TSG-RAN Meeting #9 **RP-000365**
Oahu, HI, USA, 20 – 22 September 2000

Title: **Agreed CRs to TS 25.331 (5)**

Source: **TSG-RAN WG2**

Agenda item: **5.2.3**

Doc-1st-	Status-	Spec	CR	Rev	Subject	Cat	Version	Versio
R2-001801	agreed	25.331	512	1	Clarification on Reporting Cell Status	F	3.3.0	3.4.0
R2-001830	agreed	25.331	513	1	Editorial corrections on RRC Connection Establishment and Release procedures	F	3.3.0	3.4.0
R2-001704	agreed	25.331	514		Gated Transmission Control Info	F	3.3.0	3.4.0
R2-001802	agreed	25.331	515	1	Cell selection/reselection parameters for SIB 3/4	F	3.3.0	3.4.0
R2-001708	agreed	25.331	516		Implementation of Ec/N0 parameters and optimisation of SIB 11/12	F	3.3.0	3.4.0
R2-001725	agreed	25.331	517		PRACH Info	F	3.3.0	3.4.0
R2-001803	agreed	25.331	518	1	Uplink DPCH power control info	F	3.3.0	3.4.0
R2-001734	agreed	25.331	519		AICH power offset value range	F	3.3.0	3.4.0
R2-001831	agreed	25.331	520	2	Direct paging of RRC connected UE in CELL_PCH/URA_PCH	F	3.3.0	3.4.0
R2-001737	agreed	25.331	521		Corrections to Sections 1-7	F	3.3.0	3.4.0
R2-001738	agreed	25.331	522		Error handling for Uplink Physical Channel Control procedure	F	3.3.0	3.4.0
R2-001739	agreed	25.331	523		Corrections to downlink outer loop power control in compressed mode	F	3.3.0	3.4.0
R2-001770	agreed	25.331	524	1	Clarification on measurement procedure using compressed mode	F	3.3.0	3.4.0
R2-001833	agreed	25.331	525	1	Updates to cell and URA update procedures based on RRC Ad Hoc	F	3.3.0	3.4.0
R2-001832	agreed	25.331	526	1	Updates to RNTI allocation procedure based on RRC Ad Hoc	F	3.3.0	3.4.0
R2-001773	agreed	25.331	528		PRACH constant value	F	3.3.0	3.4.0
R2-001780	agreed	25.331	530		Corrections to the paging procedure	F	3.3.0	3.4.0
R2-001834	agreed	25.331	532	1	Miscellaneous corrections and moving of text from 3G TS 25.304	F	3.3.0	3.4.0
R2-001835	agreed	25.331	533	1	Message extensibility	F	3.3.0	3.4.0
R2-001836	agreed	25.331	534	1	Additions to "State of RRC Procedure" in RRC Initialisation information, source RNC to target RNC	F	3.3.0	3.4.0
R2-001837	agreed	25.331	535	1	Support of codec negotiation	F	3.3.0	3.4.0

Document **R2-001801**

e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

3GPP-RAN-WG2 Meeting #15
Sophia Antipolis, France, 21-25 August 2000

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25.331 CR 512r1 Current Version: 3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG-RAN #9	for approval	X	strategic	(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	

Proposed change affects: (U)SIM [X] ME [ ] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: TSG-RAN WG2 **Date:** 21st August, 00

Subject: Clarification on Reporting Cell Status

Work item:

Category: *(only one category Shall be marked With an X)*

F	Correction	X	**Release:** Phase 2	
A	Corresponds to a correction in an earlier release		Release 96	
B	Addition of feature		Release 97	
C	Functional modification of feature		Release 98	
D	Editorial modification		Release 99	X
			Release 00	

Reason for change: "Need" column of "Reporting Cell Status" is either "OP" or "CV"(optional or not present), but the behaviour of the UE when "Reporting Cell Status" is not included in a message is not specified. It is proposed to exclude "Cell Measured Results" in MEASUREMENT REPORT, if "Reporting Cell Status" is not sent to the UE for intra- and inter-frequency. Such description is not needed for inter-system measurement, since the measured results to be included for inter-system is for each RAT, not for each cell satisfying the condition.

Clauses affected: 8.5.7.7.x, 10.3.7.86

Other specs Affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments: Changes made by revision 1 is highlighted by yellow

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8.5.7.7 Measurement information elements

8.5.7.7.x Reporting Cell Status

If the IE “Reporting Cell Status” is received, the UE shall set the IE “Measured Results” in MEASUREMENT REPORT as follows:

- For intra-frequency measurement and inter-frequency measurement, the UE shall include the IE “Cell Measured Results” for cells that satisfy the condition (such as “within active set cells”) specified in “Reporting Cell Status”, in descending order by the measurement quantity.
- The maximum number of the IE “Cell Measured Results” to be included in the IE “Measured Results” is the number specified in “Reporting Cell Status”.

If the IE “Reporting Cell Status” is not received for intra-frequency or inter-frequency measurement, the UE shall exclude the IE “cell measured results” for any cell in MEASUREMENT REPORT.

10.3.7.86 Reporting Cell Status

Indicates maximum allowed number of cells to report and whether active set cells and/or virtual active set cells and/or monitored set cells on used frequency and/or monitored set cells on non used frequency should/should not be included in the IE "Measured results".

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Choice reporting cell	MP			
>Within active set cells				
>> Maximum number of reporting cells type1	MP		Integer(1..6)	
>Within monitored set cells on used frequency				
>> Maximum number of reporting cells type1	MP		Integer(1..6)	
>Within monitored cells on used frequency				
>> Maximum number of reporting cells type1	MP		Integer(1..6)	
>Include all active set cells + within monitored set cells on used frequency				
>> Maximum number of reporting cells type3	MP		Enumerated (virtual/active set cells+1, virtual/active set cells+2, …., virtual/active set cells+6)	
>Within virtual active set cells				
>> Maximum number of reporting cells type1	MP		Integer(1..6)	
>Within monitored set cells on non-used frequency				
>> Maximum number of reporting cells type1	MP		Integer(1..6)	
>Within monitored cells on non-used frequency				
>> Maximum number of reporting cells type1	MP		Integer(1..6)	
>Include all virtual active set cells + within monitored set cells on non-used frequency				
>> Maximum number of reporting cells type3	MP		Enumerated (virtual/active set cells+1, virtual/active set cells+2, …., virtual/active set cells+6)	
>Within active set cells or within virtual active set cells				
>> Maximum number of reporting cells type2	MP		Integer (1..12)	
>Within monitored cells on used frequency or within monitored cells on non-used frequency				
>> Maximum number of reporting cells type2	MP		Integer(1..12)	

Note: Monitored cells consist of active set cells and monitored set cells

3GPP TSG RAN WG2#15
Sophia Antipolis, 21-25 Aug, 2000

Document R2-001830
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

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25.331 CR 512r1 Current Version: 3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-RAN #9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑	for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from:* ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: TSG-RAN WG2 **Date:** 2000-08-21

Subject: Editorial corrections on RRC Connection Establishment and Release procedures

Work item:

Category:
(only one category shall be marked with an X)

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: Editorial changes after RRC ad-hoc meeting

Clauses affected: 8.1.3.7, 8.1.4.3, 8.1.4.5, 13.2, 13.3

Other specs Affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments: open points:

-error handling for syntactic an semantic check

-activation time

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8.1.3 RRC connection establishment

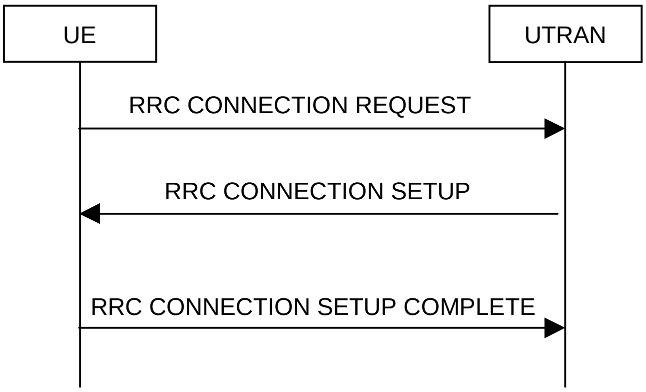

Figure 7: RRC Connection Establishment, network accepts RRC connection

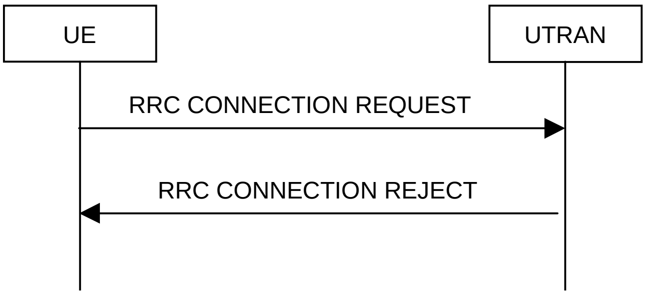

Figure 8: RRC Connection Establishment, network rejects RRC connection

8.1.3.1 General

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

8.1.3.2 Initiation

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

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

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

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

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

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

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

The UE shall include a measurement report, as specified in the IE "Intra-frequency reporting quantity for RACH reporting" and the IE "Maximum number of reported cells on RACH" in system information block type 11.

8.1.3.3 Reception of an RRC CONNECTION REQUEST message by the UTRAN

UTRAN should either:

- transmit an RRC CONNECTION SETUP message on the downlink CCCH; or

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

8.1.3.4 Reception of a RRC CONNECTION SETUP message by the UE

The UE shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION SETUP message with the value of the IE "Initial UE identity" in the most recent RRC CONNECTION REQUEST message sent by the UE:

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

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

The UE shall:

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

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

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

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

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

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

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

The UE shall enter a state according to 8.5.8.

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

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

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

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

When the transmission of the RRC CONNECTION SETUP COMPLETE message has been confirmed by RLC the UE shall update its variable UE_CAPABILITY_TRANSFERRED which UE capabilities it has transmitted to the UTRAN, set the "Status" in the variable INTEGRITY_ PROTECTION_INFO to "Not started", and the procedure ends.

8.1.3.5 Physical channel failure or T300 timeout

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

The UE shall check the value of V300, and:

- if V300 is equal to or smaller than N300, the UE shall transmit a new RRC CONNECTION REQUEST message on the uplink CCCH, restart timer T300 and increase counter V300. The UE shall set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.2;

- if V300 is greater than N300, the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2.

8.1.3.6 Invalid RRC CONNECTION SETUP message

If the UE receives an RRC CONNECTION SETUP message:

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

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

The UE shall check the value of V300, and

- if V300 is equal to or smaller than N300, the UE shall transmit a new RRC CONNECTION REQUEST message on the uplink CCCH, set the variable PROTOCOL_ERROR_INDICATOR to TRUE, restart timer T300 and increase counter V300. The UE shall set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.2;

- if V300 is greater than N300, the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2.

8.1.3.7 Reception of an RRC CONNECTION REJECT message by the UE

When the UE receives an RRC CONNECTION REJECT message on the downlink CCCH, it shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION REJECT message with the value of the IE "Initial UE identity" in the last RRC CONNECTION REQUEST message sent by the UE:

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

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

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

If the IE "frequency info" is present and:

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

- if a cell selection on the designated carrier fails, the UE shall wait at least the time stated in the IE "wait time", and then transmit a new RRC CONNECTION REQUEST message on the uplink CCCH of the original serving cell, restart timer T300 and increase counter V300. UE shall set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.2;

- if V300 is greater than N300 the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2.

If the IE "inter-system info" is present and:

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

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

If neither the IEs "frequency info" nor "inter-system info" are present and:

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

If the IE "wait time" = '0', the UE shall:

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

8.1.3.8 Invalid RRC CONNECTION REJECT message

If the UE receives an RRC CONNECTION REJECT message:

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

If the IE "wait time" is <> 0, and:

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

If the IE "wait time" is = 0 the UE shall:

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

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

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

8.1.4 RRC connection release

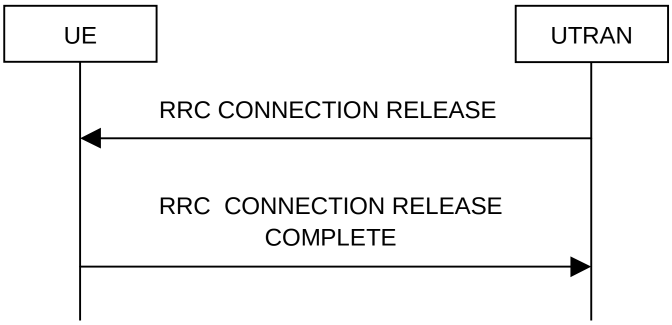

Figure 9: RRC Connection Release procedure

8.1.4.1 General

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

8.1.4.2 Initiation

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

UTRAN may transmit several RRC CONNECTION RELEASE messages to increase the probability of proper reception of the message by the UE. The number of repeated messages and the interval between the messages is a network option.

8.1.4.3 Reception of an RRC CONNECTION RELEASE message by the UE

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

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

- When in state CELL_DCH, transmit an RRC CONNECTION RELEASE COMPLETE message using unacknowledged mode to the UTRAN reset counter V308 and start timer T308.
- When in state CELL_FACH, transmit an RRC CONNECTION RELEASE COMPLETE message using acknowledged mode to the UTRAN.

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

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

When in CELL_DCH state, UE shall initialise the ~~counter V308~~ N308 with the value of the IE "Number of RRC Message Transmissions", which indicates the number of times to send the RRC CONNECTION RELEASE COMPLETE message.

8.1.4.4 Invalid RRC CONNECTION RELEASE message

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

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

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

8.1.4.5 Expiry of timer T308 in CELL_DCH state

When in state CELL_DCH and the timer T308 expires, the UE shall ~~decrease~~ increase V308 by one. If V308 is equal to or smaller ~~greater~~ than N308~~zero~~, the UE shall retransmit the RRC CONNECTION RELEASE COMPLETE message. If V308 is greater than~~equal to~~ N308~~zero~~, the UE shall release all its radio resources, enter idle mode and the procedure ends on the UE side. Actions the UE shall perform when entering idle mode are given in subclause 8.5.2

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

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

8.1.4.7 Reception of an RRC CONNECTION RELEASE COMPLETE message by UTRAN

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

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

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

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

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

8.1.4.10 No reception of an RRC CONNECTION RELEASE COMPLETE message by UTRAN

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

13.2 Counters for UE

Counter	Reset	Incremented	When reaching max value
V300	When initiating the procedure RRC connection establishment	Upon expiry of T300.	When V300 > N300, the UE enters idle mode.
V302	When initiating the procedure Cell update	Upon expiry of T302	When V302 > N302 the UE enters idle mode.
V303	When initiating the procedure URA update	Upon expiry of T303	When V302 > N303 the UE enters idle mode.
V304	When sending the first UE CAPABILITY INFORMATION message.	Upon expiry of T304	When V304 > N304 the UE initiates the RRC connection re-establishment procedure

Counter	Reset	Decremented	When reaching zero
V308	When sending the first RRC CONNECTION RELEASE COMPLETE message in a RRC connection release procedure.	Upon expiry of T308	When V308 ~~=0~~> N308 the UE stops re-transmitting the RRC CONNECTION RELEASE COMPLETE message.

Counter	Reset	Incremented	When reaching max value
V310	When sending the first PUSCH CAPACITY REQUEST message in a PUSCH capacity request procedure	Upon expiry of T310	When V310 > N310 the UE stops re-transmitting the PUSCH CAPACITY REQUEST message.

13.3 UE constants and parameters

Constant	Usage
N300	Maximum number of retransmissions of the RRC CONNECTION REQUEST message
N301	Maximum number of retransmissions of the RRC CONNECTION REESTABLISHMENT REQUEST message
N302	Maximum number of retransmissions of the CELL UPDATE message
N303	Maximum number of retransmissions of the URA UPDATE message
N304	Maximum number of retransmissions of the UE CAPABILITY INFORMATION message
N308	Maximum number of retransmissions of the RRC CONNECTION RELEASE COMPLETE message
N310	Maximum number of retransmission of the PUSCH CAPACITY REQUEST message
N312	Maximum number of successive "in sync" received from L1.
N313	Maximum number of successive "out of sync" received from L1.
N315	Maximum number of successive "in sync" received from L1 during T313 is activated.

