRAN TDD, if the UE supports either only UTRAN FDD or only UTRAN TDD and has set bit number 22 to 1 - Measurement reporting event: Event B1 - Neighbour > threshold for UTRAN FDD or UTRAN TDD, if the UE supports both UTRAN FDD and UTRAN TDD and has set bit number 22 or 39 to 1, respectively - Measurement reporting event: Event B1 - Neighbour > threshold for GERAN, 1xRTT or HRPD, if the UE has set bit number 23, 24 or 26 to 1, respectively	- can only be set to 1 if the UE has set at least one of the bit number 22, 23, 24, 26 or 39 to 1 even if the UE sets bits 41, it shall still set bit 15 to 1 if measurement reporting event B1 is tested for all RATs supported by UE	Yes for FDD, if UE supports only UTRAN FDD and does not support UTRAN TDD or GERAN or 1xRTT or HRPD	Yes
16	- Intra-frequency periodical measurement reporting where triggerType is set to periodical and purpose is set to reportStrongestCells - Inter-frequency periodical measurement reporting where triggerType is set to periodical and purpose is set to reportStrongestCells, if the UE has set bit number 25 to 1		Yes	No

			T	
	- Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportStrongestCells for UTRAN FDD or UTRAN TDD, if the UE supports either only UTRAN FDD or only UTRAN TDD and has set bit number 22 to 1			
	- Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportStrongestCells for UTRAN FDD or UTRAN TDD, if the UE supports both UTRAN FDD and UTRAN TDD and has set bit number 22 or 39 to 1, respectively			
	- Inter-RAT periodical measurement reporting where <i>triggerType</i> is set to <i>periodical</i> and <i>purpose</i> is set to <i>reportStrongestCells</i> for GERAN, 1xRTT or HRPD, if the UE has set bit number 23, 24 or 26 to 1, respectively.			
	NOTE: Event triggered periodical reporting (i.e., with <i>triggerType</i> set to event and with <i>reportAmount</i> > 1) is a mandatory functionality of event triggered reporting and therefore not the subject of this bit.			
17	Intra-frequency ANR features including: - Intra-frequency periodical measurement reporting where triggerType is set to periodical and purpose is set to reportStrongestCells - Intra-frequency periodical measurement reporting where triggerType is set to periodical and purpose is set to reportCGI	- can only be set to 1 if the UE has set bit number 5 to 1.	Yes	No
18	Inter-frequency ANR features including: - Inter-frequency periodical measurement reporting where triggerType is set to periodical and purpose is set to reportStrongestCells - Inter-frequency periodical measurement reporting where triggerType is set to periodical and purpose is set to reportCGI	- can only be set to 1 if the UE has set bit number 5 and bit number 25 to 1.	Yes, unless UE only supports band 13	No
19	Inter-RAT ANR features including: - Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportStrongestCells for GERAN, if the UE has set bit number 23 to 1 - Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportStrongestCellsForSON for UTRAN FDD or UTRAN TDD, if the UE supports either only UTRAN FDD or only UTRAN TDD and has set bit number 22 to 1 - Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportStrongestCellsForSON for UTRAN FDD or UTRAN TDD, if the UE supports both UTRAN FDD and UTRAN TDD and has set bit number 22 or 39 to 1, respectively	- can only be set to 1 if the UE has set bit number 5 to 1 and the UE has set at least one of the bit number 22, 23, 24 or 26 to 1 even if the UE sets bits 33 to 37, it shall still set bit 19 to 1 if inter-RAT ANR features are tested for all RATs for which inter-RAT measurement reporting is indicated as tested		Yes

			T	
	- Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportStrongestCellsForSON for 1xRTT or HRPD, if the UE has set bit number 24 or 26 to 1, respectively - Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportCGI for UTRAN FDD or UTRAN TDD, if the UE supports either only UTRAN FDD or only UTRANTDD and has set bit number 22 to 1 - Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportCGI for UTRAN FDD or UTRAN TDD, if the UE supports both UTRAN FDD and UTRAN TDD and has set bit number 22 or 39 to 1, respectively - Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportCGI for GERAN, 1xRTT or HRPD, if the UE has set bit number 23, 24 or 26 to 1, respectively			
20	If bit number 7 is set to 0: - SRB1 and SRB2 for DCCH + 8x AM DRB If bit number 7 is set to 1: - SRB1 and SRB2 for DCCH + 8x AM DRB - SRB1 and SRB2 for DCCH + 5x AM DRB + 3x UM DRB NOTE: UE which indicate support for a DRB combination also support all subsets of the DRB combination. Therefore, release of DRB(s) never results in an unsupported DRB combination.	- Regardless of what bit number 7 and bit number 20 is set to, UE shall support at least SRB1 and SRB2 for DCCH + 4x AM DRB - Regardless of what bit number 20 is set to, if bit number 7 is set to 1, UE shall support at least SRB1 and SRB2 for DCCH + 4x AM DRB + 1x UM DRB	Yes	No
21	- Predefined intra- and inter-subframe frequency hopping for PUSCH with N_sb > 1 - Predefined inter-subframe frequency			No
	hopping for PUSCH with N_sb > 1			
22	- UTRAN FDD or UTRAN TDD measurements, reporting and measurement reporting event B2 in E- UTRA connected mode, if the UE supports either only UTRAN FDD or only UTRAN TDD - UTRAN FDD measurements, reporting and measurement reporting event B2 in E-UTRA connected mode, if the UE supports both UTRAN FDD and UTRAN		Yes for FDD, if UE supports UTRA FDD	Yes
	TDD			
23	- GERAN measurements, reporting and measurement reporting event B2 in E- UTRA connected mode			Yes
24	- 1xRTT measurements, reporting and measurement reporting event B2 in E- UTRA connected mode		Yes for FDD, if UE supports enhanced 1xRTT CSFB for FDD Yes for TDD, if UE supports enhanced	Yes

		T	4 DTT 00ED (TD2	1
			1xRTT CSFB for TDD	
25	- Inter-frequency measurements and reporting in E-UTRA connected mode		Yes, unless UE only supports band 13	No
	NOTE: The UE setting this bit to 1 and indicating support for FDD and TDD frequency bands in the UE capability signalling implements and is tested for			
	FDD measurements while the UE is in TDD, and for TDD measurements while the UE is in FDD.			
26	- HRPD measurements, reporting and measurement reporting event B2 in E- UTRA connected mode		Yes for FDD, if UE supports HRPD	Yes
27	- EUTRA RRC_CONNECTED to UTRA FDD or UTRA TDD CELL_DCH CS handover, if the UE supports either only UTRAN FDD or only UTRAN TDD - EUTRA RRC_CONNECTED to UTRA FDD CELL_DCH CS handover, if the UE	- related to SR-VCC - can only be set to 1 if the UE has set bit number 8 to 1 and supports SR-VCC from EUTRA defined in TS 24.008 [49]	Yes for FDD, if UE supports VoLTE and UTRA FDD	Yes
	supports both UTRAN FDD and UTRAN TDD	11 13 24.000 [49]		
28	- TTI bundling		Yes for FDD	Yes
29	- Semi-Persistent Scheduling			Yes
30	- Handover between FDD and TDD	- can only be set to 1 if the UE has set bit number 13 to 1		No
31	- Indicates whether the UE supports the mechanisms defined for cells broadcasting multi band information i.e. comprehending multiBandInfoList, disregarding in RRC_CONNECTED the related system information fields and understanding the EARFCN signalling for all bands, that overlap with the bands supported by the UE, and that are defined in the earliest version of TS 36.101 [42] that includes all UE supported bands.		Yes	No
32	Undefined			

NOTE: The column FDD/ TDD diff indicates if the UE is allowed to signal different values for FDD and TDD.

Table B.1-1a: Definitions of feature group indicators

Index of indicator (bit number)	Definition (description of the supported functionality, if indicator set to one)	Notes	If indicated "Yes" the feature shall be implemented and successfully tested for this version of the specification	FDD/ TDD diff
33 (leftmost bit)	Inter-RAT ANR features for UTRAN FDD including: - Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportStrongestCellsForSON - Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportCGI	- can only be set to 1 if the UE has set bit number 5 and bit number 22 to 1.		Yes
34	Inter-RAT ANR features for GERAN including: - Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportStrongestCells - Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportCGI	- can only be set to 1 if the UE has set bit number 5 and bit number 23 to 1.		Yes
35	Inter-RAT ANR features for 1xRTT including: - Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportStrongestCellsForSON - Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportCGI	- can only be set to 1 if the UE has set bit number 5 and bit number 24 to 1.		Yes
36	Inter-RAT ANR features for HRPD including: - Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportStrongestCellsForSON - Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportCGI	- can only be set to 1 if the UE has set bit number 5 and bit number 26 to 1.		Yes
37	Inter-RAT ANR features for UTRAN TDD including: - Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportStrongestCellsForSON - Inter-RAT periodical measurement reporting where triggerType is set to periodical and purpose is set to reportCGI	- can only be set to 1 if the UE has set bit number 5 and at least one of the bit number 22 (for UEs supporting only UTRA TDD) or the bit number 39 to 1.		Yes
38	- EUTRA RRC_CONNECTED to UTRA TDD CELL_DCH PS handover, if the UE supports both UTRAN FDD and UTRAN TDD	- can only be set to 1 if the UE has set bit number 39 to 1		Yes
39	- UTRAN TDD measurements, reporting and measurement reporting event B2 in E-UTRA connected mode, if the UE supports both UTRAN FDD and UTRAN TDD			Yes
40	- EUTRA RRC_CONNECTED to UTRA	- related to SR-VCC		Yes

	TDD CELL_DCH CS handover, if the UE supports both UTRAN FDD and UTRAN TDD	- can only be set to 1 if the UE has set bit number 38 to 1		
41	Measurement reporting event: Event B1 - Neighbour > threshold for UTRAN FDD, if the UE supports UTRAN FDD and has set bit number 22 to 1		Yes for FDD, unless UE has set bit number 15 to 1	Yes
42	Undefined			
43	Undefined			
44	Undefined			
45	Undefined			
46	Undefined			
47	Undefined			
48	Undefined			
49	Undefined			
50	Undefined			
51	Undefined			
52	Undefined			
53	Undefined			
54	Undefined			
55	Undefined			
56	Undefined			
57	Undefined			
58	Undefined			
59	Undefined			
60	Undefined			
61	Undefined			
62	Undefined		_	
63	Undefined			
64	Undefined			

NOTE: The column FDD/ TDD diff indicates if the UE is allowed to signal different values for FDD and TDD.

Clarification for mobility from EUTRAN and inter-frequency handover within EUTRAN

There are several feature groups related to mobility from E-UTRAN and inter-frequency handover within EUTRAN. The description of these features is based on the assumption that we have 5 main "functions" related to mobility from E-UTRAN:

- A. Support of measurements and cell reselection procedure in idle mode
- B. Support of RRC release with redirection procedure in connected mode
- C. Support of Network Assisted Cell Change in connected mode
- D. Support of measurements and reporting in connected mode
- E. Support of handover procedure in connected mode

All functions can be applied for mobility to Inter-frequency to EUTRAN, GERAN, UTRAN, CDMA2000 HRPD and CDMA2000 1xRTT except for function C) which is only applicable for mobility to GERAN. Table B.1-2 below summarises the mobility functions that are supported based on the UE capability signaling (band support) and the setting of the feature group support indicators.

Table B.1-2: Mobility from E-UTRAN

Feature	GERAN	UTRAN	HRPD	1xRTT	EUTRAN
A. Measurements and cell reselection procedure in E-UTRA idle mode	Supported if GERAN band support is indicated	Supported if UTRAN band support is indicated	Supported if CDMA2000 HRPD band support is indicated	Supported if CDMA2000 1xRTT band support is indicated	Supported for supported bands
B. RRC release with blind redirection procedure in E-UTRA connected mode	Supported if GERAN band support is indicated	Supported if UTRAN band support is indicated	Supported if CDMA2000 HRPD band support is indicated	Supported if CDMA2000 1xRTT band support is indicated	Supported for supported bands
C. Cell Change Order (with or without) Network Assisted Cell Change) in E- UTRA connected mode	Group 10	N.A.	N.A	N.A	N.A.
D. Inter-frequency/RAT measurements, reporting and measurement reporting event B2 (for inter-RAT) in E-UTRA connected mode	Group 23	Group 22/39	Group 26	Group 24	Group 25
E. Inter-frequency/RAT handover procedure in E-UTRA connected mode	Group 9 (GSM_connected handover) Separate UE capability bit defined in TS 36.306 for PS handover	Group 8/38 (PS handover) or Group 27/40 (SRVCC handover)	Group 12	Group 11	Group 13 (within FDD o TDD) Group 30 (between FDE and TDD)

In case measurements and reporting function is not supported by UE, the network may still issue the mobility procedures redirection (B) and CCO (C) in a blind fashion.