3GPP TSG RAN WG2 meeting #15
Sophia Antipolis, France, 21-25 August 2000

Document* *R2-001704
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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25.331	**CR**	**514**	Current Version:	3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG-RAN #9	for approval	X	strategic		*(for SMG Use only)*
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio	X	Core Network

Source: TSG-RAN WG2 **Date:** 2000-08-18

Subject: Gated Transmission control Info

Work item:

Category:				**Release:**		
	F	Correction	X		Phase 2	
	A	Corresponds to a correction in an earlier release			Release 96	
(only one category	B	Addition of feature			Release 97	
shall be marked	C	Functional modification of feature			Release 98	
with an X)	D	Editorial modification			Release 99	X
					Release 00	

Reason for change: The messages don't contain even optionally the gated transmission control info. Thus, it is proposed to remove the general clause on this IE. The tabular format as well as the ASN.1 description are not affected.

Clauses affected: 8.5.7.6.7

Other specs affected:			
	Other 3G core specifications		→ List of CRs:
	Other GSM core specifications		→ List of CRs:
	MS test specifications		→ List of CRs:
	BSS test specifications		→ List of CRs:
	O&M specifications		→ List of CRs:

Other comments:

help.doc

<---------- double-click here for help and instructions on how to create a CR.

~~8.5.7.6.7 Gated transmission control info~~

~~If the IE "Gated transmission control info" is included and the gating rate equals Full, then UE shall:~~

- ~~Stop gated transmission of uplink(if supported) and downlink DPCCH at activation time.~~

~~Otherwise, UE shall:~~

- ~~Start gated transmission of uplink(if supported) and downlink DPCCH at activation time with given gating rate and pattern.~~

3GPP TSG RAN WG2#15
Sophia Antipolis, France, August 21- 25, 2000

***Document* R2-001802**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.331 CR 515r1 Current Version: 3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-RAN #9
list expected approval meeting # here ↑

for approval	X	strategic		*(for SMG use only)*
for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects: (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: TSG-RAN WG2 **Date:** 18/8/2000

Subject: Cell selection/Reselection Parameters for SIB 3/4

Work item:

Category:
(only one category shall be marked with an X)

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change:
-Parameters Qhyst2 and $S_{limit,ShearchRAT}$ have to be implemented in Tabular and ASN1
-S-SearchQual is more explicit than S-Shearch-FDD because it refers to a type of measurement and not a type of cell.
-Same for S-SearchRXLEV

Clauses affected: 10.3.2.3 , 11.3.2

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

help.doc

<---------- double-click here for help and instructions on how to create a CR.

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

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

>>$S_{intersearch}$	OP		Integer (-105..91 by step of 2)	TS 25.304 [dB]
>>$S_{searchHCS}$	OP		Integer (-105..91 by step of 2)	TS 25.304 [dB]
>>RAT List	OP	1 to <maxOtherRAT>		
>>>RAT identifier	MP		Enumerated (GSM, cdma2000)	At least 2 spare values Criticality: reject are needed
>>>$S_{search,RAT}$	OP		Integer (-105..91 by step of 2)	TS 25.304 [dB]
>>>$S_{HCS,RAT}$	OP		Integer (-105..91 by step of 2)	TS 25.304 [dB]
>>>$S_{limit,ShearchRAT}$	OP		Integer (-105..91 by step of 2)	TS 25.304 [dB]
$Qhyst1_s$	MP		Integer (0..40 by step of 2)	TS 25.304
$Qhyst2_s$	CV-FDD-Quality-Measure		Integer (0..40 by step of 2)	Default value is $Qhist1_s$ TS 25.304
$Treselection_s$	MP		Integer (0..31)	[s]
HCS Serving cell Information	OP		HCS Serving cell information 10.3.7.12	
Maximum allowed UL TX power	MP		Maximum allowed UL TX power 10.3.6.33	[dBm] UE_TXPWR_MAX_RACH in 25.304.
CHOICE *mode*	MP			
>FDD				
>>Qqualmin	MD		Integer (-20..0)	Ec/N0, [dB] Default value is Qrxlevmin for the serving cell
>>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell
>TDD				
>>Qrxlevmin	MP		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell

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

11.3.2 UTRAN mobility information elements

```
UTRANMobility-IEs DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    MaxAllowedUL-TX-Power
FROM PhysicalChannel-IEs

    HCS-ServingCellInformation,
    Q-QualMin,
    Q-RxlevMin
FROM Measurement-IEs

    maxAC,
    maxMeasIntervals,
    maxOtherRAT,
    maxRAT,
    maxURA
FROM Constant-definitions;

AccessClassBarred ::=               ENUMERATED {
                                        barred, notBarred }

AccessClassBarredList ::=           SEQUENCE (SIZE (maxAC)) OF
                                        AccessClassBarred

AllowedIndicator ::=                ENUMERATED {
                                        allowed, notAllowed }

CellAccessRestriction ::=           SEQUENCE {
    cellBarred                          CellBarred,
    cellReservedForOperatorUse          ReservedIndicator,
    cellReservedForSOLSA                ReservedIndicator,
    accessClassBarredList               AccessClassBarredList               OPTIONAL
}

CellBarred ::=                      CHOICE {
    barred                              SEQUENCE {
        intraFreqCellReselectionInd         AllowedIndicator,
        t-Barred                            T-Barred
    },
    notBarred                           NULL
}

CellIdentity ::=                    BIT STRING (SIZE (28))

CellSelectQualityMeasure ::=        ENUMERATED {
                                        cpich-Ec-N0, cpich-RSCP }

CellSelectReselectInfoSIB-3-4 ::=   SEQUENCE {
    mappingInfo                         MappingInfo                         OPTIONAL,
    cellSelectQualityMeasure            CHOICE {
        cpich-Ec-No                         SEQUENCE {
            q-HYST-2-S                          Q-HYST-S                    OPTIONAL
            -- Default value for q-HYST-2-S is q-HYST-1-S
        },
        cpich-RSCP                          NULL
    },
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            ~~cellSelectQualityMeasure          CellSelectQualityMeasure,~~
            s-Intrasearch                       S-SearchQual~~FDD~~             OPTIONAL,
            s-Intersearch                       S-SearchQual~~FDD~~             OPTIONAL,
            s-SearchHCS                         S-SearchRXLEV~~FDD~~                OPTIONAL,
            rat-List                            RAT-FDD-InfoList            OPTIONAL,
            q-QualMin                           Q-QualMin                   OPTIONAL,
            q-RxlevMin                          Q-RxlevMin                  OPTIONAL
        },
        tdd                                 SEQUENCE {
            s-Intrasearch                       S-SearchRXLEV~~TDD~~                OPTIONAL,
            s-Intersearch                       S-SearchRXLEV~~TDD~~                OPTIONAL,
            s-SearchHCS                         S-SearchRXLEV~~TDD~~                OPTIONAL,
            rat-List                            RAT-TDD-InfoList            OPTIONAL,
            q-RxlevMin                          Q-RxlevMin                  OPTIONAL
```

```
		}
	},	q-Hyst-1-S						Q-Hyst-S,
	t-Reselection-S					T-Reselection-S,
	hcs-ServingCellInformation			HCS-ServingCellInformation		OPTIONAL,
	maxAllowedUL-TX-Power				MaxAllowedUL-TX-Power
}

MapParameter ::=					INTEGER (0..99)

Mapping ::=							SEQUENCE {
	rat									RAT,
	mappingFunctionParameterList		MappingFunctionParameterList
}

MappingFunctionParameter ::=		SEQUENCE {
	functionType						MappingFunctionType,
	mapParameter1						MapParameter					OPTIONAL,
	mapParameter2						MapParameter,
	upperLimit							UpperLimit						OPTIONAL
	-- The parameter is conditional on the number of repetition
}

MappingFunctionParameterList ::=	SEQUENCE (SIZE (1..maxMeasIntervals)) OF
										MappingFunctionParameter

MappingFunctionType ::=				ENUMERATED {
										linear,
										functionType2,
										functionType3,
										functionType4 }

MappingInfo ::=						SEQUENCE (SIZE (1..maxRAT)) OF
										Mapping

-- Actual value = IE value * 2
Q-Hyst-S ::=						INTEGER (0..20)

RAT ::=								ENUMERATED {
										utra-FDD,
										utra-TDD,
										gsm,
										cdma2000 }

RAT-FDD-Info ::=					SEQUENCE {
	rat-Identifier						RAT-Identifier,
	s-SearchRAT							S-SearchQualFDD,
	s-HCS-RAT							S-SearchRXLEVFDD					OPTIONAL,
	s-Limit-SearchRAT					S-SearchQual
}

RAT-FDD-InfoList ::=				SEQUENCE (SIZE (1..maxOtherRAT)) OF
										RAT-FDD-Info

RAT-Identifier ::=					ENUMERATED {
										gsm, cdma2000,
										spare1, spare2 }

RAT-TDD-Info ::=					SEQUENCE {
	rat-Identifier						RAT-Identifier,
	s-SearchRAT							S-SearchRXLEVTDD,
	s-HCS-RAT							S-SearchRXLEVTDD					OPTIONAL,
	s-Limit-SearchRAT					S-SearchRXLEV

}

RAT-TDD-InfoList ::=				SEQUENCE (SIZE (1..maxOtherRAT)) OF
										RAT-TDD-Info

ReservedIndicator ::=				ENUMERATED {
										reserved,
										notReserved }

-- Actual value = IE value * 2
S-SearchQualFDD ::=						INTEGER (-16..10)

-- Actual value = (IE value * 2) + 1
S-SearchRXLEVTDD ::=						INTEGER (-53..45)
```

```
T-Barred ::=                        ENUMERATED {
                                        s10, s20, s40, s80,
                                        s160, s320, s640, s1280 }

T-Reselection-S ::=                 INTEGER (0..31)

-- The used range depends on the RAT used.
UpperLimit ::=                      INTEGER (1..91)

URA-Identity ::=                    BIT STRING (SIZE (16))

URA-IdentityList ::=                SEQUENCE (SIZE (1..maxURA)) OF
                                        URA-Identity

END
```

3GPP TSG RAN WG2#15
Sophia Antipolis, France, August 21- 25, 2000

Document R2-001708
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.331	**CR**	**516**	Current Version:	3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-RAN #9
list expected approval meeting # here ↑

for approval	X	strategic		*(for SMG use only)*
for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects: (U)SIM [ ] ME [ ] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: TSG-RAN WG2 **Date:** 18/8/2000

Subject: Implementation of Ec/No Parameters and Optimisation of SIB 11/12

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	
A	Corresponds to a correction in an earlier release		
B	Addition of feature		
C	Functional modification of feature		
D	Editorial modification		

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change:

-The Parameters Qoffset2 and TemporaryOffset2 have been introduced in 25.304, they need to be present in SIB 11/12, in tabular and ASN1.

-When HCS or Ec/No measurement is not used, the presence of some related parameters do not need to be boradcasted in SIB 11/12. The IEs "Use of HCS" and "Cell_selection_and_reselection_quality_measure" have been added in SIB 11/12 to allow this. This is implemented in ASN1 by the use of CHOICE.

Clauses affected: 8.1.1.5.11,8.1.1.5.12,10.3.2.4,10.3.7.10,10.3.7.72,11.3.7

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

8.1.1.5.11 System Information Block type 11

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

- if IEs containing scheduling information for other system information blocks are included, the UE shall act on those IEs in a similar manner as specified for the scheduling information contained within the master information block.
- for each measurement type start a measurement using the set of IEs specified for that measurement type.
- associate each measurement with the identity number given by the IE "Measurement identity number".
- if included, store the IE "Intra-frequency reporting quantity" and the IE "Intra-frequency measurement reporting criteria" or "Periodical reporting criteria" in order to activate reporting when state CELL_DCH is entered.
- If IE "Use of HCS"~~ Serving cell information"~~ is set to "used" ~~included~~, this indicates that HCS is used, and UE shall do the following:
    - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Intra-frequency Cell Information", UE shall use the default values specified for the IE "HCS neighbouring cell information" for that cell.
    - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Intra-frequency Cell Information", UE shall for that cell use the same parameter values as used for the preceding IE "Intra-frequency Cell Information".
    - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-frequency Cell Information", UE shall use the default values specified for the IE "HCS neighbouring cell information" for that cell.
    - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-frequency Cell Information", UE shall for that cell use the same parameter values as used for the preceding IE "Inter-frequency Cell Information".
    - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-system Cell Information", UE shall use the default values specified for the IE "HCS neighbouring cell information" for that cell.
    - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-system Cell Information", UE shall for that cell use the same parameter values as used for the preceding IE "Inter-system Cell Information".
- ~~If IE "HCS Serving cell information" is not included, this indicates that HCS is not used, and any occurrences of IE "HCS neighbouring cell information" in System Information Block Type 11 shall be neglected by UE.~~

8.1.1.5.12 System Information Block type 12

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

- if IEs containing scheduling information for other system information blocks are included, the UE shall act on those IEs in a similar manner as specified for the scheduling information contained within the master information block.
- for each measurement type start (or continue) a measurement using the set of IEs specified for that measurement type.
- remove the intra-frequency cells given by the IE "Removed intra-frequency cells" from the list of intra-frequency cells specified in system information block type 11. Add the intra-frequency cells given by the IE "New intra-frequency cells" to the list of intra-frequency cells specified in system information block type 11.

- if any of the IEs "Intra-frequency measurement quantity", "Intra-frequency reporting quantity for RACH reporting", "Maximum number of reported cells on RACH" or "Reporting information for state CELL_DCH" are not included in the system information block, read the corresponding IE(s) in system information block type 11 and use that information for the intra-frequency measurement.
- if included in this system information block or in system information block type 11, store the IE "Intra-frequency reporting quantity" and the IE "Intra-frequency measurement reporting criteria" or "Periodical reporting criteria" in order to activate reporting when state CELL_DCH is entered.
- remove the inter-frequency cells given by the IE "Removed inter-frequency cells" from the list of inter-frequency cells specified in system information block type 11. Add the inter-frequency cells given by the IE "New inter-frequency cells" to the list of inter-frequency cells specified in system information block type 11.
- if the IE "Inter-frequency measurement quantity" is not included in the system information block, read the corresponding IE in system information block type 11 and use that information for the inter-frequency measurement.
- remove the inter-system cells given by the IE "Removed inter-system cells" from the list of inter-system cells specified in system information block type 11. Add the inter-system cells given by the IE "New inter-system cells" to the list of inter-system cells specified in system information block type 11.
- if the IE "Inter-system measurement quantity" is not included in the system information block, read the corresponding IE in system information block type 11 and use that information for the inter-system measurement.
- if in state CELL_FACH, start traffic volume measurement reporting as specified in the IE "Traffic volume measurement reporting quantity".
- associate each measurement with the identity number given by the IE "Measurement identity number".
- If IE "Use of HCS”~~ Serving cell information" is included~~is set to “used”~~,~~ this indicates that HCS is used, and UE shall do the following:
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Intra-frequency Cell Information", UE shall use the default values specified for the IE "HCS neighbouring cell information" for that cell.
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Intra-frequency Cell Information", UE shall for that cell use the same parameter values as used for the preceding IE "Intra-frequency Cell Information".
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-frequency Cell Information", UE shall use the default values specified for the IE "HCS neighbouring cell information" for that cell.
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-frequency Cell Information", UE shall for that cell use the same parameter values as used for the preceding IE "Inter-frequency Cell Information".
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-system Cell Information", UE shall use the default values specified for the IE "HCS neighbouring cell information" for that cell.
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-system Cell Information", UE shall for that cell use the same parameter values as used for the preceding IE "Inter-system Cell Information".
- ~~If IE "HCS Serving cell information" is not included, this indicates that HCS is not used, and any occurrences of IE "HCS neighbouring cell information" in System Information Block Type 12 shall be neglected by UE.~~

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

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

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Qoffset1$_{s,n}$	MD		Real(-50.0..50.0 by step of 1)	Default value is 0.
Qoffset2$_{s,n}$	*CV-FDD-Quality-Measure*		Real(-50.0..50.0 by step of 1)	Default value is 0.
Maximum allowed UL TX power	MD		Maximum allowed UL TX power 10.3.6.33	[dBm] UE_TXPWR_MAX_RACH in 25.304. Default is the Maximum allowed UL TX power for the serving cell
HCS neighbouring cell information	OP		HCS Neighbouring cell information 10.3.7.11	
CHOICE *mode*	MP			
>FDD				
>>Qqualmin	MD		Integer (-20..0)	Ec/N0, [dB] Default value is Qqualmin for the serving cell
>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell
>TDD				
>>Qrxlevmin	MD		Integer (-115..-25 by step of 2)	RSCP, [dBm] Default value is Qrxlevmin for the serving cell

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

10.3.7.10 HCS Cell re-selection information

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

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

10.3.7.72 Measurement control system information

Information element/Group name	Need	Multi	Type and reference	Semantics description
Use of HCS	MP		Enumerated (Not used, used)	Indicates if the serving cell belongs to a HCS structure
Cell_selection_and_reselection_quality_measure	MP		Enumerated (CPICH Ec/N0, CPICH RSCP)	Choice of measurement (CPICH Ec/N0 or CPICH RSCP) to use as quality measure Q.
Intra-frequency measurement system information	OP		Intra-frequency measurement system information 10.3.7.40	
Inter-frequency measurement system information	OP		Inter-frequency measurement system information 10.3.7.20	
Inter-system measurement system information	OP		Inter-system measurement system information 10.3.7.31	
Traffic volume measurement system information	OP		Traffic volume measurement system information 10.3.7.98	
UE Internal measurement system information	OP		UE Internal measurement system information 10.3.7.106	

NOTE1: The reporting of intra-frequency measurements is activated when state CELL_DCH is entered.