B.2 CSG support

In this release of the protocol, it is mandatory for the UE to support a minimum set of CSG functionality consisting of:

- Identifying whether a cell is CSG or not;
- Ignoring CSG cells in cell selection/reselection.

Additional CSG functionality in AS, i.e. the requirement to detect and camp on CSG cells when the "CSG whitelist" is available or when manual CSG selection is triggered by the user, are related to the corresponding NAS features. This additional AS functionality consists of:

- Manual CSG selection;
- Autonomous CSG search;
- Implicit priority handling for cell reselection with CSG cells.

It is possible that this additional CSG functionality in AS is not supported or tested in early UE implementations.

Note that since the above AS features relate to idle mode operations, the capability support is not signalled to the network. For these reasons, no "feature group indicator" is assigned to this feature to indicate early support in Rel-8.

Annex C (normative): Release 10 AS feature handling

C.1 Feature group indicators

This annex contains the definitions of the bits in field featureGroupIndRel10.

In this release of the protocol, the UE shall include the field *featureGroupIndRel10* in the IE *UE-EUTRA-Capability-v1020-IEs*. All the functionalities defined within the field *featureGroupIndRel10* defined in Table C.1-1 are mandatory for the UE, if the related capability (spatial multiplexing in UL, PDSCH transmission mode 9, carrier aggregation, handover to EUTRA, or RAT) is also supported. For a specific indicator, if all functionalities for a feature group listed in Table C.1-1 have been implemented and tested, the UE shall set the indicator as one (1), else (i.e. if any one of the functionalities in a feature group listed in Table C.1-1 have not been implemented or tested), the UE shall set the indicator as zero (0).

The UE shall set all indicators that correspond to RATs not supported by the UE as zero (0).

The UE shall set all indicators, which do not have a definition in Table C.1-1, as zero (0).

If the optional field *featureGroupIndRel10* is not included by a UE of a future release, the network may assume that all features, listed in Table C.1-1 and deployed in the network, have been implemented and tested by the UE.

The indexing in Table C.1-1 starts from index 101, which is the leftmost bit in the field featureGroupIndRel10.

Table C.1-1: Definitions of feature group indicators

Index of indicator	Definition (description of the supported functionality, if indicator set to one)	Notes	If indicated "Yes" the feature shall be implemented and successfully tested for this version of the specification	FDD/ TDD diff
101 (leftmost bit)	- DMRS with OCC (orthogonal cover code) and SGH (sequence group hopping) disabling	- if the UE supports two or more layers for spatial multiplexing in UL, this bit shall be set to 1 The street two streets are supported in the set to 1. - The street two streets are supported in the set to 1. - The streets are supported in the set to 1.		No
102	- Trigger type 1 SRS (aperiodic SRS) transmission (Up to X ports) NOTE: X = number of supported layers on given band			Yes
103	- PDSCH transmission mode 9 when up to 4 CSI reference signal ports are configured	- for Category 8 UEs, this bit shall be set to 1.		Yes
104	- PDSCH transmission mode 9 for TDD when 8 CSI reference signal ports are configured	- if the UE does not support TDD, this bit is irrelevant (capability signalling exists for FDD for this feature), and this bit shall be set to 0. - for Category 8 UEs, this bit shall be set to 1.		No
105	- Periodic CQI/PMI/RI reporting on PUCCH: Mode 2-0 – UE selected subband CQI without PMI, when PDSCH transmission mode 9 is configured - Periodic CQI/PMI/RI reporting on PUCCH: Mode 2-1 – UE selected subband CQI with single PMI, when PDSCH transmission mode 9 and up to 4 CSI reference signal ports are configured	- this bit can be set to 1 only if indices 2 (Table B.1-1) and 103 are set to 1.		Yes

106	- Periodic CQI/PMI/RI/PTI reporting on PUCCH: Mode 2-1 – UE selected subband CQI with single PMI, when PDSCH transmission mode 9 and 8 CSI reference signal ports are configured	- this bit can be set to 1 only if the UE supports PDSCH transmission mode 9 with 8 CSI reference signal ports (i.e., for TDD, if index 104 is set to 1, and for FDD, if tm9-With-8Tx-FDD-r10 is set to "supported") and if index 2 (Table B.1-1) is set to 1.	Yes
107	 Aperiodic CQI/PMI/RI reporting on PUSCH: Mode 2-0 – UE selected subband CQI without PMI, when PDSCH transmission mode 9 is configured Aperiodic CQI/PMI/RI reporting on PUSCH: Mode 2-2 – UE selected subband CQI with multiple PMI, when PDSCH transmission mode 9 and up to 4 CSI reference signal ports are configured 	- this bit can be set to 1 only if indices 1 (Table B.1-1) and 103 are set to 1.	Yes
108	- Aperiodic CQI/PMI/RI reporting on PUSCH: Mode 2-2 – UE selected subband CQI with multiple PMI, when PDSCH transmission mode 9 and 8 CSI reference signal ports are configured	- this bit can be set to 1 only if the UE supports PDSCH transmission mode 9 with 8 CSI reference signal ports (i.e., for TDD, if index 104 is set to 1, and for FDD, if tm9-With-8Tx-FDD-r10 is set to "supported") and if index 1 (Table B.1-1) is set to 1.	Yes
109	- Periodic CQI/PMI/RI reporting on PUCCH Mode 1-1, submode 1	- this bit can be set to 1 only if the UE supports PDSCH transmission mode 9 with 8 CSI reference signal ports (i.e., for TDD, if index 104 is set to 1, and for FDD, if tm9-With-8Tx-FDD-r10 is set to "supported").	Yes
110	- Periodic CQI/PMI/RI reporting on PUCCH Mode 1-1, submode 2	- this bit can be set to 1 only if the UE supports PDSCH transmission mode 9 with 8 CSI reference signal ports (i.e., for TDD, if index 104 is set to 1, and for FDD, if tm9-With-8Tx-FDD-r10 is set to "supported").	Yes
111	- Measurement reporting trigger Event A6	- this bit can be set to 1 only if the UE supports carrier aggregation.	Yes
112	- SCell addition within the Handover to EUTRA procedure	this bit can be set to 1 only if the UE supports carrier aggregation and the Handover to EUTRA procedure.	Yes
113	- Trigger type 0 SRS (periodic SRS) transmission on X Serving Cells NOTE: X = number of supported component carriers in a given band	this bit can be set to 1 only if the UE supports carrier aggregation in UL.	Yes
114	combination - Reporting of both UTRA CPICH RSCP and Ec/N0 in a Measurement Report	- this bit can be set to 1 only if index 22 (Table B.1-1) is set to 1.	No
115	- time domain ICIC RLM/RRM measurement subframe restriction for the serving cell - time domain ICIC RRM measurement subframe restriction for neighbour cells - time domain ICIC CSI measurement		Yes

	subframe restriction		
116	- Relative transmit phase continuity for spatial multiplexing in UL	this bit can be set to 1 only if the UE supports two or more layers for spatial multiplexing in UL.	Yes
117	Undefined		
118	Undefined		
119	Undefined		
120	Undefined		
121	Undefined		
122	Undefined		
123	Undefined		
124	Undefined		
125	Undefined		
126	Undefined		
127	Undefined		
128	Undefined		
129	Undefined		
130	Undefined		
131	Undefined		
132	Undefined		

NOTE: The column FDD/ TDD diff indicates if the UE is allowed to signal different values for FDD and TDD.

Annex D (informative): Descriptive background information

D.1 Signalling of Multiple Frequency Band Indicators (Multiple FBI)

D.1.1 Mapping between frequency band indicator and multiple frequency band indicator

This subclause describes the use of the Multiple Frequency Band Indicator (MFBI) lists and the E-UTRA frequency bands in *SystemInformationBlockType1* by means of an example as shown in Figure D.1.1-1. In this example:

- E-UTRAN cell belongs to band B90 and also bands B6, B7, B91, and B92.
- E-UTRAN uses B64 to indicate the presence of B90 in freqBandIndciator-v9e0.
- For the MFBI list of this cell, E-UTRAN uses B64 in *MultiBAndInfoList* to indicate the position and priority of the bands in *MultiBandInfoList-v9e0*.
- The UE, after reading *SystemInformationBlockType1*, generates an MFBI list with priority of B91, B6, B92, and B7. The UE applies the first listed band which it supports.

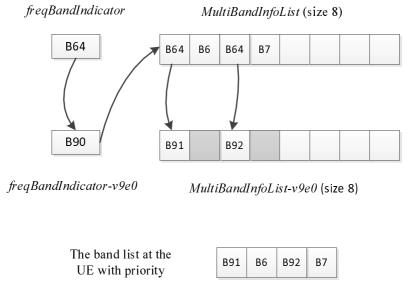


Figure D.1.1-1: Mapping of frequency bands to MultiBandInfoList/MultiBandInfoList-v9e0

D.1.2 Mapping between inter-frequency neighbour list and multiple frequency band indicator

This subclause describes the use of the Multiple Frequency Band Indicator (MFBI) lists and the E-UTRA frequencies signalled in *SystemInformationBlockType5* by means of an example as shown in Figure D.1.2-1. In this example:

- E-UTRAN includes 4 frequencies: the bands associated with f1 and f4 belong to bands lower than 64; the bands associated with f2 and f3 belong to bands larger than 64. The reserved EARFCN value of 65535 is used to indicate the presence of *ARFCN-ValueEUTRA-v9e0*.
- The band associated with f1 has two overlapping bands, B1 and B2 (lower than 64); the band associated with f2 has one overlapping band, B91; the bands associated with f3 has four overlapping bands B3, B4, B92, and B93; the band associated with f4 does not have overlapping bands.

- E-UTRAN includes 4 lists in both *interFreqCarrierFreqList-v8h0* and *interFreqCarrierFreqList-v9e0* and ensure the order of the lists is matching. Each list corresponds to one EARFCN and contains up to 8 bands. The first list corresponds to f1, the second list corresponds to f2, and so on. The grey lists mean not including *MultiBandInfoList* or *MultiBandInfoList-v9e0*, i.e. the corresponding EARFCN does not have any overlapping frequency bands in *MultiBandInfoList* or *MultiBandInfoList-v9e0*.

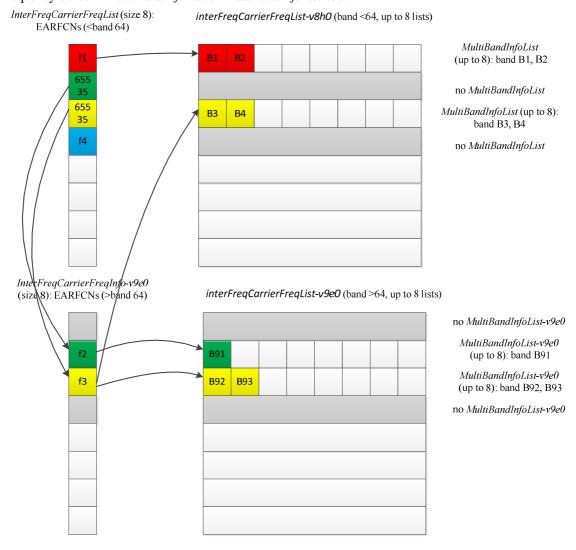


Figure D.1.2-1: Mapping of EARFCNs to MultiBandInfoList/MultiBandInfoList-v9e0

D.1.3 Mapping between UTRA FDD frequency list and multiple frequency band indicator

This subclause describes the use of the Multiple Frequency Band Indicator (MFBI) lists and the UTRA FDD frequencies signalled in *SystemInformationBlockType6* by means of an example as shown in Figure D.1.3-1. In this example:

- E-UTRA includes 4 UTRAN FDD frequencies.
- The bands associated with f1 and f4 have no overlapping bands. The band associated f2 has two overlapping bands, B1 and B2. The band associated with f3 has one overlapping band, B3.
- E-UTRA include 4 lists in *carrierFreqListUTRA-FDD-v8h0* with the first and fourth entry not including *MultiBandInfoList*.

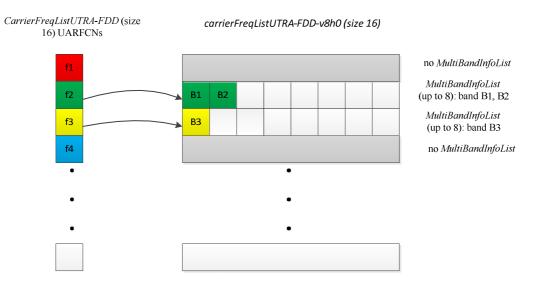


Figure D.1.3-1: Mapping of UARFCNs to MultiBandInfoList

Annex E (informative): Change history

					Change history		
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
12/2007	RP-38	RP-070920			Approved at TSG-RAN #38 and placed under Change Control	1.0.0	8.0.0
03/2008	RP-39	RP-080163		4	CR to 36.331 with Miscellaneous corrections	8.0.0	8.1.0
03/2008	RP-39	RP-080164		2	CR to 36.331 to convert RRC to agreed ASN.1 format	8.0.0	8.1.0
05/2008 09/2008	RP-40 RP-41	RP-080361		1	CR to 36.331 on Miscellaneous clarifications/ corrections CR on Miscellaneous corrections and clarifications	8.1.0 8.2.0	8.2.0 8.3.0
12/2008	RP-41	RP-080693 RP-081021	0005	-	Miscellaneous corrections and clarifications	8.3.0	8.4.0
03/2009	RP-43	RP-090131		1-	Correction to the Counter Check procedure	8.4.0	8.5.0
03/2003	RP-43	RP-090131		-	CR to 36.331-UE Actions on Receiving SIB11	8.4.0	8.5.0
	RP-43	RP-090131		1	Spare usage on BCCH	8.4.0	8.5.0
	RP-43			-	Issues in handling optional IE upon absence in GERAN NCL	8.4.0	8.5.0
	RP-43	RP-090131	0011	-	CR to 36.331 on Removal of useless RLC re-establishment at RB release	8.4.0	8.5.0
	RP-43	RP-090131	0012	1	Clarification to RRC level padding at PCCH and BCCH	8.4.0	8.5.0
	RP-43	RP-090131		-	Removal of Inter-RAT message	8.4.0	8.5.0
	RP-43		0014	-	Padding of the SRB-ID for security input	8.4.0	8.5.0
	RP-43	RP-090131		-	Validity of ETWS SIB	8.4.0	8.5.0
	RP-43	RP-090131		1	Configuration of the Two-Intervals-SPS	8.4.0	8.5.0
	RP-43	RP-090131		-	Corrections on Scaling Factor Values of Qhyst	8.4.0	8.5.0
	RP-43 RP-43	RP-090131 RP-090131		1	Optionality of srsMaxUppts CR for discussion on field name for common and dedicated IE	8.4.0 8.4.0	8.5.0 8.5.0
	RP-43			1	Corrections to Connected mode mobility	8.4.0	8.5.0
	RP-43	RP-090131		1-	Clarification regarding the measurement reporting procedure	8.4.0	8.5.0
	RP-43	RP-090131		1	Corrections on s-Measure	8.4.0	8.5.0
	RP-43	RP-090131		1	R1 of CR0023 (R2-091029) on combination of SPS and TTI bundling for TDD	8.4.0	8.5.0
	RP-43	RP-090131	0024	1_	L3 filtering for path loss measurements	8.4.0	8.5.0
	RP-43	RP-090131		1	S-measure handling for reportCGI	8.4.0	8.5.0
	RP-43	RP-090131		1	Measurement configuration clean up	8.4.0	8.5.0
	RP-43	RP-090131		-	Alignment of measurement quantities for UTRA	8.4.0	8.5.0
	RP-43	RP-090131		-	CR to 36.331 on L1 parameters ranges alignment	8.4.0	8.5.0
	RP-43	RP-090131		-	Default configuration for transmissionMode	8.4.0	8.5.0
F F	RP-43	RP-090131		-	CR to 36.331 on RRC Parameters for MAC, RLC and PDCP	8.4.0	8.5.0
	RP-43	RP-090131	0031	1	CR to 36.331 - Clarification on Configured PRACH Freq Offset	8.4.0	8.5.0
	RP-43	RP-090131		-	Clarification on TTI bundling configuration	8.4.0	8.5.0
	RP-43 RP-43	RP-090131 RP-090133		1	Update of R2-091039 on Inter-RAT UE Capability Feature Group Support Indicators	8.4.0 8.4.0	8.5.0 8.5.0
	RP-43	RP-090131			Corrections to RLF detection	8.4.0	8.5.0
	RP-43	RP-090131	0037	-	Indication of Dedicated Priority	8.4.0	8.5.0
	RP-43	RP-090131	0038	2	Security Clean up	8.4.0	8.5.0
	RP-43	RP-090131		-	Correction of TTT value range	8.4.0	8.5.0
	RP-43	RP-090131	0040	-	Correction on CDMA measurement result IE	8.4.0	8.5.0
	RP-43	RP-090131		1	Clarification of Measurement Reporting	8.4.0	8.5.0
	RP-43	RP-090131		-	Spare values in DL and UL Bandwidth in MIB and SIB2	8.4.0	8.5.0
	RP-43 RP-43	RP-090131		1	Clarifications to System Information Block Type 8	8.4.0	8.5.0
	RP-43	RP-090131 RP-090131		1	Reception of ETWS secondary notification Validity time for ETWS message Id and Sequence No	8.4.0 8.4.0	8.5.0 8.5.0
	RP-43	RP-090131		-	CR for Timers and constants values used during handover to E-	8.4.0	8.5.0
					UTRA		
	RP-43	RP-090131		-	Inter-RAT Security Clarification	8.4.0	8.5.0
	RP-43 RP-43	RP-090131 RP-090131		1-	CR to 36.331 on consistent naming of 1xRTT identifiers Capturing RRC behavior regarding NAS local release	8.4.0 8.4.0	8.5.0 8.5.0
	RP-43	RP-090131		1-	Report CGI before T321 expiry and UE null reporting	8.4.0	8.5.0
	RP-43	RP-090131		1-	System Information and 3 hour validity	8.4.0	8.5.0
	RP-43	RP-090131		1	Inter-Node AS Signalling	8.4.0	8.5.0
	RP-43	RP-090131		1-	Set of values for the parameter "messagePowerOffsetGroupB"	8.4.0	8.5.0
	RP-43	RP-090131		-	CR to paging reception for ETWS capable UEs in RRC_CONNECTED	8.4.0	8.5.0
	RP-43	RP-090131	0056	1	CR for CSG related items in 36.331	8.4.0	8.5.0
	RP-43	RP-090131		1	SRS common configuration	8.4.0	8.5.0
	RP-43	RP-090131	0058	<u> </u> -	RRC processing delay	8.4.0	8.5.0
-	RP-43	RP-090131		-	CR for HNB Name	8.4.0	8.5.0
	RP-43	RP-090131		3	Handover to EUTRA delta configuration	8.4.0	8.5.0
	RP-43	RP-090131	0063	[-	Delivery of Message Identifier and Serial Number to upper layers for ETWS	8.4.0	8.5.0
	RP-43	RP-090131	0066	1-	Clarification on the maximum size of cell lists	8.4.0	8.5.0
	RP-43	RP-090131		<u>l-</u>	Missing RRC messages in 'Protection of RRC messages'	8.4.0	8.5.0
-	RP-43	RP-090131	0069	1	Clarification on NAS Security Container	8.4.0	8.5.0
	RP-43	RP-090131		1	Extension of range of CQI/PMI configuration index	8.4.0	8.5.0
	RP-43	RP-090131	0072	1	Access barring alleviation in RRC connection establishment	8.4.0	8.5.0
	RP-43	RP-090367		6	Corrections to feature group support indicators	8.4.0	8.5.0
	RP-43	RP-090131	10078	1-	CR from email discussion to capture DRX and TTT handling	8.4.0	8.5.0

	IDD 10		I	1.	IV		To = 0
	RP-43	RP-090131		1	Need Code handling on BCCH messages	8.4.0	8.5.0
	RP-43	RP-090131		-	Unification of T300 and T301 and removal of miscallaneous FFSs	8.4.0	8.5.0
	RP-43	RP-090131	0084	1	Proposed CR modifying the code-point definitions of	8.4.0	8.5.0
	DD 42	DD 000404	0007	0	neighbourCellConfiguration	0.4.0	0.5.0
	RP-43	RP-090131		2	Remove Redundant Optionality in SIB8	8.4.0	8.5.0
	RP-43	RP-090131		-	Corrections to the generic error handling	8.4.0	8.5.0
	RP-43	RP-090131		-	Configurability of T301	8.4.0	8.5.0
	RP-43	RP-090131		1	Correction related to TTT	8.4.0	8.5.0
	RP-43	RP-090131		-	CR for 36.331 on SPS-config	8.4.0	8.5.0
	RP-43	RP-090131		2	CR for Deactivation of periodical measurement	8.4.0	8.5.0
	RP-43	RP-090131		2	SMC and reconfiguration	8.4.0	8.5.0
	RP-43	RP-090131		-	TDD handover	8.4.0	8.5.0
	RP-43	RP-090131		-	Corrections to system information acquisition	8.4.0	8.5.0
	RP-43	RP-090131	0106	-	Some Corrections and Clarifications to 36.331	8.4.0	8.5.0
	RP-43	RP-090131	0109	-	Clarification on the Maximum number of ROHC context sessions	8.4.0	8.5.0
					parameter		
	RP-43	RP-090131	0110	-	Transmission of rrm-Config at Inter-RAT Handover	8.4.0	8.5.0
	RP-43	RP-090131	0111	1	Use of SameRefSignalsInNeighbor parameter	8.4.0	8.5.0
	RP-43	RP-090131	0112	-	Default serving cell offset for measurement event A3	8.4.0	8.5.0
	RP-43	RP-090131		-	dl-EARFCN missing in HandoverPreparationInformation	8.4.0	8.5.0
	RP-43	RP-090131	_	-	Cleanup of references to 36.101	8.4.0	8.5.0
	RP-43	RP-090131		-	Correction to the value range of UE-Categories	8.4.0	8.5.0
	RP-43	RP-090131		1	Correction on RRC connection re-establishment	8.4.0	8.5.0
 	RP-43	RP-090131		<u> </u>	Performing Measurements to report CGI for CDMA2000	8.4.0	8.5.0
 	RP-43	RP-090131		t	CDMA2000-SystemTimeInfo in VarMeasurementConfiguration	8.4.0	8.5.0
 	RP-43	RP-090131		<u> </u>	UE Capability Information for CDMA2000 1xRTT	8.4.0	8.5.0
<u> </u>				-			
<u> </u>	RP-43	RP-090131		-	CDMA2000 related editorial changes	8.4.0	8.5.0
<u> </u>	RP-43	RP-090131		-	,	8.4.0	8.5.0
<u> </u>	RP-43	RP-090131		1	Draft CR to 36.331 on Renaming of AC barring related IEs	8.4.0	8.5.0
	RP-43	RP-090131	0130	2	Draft CR to 36.331 on Inheriting of dedicated priorities at inter-RAT	8.4.0	8.5.0
	RP-43	RP-090131	0135	-	reselection Proposed CR to 36.331 Description alignment for paging	8.4.0	8.5.0
					parameter, nB		
	RP-43	RP-090131	0139	2	Miscellaneous corrections and clarifications resulting from ASN.1 review	8.4.0	8.5.0
F	RP-43	RP-090131	0141	1	Correction regarding Redirection Information fo GERAN	8.4.0	8.5.0
	RP-43	RP-090131		-	Further ASN.1 review related issues	8.4.0	8.5.0
	RP-43	RP-090131		-	Periodic measurements	8.4.0	8.5.0
	RP-43	RP-090131	0144	1	Further analysis on code point "OFF" for ri-ConfigIndex	8.4.0	8.5.0
	RP-43	RP-090131		1	Adding and deleting same measurement or configuration in one	8.4.0	8.5.0
					message		
	RP-43	RP-090131	0147	-	Corrections to IE dataCodingScheme in SIB11	8.4.0	8.5.0
	RP-43	RP-090131	0148	-	Clarification on Mobility from E-UTRA	8.4.0	8.5.0
	RP-43	RP-090131	0149	-	36.331 CR related to 'not applicable'	8.4.0	8.5.0
	RP-43	RP-090131	0150	1	UE radio capability transfer	8.4.0	8.5.0
	RP-43	RP-090131		l-	CR to 36.331 on value of CDMA band classes	8.4.0	8.5.0
	RP-43	RP-090131		-	Corrections to DRB modification	8.4.0	8.5.0
	RP-43	RP-090131		l_	Correction to presence condition for pdcp-config	8.4.0	8.5.0
 	RP-43	RP-090131		l	TDD HARQ-ACK feedback mode	8.4.0	8.5.0
	RP-43	RP-090131		<u> </u>	Corrections regarding use of carrierFreq for CDMA (SIB8) and	8.4.0	8.5.0
	111 -43	171 -090213	0107		GERAN (measObject)	0.4.0	0.5.0
	RP-43	RP-090321	0156	1	Sending of GERAN SI/PSI information at Inter-RAT Handover	8.4.0	8.5.0
 	RP-43	RP-090339		<u> </u>	Clarification of CSG support	8.4.0	8.5.0
06/2009	RP-44	RP-090539		<u> </u>	Octet alignment of VarShortMAC-Input	8.5.0	8.6.0
00/2009	RP-44	RP-090516		3	Minor corrections to the feature grouping	8.5.0	8.6.0
 				3			
<u> </u>	RP-44	RP-090516		-	Security clarification	8.5.0	8.6.0
 	RP-44	RP-090516		1	Sending of GERAN SI/PSI information at Inter-RAT Handover	8.5.0	8.6.0
<u> </u>	RP-44	RP-090516		1	Correction of UE measurement model	8.5.0	8.6.0
<u> </u>	RP-44	RP-090516		-	Restricting the reconfiguration of UM RLC SN field size	8.5.0	8.6.0
	RP-44	RP-090516	0165	1	36.331 CR on Clarification on cell change order from GERAN to E- UTRAN	8.5.0	8.6.0
	RP-44	RP-090516	0166	-	36.331 CR - Handling of expired TAT and failed D-SR	8.5.0	8.6.0
	RP-44	RP-090516		1	Proposed CR to 36.331 Clarification on mandatory information in AS-Config	8.5.0	8.6.0
	RP-44	RP-090516	0168	2	Miscellaneous small corrections	8.5.0	8.6.0
	RP-44	RP-090516	0173	-	Clarification on the basis of delta signalling	8.5.0	8.6.0
	RP-44	RP-090516		-	CR on Alignment of CCCH and DCCH handling of missing mandatory field	8.5.0	8.6.0
	DD 44	RP-090516	0180	2	Handling of Measurement Context During HO Preparation	8.5.0	8.6.0
	RP-44						
	RP-44	RP-090516		<u> </u>	Clarification of key-eNodeB-Star in AdditionalReestabInfo	8.5.0	8.6.0
			0181	- 1		8.5.0 8.5.0	8.6.0
	RP-44	RP-090516	0181 0182	-	Clarification of key-eNodeB-Star in AdditionalReestabInfo		