11.3.7 Measurement information elements

```
Measurement-IEs DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    CellIdentity
FROM UTRANMobility-IEs

    UTRAN-DRX-CycleLengthCoefficient
FROM UserEquipment-IEs

    RB-Identity
FROM RadioBearer-IEs

    TFCS-IdentityPlain,
    TransportChannelIdentity
FROM TransportChannel-IEs

    BurstType,
    FrequencyInfo,
    MaxAllowedUL-TX-Power,
    PrimaryCCPCH-Info,
    PrimaryCCPCH-TX-Power,
    PrimaryCPICH-Info,
    PrimaryCPICH-TX-Power,
    TimeslotNumber,
    UL-TimingAdvance
FROM PhysicalChannel-IEs

    BSIC
FROM Other-IEs

    maxAdditionalMeas,
    maxCCTrCH,
    maxCellMeas,
    maxCellMeas-1,
    maxFreq,
    maxMeasEvent,
    maxMeasParEvent,
•   maxOtherRAT,
    maxRB,
    maxRL,
    maxRL-1,
    maxSat,
    maxTrCH,
    maxTS
FROM Constant-definitions;

AcquisitionSatInfo ::=              SEQUENCE {
    satID                               INTEGER (0..63),
    doppler0thOrder                     INTEGER (-2048..2047),
    extraDopplerInfo                    ExtraDopplerInfo                    OPTIONAL,
    codePhase                           INTEGER (0..1022),
    integerCodePhase                    INTEGER (0..19),
    gps-BitNumber                       INTEGER (0..3),
    codePhaseSearchWindow               CodePhaseSearchWindow,
    azimuthAndElevation                 AzimuthAndElevation                 OPTIONAL
}

AcquisitionSatInfoList ::=          SEQUENCE (SIZE (1..maxSat)) OF
                                        AcquisitionSatInfo

AdditionalAssistanceData ::=        OCTET STRING (SIZE (1..38))

AdditionalMeasurementID-List ::=    SEQUENCE (SIZE (1..maxAdditionalMeas)) OF
                                        MeasurementIdentityNumber


AlmanacSatInfo ::=                  SEQUENCE {
    satID                               INTEGER (0..63),
    e                                   BIT STRING (SIZE (16)),
    t-oa                                BIT STRING (SIZE (8)),
    deltaI                              BIT STRING (SIZE (16)),
```

```
    omegaDot                            BIT STRING (SIZE (16)),
    satHealth                           BIT STRING (SIZE (8)),
    a-Sqrt                              BIT STRING (SIZE (24)),
    omega0                              BIT STRING (SIZE (24)),
    m0                                  BIT STRING (SIZE (24)),
    omega                               BIT STRING (SIZE (24)),
    af0                                 BIT STRING (SIZE (11)),
    af1                                 BIT STRING (SIZE (11))
}

AlmanacSatInfoList ::=              SEQUENCE (SIZE (1..maxSat)) OF
                                        AlmanacSatInfo

AverageRLC-BufferPayload ::=        ENUMERATED {
                                        pla0, pla4, pla8, pla16, pla32,
                                        pla64, pla128, pla256, pla512,
                                        pla1024, pla2k, pla4k, pla8k, pla16k,
                                        pla32k, pla64k, pla128k, pla256k,
                                        pla512k, pla1024k }

AzimuthAndElevation ::=             SEQUENCE {
    azimuth                             INTEGER (0..31),
    elevation                           INTEGER (0..7)
}

BadSatList ::=                      SEQUENCE (SIZE (1..maxSat)) OF
                                        INTEGER (0..63)

BCCH-ARFCN ::=                      INTEGER (0..1023)

BLER-MeasurementResults ::=         SEQUENCE {
    transportChannelIdentity            TransportChannelIdentity,
    dl-TransportChannelBLER             DL-TransportChannelBLER             OPTIONAL
}

BLER-MeasurementResultsList ::=     SEQUENCE (SIZE (1..maxTrCH)) OF
                                        BLER-MeasurementResults

BLER-TransChIdList ::=              SEQUENCE (SIZE (1..maxTrCH)) OF
                                        TransportChannelIdentity


BSIC-VerificationRequired ::=       ENUMERATED {
                                        required, notRequired }


BurstModeParameters ::=             SEQUENCE {
    burstStart                          INTEGER (0..15),
    burstLength                         INTEGER (10..25),
    burstFreq                           INTEGER (1..16)
}



CellDCH-ReportCriteria ::=          CHOICE {
    intraFreqReportingCriteria          IntraFreqReportingCriteria,
    periodicalReportingCriteria         PeriodicalReportingCriteria
}

-- Actual value = IE value * 0.5
CellIndividualOffset ::=            INTEGER (-20..20)


CellInfo ::=                        SEQUENCE {
    cellIndividualOffset                CellIndividualOffset                DEFAULT 0,
    referenceTimeDifferenceToCell       ReferenceTimeDifferenceToCell       OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            primaryCPICH-Info                   PrimaryCPICH-Info           OPTIONAL,
            primaryCPICH-TX-Power               PrimaryCPICH-TX-Power       OPTIONAL,
            readSFN-Indicator                   BOOLEAN,
            tx-DiversityIndicator               BOOLEAN
        },
        tdd                                 SEQUENCE {
            primaryCCPCH-Info                   PrimaryCCPCH-Info,
            primaryCCPCH-TX-Power               PrimaryCCPCH-TX-Power       OPTIONAL,
            timeslotInfoList                    TimeslotInfoList            OPTIONAL
        }
```

```
    }
}

CellInfoSI-RSCP ::=                 SEQUENCE {
    cellIndividualOffset                CellIndividualOffset                DEFAULT 0,
    referenceTimeDifferenceToCell       ReferenceTimeDifferenceToCell       OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            primaryCPICH-Info                   PrimaryCPICH-Info               OPTIONAL,
            primaryCPICH-TX-Power               PrimaryCPICH-TX-Power           OPTIONAL,
            readSFN-Indicator                   BOOLEAN,
            tx-DiversityIndicator               BOOLEAN
        },
        tdd                                 SEQUENCE {
            primaryCCPCH-Info                   PrimaryCCPCH-Info,
            primaryCCPCH-TX-Power               PrimaryCCPCH-TX-Power           OPTIONAL,
            timeslotInfoList                    TimeslotInfoList                OPTIONAL
        }
    },
    cellSelectionReselectionInfo        CellSelectReselectInfoSIB-11-12-RSCP        OPTIONAL
}

CellInfoSI-ECN0 ::=                 SEQUENCE {
    cellIndividualOffset                CellIndividualOffset                DEFAULT 0,
    referenceTimeDifferenceToCell       ReferenceTimeDifferenceToCell       OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            primaryCPICH-Info                   PrimaryCPICH-Info               OPTIONAL,
            primaryCPICH-TX-Power               PrimaryCPICH-TX-Power           OPTIONAL,
            readSFN-Indicator                   BOOLEAN,
            tx-DiversityIndicator               BOOLEAN
        },
        tdd                                 SEQUENCE {
            primaryCCPCH-Info                   PrimaryCCPCH-Info,
            primaryCCPCH-TX-Power               PrimaryCCPCH-TX-Power           OPTIONAL,
            timeslotInfoList                    TimeslotInfoList                OPTIONAL
        }
    },
    cellSelectionReselectionInfo        CellSelectReselectInfoSIB-11-12-ECN0    OPTIONAL
}

CellInfoSI-HCS-RSCP ::=             SEQUENCE {
    cellIndividualOffset                CellIndividualOffset                DEFAULT 0,
    referenceTimeDifferenceToCell       ReferenceTimeDifferenceToCell       OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            primaryCPICH-Info                   PrimaryCPICH-Info               OPTIONAL,
            primaryCPICH-TX-Power               PrimaryCPICH-TX-Power           OPTIONAL,
            readSFN-Indicator                   BOOLEAN,
            tx-DiversityIndicator               BOOLEAN
        },
        tdd                                 SEQUENCE {
            primaryCCPCH-Info                   PrimaryCCPCH-Info,
            primaryCCPCH-TX-Power               PrimaryCCPCH-TX-Power           OPTIONAL,
            timeslotInfoList                    TimeslotInfoList                OPTIONAL
        }
    },
    cellSelectionReselectionInfo        CellSelectReselectInfoSIB-11-12-HCS-RSCP    OPTIONAL
}

CellInfoSI-HCS-ECN0 ::=             SEQUENCE {
    cellIndividualOffset                CellIndividualOffset                DEFAULT 0,
    referenceTimeDifferenceToCell       ReferenceTimeDifferenceToCell       OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            primaryCPICH-Info                   PrimaryCPICH-Info               OPTIONAL,
            primaryCPICH-TX-Power               PrimaryCPICH-TX-Power           OPTIONAL,
            readSFN-Indicator                   BOOLEAN,
            tx-DiversityIndicator               BOOLEAN
        },
        tdd                                 SEQUENCE {
            primaryCCPCH-Info                   PrimaryCCPCH-Info,
            primaryCCPCH-TX-Power               PrimaryCCPCH-TX-Power           OPTIONAL,
            timeslotInfoList                    TimeslotInfoList                OPTIONAL
        }
    },
    cellSelectionReselectionInfo        CellSelectReselectInfoSIB-11-12-HCS-ECN0    OPTIONAL
```

```
}


CellMeasuredResults ::=             SEQUENCE {
    cellIdentity                        CellIdentity                        OPTIONAL,
    sfn-SFN-ObsTimeDifference           SFN-SFN-ObsTimeDifference           OPTIONAL,
    cfn-SFN-ObsTimeDifference           CFN-SFN-ObsTimeDifference           OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            primaryCPICH-Info                   PrimaryCPICH-Info,
            cpich-Ec-N0                         CPICH-Ec-N0                 OPTIONAL,
            cpich-RSCP                          CPICH-RSCP                  OPTIONAL,
            pathloss                            Pathloss                    OPTIONAL
        },
        tdd                                 SEQUENCE {
            primaryCCPCH-Info                   PrimaryCCPCH-Info,
            primaryCCPCH-RSCP                   PrimaryCCPCH-RSCP           OPTIONAL,
            timeslotISCP-List                   TimeslotISCP-List           OPTIONAL
        }
    }
}

CellMeasurementEventResults ::=     CHOICE {
    fdd                                 SEQUENCE (SIZE (1..maxCellMeas)) OF
                                            PrimaryCPICH-Info,
    tdd                                 SEQUENCE (SIZE (1..maxCellMeas)) OF
                                            PrimaryCCPCH-Info
}

CellPosition ::=                    SEQUENCE {
    relativeNorth                       INTEGER (-32767..32767),
    relativeEast                        INTEGER (-32767..32767),
    relativeAltitude                    INTEGER (-4095..4095)
}


CellReportingQuantities ::=         SEQUENCE {
    sfn-SFN-OTD-Type                    SFN-SFN-OTD-Type,
    cellIdentity                        BOOLEAN,
    cfn-SFN-ObsTimeDifference           BOOLEAN,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            cpich-Ec-N0                         BOOLEAN,
            cpich-RSCP                          BOOLEAN,
            pathloss                            BOOLEAN
        },
        tdd                                 SEQUENCE {
            timeslotISCP                        BOOLEAN,
            primaryCCPCH-RSCP                   BOOLEAN,
            pathloss                            BOOLEAN
        }
    }
}


CellSelectReselectInfoSIB-11-12-RSCP ::=    SEQUENCE {
    q-OffsetS-N                     Q-OffsetS-N                     DEFAULT 0,
    maxAllowedUL-TX-Power               MaxAllowedUL-TX-Power               OPTIONAL,
    hcs-NeighbouringCellInformation     HCS-NeighbouringCellInformation     OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            q-QualMin                           Q-QualMin                   OPTIONAL,
            q-RxlevMin                          Q-RxlevMin                  OPTIONAL
        },
        tdd                                 SEQUENCE {
            q-RxlevMin                          Q-RxlevMin                  OPTIONAL
        }
    }
}

CellSelectReselectInfoSIB-11-12-ECN0 ::=    SEQUENCE {
    q-Offset1S-N                        Q-OffsetS-N                     DEFAULT 0,
    q-Offset2S-N                        Q-OffsetS-N                     DEFAULT 0,
    maxAllowedUL-TX-Power               MaxAllowedUL-TX-Power               OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            q-QualMin                           Q-QualMin                   OPTIONAL,
```

```
            q-RxlevMin                          Q-RxlevMin                  OPTIONAL
        },
        tdd                                 SEQUENCE {
            q-RxlevMin                          Q-RxlevMin                  OPTIONAL
        }
    }
}

CellSelectReselectInfoSIB-11-12-HCS-RSCP ::=    SEQUENCE {
    q-OffsetS-N                         Q-OffsetS-N                 DEFAULT 0,
    maxAllowedUL-TX-Power                   MaxAllowedUL-TX-Power               OPTIONAL,
    hcs-NeighbouringCellInformation         HCS-NeighbouringCellInformation     OPTIONAL,
    modeSpecificInfo                        CHOICE {
        fdd                                     SEQUENCE {
            q-QualMin                               Q-QualMin                   OPTIONAL,
            q-RxlevMin                              Q-RxlevMin                  OPTIONAL
        },
        tdd                                     SEQUENCE {
            q-RxlevMin                              Q-RxlevMin                  OPTIONAL
        }
    }
}

CellSelectReselectInfoSIB-11-12-HCS-ECN0 ::=    SEQUENCE {
    q-Offset1S-N                            Q-OffsetS-N                 DEFAULT 0,
    q-Offset2S-N                            Q-OffsetS-N                 DEFAULT 0,
    maxAllowedUL-TX-Power                   MaxAllowedUL-TX-Power               OPTIONAL,
    hcs-NeighbouringCellInformation         HCS-NeighbouringCellInformation     OPTIONAL,
    modeSpecificInfo                        CHOICE {
        fdd                                     SEQUENCE {
            q-QualMin                               Q-QualMin                   OPTIONAL,
            q-RxlevMin                              Q-RxlevMin                  OPTIONAL
        },
        tdd                                     SEQUENCE {
            q-RxlevMin                              Q-RxlevMin                  OPTIONAL
        }
    }
}


CellToMeasure ::=                   SEQUENCE {
    sfn-sfn-Drift                       INTEGER (0..30)                     OPTIONAL,
    primaryCPICH-Info                   PrimaryCPICH-Info,
    frequencyInfo                       FrequencyInfo                       OPTIONAL,
    sfn-SFN-ObservedTimeDifference      SFN-SFN-ObsTimeDifference1,
    fineSFN-SFN                         FineSFN-SFN,
    cellPosition                        CellPosition                        OPTIONAL
}

CellToMeasureInfoList ::=           SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        CellToMeasure

CellToReport ::=                    SEQUENCE {
    frequency                           Frequency,
    bsic                                BSIC
}

CellToReportList ::=                SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        CellToReport


CFN-SFN-ObsTimeDifference ::=       CHOICE {
    fdd-ChipDiff                        INTEGER (0..157286399),
    tdd-FrameDiff                       INTEGER (0..4095)
}

CodePhaseSearchWindow ::=           ENUMERATED {
                                        w1023, w1, w2, w3, w4, w6, w8,
                                        w12, w16, w24, w32, w48, w64,
                                        w96, w128, w192 }

CPICH-Ec-N0 ::=                     INTEGER (-20..0)

-- IE value 0 = <-24 dB, 1 = between -24 and -23 and so on
CPICH-Ec-N0-OTDOA ::=               INTEGER (0..26)

CPICH-RSCP ::=                      INTEGER (-115..-40)
```

```
DeltaPRC ::=                       INTEGER (-127..127)

DeltaRRC ::=                       INTEGER (-7..7)

DGPS-CorrectionSatInfo ::=         SEQUENCE {
    satID                              INTEGER (0..63),
    iode                               BIT STRING (SIZE (8)),
    udre                               UDRE,
    prc                                PRC,
    rrc                                RRC,
    deltaPRC2                          DeltaPRC,
    deltaRRC2                          DeltaRRC,
    deltaPRC3                          DeltaPRC,
    deltaRRC3                          DeltaRRC
}

DGPS-CorrectionSatInfoList ::=     SEQUENCE (SIZE (1..maxSat)) OF
                                       DGPS-CorrectionSatInfo

DGPS-Information ::=               SEQUENCE {
    satID                              SatID,