	RP-44	RP-090516	0195	2	RB combination in feature group indicator	8.5.0	8.6.0
	RP-44	RP-090516	0196	1	CR for need code for fields in mobilityControlInfo	8.5.0	8.6.0
	RP-44	RP-090497	0197	-	Alignment of pusch-HoppingOffset with 36.211	8.5.0	8.6.0
	RP-44	RP-090570	0198	-	Explicit srb-Identity values for SRB1 and SRB2	8.5.0	8.6.0
	RP-44	RP-090516		-	Removing use of defaultValue for mac-MainConfig	8.5.0	8.6.0
09/2009	RP-45	RP-090906		-	Proposed update of the feature grouping	8.6.0	8.7.0
00/2000	RP-45	RP-090906		-	Clarification on measurement object configuration for serving	8.6.0	8.7.0
	DD 45	DD 000000	0000		frequency	0.00	070
	RP-45	RP-090906		-	Correction regarding SRVCC	8.6.0	8.7.0
	RP-45	RP-090906		-	Indication of DRB Release during HO	8.6.0	8.7.0
	RP-45	RP-090906		1	Correction regarding application of dedicated resource configuration upon handover	8.6.0	8.7.0
	RP-45	RP-090906	0205	-	REL-9 protocol extensions in RRC	8.6.0	8.7.0
	RP-45	RP-090906	0206	-	In-order delivery of NAS PDUs at RRC connection reconfiguration	8.6.0	8.7.0
	RP-45	RP-090906	0207	-	Correction on Threshold of Measurement Event	8.6.0	8.7.0
	RP-45	RP-090906		-	Clarification on dedicated resource of RA procedure	8.6.0	8.7.0
	RP-45	RP-090906	0213	1	Cell barring when MasterInformationBlock or SystemInformationBlock1 is missing	8.6.0	8.7.0
	RP-45	RP-090915	0219		Security threat with duplicate detection for ETWS	8.6.0	8.7.0
	RP-45	RP-090915		-	Clarification on supported handover types in feature grouping	8.6.0	8.7.0
	_			-			
	RP-45	RP-090906		1	Handling of unsupported / non-comprehended frequency band and emission requirement	8.6.0	8.7.0
	RP-45	RP-090906		-	RB combinations in feature group indicator 20	8.6.0	8.7.0
09/2009	RP-45	RP-090934	0220	1	Introduction of Per-QCI radio link failure timers (option 1)	8.7.0	9.0.0
	RP-45	RP-090926	0222	-	Null integrity protection algorithm	8.7.0	9.0.0
	RP-45	RP-090926		-	Emergency Support Indicator in BCCH	8.70	9.0.0
	RP-45	RP-090934		2	CR to 36.331 for Enhanced CSFB to 1xRTT with concurrent PS handover	8.7.0	9.0.0
	RP-45	RP-090934	0243	<u> </u> -	REL-9 on Miscellaneous editorial corrections	8.7.0	9.0.0
	RP-45	RP-090934		-	Periodic CQI/PMI/RI masking	8.7.0	9.0.0
	RP-45			-	Introduction of CMAS	8.7.0	
40/0000		RP-090933		-			9.0.0
12/2009	RP-46	RP-091346		1	(Rel-9)-clarification on the description of redirectedCarrierInfo	9.0.0	9.1.0
	RP-46	RP-091346		1	Adding references to RRC processing delay for inter-RAT mobiltiy messages	9.0.0	9.1.0
	RP-46	RP-091314		-	Alignment of srs-Bandwidth with 36.211	9.0.0	9.1.0
	RP-46	RP-091341		5	Baseline CR capturing eMBMS agreements	9.0.0	9.1.0
	RP-46	RP-091343		3	Capturing agreements on inbound mobility	9.0.0	9.1.0
	RP-46	RP-091314	0260	-	Clarification of preRegistrationZoneID/secondaryPreRegistrationZoneID	9.0.0	9.1.0
	RP-46	RP-091346	0261	-	Clarification on NCC for IRAT HO	9.0.0	9.1.0
	RP-46	RP-091314		-	Clarification on P-max	9.0.0	9.1.0
	RP-46	RP-091314		1	Clarification on the definition of maxCellMeas	9.0.0	9.1.0
	RP-46	RP-091346		<u> </u>	Correction of q-RxLevMin reference in SIB7	9.0.0	9.1.0
	RP-46	RP-091346		-	Correction on SPS-Config field descriptions	9.0.0	9.1.0
		RP-091346		-	Correction on SPS-Coring field descriptions		
	RP-46			1	correction on the definition of CellsTriggeredList	9.0.0	9.1.0
	RP-46	RP-091345		-	Correction relating to CMAS UE capability	9.0.0	9.1.0
	RP-46	RP-091314		1	Feature grouping bit for SRVCC handover	9.0.0	9.1.0
	RP-46	RP-091314		1	Correction and completion of extension guidelines	9.0.0	9.1.0
	RP-46	RP-091344			RACH optimization Stage-3	9.0.0	9.1.0
	RP-46	RP-091345		<u> -</u>	Stage 3 correction for CMAS	9.0.0	9.1.0
	RP-46	RP-091346	0276	1	SR prohibit mechanism for UL SPS	9.0.0	9.1.0
	RP-46	RP-091346	0277	-	Parameters used for enhanced 1xRTT CS fallback	9.0.0	9.1.0
	RP-46	RP-091346		-	Correction on UTRAN UE Capability transfer	9.0.0	9.1.0
	RP-46	RP-091346		-	Maximum number of CDMA2000 neighbors in SIB8	9.0.0	9.1.0
	RP-46	RP-091340		1	Introduction of UE Rx-Tx Time Difference measurement	9.0.0	9.1.0
	RP-46	RP-091346	0297	ļ-	Introduction of SR prohibit timer	9.0.0	9.1.0
	RP-46	RP-091346	0298	<u> </u>	Remove FFSs from RAN2 specifications	9.0.0	9.1.0
	RP-46	RP-091343		1	Renaming Allowed CSG List (36.331 Rel-9)	9.0.0	9.1.0
	RP-46	RP-091346		<u> -</u>	Re-introduction of message segment discard time	9.0.0	9.1.0
	RP-46	RP-091346		1	Application of ASN.1 extension guidelines	9.0.0	9.1.0
	RP-46	RP-091346		1	Support for Dual Radio 1xCSFB	9.0.0	9.1.0
	RP-46	RP-091346		<u> -</u>	Shorter SR periodicity	9.0.0	9.1.0
	RP-46	RP-091346		Ē	CR to 36.331 for Introduction of Dual Layer Transmission	9.0.0	9.1.0
-				1			
	RP-46	RP-091343		1	Draft CR to 36.331 on Network ordered SI reporting	9.0.0	9.1.0
	RP-46	RP-091346		-	UE e1xcsfb capabilities correction	9.0.0	9.1.0
00/22:-	RP-46	RP-091331		1	Clarification on coding of ETWS related IEs	9.0.0	9.1.0
03/2010	RP-47	RP-100285		-	Clarification of CGI reporting	9.1.0	9.2.0
	RP-47	RP-100305		-	Clarification on MCCH change notification	9.1.0	9.2.0
	RP-47	RP-100308			Clarification on measurement for serving cell only	9.1.0	9.2.0
	RP-47	RP-100306	0334	-	Clarification on proximity indication configuraiton in handover to E-UTRA	9.1.0	9.2.0
	1	ļ		1		0.4.0	9.2.0
	RP-47	RP-100308	0335	-	Clarification on radio resource configuration in handover to E-UTRA	9.1.0	9.2.0
	RP-47	RP-100308 RP-100308		-	Clarification on radio resource configuration in handover to E-UTRA procedure Clarification on UE maximum transmission power	9.1.0	9.2.0