    iode                               IODE,
    udre                               UDRE,
    prc                                PRC,
    rrc                                RRC,
    deltaPRC2                          DeltaPRC,
    deltaRRC2                          DeltaRRC
}

DGPS-InformationList ::=           SEQUENCE (SIZE (1..maxSat)) OF
                                       DGPS-Information

DiffCorrectionStatus ::=           ENUMERATED {
                                       udre-1-0, udre-0-75, udre-0-5, udre-0-3,
                                       udre-0-2, udre-0-1, noData, invalidData }


-- Actual value = IE value * 0.02
DL-PhysicalChannelBER ::=          INTEGER (0..255)

-- Actual value = IE value * 0.02
DL-TransportChannelBLER ::=        INTEGER (0..255)

DopplerUncertainty ::=             ENUMERATED {
                                       hz12-5, hz25, hz50, hz100, hz200 }

EllipsoidPoint ::=                 OCTET STRING (SIZE (7))

EllipsoidPointAltitude ::=         OCTET STRING (SIZE (9))

EllipsoidPointAltitudeEllipse ::=  OCTET STRING (SIZE (14))

EllipsoidPointUncertCircle ::=     OCTET STRING (SIZE (8))

EllipsoidPointUncertEllipse ::=    OCTET STRING (SIZE (11))

EnvironmentCharacterization ::=    ENUMERATED {
                                       possibleHeavyMultipathNLOS,
                                       lightMultipathLOS,
                                       notDefined }


Event1a ::=                        SEQUENCE {
    triggeringCondition                TriggeringCondition,
    reportingRange                     ReportingRange,
    forbiddenAffectCellList            ForbiddenAffectCellList             OPTIONAL,
    w                                  W,
    reportDeactivationThreshold        ReportDeactivationThreshold
}


Event1b ::=                        SEQUENCE {
    triggeringCondition                TriggeringCondition,
    reportingRange                     ReportingRange,
    forbiddenAffectCellList            ForbiddenAffectCellList             OPTIONAL,
    w                                  W
```

```
}

Event1c ::=                         SEQUENCE {
    replacementActivationThreshold      ReplacementActivationThreshold
}

Event1ef ::=                        SEQUENCE {
    triggeringCondition                 TriggeringCondition,
    thresholdUsedFrequency              ThresholdUsedFrequency
}

Event2a ::=                         SEQUENCE {
    usedFreqThreshold                   Threshold,
    usedFreqW                           W,
    hysteresis                          HysteresisInterFreq,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL,
    nonUsedFreqParameterList            NonUsedFreqParameterList            OPTIONAL
}

Event2b ::=                         SEQUENCE {
    usedFreqThreshold                   Threshold,
    usedFreqW                           W,
    hysteresis                          HysteresisInterFreq,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL,
    nonUsedFreqParameterList            NonUsedFreqParameterList            OPTIONAL
}

Event2c ::=                         SEQUENCE {
    hysteresis                          HysteresisInterFreq,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL,
    nonUsedFreqParameterList            NonUsedFreqParameterList            OPTIONAL
}

Event2d ::=                         SEQUENCE {
    usedFreqThreshold                   Threshold,
    usedFreqW                           W,
    hysteresis                          HysteresisInterFreq,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL
}

Event2e ::=                         SEQUENCE {
    hysteresis                          HysteresisInterFreq,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL,
    nonUsedFreqParameterList            NonUsedFreqParameterList            OPTIONAL
}

Event2f ::=                         SEQUENCE {
    usedFreqThreshold                   Threshold,
    usedFreqW                           W,
    hysteresis                          HysteresisInterFreq,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL
}
```

```
Event3a ::=                         SEQUENCE {
    thresholdOwnSystem                  Threshold,
    w                                   W,
    thresholdOtherSystem                Threshold,
    hysteresis                          Hysteresis,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL
}

Event3b ::=                         SEQUENCE {
    thresholdOtherSystem                Threshold,
    hysteresis                          Hysteresis,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL

}

Event3c ::=                         SEQUENCE {
    thresholdOtherSystem                Threshold,
    hysteresis                          Hysteresis,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL

}

Event3d ::=                         SEQUENCE {
    hysteresis                          Hysteresis,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL

}

EventIDInterFreq ::=                ENUMERATED {
                                        e2a, e2b, e2c, e2d, e2e, e2f }

EventIDInterSystem ::=              ENUMERATED {
                                        e3a, e3b, e3c, e3d }

EventIDIntraFreq ::=                ENUMERATED {
                                        e1a, e1b, e1c, e1d, e1e,
                                        e1f, e1g, e1h, e1i }

EventResults ::=                    CHOICE {
    intraFreqEventResults               IntraFreqEventResults,
    interFreqEventResults               InterFreqEventResults,
    interSystemEventResults             InterSystemEventResults,
    trafficVolumeEventResults           TrafficVolumeEventResults,
    qualityEventResults                 QualityEventResults,
    ue-InternalEventResults             UE-InternalEventResults,
    lcs-MeasurementEventResults         LCS-MeasurementEventResults
}

ExtraDopplerInfo ::=                SEQUENCE {
    doppler1stOrder                     INTEGER (-42..21),
    dopplerUncertainty                  DopplerUncertainty
}

FACH-MeasurementOccasionInfo ::=    SEQUENCE {
    k-UTRA                              UTRAN-DRX-CycleLengthCoefficient,
    otherRAT-InSysInfoList              OtherRAT-InSysInfoList              OPTIONAL
}
```

```
FilterCoefficient ::=                ENUMERATED {
                                         fc0, fc1, fc2, fc3, fc4, fc5,
                                         fc6, fc7, fc8, fc9, fc11, fc13,
                                         fc15, fc17, fc19, spare1 }

FineSFN-SFN ::=                      ENUMERATED {
                                         fs0, fs0-25, fs0-5, fs0-75 }

ForbiddenAffectCell ::=              CHOICE {
    fdd                                  PrimaryCPICH-Info,
    tdd                                  PrimaryCCPCH-Info
}

ForbiddenAffectCellList ::=          SEQUENCE (SIZE (1..maxCellMeas)) OF
                                         ForbiddenAffectCell

FreqQualityEstimateQuantity-FDD ::= ENUMERATED {
                                         cpich-Ec-N0,
                                         cpich-RSCP }

FreqQualityEstimateQuantity-TDD ::= ENUMERATED {
                                         primaryCCPCH-RSCP }

-- **TODO**, not defined yet
Frequency ::=                        SEQUENCE {
}

GSM-CarrierRSSI ::=                  BIT STRING (SIZE (6))

GPS-MeasurementParam ::=             SEQUENCE {
    satelliteID                          INTEGER (0..63),
    c-N0                                 INTEGER (0..63),
    doppler                              INTEGER (-32768..32768),
    wholeGPS-Chips                       INTEGER (0..1023),
    fractionalGPS-Chips                  INTEGER (0..1023),
    multipathIndicator                   MultipathIndicator,
    pseudorangeRMS-Error                 INTEGER (0..63)
}

GPS-MeasurementParamList ::=         SEQUENCE (SIZE (1..maxSat)) OF
                                         GPS-MeasurementParam

-- **TODO**, not defined yet
GSM-OutputPower ::=                  SEQUENCE {
}


GPS-TOW-1msec ::=                    INTEGER (0..604799999)


GPS-TOW-1usec ::=                    SEQUENCE {
    tow-1msec                            GPS-TOW-1msec,
    tow-rem-usec                         GPS-TOW-rem-usec
}

GPS-TOW-Assist ::=                   SEQUENCE {
    satID                                INTEGER (0..63),
    tlm-Message                          BIT STRING (SIZE (14)),
    antiSpoof                            BOOLEAN,
    alert                                BOOLEAN,
    tlm-Reserved                         BIT STRING (SIZE (2))
}

GPS-TOW-AssistList ::=               SEQUENCE (SIZE (1..maxSat)) OF
                                         GPS-TOW-Assist


GPS-TOW-rem-usec ::=                 INTEGER (0..999)

HCS-CellReselectInformation-RSCP ::=         SEQUENCE {
    penaltyTime                          PenaltyTime-RSCP                            ~~OPTIONAL~~
    -- TABULAR: The default value is "notUsed", temporary offset is nested inside PenaltyTime
}

HCS-CellReselectInformation-ECN0 ::=         SEQUENCE {
    penaltyTime                          PenaltyTime-ECN0
    -- TABULAR: The default value is "notUsed", temporary offset is nested inside PenaltyTime
}
```

```
HCS-NeighbouringCellInformation-RSCP ::= SEQUENCE {
    hcs-PRIO                            HCS-PRIO                            DEFAULT 0,
    q-HCS                               Q-HCS                               DEFAULT 0,
    hcs-CellReselectInformation         HCS-CellReselectInformation-RSCP            OPTIONAL
}

HCS-NeighbouringCellInformation-ECNO ::= SEQUENCE {
    hcs-PRIO                            HCS-PRIO                            DEFAULT 0,
    q-HCS                               Q-HCS                               DEFAULT 0,
    hcs-CellReselectInformation         HCS-CellReselectInformation-ECNO
}


HCS-PRIO ::=                        INTEGER (0..7)

HCS-ServingCellInformation ::=      SEQUENCE {
    hcs-PRIO                            HCS-PRIO                            DEFAULT 0,
    q-HCS                               Q-HCS                               DEFAULT 0,
    t-CR-Max                            T-CRMax                             OPTIONAL
}

-- Actual value = IE value * 0.5
Hysteresis ::=                      INTEGER (0..15)

-- Actual value = IE value * 0.5
HysteresisInterFreq ::=             INTEGER (0..29)

InterFreqCell ::=                   SEQUENCE {
    frequencyInfo                       FrequencyInfo,
    nonFreqRelatedEventResults          CellMeasurementEventResults
}

InterFreqCellID ::=                 INTEGER (0..maxCellMeas-1)
•
InterFreqCellInfoList ::=           SEQUENCE {
    removedInterFreqCellList            RemovedInterFreqCellList            OPTIONAL,
    newInterFreqCellList                NewInterFreqCellList                OPTIONAL
}

InterFreqCellInfoSI-List-RSCP ::=       SEQUENCE {
    removedInterFreqCellList            RemovedInterFreqCellList            OPTIONAL,
    newInterFreqCellList                NewInterFreqCellSI-List-RSCP                OPTIONAL
}

InterFreqCellInfoSI-List-ECN0 ::=       SEQUENCE {
    removedInterFreqCellList            RemovedInterFreqCellList            OPTIONAL,
    newInterFreqCellList                NewInterFreqCellSI-List-ECN0        OPTIONAL
}

InterFreqCellInfoSI-List-HCS-RSCP ::=       SEQUENCE {
    removedInterFreqCellList            RemovedInterFreqCellList            OPTIONAL,
    newInterFreqCellList                NewInterFreqCellSI-List-HCS-RSCP    OPTIONAL
}
InterFreqCellInfoSI-List-HCS-ECN0 ::=       SEQUENCE {
    removedInterFreqCellList            RemovedInterFreqCellList            OPTIONAL,
    newInterFreqCellList                NewInterFreqCellSI-List-HCS-ECN0    OPTIONAL
}

InterFreqCellList ::=               SEQUENCE (SIZE (1..maxFreq)) OF
                                        InterFreqCell

InterFreqCellMeasuredResultsList ::= SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        CellMeasuredResults

InterFreqEvent ::=                  CHOICE {
    event2a                             Event2a,
    event2b                             Event2b,
    event2c                             Event2c,
    event2d                             Event2d,
    event2e                             Event2e,
    event2f                             Event2f
}

InterFreqEventList ::=              SEQUENCE (SIZE (1..maxMeasEvent)) OF
                                        InterFreqEvent
```

```
InterFreqEventResults ::=           SEQUENCE {
    eventID                             EventIDInterFreq,
    interFreqCellList                   InterFreqCellList                   OPTIONAL
}


InterFreqMeasQuantity ::=           SEQUENCE {
    reportingCriteria                   CHOICE {
        intraFreqReportingCriteria          SEQUENCE {
            intraFreqMeasQuantity               IntraFreqMeasQuantity
        },
        interFreqReportingCriteria          SEQUENCE {
            filterCoefficient                   FilterCoefficient           DEFAULT fc0,
            modeSpecificInfo                    CHOICE {
                fdd                                 SEQUENCE {
                    freqQualityEstimateQuantity-FDD     FreqQualityEstimateQuantity-FDD
                },
                tdd                                 SEQUENCE {
                    freqQualityEstimateQuantity-TDD     FreqQualityEstimateQuantity-TDD
                }
            }
        }
    }
}

InterFreqMeasuredResults ::=        SEQUENCE {
    frequencyInfo                       FrequencyInfo                       OPTIONAL,
    utra-CarrierRSSI                    UTRA-CarrierRSSI                    OPTIONAL,
    interFreqCellMeasuredResultsList    InterFreqCellMeasuredResultsList    OPTIONAL
}

InterFreqMeasuredResultsList ::=    SEQUENCE (SIZE (1..maxFreq)) OF
                                        InterFreqMeasuredResults


InterFreqMeasurementSysInfo-RSCP ::=        SEQUENCE {
    interFreqMeasurementID              MeasurementIdentityNumber           DEFAULT 2,
    interFreqCellInfoSI-List            InterFreqCellInfoSI-List-RSCP           OPTIONAL,
    interFreqMeasQuantity               InterFreqMeasQuantity               OPTIONAL,
    interFreqReportingCriteria          InterFreqReportingCriteria          OPTIONAL
}

InterFreqMeasurementSysInfo-ECN0 ::=        SEQUENCE {
    interFreqMeasurementID              MeasurementIdentityNumber           DEFAULT 2,
    interFreqCellInfoSI-List            InterFreqCellInfoSI-List-ECN0       OPTIONAL,
    interFreqMeasQuantity               InterFreqMeasQuantity               OPTIONAL,
    interFreqReportingCriteria          InterFreqReportingCriteria          OPTIONAL
}

InterFreqMeasurementSysInfo-HCS-RSCP ::=        SEQUENCE {
    interFreqMeasurementID              MeasurementIdentityNumber           DEFAULT 2,
    interFreqCellInfoSI-List            InterFreqCellInfoSI-List-HCS-RSCP   OPTIONAL,
    interFreqMeasQuantity               InterFreqMeasQuantity               OPTIONAL,
    interFreqReportingCriteria          InterFreqReportingCriteria          OPTIONAL
}

InterFreqMeasurementSysInfo-HCS-ECN0 ::=        SEQUENCE {
    interFreqMeasurementID              MeasurementIdentityNumber           DEFAULT 2,
    interFreqCellInfoSI-List            InterFreqCellInfoSI-List-HCS-ECN0   OPTIONAL,
    interFreqMeasQuantity               InterFreqMeasQuantity               OPTIONAL,
    interFreqReportingCriteria          InterFreqReportingCriteria          OPTIONAL
}


InterFreqReportCriteria ::=         CHOICE {
    intraFreqReportingCriteria          IntraFreqReportingCriteria,
    interFreqReportingCriteria          InterFreqReportingCriteria,
    periodicalReportingCriteria         PeriodicalWithReportingCellStatus,
    noReporting                         ReportingCellStatusOpt
}

InterFreqReportingCriteria ::=      SEQUENCE {
    interFreqEventList                  InterFreqEventList                  OPTIONAL
}

InterFreqReportingQuantity ::=      SEQUENCE {
```

```
    utra-Carrier-RSSI                    BOOLEAN,
    frequencyQualityEstimate             BOOLEAN,
    nonFreqRelatedQuantities             CellReportingQuantities
}


InterFrequencyMeasurement ::=        SEQUENCE {
    interFreqCellInfoList                InterFreqCellInfoList,
    interFreqMeasQuantity                InterFreqMeasQuantity              OPTIONAL,
    interFreqReportingQuantity           InterFreqReportingQuantity         OPTIONAL,
    measurementValidity                  MeasurementValidity                OPTIONAL,
    interFreqSetUpdate                   UE-AutonomousUpdateMode            OPTIONAL,
    reportCriteria                       InterFreqReportCriteria
}

InterSystemCellID ::=                INTEGER (0..maxCellMeas-1)

InterSystemCellInfoList ::=          SEQUENCE {