	RP-47	RP-100308		-	Correction to field descriptions of UE-EUTRA-Capability	9.1.0	9.2.0
	RP-47	RP-100305		-	Correction to MBMS scheduling terminology	9.1.0	9.2.0
	RP-47	RP-100308	0339	-	Corrections to SIB8	9.1.0	9.2.0
	RP-47	RP-100306	0340	-	CR 36.331 R9 for Unifying SI reading for ANR and inbound mobility	9.1.0	9.2.0
	RP-47	RP-100308	0341	1	CR to 36.331 for 1xRTT pre-registration information in SIB8	9.1.0	9.2.0
	RP-47	RP-100305		-	CR to 36.331 on corrections for MBMS	9.1.0	9.2.0
	RP-47	RP-100306		1	CR to 36.331 on CSG identity reporting	9.1.0	9.2.0
	RP-47	RP-100308		2	CR to 36.331 on Optionality of Rel-9 UE features	9.1.0	9.2.0
	RP-47	RP-100308		1	CR to 36.331 on Service Specific Acces Control (SSAC)	9.1.0	9.2.0
	RP-47	RP-100308		<u> </u>	Introduction of power-limited device indication in UE capability.	9.1.0	9.2.0
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	RP-47	RP-100305		-	Missing agreement in MCCH change notification.	9.1.0	9.2.0
	RP-47	RP-100305		1	Corrections related to MCCH change notification and value ranges	9.1.0	9.2.0
	RP-47	RP-100306		2	Prohibit timer for proximity indication	9.1.0	9.2.0
	RP-47	RP-100306		1	Proximity Indication after handover and re-establishment	9.1.0	9.2.0
	RP-47	RP-100305	0351	-	Specifying the exact mapping of notificationIndicator in SIB13 to PDCCH bits	9.1.0	9.2.0
	RP-47	RP-100308	0352	-	Corrections out of ASN.1 review scope	9.1.0	9.2.0
	RP-47	RP-100308		_	CR on clarification of system information change	9.1.0	9.2.0
	RP-47	RP-100285		<u> </u>	Measurement Result CDMA2000 Cell	9.1.0	9.2.0
	RP-47	RP-100203		-			9.2.0
	RP-47	RP-100304	0361	_	Correction on the range of UE Rx-Tx time difference measurement result	9.1.0	9.2.0
	RP-47	RP-100305		-	Small clarifications regarding MBMS	9.1.0	9.2.0
	RP-47	RP-100308	0363	-	Introduction of REL-9 indication within field accessStratumRelease	9.1.0	9.2.0
	RP-47	RP-100306	0364	-	Extending mobility description to cover inbound mobility	9.1.0	9.2.0
	RP-47	RP-100308		1	Clarification regarding enhanced CSFB to 1XRTT	9.1.0	9.2.0
	RP-47	RP-100308		-	Handling of dedicated RLF timers	9.1.0	9.2.0
	RP-47	RP-100305		1	Clarification on UE's behavior of receiving MBMS service	9.1.0	9.2.0
 	RP-47	RP-100305		Ľ	MBMS Service ID and Session ID	9.1.0	9.2.0
		RP-100305		1			
 	RP-47			1	Inclusion of non-MBSFN region length in SIB13	9.1.0	9.2.0
	RP-47	RP-100309	0374	1	CR to 36.331 for e1xCSFB access class barring parameters in SIB8	9.1.0	9.2.0
	RP-47	RP-100308	0375	-	Multiple 1xRTT/HRPD target cells in MobilityFromEUTRACommand	9.1.0	9.2.0
	RP-47	RP-100308	0376	-	Independent support indicators for Dual-Rx CSFB and S102 in SIB8	9.1.0	9.2.0
	RP-47	RP-100285	0378	-	Clarification on DRX StartOffset for TDD	9.1.0	9.2.0
	RP-47	RP-100308		1	Miscellaneous corrections from REL-9 ASN.1 review	9.1.0	9.2.0
	RP-47	RP-100308		Ľ	Need codes and missing conventions	9.1.0	9.2.0
	RP-47	RP-100308		1	Introduction of Full Configuration Handover for handling earlier eNB	-	9.2.0
	DD 47	DD 400000	0005	-	releases	0.4.0	0.0.0
	RP-47	RP-100308		-	Clarification to SFN reference in RRC	9.1.0	9.2.0
	RP-47	RP-100308		-	RSRP and RSRQ based Thresholds	9.1.0	9.2.0
	RP-47	RP-100189		3	Redirection enhancements to GERAN	9.1.0	9.2.0
	RP-47	RP-100308		-	Cell reselection enhancements CR for 36.331	9.1.0	9.2.0
	RP-47	RP-100307	0401	3	CR on UE-originated RLFreporting for MRO SON use case	9.1.0	9.2.0
	RP-47	RP-100309	0402	3	CR to 36.331 on Redirection enhancements to UTRAN	9.1.0	9.2.0
	RP-47	RP-100306	0403	2	Proximity status indication handling at mobility	9.1.0	9.2.0
	RP-47	RP-100305		-	Upper layer aspect of MBSFN area id	9.1.0	9.2.0
	RP-47	RP-100308		-	Redirection for enhanced 1xRTT CS fallback with concurrent	9.1.0	9.2.0
					PSHO		
ļ	RP-47	RP-100301		-	Avoiding interleaving transmission of CMAS notifications	9.1.0	9.2.0
	RP-47	RP-100308		1	Introduction of UE GERAN DTM capability indicator	9.1.0	9.2.0
	RP-47	RP-100381		2	Introducing provisions for late ASN.1 corrections	9.1.0	9.2.0
	RP-47	RP-100245		-	Correction/ alignment of REL-9 UE capability signalling	9.1.0	9.2.0
06/2010	RP-48	RP-100553	0412	-	Clarification for mapping between warning message and CB-data	9.2.0	9.3.0
	RP-48	RP-100556		-	Clarification of radio link failure related actions	9.2.0	9.3.0
	RP-48	RP-100554		-	Clarification on UE actions upon leaving RRC_CONNECTED	9.2.0	9.3.0
				-	Correction on CMAS system information	9.2.0	9.3.0
	IRP-48	IRP-100553	10413				
	RP-48	RP-100553		1			1930
	RP-48	RP-100554	0416	1	Corrections to MBMS	9.2.0	9.3.0
	RP-48 RP-48	RP-100554 RP-100536	0416 0418	1 -	Corrections to MBMS Decoding of unknown future extensions	9.2.0 9.2.0	9.3.0
	RP-48 RP-48 RP-48	RP-100554 RP-100536 RP-100556	0416 0418 0419	1 - 1	Corrections to MBMS Decoding of unknown future extensions Miscellaneous small corrections and clarifications	9.2.0 9.2.0 9.2.0	9.3.0 9.3.0
	RP-48 RP-48 RP-48 RP-48	RP-100554 RP-100536 RP-100556 RP-100551	0416 0418 0419 0420	1 - 1 -	Corrections to MBMS Decoding of unknown future extensions Miscellaneous small corrections and clarifications Prohibit timer for proximity indication	9.2.0 9.2.0 9.2.0 9.2.0	9.3.0 9.3.0 9.3.0
	RP-48 RP-48 RP-48 RP-48 RP-48	RP-100554 RP-100536 RP-100556 RP-100551 RP-100556	0416 0418 0419 0420 0421	-	Corrections to MBMS Decoding of unknown future extensions Miscellaneous small corrections and clarifications Prohibit timer for proximity indication RLF report for MRO correction	9.2.0 9.2.0 9.2.0 9.2.0 9.2.0	9.3.0 9.3.0 9.3.0 9.3.0
	RP-48 RP-48 RP-48 RP-48 RP-48 RP-48	RP-100554 RP-100536 RP-100556 RP-100551 RP-100556 RP-100546	0416 0418 0419 0420 0421 0423	1 - 1 - - 1	Corrections to MBMS Decoding of unknown future extensions Miscellaneous small corrections and clarifications Prohibit timer for proximity indication RLF report for MRO correction Missing UTRA bands in IRAT-ParametersUTRA-FDD	9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0	9.3.0 9.3.0 9.3.0 9.3.0 9.3.0
	RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48	RP-100554 RP-100536 RP-100555 RP-100551 RP-100556 RP-100546 RP-100556	0416 0418 0419 0420 0421 0423 0424	-	Corrections to MBMS Decoding of unknown future extensions Miscellaneous small corrections and clarifications Prohibit timer for proximity indication RLF report for MRO correction Missing UTRA bands in IRAT-ParametersUTRA-FDD Correction on handling of dedicated RLF timers	9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0	9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0
	RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48	RP-100554 RP-100536 RP-100556 RP-100551 RP-100556 RP-100556 RP-100556	0416 0418 0419 0420 0421 0423 0424 0431	-	Corrections to MBMS Decoding of unknown future extensions Miscellaneous small corrections and clarifications Prohibit timer for proximity indication RLF report for MRO correction Missing UTRA bands in IRAT-ParametersUTRA-FDD Correction on handling of dedicated RLF timers Protection of RRC messages	9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0	9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0
	RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48	RP-100554 RP-100536 RP-100556 RP-100551 RP-100556 RP-100556 RP-100556	0416 0418 0419 0420 0421 0423 0424 0431	- - 1	Corrections to MBMS Decoding of unknown future extensions Miscellaneous small corrections and clarifications Prohibit timer for proximity indication RLF report for MRO correction Missing UTRA bands in IRAT-ParametersUTRA-FDD Correction on handling of dedicated RLF timers Protection of RRC messages	9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0	9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0
	RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48	RP-100554 RP-100536 RP-100556 RP-100551 RP-100556 RP-100556 RP-100556 RP-100556	0416 0418 0419 0420 0421 0423 0424 0431 0433	- - 1	Corrections to MBMS Decoding of unknown future extensions Miscellaneous small corrections and clarifications Prohibit timer for proximity indication RLF report for MRO correction Missing UTRA bands in IRAT-ParametersUTRA-FDD Correction on handling of dedicated RLF timers Protection of RRC messages Handling missing Essential system information	9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0	9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0
	RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48	RP-100554 RP-100536 RP-100551 RP-100551 RP-100556 RP-100556 RP-100556 RP-100556 RP-100551	0416 0418 0419 0420 0421 0423 0424 0431 0433 0434	- - 1	Corrections to MBMS Decoding of unknown future extensions Miscellaneous small corrections and clarifications Prohibit timer for proximity indication RLF report for MRO correction Missing UTRA bands in IRAT-ParametersUTRA-FDD Correction on handling of dedicated RLF timers Protection of RRC messages Handling missing Essential system information Clarification on UMTS CSG detected cell reporting in LTE	9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0	9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0
	RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48	RP-100554 RP-100536 RP-100556 RP-100551 RP-100556 RP-100556 RP-100556 RP-100556 RP-100551 RP-100556	0416 0418 0419 0420 0421 0423 0424 0431 0433 0434 0436	- - 1	Corrections to MBMS Decoding of unknown future extensions Miscellaneous small corrections and clarifications Prohibit timer for proximity indication RLF report for MRO correction Missing UTRA bands in IRAT-ParametersUTRA-FDD Correction on handling of dedicated RLF timers Protection of RRC messages Handling missing Essential system information Clarification on UMTS CSG detected cell reporting in LTE Introducing provisions for late corrections	9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0	9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0
00/2040	RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48	RP-100554 RP-100556 RP-100551 RP-100556 RP-100556 RP-100556 RP-100556 RP-100556 RP-100551 RP-100556 RP-100556	0416 0418 0419 0420 0421 0423 0424 0431 0433 0434 0436 0437	- - 1	Corrections to MBMS Decoding of unknown future extensions Miscellaneous small corrections and clarifications Prohibit timer for proximity indication RLF report for MRO correction Missing UTRA bands in IRAT-ParametersUTRA-FDD Correction on handling of dedicated RLF timers Protection of RRC messages Handling missing Essential system information Clarification on UMTS CSG detected cell reporting in LTE Introducing provisions for late corrections Clarification regarding / alignment of REL-9 UE capabilities	9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0	9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0
09/2010	RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48	RP-100554 RP-100556 RP-100551 RP-100556 RP-100556 RP-100556 RP-100556 RP-100556 RP-100551 RP-100556 RP-100556 RP-100556 RP-100556	0416 0418 0419 0420 0421 0423 0424 0431 0433 0434 0436 0437	- - 1	Corrections to MBMS Decoding of unknown future extensions Miscellaneous small corrections and clarifications Prohibit timer for proximity indication RLF report for MRO correction Missing UTRA bands in IRAT-ParametersUTRA-FDD Correction on handling of dedicated RLF timers Protection of RRC messages Handling missing Essential system information Clarification on UMTS CSG detected cell reporting in LTE Introducing provisions for late corrections Clarification regarding / alignment of REL-9 UE capabilities Correction to 3GPP2 reference for interworking with cdma2000 1x	9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.3.0	9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0
09/2010	RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48 RP-48	RP-100554 RP-100556 RP-100551 RP-100556 RP-100556 RP-100556 RP-100556 RP-100556 RP-100551 RP-100556 RP-100556	0416 0418 0419 0420 0421 0423 0424 0431 0433 0434 0436 0437 0440	- - 1	Corrections to MBMS Decoding of unknown future extensions Miscellaneous small corrections and clarifications Prohibit timer for proximity indication RLF report for MRO correction Missing UTRA bands in IRAT-ParametersUTRA-FDD Correction on handling of dedicated RLF timers Protection of RRC messages Handling missing Essential system information Clarification on UMTS CSG detected cell reporting in LTE Introducing provisions for late corrections Clarification regarding / alignment of REL-9 UE capabilities	9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0 9.2.0	9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0 9.3.0