    removedInterSystemCellList           RemovedInterSystemCellList,
    newInterSystemCellList               NewInterSystemCellList
}

InterSystemCellInfoList-HCS ::=          SEQUENCE {
    removedInterSystemCellList           RemovedInterSystemCellList,
    newInterSystemCellList               NewInterSystemCellList-HCS
}

InterSystemEvent ::=                 CHOICE {
    event3a                              Event3a,
    event3b                              Event3b,
    event3c                              Event3c,
    event3d                              Event3d
}

InterSystemEventList ::=             SEQUENCE (SIZE (1..maxMeasEvent)) OF
                                         InterSystemEvent

InterSystemEventResults ::=          SEQUENCE {
    eventID                              EventIDInterSystem,
    cellToReportList                     CellToReportList
}

InterSystemInfo ::=                  ENUMERATED {
                                         gsm, spare1 }


InterSystemMeasQuantity ::=              SEQUENCE {
    measQuantityUTRAN-QualityEstimate        IntraFreqMeasQuantity,
    systemSpecificInfo                       CHOICE {
        gsm                                      SEQUENCE {
            measurementQuantity                      MeasurementQuantityGSM,
            filterCoefficient                        FilterCoefficient       DEFAULT fc1,
            bsic-VerificationRequired                BSIC-VerificationRequired
        },
        is-2000                                  SEQUENCE {
            tadd-EcIo                                INTEGER (0..63),
            tcomp-EcIo                               INTEGER (0..15),
            softSlope                                INTEGER (0..63)         OPTIONAL,
            addIntercept                             INTEGER (0..63)         OPTIONAL
        }
    }
}

InterSystemMeasuredResults ::=       CHOICE {
    gsm                                  SEQUENCE {
        frequency                            Frequency,
        gsm-CarrierRSSI                      GSM-CarrierRSSI                OPTIONAL,
        pathloss                             Pathloss                       OPTIONAL,
        bsic                                 BSIC                           OPTIONAL,
        observedTimeDifferenceToGSM          ObservedTimeDifferenceToGSM    OPTIONAL
    },
    spare                                NULL
}

InterSystemMeasuredResultsList ::= SEQUENCE (SIZE (1..maxOtherRAT)) OF
                                         InterSystemMeasuredResults
```

```
InterSystemMeasurement ::=          SEQUENCE {
    interSystemCellInfoList             InterSystemCellInfoList             OPTIONAL,
    interSystemMeasQuantity             InterSystemMeasQuantity             OPTIONAL,
    interSystemReportingQuantity        InterSystemReportingQuantity        OPTIONAL,
    reportCriteria                      InterSystemReportCriteria
}

InterSystemMeasurementSysInfo ::=   SEQUENCE {
    interSystemMeasurementID            MeasurementIdentityNumber           DEFAULT 3,
    interSystemCellInfoList             InterSystemCellInfoList             OPTIONAL,
    interSystemMeasQuantity             InterSystemMeasQuantity             OPTIONAL
}

InterSystemMeasurementSysInfo-HCS ::=   SEQUENCE {
    interSystemMeasurementID            MeasurementIdentityNumber           DEFAULT 3,
    interSystemCellInfoList             InterSystemCellInfoList-HCS         OPTIONAL,
    interSystemMeasQuantity             InterSystemMeasQuantity             OPTIONAL
}

InterSystemReportCriteria ::=       CHOICE {
    interSystemReportingCriteria        InterSystemReportingCriteria,
    periodicalReportingCriteria         PeriodicalWithReportingCellStatus,
    noReporting                         ReportingCellStatusOpt
}

InterSystemReportingCriteria ::=    SEQUENCE {
    interSystemEventList                InterSystemEventList                OPTIONAL
}

InterSystemReportingQuantity ::=    SEQUENCE {
    utran-EstimatedQuality              BOOLEAN,
    systemSpecificInfo                  CHOICE {
        gsm                                 SEQUENCE {
            pathloss                            BOOLEAN,
            observedTimeDifferenceGSM           BOOLEAN,
            gsm-Carrier-RSSI                    BOOLEAN,
            bsic                                BOOLEAN
        },
        spare1                              NULL
    }
}

IntraFreqCellID ::=                 INTEGER (0..maxCellMeas-1)

IntraFreqCellInfoList ::=           SEQUENCE {
    removedIntraFreqCellList            RemovedIntraFreqCellList            OPTIONAL,
    newIntraFreqCellList                NewIntraFreqCellList                OPTIONAL
}


IntraFreqCellInfoSI-List-RSCP ::=       SEQUENCE {
    removedIntraFreqCellList            RemovedIntraFreqCellList            OPTIONAL,
    newIntraFreqCellList                NewIntraFreqCellSI-List-RSCP
}


IntraFreqCellInfoSI-List-ECN0 ::=       SEQUENCE {
    removedIntraFreqCellList            RemovedIntraFreqCellList            OPTIONAL,
    newIntraFreqCellList                NewIntraFreqCellSI-List-ECN0
}

IntraFreqCellInfoSI-List-HCS-RSCP ::=       SEQUENCE {
    removedIntraFreqCellList            RemovedIntraFreqCellList            OPTIONAL,
    newIntraFreqCellList                NewIntraFreqCellSI-List-HCS-RSCP
}

IntraFreqCellInfoSI-List-HCS-ECN0 ::=       SEQUENCE {
    removedIntraFreqCellList            RemovedIntraFreqCellList            OPTIONAL,
    newIntraFreqCellList                NewIntraFreqCellSI-List-HCS-ECN0
}

IntraFreqEvent ::=                  CHOICE {
    e1a                                 Event1a,
    e1b                                 Event1b,
    e1c                                 Event1c,
    e1d                                 NULL,
    e1e                                 Event1ef,
    e1f                                 Event1ef,
```

```
    e1g                                 NULL,
    e1h                                 ThresholdUsedFrequency,
    e1i                                 ThresholdUsedFrequency
}


IntraFreqEventCriteria ::=          SEQUENCE {
    event                               IntraFreqEvent,
    hysteresis                          Hysteresis,
    timeToTrigger                       TimeToTrigger,
    reportingAmount                     ReportingAmount,
    reportingInterval                   ReportingInterval,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL
}

IntraFreqEventCriteriaList ::=      SEQUENCE (SIZE (1..maxMeasEvent)) OF
                                        IntraFreqEventCriteria

IntraFreqEventResults ::=           SEQUENCE {
    eventID                             EventIDIntraFreq,
    cellMeasurementEventResults         CellMeasurementEventResults
}


IntraFreqMeasQuantity ::=           SEQUENCE {
    filterCoefficient                   FilterCoefficient                   DEFAULT fc1,
    modeSpecificInfo                    CHOICE {
        fdd                             SEQUENCE {
            intraFreqMeasQuantity-FDD       IntraFreqMeasQuantity-FDD
        },
        tdd                             SEQUENCE {
            intraFreqMeasQuantity-TDDList   IntraFreqMeasQuantity-TDDList
        }
    }
}


IntraFreqMeasQuantity-FDD ::=       ENUMERATED {
                                        cpich-Ec-NO,
                                        cpich-RSCP,
                                        pathloss,
                                        utra-CarrierRSSI }

IntraFreqMeasQuantity-TDD ::=       ENUMERATED {
                                        primaryCCPCH-RSCP,
                                        pathloss,
                                        timeslotISCP,
                                        utra-CarrierRSSI }


IntraFreqMeasQuantity-TDDList ::=   SEQUENCE (SIZE (1..4)) OF
                                        IntraFreqMeasQuantity-TDD

IntraFreqMeasuredResultsList ::=    SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        CellMeasuredResults

IntraFreqMeasurementSysInfo-RSCP ::=        SEQUENCE {
    intraFreqMeasurementID              MeasurementIdentityNumber           DEFAULT 1,
    intraFreqCellInfoSI-List            IntraFreqCellInfoSI-List-RSCP           OPTIONAL,
    intraFreqMeasQuantity               IntraFreqMeasQuantity               OPTIONAL,
    intraFreqReportingQuantityForRACH   IntraFreqReportingQuantityForRACH   OPTIONAL,
    maxReportedCellsOnRACH              MaxReportedCellsOnRACH              OPTIONAL,
    reportingInfoForCellDCH             ReportingInfoForCellDCH             OPTIONAL
}

IntraFreqMeasurementSysInfo-ECN0 ::=        SEQUENCE {
    intraFreqMeasurementID              MeasurementIdentityNumber           DEFAULT 1,
    intraFreqCellInfoSI-List            IntraFreqCellInfoSI-List-ECN0       OPTIONAL,
    intraFreqMeasQuantity               IntraFreqMeasQuantity               OPTIONAL,
    intraFreqReportingQuantityForRACH   IntraFreqReportingQuantityForRACH   OPTIONAL,
    maxReportedCellsOnRACH              MaxReportedCellsOnRACH              OPTIONAL,
    reportingInfoForCellDCH             ReportingInfoForCellDCH             OPTIONAL
}

IntraFreqMeasurementSysInfo-HCS-RSCP ::=    SEQUENCE {
    intraFreqMeasurementID              MeasurementIdentityNumber           DEFAULT 1,
    intraFreqCellInfoSI-List            IntraFreqCellInfoSI-List-HCS-RSCP   OPTIONAL,
    intraFreqMeasQuantity               IntraFreqMeasQuantity               OPTIONAL,
```

```
    intraFreqReportingQuantityForRACH   IntraFreqReportingQuantityForRACH   OPTIONAL,
    maxReportedCellsOnRACH              MaxReportedCellsOnRACH              OPTIONAL,
    reportingInfoForCellDCH             ReportingInfoForCellDCH             OPTIONAL
}

IntraFreqMeasurementSysInfo-HCS-ECN0 ::=    SEQUENCE {
    intraFreqMeasurementID              MeasurementIdentityNumber           DEFAULT 1,
    intraFreqCellInfoSI-List            IntraFreqCellInfoSI-List-HCS-ECN0   OPTIONAL,
    intraFreqMeasQuantity               IntraFreqMeasQuantity               OPTIONAL,
    intraFreqReportingQuantityForRACH   IntraFreqReportingQuantityForRACH   OPTIONAL,
    maxReportedCellsOnRACH              MaxReportedCellsOnRACH              OPTIONAL,
    reportingInfoForCellDCH             ReportingInfoForCellDCH             OPTIONAL
}

IntraFreqReportCriteria ::=         CHOICE {
    intraFreqReportingCriteria          IntraFreqReportingCriteria,
    periodicalReportingCriteria         PeriodicalWithReportingCellStatus,
    noReporting                         ReportingCellStatusOpt
}

IntraFreqReportingCriteria ::=      SEQUENCE {
    eventCriteriaList                   IntraFreqEventCriteriaList
}


IntraFreqReportingQuantity ::=      SEQUENCE {
    activeSetReportingQuantities        CellReportingQuantities,
    monitoredSetReportingQuantities     CellReportingQuantities,
    detectedSetReportingQuantities      CellReportingQuantities             OPTIONAL
}


IntraFreqReportingQuantityForRACH ::= SEQUENCE {
    sfn-SFN-OTD-Type                    SFN-SFN-OTD-Type,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            intraFreqRepQuantityRACH-FDD        IntraFreqRepQuantityRACH-FDD
        },
        tdd                                 SEQUENCE {
            intraFreqRepQuantityRACH-TDDList    IntraFreqRepQuantityRACH-TDDList
        }
    }
}


IntraFreqRepQuantityRACH-FDD ::=    ENUMERATED {
                                        cpich-EcN0, cpich-RSCP,
                                        pathloss, noReport }

IntraFreqRepQuantityRACH-TDD ::=    ENUMERATED {
                                        timeslotISCP,
                                        primaryCCPCH-RSCP,
                                        noReport }


IntraFreqRepQuantityRACH-TDDList ::= SEQUENCE (SIZE (1..2)) OF
                                        IntraFreqRepQuantityRACH-TDD

IntraFrequencyMeasurement ::=       SEQUENCE {
    intraFreqCellInfoList               IntraFreqCellInfoList               OPTIONAL,
    intraFreqMeasQuantity               IntraFreqMeasQuantity               OPTIONAL,
    intraFreqReportingQuantity          IntraFreqReportingQuantity          OPTIONAL,
    measurementValidity                 MeasurementValidity                 OPTIONAL,
    reportCriteria                      IntraFreqReportCriteria
}

IODE ::=                            INTEGER (0..255)

IP-Length ::=                       ENUMERATED {
                                        ipl5, ipl10 }

IP-Spacing ::=                      ENUMERATED {
                                        e5, e7, e10, e15, e20,
                                        e30, e40, e50 }

IS-2000SpecificMeasInfo ::=         ENUMERATED {
                                        frequency, timeslot, colourcode,
                                        outputpower, pn-Offset }
```

```
K-InterRAT ::=                      INTEGER (0..12)

LCS-Accuracy ::=                    BIT STRING (SIZE (7))


--  For sfID=0 (sf4), pageNo=18, and sfID=0 & sfID=1 (sf4 & sf5), pageNo=25,
--  the IE fileds for word3 – word110 are the same as LCS-GPS-IonosphericModel
--  and LCS-GPS-UTC-Model. For the rest of the pages, they are the same as
--  LCS-GPS-Almanac.
LCS-Alma-SIB-Data ::=                   SEQUENCE {
    sfID                                INTEGER (0..1),
    dataID                              INTEGER (0..3),
    pageNo                              INTEGER (0..63),
    word3                               BIT STRING (SIZE (16)),
    word4                               BIT STRING (SIZE (24)),
    word5                               BIT STRING (SIZE (24)),
    word6                               BIT STRING (SIZE (24)),
    word7                               BIT STRING (SIZE (24)),
    word8                               BIT STRING (SIZE (24)),
    word9                               BIT STRING (SIZE (24)),
    word10                              BIT STRING (SIZE (22))
}

LCS-Alma-SIB-DataList ::=           SEQUENCE (SIZE (1..3)) OF
                                        LCS-Alma-SIB-Data

LCS-CipherParameters ::=            SEQUENCE {
    cipheringKeyFlag                    BIT STRING (SIZE (1)),
    cipheringSerialNumber               INTEGER (0..65535)                  OPTIONAL
}

LCS-DGPS-SIB-Data ::=               SEQUENCE {
    nodeBClockDrift                     NodeB-ClockDrift                    OPTIONAL,
    referenceLocationforSIB ReferenceLocationforSIB,
    referenceSFN                        ReferenceSFN                        OPTIONAL,
    referenceGPS-TOW                    GPS-TOW-1usec,
    statusHealth                        DiffCorrectionStatus,
    dgps-InformationList                DGPS-InformationList
}

LCS-Ephe-SIB-Data ::=               SEQUENCE {
    transmissiontTOW                    INTEGER (0..1048575),
    satID                               INTEGER (0..63),
    tlmMessage                          BIT STRING (SIZE (14)),
    tlmRevd                             BIT STRING (SIZE (2)),
    how                                 BIT STRING (SIZE (22)),
    wn                                  BIT STRING (SIZE (10)),
    navModel                            NavModel
}

LCS-Error ::=                       SEQUENCE {
    errorReason                         LCS-ErrorCause,
    additionalAssistanceData            AdditionalAssistanceData
}

LCS-ErrorCause ::=                  ENUMERATED {
                                        notEnoughOTDOA-Cells,
                                        notEnoughGPS-Satellites,
                                        assistanceDataMissing,
                                        methodNotSupported,
                                        undefinedError,
                                        requestDeniedByUser,
                                        notProcessedAndTimeout }

LCS-EventID ::=                     ENUMERATED {
                                        e7a, e7b, e7c }

LCS-EventParam ::=                  SEQUENCE {
    eventID                             LCS-EventID,
    reportingAmount                     ReportingAmount,
    reportFirstFix                      BOOLEAN,
    measurementInterval                 LCS-MeasurementInterval,
    eventSpecificInfo                   LCS-EventSpecificInfo
}

LCS-EventParamList ::=              SEQUENCE (SIZE (1..maxMeasEvent)) OF
                                        LCS-EventParam
```

```
LCS-EventSpecificInfo ::=           CHOICE {
    e7a                                 ThresholdPositionChange,
    e7b                                 ThresholdSFN-SFN-Change,
    e7c                                 ThresholdSFN-GPS-TOW
}


LCS-GPS-AcquisitionAssistance ::=   SEQUENCE {
    referenceTime                       CHOICE {
        utran-ReferenceTime                 UTRAN-ReferenceTime,
        gps-ReferenceTimeOnly               INTEGER (0..604799999)
    },