	IDD 40	IDD 400054	0.440		Ober 15 and the second of the	1000	10.40
	RP-49	RP-100851		-	Clarifications regarding handover to E-UTRAN	9.3.0	9.4.0
	RP-49	RP-100854	0444	-	Correction on the table of conditionally mandatory Release 9	9.3.0	9.4.0
	DD 40	DD 400054	0445		features	0.0.0	0.4.0
	RP-49 RP-49	RP-100851 RP-100853	0445	2	Corrections to TS36.331 on MeasConfig IE	9.3.0	9.4.0
	RP-49	RP-100853			CR to 36.331 on clarification for MBMS PTM RBs Introduction of late corrections container for E-UTRA UE	9.3.0	9.4.0
	KF-49	KF-100651	0447	-	capabilities	9.3.0	9.4.0
	RP-49	RP-100851	0448	-	Renaming of containers for late non-critical extensions	9.3.0	9.4.0
	RP-49	RP-100851	0452	-	Clarifications Regarding Redirection from LTE	9.3.0	9.4.0
	RP-49	RP-100845		-	Description of multi-user MIMO functionality in feature group	9.3.0	9.4.0
					indicator table		
	RP-49	RP-100845		-	Correct the PEMAX_H to PEMAX	9.3.0	9.4.0
	RP-49	RP-100851		-	Clarification for feature group indicator bit 11	9.3.0	9.4.0
	RP-49	RP-100851	0465	1	Clarification of FGI setting for inter-RAT features not supported by the UE	9.3.0	9.4.0
	RP-49	RP-101008	0475	1	FGI settings in Rel-9	9.3.0	9.4.0
12/2010	RP-50	RP-101197	0483	-	Clarification on Meaning of FGI Bits	9.4.0	9.5.0
	RP-50	RP-101197	0485	-	Clarification regarding reconfiguration of the quantityConfig	9.4.0	9.5.0
	RP-50	RP-101210		1	Corrections to the presence of IE regarding DRX and CQI	9.4.0	9.5.0
	RP-50	RP-101210	0493	-	The field descriptions of MeasObjectEUTRA	9.4.0	9.5.0
	RP-50	RP-101197	0498	1	Clarification of FGI settings non ANR periodical measurement reporting	9.4.0	9.5.0
	RP-50	RP-101209	0500	_	Corrections to RLF Report	9.4.0	9.5.0
	RP-50	RP-101206		1	T321 timer fix	9.4.0	9.5.0
	RP-50	RP-101197		t -	Restriction of AC barring parameter setting	9.4.0	9.5.0
	RP-50	RP-101210		-	Removal of SEQUENCE OF SEQUENCE in	9.4.0	9.5.0
	00		0020		UEInformationResponse		0.0.0
	RP-50	RP-101197	0526	1	Clarification regarding default configuration value N/A	9.4.0	9.5.0
	RP-50	RP-101431	0532	-	Splitting FGI bit 3	9.4.0	9.5.0
	RP-50	RP-101183	0476	4	36.331 CR on Introduction of Minimization of Drive Tests	9.4.0	10.0.0
	RP-50	RP-101293	0477	4	AC-Barring for Mobile Originating CSFB call	9.4.0	10.0.0
	RP-50	RP-101214		-	Addition of UE-EUTRA-Capability descriptions	9.4.0	10.0.0
	RP-50	RP-101214		-	Clarification on Default Configuration for CQI-ReportConfig	9.4.0	10.0.0
	RP-50	RP-101215		-	CR to 36.331 adding e1xCSFB support for dual Rx/Tx UE	9.4.0	10.0.0
	RP-50	RP-101227		1	Introduction of Carrier Aggregation and UL/ DL MIMO	9.4.0	10.0.0
	RP-50	RP-101228		1	Introduction of relays in RRC	9.4.0	10.0.0
	RP-50	RP-101214		1	Priority indication for CSFB with re-direction	9.4.0	10.0.0
	RP-50	RP-101214		-	SIB Size Limitations	9.4.0	10.0.0
	RP-50	RP-101214		-	Combined Quantity Report for IRAT measurement of UTRAN	9.4.0	10.0.0
	RP-50	RP-101214		1	UE power saving and Local release	9.4.0	10.0.0
00/0044	RP-50	RP-101429		1	Inclusion of new UE categories in Rel-10	9.4.0	10.0.0
03/2011	RP-51	RP-110282		-	36331_CRxxx_Protection of Logged Measurements Configuration	10.0.0	10.1.0
	RP-51	RP-110294		1	Stage-3 CR for MBMS enhancement Clean up MDT-related text	10.0.0	10.1.0
	RP-51 RP-51	RP-110282 RP-110282		-	Clear MDT configuration and logs when the UE is not registered	10.0.0	10.1.0
	RP-51	RP-110282		-	Correction to the field description of nB	10.0.0	10.1.0
	RP-51	RP-110280		+	CR on impact on UP with remove&add approach_2	10.0.0	10.1.0
-	RP-51	RP-110289		-	CR to 36.331 on corrections for MDT	10.0.0	10.1.0
-	RP-51	RP-110202		-	Introduction of CA/MIMO capability signalling and measurement	10.0.0	10.1.0
	101-51	10290	0343	_	capability signalling in CA	10.0.0	10.1.0
	RP-51	RP-110282	0544	-	MDT PDU related clarifications	10.0.0	10.1.0
	RP-51	RP-110282		1-	Correction on release of logged measurement configuration while	10.0.0	10.1.0
			-		in another RAT		
	RP-51	RP-110289	0546	-	Miscellaneous Corrections for CA Running RRC CR	10.0.0	10.1.0
	RP-51	RP-110280		1	Miscellaneous small clarifications and corrections	10.0.0	10.1.0
	RP-51	RP-110293		4	Necessary changes for RLF reporting enhancements	10.0.0	10.1.0
	RP-51	RP-110282		1	Memory size for logged measurements capable UE	10.0.0	10.1.0
	RP-51	RP-110289		-	Parameters confusion of non-CA and CA configurations	10.0.0	10.1.0
	RP-51	RP-110272		-	Presence condition for cellSelectionInfo-v920 in SIB1	10.0.0	10.1.0
	RP-51	RP-110282		1	Removal of MDT configuration at T330 expiry	10.0.0	10.1.0
	RP-51	RP-110289		1	Signalling aspects of existing LTE-A parameters	10.0.0	10.1.0
	RP-51	RP-110280		1	Some Corrections on measurement	10.0.0	10.1.0
ļ	RP-51	RP-110291		-	Stored system information for RNs	10.0.0	10.1.0
1	RP-51	RP-110291		-	Support of Integrity Protection for Relay	10.0.0	10.1.0
——	RP-51	RP-110290		2	Updates of L1 parameters for CA and UL/DL MIMO	10.0.0	10.1.0
		DD 4	・ハヒフィ	11	Note for Dedicated SIB for RNs	10.0.0	10.1.0
	RP-51	RP-110291		1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	40 -	
	RP-51 RP-51	RP-110272	0579	-	Correction to cs-fallbackIndicator field description	10.0.0	10.1.0
	RP-51 RP-51 RP-51	RP-110272 RP-110289	0579 0580	-	Clarification to the default configuration of sCellDeactivationTimer	10.0.0	10.1.0
	RP-51 RP-51 RP-51 RP-51	RP-110272 RP-110289 RP-110289	0579 0580 0581	-	Clarification to the default configuration of sCellDeactivationTimer Miscellaneous corrections to TS 36.331 on Carrier Aggregation	10.0.0 10.0.0	10.1.0 10.1.0
	RP-51 RP-51 RP-51 RP-51 RP-51	RP-110272 RP-110289 RP-110289 RP-110280	0579 0580 0581 0584		Clarification to the default configuration of sCellDeactivationTimer Miscellaneous corrections to TS 36.331 on Carrier Aggregation Correction of configuration description in SIB2	10.0.0 10.0.0 10.0.0	10.1.0 10.1.0 10.1.0
	RP-51 RP-51 RP-51 RP-51	RP-110272 RP-110289 RP-110289	0579 0580 0581 0584	- - - -	Clarification to the default configuration of sCellDeactivationTimer Miscellaneous corrections to TS 36.331 on Carrier Aggregation	10.0.0 10.0.0	10.1.0 10.1.0

	RP-51	RP-110292	0590	-	- - - - - - - - - -	10.0.0	10.1.0
	RP-51	RP-110292	0501	<u> </u>	time domain ICIC Update of R2-110821 on RRM/RLM resource restriction for time	10.0.0	10.1.0
	KP-51	RP-110292	0591	-	Idomain ICIC	10.0.0	10.1.0
	RP-51	RP-110290	0592	-	Corrections on UE capability related parameters	10.0.0	10.1.0
	RP-51	RP-110282		-	Validity time for location information in Immediate MDT	10.0.0	10.1.0
	RP-51	RP-110280		-	CR to 36.331 adding UE capability indicator for dual Rx/Tx	10.0.0	10.1.0
					e1xCSFB		
	RP-51	RP-110289		-	Miscellaneous corrections to CA	10.0.0	10.1.0
	RP-51	RP-110280		-	Further correction to combined measurement report of UTRAN	10.0.0	10.1.0
	RP-51	RP-110280		-	Correction to the reference of ETWS	10.0.0	10.1.0
	RP-51	RP-110269	0602	1	Introduction of OTDOA inter-freq RSTD measurement indication	10.0.0	10.1.0
					procedure		
	RP-51	RP-110280	0603	-	Correction of use of RRCConnectionReestablishment message for contention resolution	10.0.0	10.1.0
	RP-51	RP-110282	0604	<u> </u>	CR to 36.331 on MDT neighbour cell measurements logging	10.0.0	10.1.0
	RP-51	RP-110272		<u> </u>	Minor ASN.1 corrections for the UEInformationResponse message	10.0.0	10.1.0
	RP-51	RP-110280		-	Clarification regarding dedicated RLF timers and constants	10.0.0	10.1.0
	RP-51	RP-110282		_	Release of Logged Measurement Configuration	10.0.0	10.1.0
	RP-51	RP-110280		-	Some corrections on TS 36.331	10.0.0	10.1.0
	RP-51	RP-110280		-	AC barring procedure clean up	10.0.0	10.1.0
	RP-51	RP-110282		1-	Counter proposal to R2-110826 on UE capabilities for MDT	10.0.0	10.1.0
	RP-51	RP-110280		1	UE information report for RACH	10.0.0	10.1.0
	RP-51	RP-110289		2	Measurement on the deactivated SCells	10.0.0	10.1.0
	RP-51	RP-110282		1	Trace configuration paremeters for Logged MDT	10.0.0	10.1.0
	RP-51	RP-110282		-	Clarification on stop condition for timer T3330	10.0.0	10.1.0
	RP-51	RP-110282	0637	-	User consent for MDT	10.0.0	10.1.0
	RP-51	RP-110280	0638	-	Correction on the range of CQI resource index	10.0.0	10.1.0
	RP-51	RP-110272		1	Small corrections to ETWS & CMAS system information	10.0.0	10.1.0
	RP-51	RP-110290	0641	1	UE capability signaling structure w.r.t carrier aggregation, MIMO	10.0.0	10.1.0
					and measurement gap		
	RP-51	RP-110289		1	Normal PHR and the multiple uplink carriers	10.0.0	10.1.0
	RP-51	RP-110280		1	Corrections to TS36.331 on SIB2 handling	10.0.0	10.1.0
	RP-51	RP-110280		1	Adding a Power Management indication in PHR	10.0.0	10.1.0
	RP-51	RP-110289		1	Clarification for CA and TTI bundling in RRC	10.0.0	10.1.0
00/0044	RP-51	RP-110443		1	Updates to FGI settings	10.0.0	10.1.0
06/2011	RP-52	RP-110836	0651	-		10.1.0	10.2.0
	DD 50	DD 440000	0050		RRC procedure Section 11.2	40.4.0	40.00
	RP-52	RP-110830	0653	-	Add pre Rel-10 procedures to processing delay requirement for RRC procedure Section 11.2	10.1.0	10.2.0
	RP-52	RP-110847	0654	1	Addition of a specific reference for physical configuration fields	10.1.0	10.2.0
	RP-52	RP-110839		<u> </u>	Clarification of inter-frequency RSTD measurement indication	10.1.0	10.2.0
	111 02	111 110000	0000		procedure	10.1.0	10.2.0
	RP-52	RP-110830	0658	-	Clarification of optionality of UE features without capability	10.1.0	10.2.0
	RP-52	RP-110839		-	Clarification on the definition of maxCellBlack	10.1.0	10.2.0
	RP-52	RP-110839		-	Clarification on upper layer requested connection release	10.1.0	
	RP-52	RP-110850		3	Clarification regarding elCIC measurements	10.1.0	10.2.0
	RP-52	RP-110839	0663	-	CR for s-measure handling	10.1.0	10.2.0
	RP-52	RP-110851		1	CR on clarification of RLF Report in Carrier Aggregation	10.1.0	10.2.0
	RP-52	RP-110830		-	FGI bit for handover between LTE FDD/TDD	10.1.0	10.2.0
	RP-52	RP-110847		2	Further updates on L1 parameters	10.1.0	10.2.0
	RP-52	RP-110839		2	General error handling for extension fields	10.1.0	10.2.0
	RP-52	RP-110851		2	Additional information for RLF report	10.1.0	10.2.0
	RP-52	RP-110843		-	Introduction of TCE ID for logged MDT	10.1.0	10.2.0
	RP-52	RP-110670	0674	4	Miscellaneous corrections (related to review in preparation for	10.1.0	10.2.0
	DD 50	DD 440040	0075		ASN.1 freeze)	40.4.0	40.0.0
	RP-52	RP-110843		-	PLMN check for MDT logging	10.1.0	10.2.0
	RP-52	RP-110839		-	UE actions upon leaving RRC_CONNECTED	10.1.0	10.2.0
	RP-52	RP-110847		-	Clarification on bandEUTRA-r10 and supportedBandListEUTRA	10.1.0	10.2.0
	RP-52	RP-110837		1	Updated value range for the Extended Wait Timer	10.1.0	10.2.0
	RP-52	RP-110839		1	Value range of DRX-InactivityTimer	10.1.0	10.2.0
<u> </u>	RP-52	RP-110828		1	Correction for SR-VCC and QCI usage	10.1.0	10.2.0
	RP-52 RP-52	RP-110847 RP-110839		2	Restructuring of CQI-ReportConfig-r10 Correction on DL allocations in MBSFN subframes	10.1.0	10.2.0
	RP-52 RP-52	RP-110839 RP-110850		_	Reference SFN for MeasSubframePattern	10.1.0	10.2.0
	RP-52	RP-110830		 	Clarifications to CA related field descriptions	10.1.0	10.2.0
	RP-52	RP-110847		 -	Corrections to codebookSubsetRestriction and SRS parameters	10.1.0	10.2.0
-	RP-52	RP-110834		<u> </u>	Corrections to toolespooks observes the first and SNS parameters Corrections to the handling of ri-ConfigIndex for TM9	10.1.0	10.2.0
	RP-52	RP-110715		2	UE capabilities for Rel-10 LTE features with elCIC measurement	10.1.0	10.2.0
	02	113713		[restrictions as FGI (Alt.1)	. 5	
	RP-52	RP-110839	0713	ļ-	CR to 36.331 on redirected utra-TDD carrier frequency	10.1.0	10.2.0
	RP-52	RP-110839		-	Explicit AS signalling for mapped PTMSI/GUTI	10.1.0	10.2.0
	RP-52	RP-110847		 -	Counter proposal for Updates of mandatory information in AS-	10.1.0	10.2.0
<u></u>				<u>L</u>	Config		<u> </u>