    satelliteInformationList            AcquisitionSatInfoList
}

0
LCS-GPS-Almanac ::=                 SEQUENCE {
    wn-a                                BIT STRING (SIZE (8)),
    almanacSatInfoList                  AlmanacSatInfoList
}

LCS-GPS-AssistanceData ::=          SEQUENCE {
    lcs-GPS-ReferenceTime               LCS-GPS-ReferenceTime               OPTIONAL,
    lcs-GPS-ReferenceLocation           EllipsoidPointAltitude              OPTIONAL,
    lcs-GPS-DGPS-Corrections            LCS-GPS-DGPS-Corrections            OPTIONAL,
    lcs-GPS-NavigationModel             LCS-GPS-NavigationModel             OPTIONAL,
    lcs-GPS-IonosphericModel            LCS-GPS-IonosphericModel            OPTIONAL,
    lcs-GPS-UTC-Model                   LCS-GPS-UTC-Model                   OPTIONAL,
    lcs-GPS-Almanac                     LCS-GPS-Almanac                     OPTIONAL,
    lcs-GPS-AcquisitionAssistance       LCS-GPS-AcquisitionAssistance       OPTIONAL,
    lcs-GPS-Real-timeIntegrity          BadSatList                          OPTIONAL
}

LCS-GPS-AssistanceSIB ::=           SEQUENCE {
    lcs-CipherParameters                LCS-CipherParameters
}

LCS-GPS-DGPS-Corrections ::=        SEQUENCE {
    gps-TOW                             INTEGER (0..604799),
    statusHealth                        DiffCorrectionStatus,
    dgps-CorrectionSatInfoList          DGPS-CorrectionSatInfoList
}

LCS-GPS-IonosphericModel ::=        SEQUENCE {
    alfa0                               BIT STRING (SIZE (8)),
    alfa1                               BIT STRING (SIZE (8)),
    alfa2                               BIT STRING (SIZE (8)),
    alfa3                               BIT STRING (SIZE (8)),
    beta0                               BIT STRING (SIZE (8)),
    beta1                               BIT STRING (SIZE (8)),
    beta2                               BIT STRING (SIZE (8)),
    beta3                               BIT STRING (SIZE (8))
}


LCS-GPS-Measurement ::=             SEQUENCE {
    referenceSFN                        ReferenceSFN                        OPTIONAL,
    gps-TOW-1msec                       GPS-TOW-1msec,
    gps-TOW-rem-usec                    GPS-TOW-rem-usec                    OPTIONAL,
    gps-MeasurementParamList            GPS-MeasurementParamList
}

LCS-GPS-NavigationModel ::=         SEQUENCE {
    n-SAT                               INTEGER (1..16),
    navigationModelSatInfoList          NavigationModelSatInfoList
}


LCS-GPS-ReferenceTime ::=           SEQUENCE {
    gps-Week                            INTEGER (0..1023),
    gps-TOW                             GPS-TOW-1usec,
    sfn                                 INTEGER (0..4095),
    gps-TOW-AssistList                  GPS-TOW-AssistList                  OPTIONAL
}

LCS-GPS-UTC-Model ::=               SEQUENCE {
    a1                                  BIT STRING (SIZE (24)),
```

```
    a0                                  BIT STRING (SIZE (32)),
    t-ot                                BIT STRING (SIZE (8)),
    wn-t                                BIT STRING (SIZE (8)),
    delta-t-LS                          BIT STRING (SIZE (8)),
    wn-lsf                              BIT STRING (SIZE (8)),
    dn                                  BIT STRING (SIZE (8)),
    delta-t-LSF                         BIT STRING (SIZE (8))
}

LCS-IPDL-Parameters ::=             SEQUENCE {
    ip-Spacing                          IP-Spacing,
    ip-Length                           IP-Length,
    ip-Offset                           INTEGER (0..9),
    seed                                INTEGER (0..63),
    burstModeParameters                 BurstModeParameters
}

LCS-MeasuredResults ::=             SEQUENCE {
    lcs-MultipleSets                    LCS-MultipleSets                    OPTIONAL,
    lcs-ReferenceCellIdentity           PrimaryCPICH-Info                   OPTIONAL,
    lcs-OTDOA-Measurement               LCS-OTDOA-Measurement               OPTIONAL,
    lcs-Position                        LCS-Position                        OPTIONAL,
    lcs-GPS-Measurement                 LCS-GPS-Measurement                 OPTIONAL,
    lcs-Error                           LCS-Error                           OPTIONAL
}

LCS-Measurement ::=                 SEQUENCE {
    lcs-ReportingQuantity               LCS-ReportingQuantity,
    reportCriteria                      LCS-ReportCriteria,
    lcs-OTDOA-AssistanceData            LCS-OTDOA-AssistanceData            OPTIONAL,
    lcs-GPS-AssistanceData              LCS-GPS-AssistanceData              OPTIONAL
}

LCS-MeasurementEventResults ::=     SEQUENCE {
    event7a                             LCS-Position,
    event7b                             LCS-OTDOA-Measurement,
    event7c                             LCS-GPS-Measurement
}

LCS-MeasurementInterval ::=         ENUMERATED {
                                        e5, e15, e60, e300,
                                        e900, e1800, e3600, e7200 }

LCS-MethodType ::=                  ENUMERATED {
                                        ue-Assisted,
                                        ue-Based,
                                        ue-BasedPreferred,
                                        ue-AssistedPreferred }

LCS-MultipleSets ::=                SEQUENCE {
    numberOfOTDOA-IPDL-GPS-Sets         INTEGER (2..3),
    numberOfReferenceCells              INTEGER (1..3),
    referenceCellRelation               ReferenceCellRelation
}

LCS-OTDOA-AssistanceData ::=        SEQUENCE {
    lcs-OTDOA-ReferenceCell             LCS-OTDOA-ReferenceCell             OPTIONAL,
    lcs-OTDOA-MeasurementAssistDataList LCS-OTDOA-MeasurementAssistDataList OPTIONAL,
    lcs-IPDL-Parameters                 LCS-IPDL-Parameters                 OPTIONAL
}

LCS-OTDOA-AssistanceSIB ::=         SEQUENCE {
    lcs-CipherParameters                LCS-CipherParameters,
    searchWindowSize                    OTDOA-SearchWindowSize,
    referenceCellPosition               ReferenceCellPosition,
    lcs-IPDL-Parameters                 LCS-IPDL-Parameters                 OPTIONAL,
    cellToMeasureInfoList               CellToMeasureInfoList
}

LCS-OTDOA-Measurement ::=           SEQUENCE {
    sfn                                 INTEGER (0..4095),
    -- Actual value = IE value * 0.25 + 876
    ue-Rx-Tx-TimeDifference             INTEGER (0..1184),
    qualityType                         QualityType,
    qualityChoice                       CHOICE {
        std-10                              ReferenceQuality10,
        std-50                              ReferenceQuality50,
        cpich-EcN0                          CPICH-Ec-N0-OTDOA,
```

```
        defaultQuality                      ReferenceQuality
    },
    neighborList                        NeighborList                        OPTIONAL
}

LCS-OTDOA-MeasurementAssistData ::= SEQUENCE {
    primaryCPICH-Info                   PrimaryCPICH-Info,
    frequencyInfo                       FrequencyInfo                       OPTIONAL,
    sfn-SFN-ObsTimeDifference           SFN-SFN-ObsTimeDifference1,
    fineSFN-SFN                         FineSFN-SFN                         OPTIONAL,
    searchWindowSize                    OTDOA-SearchWindowSize,
    relativeNorth                       INTEGER (-20000..20000)             OPTIONAL,
    relativeEast                        INTEGER (-20000..20000)             OPTIONAL,
    relativeAltitude                    INTEGER (-4000..4000)               OPTIONAL
}

LCS-OTDOA-MeasurementAssistDataList ::= SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        LCS-OTDOA-MeasurementAssistData

LCS-OTDOA-ReferenceCell ::=         SEQUENCE {
    primaryCPICH-Info                   PrimaryCPICH-Info,
    frequencyInfo                       FrequencyInfo                       OPTIONAL,
    cellPosition                        ReferenceCellPosition               OPTIONAL
}


LCS-Position ::=                    SEQUENCE {
    referenceSFN                        ReferenceSFN,
    gps-TOW                             GPS-TOW-1usec,
    positionEstimate                    PositionEstimate
}

LCS-ReportCriteria ::=              CHOICE {
    lcs-ReportingCriteria               LCS-EventParamList,
    periodicalReportingCriteria         PeriodicalReportingCriteria,
    noReporting                         NULL
}

LCS-ReportingQuantity ::=           SEQUENCE {
    methodType                          LCS-MethodType,
    positioningMethod                   PositioningMethod,
    responseTime                        LCS-ResponseTime,
    accuracy                            LCS-Accuracy                        OPTIONAL,
    gps-TimingOfCellWanted              BOOLEAN,
    multipleSets                        BOOLEAN,
    environmentCharacterization         EnvironmentCharacterization         OPTIONAL
}

LCS-ResponseTime ::=                ENUMERATED {
                                        s1, s2, s4, s8, s16,
                                        s32, s64, s128 }


MaxNumberOfReportingCellsType1 ::=  ENUMERATED {
                                        e1, e2, e3, e4, e5, e6}

MaxNumberOfReportingCellsType2 ::=  ENUMERATED {
                                        e1, e2, e3, e4, e5, e6, e7, e8, e9, e10, e11, e12}

MaxNumberOfReportingCellsType3 ::=  ENUMERATED {
                                        viactCellsPlus1,
                                        viactCellsPlus2,
                                        viactCellsPlus3,
                                        viactCellsPlus4,
                                        viactCellsPlus5,
                                        viactCellsPlus6 }

MaxReportedCellsOnRACH ::=          ENUMERATED {
                                        noReport,
                                        currentCell,
                                        currentAnd-1-BestNeighbour,
                                        currentAnd-2-BestNeighbour,
                                        currentAnd-3-BestNeighbour,
                                        currentAnd-4-BestNeighbour,
                                        currentAnd-5-BestNeighbour,
                                        currentAnd-6-BestNeighbour }

MeasuredResults ::=                 CHOICE {
```

```
    intraFreqMeasuredResultsList        IntraFreqMeasuredResultsList,
    interFreqMeasuredResultsList        InterFreqMeasuredResultsList,
    interSystemMeasuredResultsList      InterSystemMeasuredResultsList,
    trafficVolumeMeasuredResultsList    TrafficVolumeMeasuredResultsList,
    qualityMeasuredResults              QualityMeasuredResults,
    ue-InternalMeasuredResults          UE-InternalMeasuredResults,
    lcs-MeasuredResults                 LCS-MeasuredResults
}

MeasuredResultsList ::=             SEQUENCE (SIZE (1..maxAdditionalMeas)) OF
                                        MeasuredResults


MeasuredResultsOnRACH ::=           SEQUENCE {
    currentCell                         SEQUENCE {
        modeSpecificInfo                    CHOICE {
            fdd                                 SEQUENCE {
                measurementQuantity                 CHOICE {
                    cpich-Ec-N0                         CPICH-Ec-N0,
                    cpich-RSCP                          CPICH-RSCP,
                    pathloss                            Pathloss
                }
            },
            tdd                                 SEQUENCE {
                timeslotISCP                        TimeslotISCP-List       OPTIONAL,
                primaryCCPCH-RSCP                   PrimaryCCPCH-RSCP       OPTIONAL
            }
        }
    },
    monitoredCells                      MonitoredCellRACH-List              OPTIONAL
}

MeasurementCommand ::=              CHOICE {
    setup                               MeasurementType,
    modify                              SEQUENCE {
        measurementType                     MeasurementType                 OPTIONAL
    },
    release                             NULL
}

MeasurementControlSysInfo ::=       SEQUENCE {
    use-of-HCS                          CHOICE  {
        hcs-not-used                        SEQUENCE    {
            cellSelectQualityMeasure        CHOICE  {
                cpich-RSCP                  SEQUENCE    {
                    intraFreqMeasurementSysInfo         IntraFreqMeasurementSysInfo-HCS-RSCP
    OPTIONAL,
                    interFreqMeasurementSysInfo         InterFreqMeasurementSysInfo-HCS-RSCP
    OPTIONAL
                },
                cpich-Ec-No                 SEQUENCE    {
                    intraFreqMeasurementSysInfo         IntraFreqMeasurementSysInfo-HCS-ECN0
    OPTIONAL,
                    interFreqMeasurementSysInfo         InterFreqMeasurementSysInfo-HCS-ECN0
    OPTIONAL
                }
            },
            interSystemMeasurementSysInfo       InterSystemMeasurementSysInfo-HCS       OPTIONAL
        },
        hcs-used                            SEQUENCE    {
            cellSelectQualityMeasure        CHOICE  {
                cpich-RSCP                  SEQUENCE    {
                    intraFreqMeasurementSysInfo         IntraFreqMeasurementSysInfo-RSCP
    OPTIONAL,
                    interFreqMeasurementSysInfo         InterFreqMeasurementSysInfo-RSCP
    OPTIONAL
                },
                cpich-Ec-No                 SEQUENCE    {
                    intraFreqMeasurementSysInfo         IntraFreqMeasurementSysInfo-ECN0
    OPTIONAL,
                    interFreqMeasurementSysInfo         InterFreqMeasurementSysInfo-ECN0
    OPTIONAL
                }
            },
            interSystemMeasurementSysInfo       InterSystemMeasurementSysInfo       OPTIONAL
        }
    },
```

```
    ~~intraFreqMeasurementSysInfo           IntraFreqMeasurementSysInfo           OPTIONAL,~~
    ~~interFreqMeasurementSysInfo           InterFreqMeasurementSysInfo           OPTIONAL,~~
    ~~interSystemMeasurementSysInfo         InterSystemMeasurementSysInfo         OPTIONAL,~~
    trafficVolumeMeasSysInfo            TrafficVolumeMeasSysInfo            OPTIONAL,
    ue-InternalMeasurementSysInfo       UE-InternalMeasurementSysInfo       OPTIONAL
}


MeasurementIdentityNumber ::=       INTEGER (1..16)

MeasurementQuantityGSM ::=          ENUMERATED {
                                        gsm-CarrierRSSI,
                                        pathloss }

MeasurementReportingMode ::=        SEQUENCE {
    measurementReportTransferMode       TransferMode,
    periodicalOrEventTrigger            PeriodicalOrEventTrigger
}

MeasurementType ::=                 CHOICE {
    intraFrequencyMeasurement           IntraFrequencyMeasurement,
    interFrequencyMeasurement           InterFrequencyMeasurement,
    interSystemMeasurement              InterSystemMeasurement,
    lcs-Measurement                     LCS-Measurement,
    trafficVolumeMeasurement            TrafficVolumeMeasurement,
    qualityMeasurement                  QualityMeasurement,
    ue-InternalMeasurement              UE-InternalMeasurement
}

MeasurementValidity ::=             SEQUENCE {
    resume-Release                      Resume-Release
}

MonitoredCellRACH-List ::=          SEQUENCE (SIZE (1..7)) OF
                                        MonitoredCellRACH-Result


MonitoredCellRACH-Result ::=        SEQUENCE {
    sfn-SFN-ObsTimeDifference           SFN-SFN-ObsTimeDifference           OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            primaryCPICH-Info                   PrimaryCPICH-Info,
            measurementQuantity                 CHOICE {
                cpich-Ec-N0                         CPICH-Ec-N0,
                cpich-RSCP                          CPICH-RSCP,
                pathloss                            Pathloss
            }                                                               OPTIONAL
        },
        tdd                                 SEQUENCE {
            primaryCCPCH-Info                   PrimaryCCPCH-Info,
            primaryCCPCH-RSCP                   PrimaryCCPCH-RSCP           OPTIONAL
        }
    }
}

MultipathIndicator ::=              ENUMERATED {
                                        nm,
                                        low,
                                        medium,
                                        high }

N-CR-T-CRMaxHyst ::=                SEQUENCE {
    n-CR                                INTEGER (1..16)                     DEFAULT 8,
    t-CRMaxHyst                         T-CRMaxHyst
}

NavigationModelSatInfo ::=          SEQUENCE {
    satID                               INTEGER (0..63),
    satelliteStatus                     SatelliteStatus,
    navModel                            NavModel
}

NavigationModelSatInfoList ::=      SEQUENCE (SIZE (1..maxSat)) OF
                                        NavigationModelSatInfo