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	RP-52	RP-110839		-	CR for Reconfiguration of discardTimer in PDCP-Config	10.1.0	10.2.0
	RP-52	RP-110847		-	On the missing multiplicity of UE capability parameters	10.1.0	10.2.0
	RP-52 RP-52	RP-110830 RP-110847		-	Radio frame alignment of CSA and MSP Reconfiguration involving critically extended IEs (using	10.1.0	10.2.0
	RP-52	RP-110839	0744	-	fullFieldConfig i.e. option 2) Counter proposal to R2-112753 on CR to remove CSG Identity	10.1.0	10.2.0
	DD 50	DD 440000	0740	4	validity limited to CSG cell	40.4.0	40.00
	RP-52	RP-110839		1	Increase of prioritisedBitRate	10.1.0	10.2.0
00/0044	RP-52	RP-110847		-	CA and MIMO Capabilities in LTE Rel-10	10.1.0	10.2.0
09/2011	RP-53 RP-53	RP-111297 RP-111297		-	TS36.331 Correction maxNumberROHC-ContextSessions when no ROHC profile is	10.2.0	10.3.0
	RP-53	RP-111280	0757	-	Supported Correction to Subframe Allocation End in PMCH-Info	10.2.0	10.3.0
	RP-53	RP-111288		-	Correction on PUCCH configuration for Un interface	10.2.0	10.3.0
	RP-53	RP-111297		-	Miscellaneous corrections to 36.331	10.2.0	10.3.0
	RP-53	RP-111278		2	36.331 correction on CSG identity validity to allow introduction of CSG RAN sharing	10.2.0	10.3.0
	RP-53	RP-111283	0770	2	AdditionalSpectrumEmissions in CA	10.2.0	10.3.0
	RP-53	RP-111297		-	CR to 36.331 on Small correction of PHR parameter	10.2.0	10.3.0
	RP-53	RP-111283		2	Clarifications to P-max on CA	10.2.0	10.3.0
	RP-53	RP-111280		-	Clarification on for which subframes signalling MCS applies	10.2.0	10.3.0
	RP-53	RP-111283	0792	-	Corrections in RRC	10.2.0	10.3.0
	RP-53		0793	-	Replace the tables with exception list in 10.5 AS-Config	10.2.0	10.3.0
	RP-53	RP-111297	0796	-	Corrections to the field descriptions	10.2.0	10.3.0
	RP-53	RP-111283		-	Configuration of simultaneous PUCCH&PUSCH	10.2.0	10.3.0
	RP-53	RP-111297	0806	-	Corrections to release of csi-SubframePatternConfig and cqi-Mask	10.2.0	10.3.0
	RP-53	RP-111272	0810	-	GERAN SI format for cell change order&PS handover& enhanced redirection to GERAN	10.2.0	10.3.0
	RP-53	RP-111283	0811	-	Corrections to PUCCH-Config field descriptions	10.2.0	10.3.0
12/2011	RP-54	RP-111711	0812	1	Clarification of PCI range for CSG cells	10.3.0	10.4.0
	RP-54	RP-111716	0813	-	Clarifications to Default Radio Configurations	10.3.0	10.4.0
	RP-54	RP-111716	0814	1	Corrections to enhancedDualLayerTDD	10.3.0	10.4.0
	RP-54	RP-111716		-	Miscellaneous small corrections	10.3.0	10.4.0
	RP-54	RP-111716		1	Correction on notation of SRS transmission comb	10.3.0	10.4.0
	RP-54	RP-111706		1	36.331 CR SPS reconfiguration	10.3.0	10.4.0
	RP-54	RP-111716		2	Clarification of list sizes in measurement configuration stored by UE	10.3.0	10.4.0
	RP-54	RP-111706		-	Clarification of the event B1 and ANR related FGI bits	10.3.0	10.4.0
	RP-54	RP-111714		1	Clarification on MBSFN and measurement resource restrictions	10.3.0	10.4.0
	RP-54	RP-111706		-	Clarification on parallel message transmission upon connection re- establishment	10.3.0	10.4.0
03/2012	RP-55	RP-120326		1	Limiting MBMS counting responses to within the PLMN	10.4.0	10.5.0
	RP-55	RP-120321		-	CR to 36.331 on cdma2000 band classes and references	10.4.0	10.5.0
	RP-55	RP-120326		1	Clarification on MBSFN and measurement resource restrictions	10.4.0	10.5.0
	RP-55	RP-120325		-	On SIB10/11 Reception Timing	10.4.0	10.5.0
	RP-55	RP-120326		1	Clarification on MBMS counting for uncipherable services	10.4.0	10.5.0
	RP-55	RP-120325		-	Minor correction regarding limited service access on non-CSG- member cell	10.4.0	10.5.0
	RP-55	RP-120326		-	Time to keep RLF Reporting logs	10.4.0	10.5.0
	RP-55	RP-120356		1	Introducing means to signal different FDD/TDD Capabilities/FGIs for Dual-xDD UE	10.4.0	10.5.0
	RP-55	RP-120321		-	Clarification on SRB2 resumption upon connection re- establishment (parallel message transmission)	10.4.0	10.5.0
	RP-55	RP-120321		1	Duplicated ASN.1 naming correction	10.4.0	10.5.0
06/2012	RP-56	RP-120805		-	SPS Reconfiguration	10.5.0	10.6.0
	RP-56	RP-120805		1	Change in Scheduling Information for ETWS	10.5.0	10.6.0
	RP-56	RP-120807		1-	Clarification of mch-SchedulingPeriod configuration	10.5.0	10.6.0
	RP-56 RP-56	RP-120808 RP-120814		1	Change in Scheduling Information for CMAS Introducing means to signal different REL-10 FDD/TDD	10.5.0	10.6.0
-	RP-56	RP-120812	0020	1	Capabilities/FGIs for Dual-xDD UE Clarification on setting of dedicated NS value for CA by E-UTRAN	10.5.0	10.6.0
-	RP-56	RP-120812 RP-120808		-	T321 value for UTRA SI acquisition	10.5.0	10.6.0
-	RP-56	RP-120808 RP-120813		1	Korean Public Alert System (KPAS) in relation to CMAS	10.5.0	10.6.0
-	RP-56	RP-120813 RP-120812		1	Introduction of supported bandwidth combinations for CA	10.5.0	10.6.0
	RP-56	RP-120734		1	Introduction of multiple frequency band indicator	10.5.0	10.6.0
	RP-56	RP-120734		-	Introduction of multiple frequency band indicator	10.5.0	11.0.0
	RP-56	RP-120823		1	EU-Alert in relation to CMAS	10.5.0	11.0.0
09/2012	RP-57	RP-121371		1	Introduction of EAB	11.0.0	11.1.0
00,2012	RP-57	RP-121381		† -	Additional special subframe configuration related correction	11.0.0	11.1.0
	RP-57	RP-121423		4	36.331 CR introducing In-Device Coexistence (IDC)	11.0.0	11.1.0
	RP-57	RP-121359		†-	Voice support Capabilities	11.0.0	11.1.0
	RP-57	RP-121361		<u> </u>	Differentiating UTRAN modes in FGIs	11.0.0	11.1.0
	RP-57	RP-121368		1	Introduction of absolute priority based measurements and	11.0.0	11.1.0
	RP-57	RP-121370		-	reselection in CELL_FACH State in 36.331 Introducing MDT enhancements for REL-11	11.0.0	11.1.0
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	RP-57	RP-121376		2	Signaling support for CRS interference management in elCIC	11.0.0	11.1.0
	RP-57	RP-121395		-	CR on scell measurement cycle	11.0.0	11.1.0
	RP-57	RP-121395		-	CR on measurement report	11.0.0	11.1.0
	RP-57	RP-121378		3	Introduction of 'Power preference indication'	11.0.0	11.1.0
	RP-57	RP-121280	1060	-	Correction for PUCCH/SRS Release	11.0.0	11.1.0
12/2012	RP-58	RP-121933		-	Correction related to differentiating UTRAN modes in FGIs	11.1.0	11.2.0
	RP-58	RP-121936		-	Processing delay for RRCConnectionReconfiguration	11.1.0	11.2.0
	RP-58	RP-121953		2	Addition of the stage-3 agreements on IDC	11.1.0	11.2.0
	RP-58	RP-121951		3	Carrier Aggregation Enhancement RAN1 parameters	11.1.0	11.2.0
	RP-58	RP-121957		1	Clarification of SR period	11.1.0	11.2.0
	RP-58 RP-58	RP-121957 RP-121957	1069	1	Clarification on HandoverCommand message Clarification on mobility related issues	11.1.0 11.1.0	11.2.0 11.2.0
	RP-58	RP-121946		1	Correction of the signaling for Uncertainty and Confidence	11.1.0	11.2.0
	RP-58	RP-121940		2	Corrections to MBMS Service Continuity	11.1.0	11.2.0
	RP-58	RP-121940		-	CR to 36.331 on SIB15 acquisition	11.1.0	11.2.0
	RP-58	RP-121957		1	Handling of 1xCSFB failure	11.1.0	11.2.0
	RP-58	RP-121957		-	Miscellaneous corrections	11.1.0	11.2.0
	RP-58	RP-121958	1076	1	RAN overload control using RRC connection Rejection	11.1.0	11.2.0
	RP-58	RP-121954		-	RRC support for CoMP in UL	11.1.0	11.2.0
	RP-58	RP-121951		-	Some clarification to Carrier aggregation enhancements	11.1.0	11.2.0
	RP-58	RP-121939		1	Validity of EAB SIB and acquisition of SIB1	11.1.0	11.2.0
	RP-58	RP-121922			Clarification for Multiple Frequency Band Indicators feature	11.1.0	11.2.0
	RP-58	RP-121924		1	Moving the TM5 capability	11.1.0	11.2.0
	RP-58	RP-121959	1093	1	CR to 36.331 on introducing ROHC context continue for intra-ENB handover	11.1.0	11.2.0
	RP-58	RP-121946	1100	 	Correction on MDT multi-PLMN support	11.1.0	11.2.0
	RP-58	RP-121940		 	Clarification and alignment of handling of other configuration	11.1.0	11.2.0
	RP-58	RP-121970		6	Introducing support for Coordinated Multi-Point (CoMP) operation	11.1.0	11.2.0
	RP-58	RP-121922		2	Introducing further UE aspects regarding multi band cells	11.1.0	11.2.0
	RP-58	RP-121947		-	CR to 36.331 on additional information in RLF report for inter-RAT	11.1.0	11.2.0
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	RP-58	RP-121952		1	Correction on Power preference indication	11.1.0	11.2.0
	RP-58	RP-121950		1	SIB1 provisioning via dedicated signalling	11.1.0	11.2.0
	RP-58	RP-121936		2	Measurement reporting of Scells	11.1.0	11.2.0
	RP-58	RP-121956		1	Introduction of EPDCCH parameters in TS 36.331	11.1.0	11.2.0
	RP-58	RP-121961		2	Introduction of Rel-11 UE capabilities	11.1.0	11.2.0
	RP-58 RP-58	RP-121958 RP-121958		-	Introducion of wideband RSRQ measurements Introduction of network sharing for CDMA2000 inter-working	11.1.0 11.1.0	11.2.0
	RP-58	RP-121960			Broadcast of Time Info by Using a New SIB	11.1.0	11.2.0
	RP-58	RP-121957		-	GERAN measurement object at ANR	11.1.0	11.2.0
03/2013	RP-59	RP-130246		2	Miscellaneous corrections from review preceeding ASN.1 freeze	11.2.0	11.3.0
	RP-59	RP-130243		2	DL COMP capability related correction	11.2.0	11.3.0
	RP-59	RP-130231		1	Mandatory supporting of B1 measurement to UMTS FDD (FGI bit	11.2.0	11.3.0
					15)		
	RP-59	RP-130241		-	Clarification on MBMS Service Continuity	11.2.0	11.3.0
	RP-59	RP-130241		-	IDC Problem Reporting	11.2.0	11.3.0
	RP-59	RP-130247		-	Corrections on definition of CSG member cell	11.2.0	11.3.0
	RP-59	RP-130237		-	Extension of FBI and EARFCN	11.2.0	11.3.0
	RP-59 RP-59	RP-130228 RP-130225		<u> </u>	Invalidation of ETWS with security feature Invalid measurement configuration with different (E)ARFCN	11.2.0 11.2.0	11.3.0
	RP-59	RP-130225 RP-130241		2	PPI and IDC indication upon handover	11.2.0	11.3.0
	RP-59	RP-130227		1	Correcting further UE aspects regarding multi band cells	11.2.0	11.3.0
	RP-59	RP-130248		1	Behaviour in case of excessive dedicated priority information	11.2.0	11.3.0
	RP-59	RP-130225		-	Clarification on EARFCN signalling in Mobility control info	11.2.0	11.3.0
	RP-59	RP-130241	1244	<u> </u>	IDC-SubframePattern length for FDD	11.2.0	11.3.0
	RP-59	RP-130249	1252	-	Introduction of wideband RSRQ measurements in RRC_IDLE	11.2.0	11.3.0
	RP-59	RP-130240	1255	-	Optional support of RLF report for inter-RAT MRO	11.2.0	11.3.0
	RP-59	RP-130233		2	The presence of bandcombination for non-CA capable UEs	11.2.0	11.3.0
	RP-59	RP-130248		-	Correction for event A5	11.2.0	11.3.0
00/0040	RP-59	RP-130332		-	Mandating the settings of FGI bit 14, 27 and 28 to true	11.2.0	11.3.0
06/2013	RP-60	RP-130805	1267	-	Clarification on the redirection to UTRA-TDD frequency in case of	11.3.0	11.4.0
	RP-60	RP-130804	1269	1	CSFB High Priority Correction of wrong reference	11.3.0	11.4.0
	RP-60	RP-130809		<u> </u>	Clarification to support of deprioritisation feature	11.3.0	11.4.0
	RP-60	RP-130809		-	Clarification on KASME key usage	11.3.0	11.4.0
	RP-60	RP-130808		-	Correction on multi-TA capability	11.3.0	11.4.0
				1_	MBMS interest indication upon handover/ re-establishment	11.3.0	11.4.0
	RP-60	RP-130808	12/3				
	RP-60	RP-130808	1274	-	Conditions RI reference inheriting CSI process (DL CoMP)	11.3.0	11.4.0
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	RP-60	RP-130808	1274 1275	-	Conditions RI reference inheriting CSI process (DL CoMP)	11.3.0	