NavModel ::=                        SEQUENCE {
    codeOnL2                            BIT STRING (SIZE (2)),
    uraIndex                            BIT STRING (SIZE (4)),
```

```
    satHealth                           BIT STRING (SIZE (6)),
    iodc                                BIT STRING (SIZE (10)),
    l2Pflag                             BIT STRING (SIZE (1)),
    sf1Revd                             SubFrame1Reserved,
    t-GD                                BIT STRING (SIZE (8)),
    t-oc                                BIT STRING (SIZE (16)),
    af2                                 BIT STRING (SIZE (8)),
    af1                                 BIT STRING (SIZE (16)),
    af0                                 BIT STRING (SIZE (22)),
    c-rs                                BIT STRING (SIZE (16)),
    delta-n                             BIT STRING (SIZE (16)),
    m0                                  BIT STRING (SIZE (32)),
    c-uc                                BIT STRING (SIZE (16)),
    e                                   BIT STRING (SIZE (32)),
    c-us                                BIT STRING (SIZE (16)),
    a-Sqrt                              BIT STRING (SIZE (32)),
    t-oe                                BIT STRING (SIZE (16)),
    fitInterval                         BIT STRING (SIZE (1)),
    aodo                                BIT STRING (SIZE (5)),
    c-ic                                BIT STRING (SIZE (16)),
    omega0                              BIT STRING (SIZE (32)),
    c-is                                BIT STRING (SIZE (16)),
    i0                                  BIT STRING (SIZE (32)),
    c-rc                                BIT STRING (SIZE (16)),
    omega                               BIT STRING (SIZE (32)),
    omegaDot                            BIT STRING (SIZE (24)),
    iDot                                BIT STRING (SIZE (14))
}

Neighbor ::=                        SEQUENCE {
    neighborIdentity                    PrimaryCPICH-Info                   OPTIONAL,
    neignborQuantity                    NeighborQuantity,
    sfn-SFN-ObsTimeDifference2          SFN-SFN-ObsTimeDifference2
}

NeighborList ::=                    SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        Neighbor

-- **TODO**, to be defined fully
NeighborQuantity ::=                SEQUENCE {
}

NewInterFreqCell ::=                SEQUENCE {
    interFreqCellID                     InterFreqCellID                     OPTIONAL,
    frequencyInfo                       FrequencyInfo                       OPTIONAL,
    cellInfo                            CellInfo
}

NewInterFreqCellList ::=            SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        NewInterFreqCell

NewInterFreqCellSI-RSCP ::=             SEQUENCE {
    interFreqCellID                     InterFreqCellID                     OPTIONAL,
    frequencyInfo                       FrequencyInfo                       OPTIONAL,
    cellInfo                            CellInfoSI-RSCP
}

NewInterFreqCellSI-ECN0 ::=             SEQUENCE {
    interFreqCellID                     InterFreqCellID                     OPTIONAL,
    frequencyInfo                       FrequencyInfo                       OPTIONAL,
    cellInfo                            CellInfoSI-ECN0
}

NewInterFreqCellSI-HCS-RSCP ::=             SEQUENCE {
    interFreqCellID                     InterFreqCellID                     OPTIONAL,
    frequencyInfo                       FrequencyInfo                       OPTIONAL,
    cellInfo                            CellInfoSI-HCS-RSCP
}

NewInterFreqCellSI-HCS-ECN0 ::=             SEQUENCE {
    interFreqCellID                     InterFreqCellID                     OPTIONAL,
    frequencyInfo                       FrequencyInfo                       OPTIONAL,
    cellInfo                            CellInfoSI-HCS-ECN0
}

NewInterFreqCellSI-List-RSCP ::=            SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        NewInterFreqCellSI-RSCP
```

```
NewInterFreqCellSI-List-ECN0 ::=          SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        NewInterFreqCellSI-ECN0

NewInterFreqCellSI-List-HCS-RSCP ::=          SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        NewInterFreqCellSI-HCS-RSCP

NewInterFreqCellSI-List-HCS-ECN0 ::=          SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        NewInterFreqCellSI-HCS-ECN0


NewInterSystemCell ::=              SEQUENCE {
    technologySpecificInfo              CHOICE {
        gsm                                 SEQUENCE {
            q-Offset                            Q-Offset                    OPTIONAL,
            hcs-NeighbouringCellInformation     HCS-NeighbouringCellInformation
                                                                            OPTIONAL,
            q-RxlevMin                          Q-RxlevMin,
            maxAllowedUL-TX-Power               MaxAllowedUL-TX-Power,
            bsic                                BSIC,
            bcch-ARFCN                          BCCH-ARFCN,
            gsm-OutputPower                     GSM-OutputPower             OPTIONAL
        },
        is-2000                             SEQUENCE {
            is-2000SpecificMeasInfo             IS-2000SpecificMeasInfo
        },
        spare                               NULL
    }
}

NewInterSystemCell-HCS ::=              SEQUENCE {
    technologySpecificInfo              CHOICE {
        gsm                                 SEQUENCE {
            q-Offset                            Q-Offset                    OPTIONAL,
            hcs-NeighbouringCellInformation     HCS-NeighbouringCellInformation
                                                                            OPTIONAL,
            q-RxlevMin                          Q-RxlevMin,
            maxAllowedUL-TX-Power               MaxAllowedUL-TX-Power,
            bsic                                BSIC,
            bcch-ARFCN                          BCCH-ARFCN,
            gsm-OutputPower                     GSM-OutputPower             OPTIONAL
        },
        is-2000                             SEQUENCE {
            is-2000SpecificMeasInfo             IS-2000SpecificMeasInfo
        },
        spare                               NULL
    }
}

NewInterSystemCellList ::=          SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        NewInterSystemCell

NewInterSystemCellList-HCS ::=          SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        NewInterSystemCell-HCS

NewIntraFreqCell ::=                SEQUENCE {
    intraFreqCellID                     IntraFreqCellID                     OPTIONAL,
    cellInfo                            CellInfo
}

NewIntraFreqCellList ::=            SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        NewIntraFreqCell

NewIntraFreqCellSI-RSCP ::=             SEQUENCE {
    intraFreqCellID                     IntraFreqCellID                     OPTIONAL,
    cellInfo                            CellInfoSI-RSCP
}

NewIntraFreqCellSI-ECN0 ::=         SEQUENCE {
    intraFreqCellID                     IntraFreqCellID                     OPTIONAL,
    cellInfo                            CellInfoSI-ECN0
}

NewIntraFreqCellSI-HCS-RSCP ::=     SEQUENCE {
    intraFreqCellID                     IntraFreqCellID                     OPTIONAL,
    cellInfo                            CellInfoSI-HCS-RSCP
}
```

```
NewIntraFreqCellSI-HCS-ECN0 ::=      SEQUENCE {
    intraFreqCellID                      IntraFreqCellID                    OPTIONAL,
    cellInfo                             CellInfoSI-HCS-ECN0
}

NewIntraFreqCellSI-List-RSCP ::=            SEQUENCE (SIZE (1..maxCellMeas)) OF
                                         NewIntraFreqCellSI-RSCP

NewIntraFreqCellSI-List-ECN0 ::=         SEQUENCE (SIZE (1..maxCellMeas)) OF
                                         NewIntraFreqCellSI-ECN0

NewIntraFreqCellSI-List-HCS-RSCP ::=     SEQUENCE (SIZE (1..maxCellMeas)) OF
                                         NewIntraFreqCellSI-HCS-RSCP

NewIntraFreqCellSI-List-HCS-ECN0 ::=     SEQUENCE (SIZE (1..maxCellMeas)) OF
                                         NewIntraFreqCellSI-HCS-ECN0


NodeB-ClockDrift ::=                 INTEGER (0..15)

NonUsedFreqParameter ::=             SEQUENCE {
    nonUsedFreqThreshold                 Threshold,
    nonUsedFreqW                         W
}

NonUsedFreqParameterList ::=         SEQUENCE (SIZE (1..maxFreq)) OF
                                         NonUsedFreqParameter

ObservedTimeDifferenceToGSM ::=      INTEGER (0..4095)

OTDOA-SearchWindowSize ::=           ENUMERATED {
                                         c10, c20, c30, c40, c50,
                                         c60, c70, moreThan70 }

OtherRAT-InSysInfo ::=               SEQUENCE {
    rat-Type                             RAT-Type,
    k-InterRAT                           K-InterRAT
}

OtherRAT-InSysInfoList ::=           SEQUENCE (SIZE (1..maxOtherRAT)) OF
                                         OtherRAT-InSysInfo

Pathloss ::=                         INTEGER (46..158)

PenaltyTime-RSCP ::=                         CHOICE {
    notUsed                              NULL,
    pt10                                 TemporaryOffset,
    pt20                                 TemporaryOffset,
    pt30                                 TemporaryOffset,
    pt40                                 TemporaryOffset,
    pt50                                 TemporaryOffset,
    pt60                                 TemporaryOffset
}

PenaltyTime-ECNO ::=                 CHOICE {
    notUsed                              NULL,
    pt10                                 TemporaryOffsetList,
    pt20                                 TemporaryOffsetList,
    pt30                                 TemporaryOffsetList,
    pt40                                 TemporaryOffsetList,
    pt50                                 TemporaryOffsetList,
    pt60                                 TemporaryOffsetList
}

PendingTimeAfterTrigger ::=          ENUMERATED {
                                         ptat0-25, ptat0-5, ptat1,
                                         ptat2, ptat4, ptat8, ptat16 }

PeriodicalOrEventTrigger ::=         ENUMERATED {
                                         periodical,
                                         eventTrigger }


PeriodicalReportingCriteria ::=      SEQUENCE {
    reportingAmount                      ReportingAmount                DEFAULT ra-Infinity,
    reportingInterval                    ReportingIntervalLong
}
```

```
PeriodicalWithReportingCellStatus ::= SEQUENCE {
    periodicalReportingCriteria         PeriodicalReportingCriteria,
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL
}

PositionEstimate ::=                CHOICE {
    ellipsoidPoint                      EllipsoidPoint,
    ellipsoidPointUncertCircle          EllipsoidPointUncertCircle,
    ellipsoidPointUncertEllipse         EllipsoidPointUncertEllipse,
    ellipsoidPointAltitude              EllipsoidPointAltitude,
    ellipsoidPointAltitudeEllipse       EllipsoidPointAltitudeEllipse
}

PositioningMethod ::=               ENUMERATED {
                                        otdoa,
                                        gps,
                                        otdoaOrGPS }

PRC ::=                             INTEGER (-2047..2047)


PrimaryCCPCH-RSCP ::=               INTEGER (-115..-25)

Q-HCS ::=                           INTEGER (0..99)

Q-Offset ::=                        INTEGER (-50..50)

Q-OffsetS-N ::=                     INTEGER (-50..50)

Q-QualMin ::=                       INTEGER (-20..0)

-- Actual value = (IE value * 2) + 1
Q-RxlevMin ::=                      INTEGER (-58..-13)

QualityEventResults ::=             SEQUENCE (SIZE (1..maxTrCH)) OF
                                        TransportChannelIdentity


QualityMeasuredResults ::=          SEQUENCE {
    blerMeasurementResultsList          BLER-MeasurementResultsList         OPTIONAL,
    dl-PhysicalChannelBER               DL-PhysicalChannelBER               OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            sir                                 SIR                         OPTIONAL
        },
        tdd                                 SEQUENCE {
            sir-MeasurementResults              SIR-MeasurementList         OPTIONAL
        }
    }
}


QualityMeasurement ::=              SEQUENCE {
    qualityReportingQuantity            QualityReportingQuantity            OPTIONAL,
    reportCriteria                      QualityReportCriteria
}


QualityReportCriteria ::=           CHOICE {
    qualityReportingCriteria            QualityReportingCriteria,
    periodicalReportingCriteria         PeriodicalReportingCriteria,
    noReporting                         NULL
}

QualityReportingCriteria ::=        SEQUENCE (SIZE (1..maxTrCH)) OF
                                        QualityReportingCriteriaSingle

QualityReportingCriteriaSingle ::=  SEQUENCE {
    transportChannelIdentity            TransportChannelIdentity,
    totalCRC                            INTEGER (1..512),
    badCRC                              INTEGER (1..512),
    pendingAfterTrigger                 INTEGER (1..512)
}


QualityReportingQuantity ::=        SEQUENCE {
```

```
    dl-TransChBLER                      BOOLEAN,
    bler-dl-TransChIdList               BLER-TransChIdList                  OPTIONAL,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            sir                                 BOOLEAN
        },
        tdd                                 SEQUENCE {
            sir-TFCS-List                       SIR-TFCS-List               OPTIONAL
        }
    }
}

QualityType ::=                     ENUMERATED {
                                        std-10, std-50, cpich-Ec-N0 }

RAT-Type ::=                        ENUMERATED {
                                        gsm, is2000, spare1, spare2,
                                        spare3, spare4, spare5, spare6,
                                        spare7, spare8, spare9, spare10,
                                        spare11, spare12, spare13, spare14 }

ReferenceCellPosition ::=           CHOICE {
    ellipsoidPoint                      EllipsoidPoint,
    ellipsoidPointWithAltitude          EllipsoidPointAltitude
}

ReferenceCellRelation ::=           ENUMERATED {
                                        first-12-second-3,
                                        first-13-second-2,
                                        first-1-second-23 }

, the reference to ReferenceGPS-TOW is replaced with GPS-TOW-1usec
-- As defined in 23.032 (2D with 24bits for each coordinate)
ReferenceLocationforSIB ::=         SEQUENCE {
    ellipsoidPoint                      EllipsoidPoint
}

ReferenceQuality ::=                ENUMERATED {
                                        m0-19, m20-39, m40-79,
                                        m80-159, m160-319, m320-639,
                                        m640-1319, m1320Plus }

-- Actual value = IE value * 10
ReferenceQuality10 ::=              INTEGER (1..32)

-- Actual value = IE value * 50
ReferenceQuality50 ::=              INTEGER (1..32)

ReferenceSFN ::=                    INTEGER (0..4095)

-- Actual value = IE value * 512
ReferenceTimeDifferenceToCell ::=   CHOICE {
    -- Actual value = IE value * 40
    accuracy40                          INTEGER (0..960),
    -- Actual value = IE value * 256
    accuracy256                         INTEGER (0..150),
    -- Actual value = IE value * 2560
    accuracy2560                        INTEGER (0..15)
}

RemovedInterFreqCellList ::=        SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        InterFreqCellID

RemovedInterSystemCellList ::=      SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        InterSystemCellID

RemovedIntraFreqCellList ::=        SEQUENCE (SIZE (1..maxCellMeas)) OF
                                        IntraFreqCellID

ReplacementActivationThreshold ::=  ENUMERATED {
                                        notApplicable, t1, t2,
                                        t3, t4, t5, t6, t7 }

ReportDeactivationThreshold ::=     ENUMERATED {
                                        notApplicable, t1, t2,
                                        t3, t4, t5, t6, t7 }

ReportingAmount ::=                 ENUMERATED {
```

```
                                        ra1, ra2, ra4, ra8, ra16, ra32,
                                        ra64, ra-Infinity }


ReportingCellStatus ::=             CHOICE{
    withinActiveSet                     MaxNumberOfReportingCellsType1,
    withinMonitoredSetUsedFreq          MaxNumberOfReportingCellsType1,
    withinMonitoredUsedFreq             MaxNumberOfReportingCellsType1,
    allActiveplusMonitoredSet           MaxNumberOfReportingCellsType3,