	RP-60	RP-130809	1277	-	Need code corrections in Rel-11 RRC	11.3.0	11.4.0
	RP-60	RP-130808	1278	ļ_	Miscellanous small corrections	11.3.0	11.4.0
	RP-60	RP-130809		1	FDD/TDD diff column correction for FGI31	11.3.0	11.4.0
	RP-60	RP-130804		1-	measCycleSCell upon SCell configuration	11.3.0	11.4.0
	RP-60	RP-130809		1	Clarification on RRC Connection Reconfiguration with Critical	11.3.0	11.4.0
	111 00	100003	1254		Extension	11.5.0	11.4.0
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	RP-60	RP-130802		-	Security key generation in case of MFBI	11.3.0	11.4.0
	RP-60	RP-130804		1	Clarification on inclusion of non-CA band combinations	11.3.0	11.4.0
	RP-60	RP-130809		-	CR on ROHC parameter configuration in Rel-11 RRC	11.3.0	11.4.0
	RP-60	RP-130804	1315	2	Clarification on UE CA capability	11.3.0	11.4.0
	RP-60	RP-130809	1321	Ī-	Updating 3GPP2 specification references	11.3.0	11.4.0
	RP-60	RP-130805		i -	Clarification on the configuration of the extended PHR	11.3.0	11.4.0
	RP-60	RP-130805		1	Clarifications on SystemTimeInfoCDMA2000 IE	11.3.0	11.4.0
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	RP-60	RP-130808		ļ- <u> </u>	MFBI impact on MBMS service continuity	11.3.0	11.4.0
	RP-60	RP-130819		1	MFBI aspects for dedicated signalling	11.3.0	11.4.0
09/2013	RP-61	RP-131311		-	Clarification on PhysCellIdRange	11.4.0	11.5.0
	RP-61	RP-131311	1339	1	Correction on the first subframe of the measurement gap	11.4.0	11.5.0
	RP-61	RP-131319	1340	1	Correction for MFBI in SIB15 and SIB6	11.4.0	11.5.0
	RP-61	RP-131319		i	Clarification of MFBI impact on MBMS service continuity	11.4.0	11.5.0
	RP-61	RP-131238		2	Clarification of UE action for otherwise in conditions	11.4.0	11.5.0
-	RP-61	RP-131311		ļ -	Corrections to the 3GPP2 specification references in 36.331	11.4.0	11.5.0
	RP-61	RP-131318	1353	-	Clarifications regarding the usage of "rlf-Cause" in case of	11.4.0	11.5.0
					handover failure		
12/2013	RP-62	RP-131986		-	Introduction of capability bit for UTRA MFBI	11.5.0	11.6.0
	RP-62	RP-131984	1368	1	Addition of inter-frequency RSTD measurement capability indicator	11.5.0	11.6.0
					for OTDOA		
	RP-62	RP-131989	1370	İ-	Clarification on supportedBand	11.5.0	11.6.0
	RP-62	RP-132003		t	Capturing mandatory/optional agreements on Rel-11 UE features	11.5.0	11.6.0
—					Clarification on otherwise behaviour		11.6.0
	RP-62	RP-131995		-		11.5.0	
	RP-62	RP-131995		-	Corrections of the 3GPP2 references in TS 36.331	11.5.0	11.6.0
	RP-62	RP-131991		-	measResultLastServCell for SON-HOF report	11.5.0	11.6.0
	RP-62	RP-131729	1375	1	Clarification to timeInfoUTC field in SIB16	11.5.0	11.6.0
	RP-62	RP-131991	1389	-	Clarification on eRedirection to UMTS TDD with multiple UMTS	11.5.0	11.6.0
					TDD frequencies		
	RP-62	RP-131995	1300	1	Delta signalling for critical extension	11.5.0	11.6.0
	RP-62	RP-132005			Capability signalling for CSI processes	11.5.0	11.6.0
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	RP-62	RP-131991		1	Clarifications on Measurement	11.5.0	11.6.0
	RP-62	RP-131984	1397	-	Correction to InterFreqRSTDMeasurementIndication field	11.5.0	11.6.0
					descriptions		
	RP-62	RP-131984	1404	-	Correction of Inter-frequency RSTD indication for multiple	11.5.0	11.6.0
					frequencies		
	RP-62	RP-131993	1405	1	Enabling SRVCC from GERAN without forwarding UE-EUTRA-	11.5.0	11.6.0
	1 02	141 101000	100	1	Capability	11.0.0	11.0.0
	RP-62	RP-131995	1400	1	System information and change monitoring procedure	11.5.0	11.6.0
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	RP-62	RP-131991		1	Correction on presence of codebookSubsetRestriction-r10	11.5.0	11.6.0
03/2014	RP-63	RP-140364		1	New UE categories for DL 450Mbps class	11.6.0	11.7.0
	RP-63	RP-140340	1437	2	Clarification regarding need codes, conditions and ASN.1 defaults	11.6.0	11.7.0
					for extension fields		
	RP-63	RP-140340	1440	-	ASN.1 issue with inter-node signalling (AS-Config)	11.6.0	11.7.0
	RP-63	RP-140354		1	IoT indication for inter-band TDD CA with different UL/DL	11.6.0	11.7.0
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1	DD 62	DD 140256	1///0	1		1160	11 7 0
	RP-63	RP-140356		1	Clarification on the presence of TDD special subframe	11.6.0	11.7.0
00/	RP-63	RP-140357	_	1	Clarification for the SIB occurrence in a single SI message	11.6.0	11.7.0
06/2014	RP-64	RP-140869		-	Removal of comment line from EUTRA-UE-Variables imports	11.7.0	11.8.0
	RP-64	RP-140871		-	Correction on measObjectList in VarMeasConfig	11.7.0	11.8.0
	RP-64	RP-140873	1476	-	Clarification on precedence of SCell SI provided dedicately	11.7.0	11.8.0
	RP-64	RP-140873		-	ACK/NACK feedback mode on PUSCH	11.7.0	11.8.0
	RP-64	RP-140873		1	Network-requested CA Band Combination Capability Signalling	11.7.0	11.8.0
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	RP-64	RP-140848	1000	4	Introduction of UE capability for eMBMS reception on SCell and	11.7.0	11.8.0
	DD 01	DD 4465=	4500	1	Non-Serving Cell	44 7 2	44.0.0
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35/2014	RP-65			1	Correction to Network-requested CA Band Combination Capability		
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