    withinVirtualActSet                 MaxNumberOfReportingCellsType1,
    withinMonitoredSetNonUsedFreq       MaxNumberOfReportingCellsType1,
    withinMonitoredNonUsedFreq          MaxNumberOfReportingCellsType1,
    allVirtualActSetplusMonitoredSetNonUsedFreq
                                        MaxNumberOfReportingCellsType3,
    withinActSetOrVirtualActSet         MaxNumberOfReportingCellsType2,
    withinMonitoredUsedFreqOrMonitoredNonUsedFreq
                                        MaxNumberOfReportingCellsType2
}


ReportingCellStatusOpt ::=          SEQUENCE {
    reportingCellStatus                 ReportingCellStatus                 OPTIONAL
}


ReportingInfoForCellDCH ::=         SEQUENCE {
    intraFreqReportingQuantity          IntraFreqReportingQuantity,
    measurementReportingMode            MeasurementReportingMode,
    reportCriteria                      CellDCH-ReportCriteria
}

ReportingInterval ::=               ENUMERATED {
                                        noPeriodicalreporting, ri0-25,
                                        ri0-5, ri1, ri2, ri4, ri8, ri16 }

ReportingIntervalLong ::=           ENUMERATED {
                                        ril0, ril0-25, ril0-5, ril1,
                                        ril2, ril3, ril4, ril6, ril8,
                                        ril12, ril16, ril20, ril24,
                                        ril28, ril32, ril64 }

-- Actual value = IE value * 0.5
ReportingRange ::=                  INTEGER (0..29)

Resume-Release ::=                  CHOICE {
    resume                              UE-State,
    release                             NULL
}

RL-AdditionInfoList ::=             SEQUENCE (SIZE (1..maxRL-1)) OF
                                        PrimaryCPICH-Info

RL-InformationLists ::=             SEQUENCE {
    rl-AdditionInfoList                 RL-AdditionInfoList                 OPTIONAL,
    rl-RemovalInfoList                  RL-RemovalInfoList                  OPTIONAL
}

RL-RemovalInfoList ::=              SEQUENCE (SIZE (1..maxRL)) OF
                                        PrimaryCPICH-Info

RLC-BuffersPayload ::=              ENUMERATED {
                                        pl0, pl4, pl8, pl16, pl32, pl64, pl128,
                                        pl256, pl512, pl1024, pl2k, pl4k,
                                        pl8k, pl16k, pl32k, pl64k, pl128k,
                                        pl256k, pl512k, pl1024k }

RRC ::=                             INTEGER (-127..127)

SatelliteStatus ::=                 ENUMERATED {
                                        ns-NN-U,
                                        es-SN,
                                        es-NN-U,
                                        es-NN-C }

SatID ::=                           INTEGER (0..31)

SFN-SFN-ObsTimeDifference ::=       CHOICE {
    type1                               SFN-SFN-ObsTimeDifference1,
```

```
    -- Actual value for type2 = IE value * 0.25
    type2                               SFN-SFN-ObsTimeDifference2
}

SFN-SFN-ObsTimeDifference1 ::=      INTEGER (0..9830399)

SFN-SFN-ObsTimeDifference2 ::=      INTEGER (-5119..5120)

SFN-SFN-OTD-Type ::=                ENUMERATED {
                                        noReport,
                                        type1,
                                        type2 }

SIR ::=                             INTEGER (-10..20)


SIR-MeasurementList ::=             SEQUENCE (SIZE (1..maxCCTrCH)) OF
                                        SIR-MeasurementResults


SIR-MeasurementResults ::=          SEQUENCE {
    tfcs-ID                             TFCS-IdentityPlain,
    sir-TimeslotList                    SIR-TimeslotList
}


SIR-TFCS ::=                        TFCS-IdentityPlain


SIR-TFCS-List ::=                   SEQUENCE (SIZE (1..maxCCTrCH)) OF
                                        SIR-TFCS


SIR-TimeslotList ::=                SEQUENCE (SIZE (1..maxTS)) OF
                                        SIR

-- Reserved bits in subframe 1 of the GPS navigation message
SubFrame1Reserved ::=               SEQUENCE {
    reserved1                           BIT STRING (SIZE (23)),
    reserved2                           BIT STRING (SIZE (24)),
    reserved3                           BIT STRING (SIZE (24)),
    reserved4                           BIT STRING (SIZE (16))
}

T-CRMax ::=                         CHOICE {
    notUsed                             NULL,
    t30                                 N-CR-T-CRMaxHyst,
    t60                                 N-CR-T-CRMaxHyst,
    t120                                N-CR-T-CRMaxHyst,
    t180                                N-CR-T-CRMaxHyst,
    t240                                N-CR-T-CRMaxHyst
}

T-CRMaxHyst ::=                     ENUMERATED {
                                        notUsed, t10, t20, t30,
                                        t40, t50, t60, t70 }

TemporaryOffset ::=                 ENUMERATED {
                                        to10, to20, to30, to40, to50,
                                        to60, to70, infinite }

TemporaryOffsetList ::=             SEQUENCE    {
        temporaryOffset1                TemporaryOffset,
        temporaryOffset2                TemporaryOffset
}

Threshold ::=                       INTEGER (-115..0)

ThresholdPositionChange ::=         ENUMERATED {
                                        pc10, pc20, pc30, pc40, pc50,
                                        pc100, pc200, pc300, pc500,
                                        pc1000, pc2000, pc5000, pc10000,
                                        pc20000, pc50000, pc100000 }

ThresholdSFN-GPS-TOW ::=            ENUMERATED {
                                        ms1, ms2, ms3, ms5, ms10,
                                        ms20, ms50, ms100 }
```

```
ThresholdSFN-SFN-Change ::=         ENUMERATED {
                                        c0-25, c0-5, c1, c2, c3, c4, c5,
                                        c10, c20, c50, c100, c200, c500,
                                        c1000, c2000, c5000 }

ThresholdUsedFrequency ::=          INTEGER (-125..165)


-- Actual value = IE value * 20, IE values 14-16 are spare values.
TimeInterval ::=                    INTEGER (1..16)


TimeslotInfo ::=                    SEQUENCE {
    timeslotNumber                      TimeslotNumber,
    burstType                           BurstType
}


TimeslotInfoList ::=                SEQUENCE (SIZE (1..maxTS)) OF
                                        TimeslotInfo

TimeslotISCP ::=                    INTEGER (-115..-25)


TimeslotISCP-List ::=               SEQUENCE (SIZE (1..maxTS)) OF
                                        TimeslotISCP

TimeslotListWithISCP ::=            SEQUENCE (SIZE (1..maxTS)) OF
                                        TimeslotWithISCP

TimeslotWithISCP ::=                SEQUENCE {
    timeslot                            TimeslotNumber,
    timeslotISCP                        TimeslotISCP
}

TimeToTrigger ::=                   ENUMERATED {
                                        ttt0, ttt10, ttt20, ttt40, ttt60,
                                        ttt80, ttt100, ttt120, ttt160,
                                        ttt200, ttt240, tt320, ttt640,
                                        ttt1280, ttt2560, ttt5000 }

TrafficVolumeEventParam ::=         SEQUENCE {
    eventID                             TrafficVolumeEventType,
    reportingThreshold                  TrafficVolumeThreshold
}

TrafficVolumeEventResults ::=       SEQUENCE {
    ul-transportChannelCausingEvent     TransportChannelIdentity,
    trafficVolumeEventIdentity          TrafficVolumeEventType
}

TrafficVolumeEventType ::=          ENUMERATED {
                                        e4a,
                                        e4b }


TrafficVolumeMeasQuantity ::=       CHOICE {
    rlc-BufferPayload                   NULL,
    averageRLC-BufferPayload            TimeInterval,
    varianceOfRLC-BufferPayload         TimeInterval
}


TrafficVolumeMeasSysInfo ::=        SEQUENCE {
    trafficVolumeMeasurementID          MeasurementIdentityNumber           DEFAULT 4,
    trafficVolumeMeasurementObjectList  TrafficVolumeMeasurementObjectList  OPTIONAL,
    trafficVolumeMeasQuantity           TrafficVolumeMeasQuantity           OPTIONAL,
    trafficVolumeReportingQuantity      TrafficVolumeReportingQuantity      OPTIONAL,
    trafficVolumeMeasRepCriteria        TrafficVolumeReportingCriteria      OPTIONAL,
    measurementValidity                 MeasurementValidity                 OPTIONAL,
    measurementReportingMode            MeasurementReportingMode,
    reportCriteriaSysInf                TrafficVolumeReportCriteriaSysInfo

}

TrafficVolumeMeasuredResults ::=    SEQUENCE {
    rb-Identity                         RB-Identity,
    rlc-BuffersPayload                  RLC-BuffersPayload                  OPTIONAL,
```

```
    averageRLC-BufferPayload            AverageRLC-BufferPayload            OPTIONAL,
    varianceOfRLC-BufferPayload         VarianceOfRLC-BufferPayload         OPTIONAL
}

TrafficVolumeMeasuredResultsList ::= SEQUENCE (SIZE (1..maxRB)) OF
                                        TrafficVolumeMeasuredResults

TrafficVolumeMeasurement ::=        SEQUENCE {
    trafficVolumeMeasurementObjectList  TrafficVolumeMeasurementObjectList  OPTIONAL,
    trafficVolumeMeasQuantity           TrafficVolumeMeasQuantity           OPTIONAL,
    trafficVolumeReportingQuantity      TrafficVolumeReportingQuantity      OPTIONAL,
    measurementValidity                 MeasurementValidity                 OPTIONAL,
    reportCriteria                      TrafficVolumeReportCriteria
}

TrafficVolumeMeasurementObjectList ::= SEQUENCE (SIZE (1..maxTrCH)) OF
                                            TransportChannelIdentity

TrafficVolumeReportCriteria ::=     CHOICE {
    trafficVolumeReportingCriteria      TrafficVolumeReportingCriteria,
    periodicalReportingCriteria         PeriodicalReportingCriteria,
    noReporting                         NULL
}


TrafficVolumeReportCriteriaSysInfo ::=  CHOICE {
    trafficVolumeReportingCriteria      TrafficVolumeReportingCriteria,
    periodicalReportingCriteria         PeriodicalReportingCriteria
}


TrafficVolumeReportingCriteria ::= SEQUENCE {
    transChCriteriaList                 TransChCriteriaList                 OPTIONAL,
    timeToTrigger                       TimeToTrigger                       OPTIONAL,
    pendingTimeAfterTrigger             PendingTimeAfterTrigger             OPTIONAL,
    tx-InterruptionAfterTrigger         TX-InterruptionAfterTrigger         OPTIONAL,
    reportingAmount                     ReportingAmount                     OPTIONAL
}

TrafficVolumeReportingQuantity ::= SEQUENCE {
    rlc-RB-BufferPayload                BOOLEAN,
    rlc-RB-BufferPayloadAverage         BOOLEAN,
    rlc-RB-BufferPayloadVariance        BOOLEAN
}

TrafficVolumeThreshold ::=          ENUMERATED {
                                        th8, th16, th32, th64, th128,
                                        th256, th512, th1024, th1536,
                                        th2048, th3072, th4096, th6144,
                                        th8192 }


TransChCriteria ::=                 SEQUENCE {
    ul-transportChannelID               TransportChannelIdentity        OPTIONAL,
    eventSpecificParameters             SEQUENCE (SIZE (1..maxMeasParEvent)) OF
                                            TrafficVolumeEventParam         OPTIONAL
}

TransChCriteriaList ::=         SEQUENCE (SIZE (1..maxTrCH)) OF
                                        TransChCriteria

TransferMode ::=                    ENUMERATED {
                                        acknowledgedModeRLC,
                                        unacknowledgedModeRLC }

TransmittedPowerThreshold ::=       INTEGER (-50..33)

TriggeringCondition ::=             ENUMERATED {
                                        activeSetCellsOnly,
                                        monitoredCellsOnly,
                                        activeSetAndMonitoredCells }

TX-InterruptionAfterTrigger ::=     ENUMERATED {
                                        txiat0-25, txiat0-5, txiat1,
                                        txiat2, txiat4, txiat8, txiat16 }

UDRE ::=                            ENUMERATED {
                                        lessThan1,
```

```
                                        between1-and-4,
                                        between4-and-8,
                                        over8 }

UE-6AB-Event ::=                    SEQUENCE {
    timeToTrigger                       TimeToTrigger,
    transmittedPowerThreshold           TransmittedPowerThreshold
}

UE-6FG-Event ::=                    SEQUENCE {
    timeToTrigger                       TimeToTrigger,
    ue-RX-TX-TimeDifferenceThreshold    UE-RX-TX-TimeDifferenceThreshold
}

UE-AutonomousUpdateMode ::=         CHOICE {
    on                                  NULL,
    onWithNoReporting                   NULL,
    off                                 RL-InformationLists
}


UE-InternalEventParam ::=           CHOICE {
    event6a                             UE-6AB-Event,
    event6b                             UE-6AB-Event,
    event6c                             TimeToTrigger,
    event6d                             TimeToTrigger,
    event6e                             TimeToTrigger,
    event6f                             UE-6FG-Event,
    event6g                             UE-6FG-Event
}

UE-InternalEventParamList ::=       SEQUENCE (SIZE (1..maxMeasEvent)) OF
                                        UE-InternalEventParam

UE-InternalEventResults ::=         CHOICE {
    event6a                             NULL,
    event6b                             NULL,
    event6c                             NULL,
    event6d                             NULL,
    event6e                             NULL,
    event6f                             PrimaryCPICH-Info,
    event6g                             PrimaryCPICH-Info
}

UE-InternalMeasQuantity ::=         SEQUENCE {
    measurementQuantity                 UE-MeasurementQuantity,
    filterCoefficient                   FilterCoefficient                   DEFAULT fc1
}


UE-InternalMeasuredResults ::=      SEQUENCE {
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            ue-TransmittedPowerFDD              UE-TransmittedPower         OPTIONAL,
            ue-RX-TX-ReportEntryList            UE-RX-TX-ReportEntryList    OPTIONAL
        },
        tdd                                 SEQUENCE {
            ue-TransmittedPowerTDD-List         UE-TransmittedPowerTDD-List OPTIONAL,
            appliedTA                           UL-TimingAdvance            OPTIONAL
        }
    }
}

UE-InternalMeasurement ::=          SEQUENCE {
    ue-InternalMeasQuantity             UE-InternalMeasQuantity             OPTIONAL,
    ue-InternalReportingQuantity        UE-InternalReportingQuantity        OPTIONAL,
    reportCriteria                      UE-InternalReportCriteria
}

UE-InternalMeasurementSysInfo ::=   SEQUENCE {
    ue-InternalMeasurementID            MeasurementIdentityNumber           DEFAULT 5,
    ue-InternalMeasQuantity             UE-InternalMeasQuantity
}

UE-InternalReportCriteria ::=       CHOICE {
    ue-InternalReportingCriteria        UE-InternalReportingCriteria,
    periodicalReportingCriteria         PeriodicalReportingCriteria,
    noReporting                         NULL
```

```
}

UE-InternalReportingCriteria ::=    SEQUENCE {
    ue-InternalEventParamList           UE-InternalEventParamList           OPTIONAL
}


UE-InternalReportingQuantity ::=    SEQUENCE {
    ue-TransmittedPower                 BOOLEAN,
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            ue-RX-TX-TimeDifferece              BOOLEAN
        },
        tdd                                 SEQUENCE {
            appliedTA                           BOOLEAN
        }
    }
}


-- TABULAR: For TDD only the first two values are used.
UE-MeasurementQuantity ::=          ENUMERATED {
                                        ue-TransmittedPower,
                                        utra-Carrier-RSSI,
                                        ue-RX-TX-TimeDifference }

UE-RX-TX-ReportEntry ::=            SEQUENCE {
    primaryCPICH-Info                   PrimaryCPICH-Info,
    ue-RX-TX-TimeDifference             UE-RX-TX-TimeDifference
}

UE-RX-TX-ReportEntryList ::=        SEQUENCE (SIZE (1..maxRL)) OF
                                        UE-RX-TX-ReportEntry

UE-RX-TX-TimeDifference ::=         INTEGER (876..1172)

UE-RX-TX-TimeDifferenceThreshold ::= INTEGER (769..1280)

UE-State ::=                        ENUMERATED {
                                        cell-DCH, all-But-Cell-DCH, all-States }


UE-TransmittedPower ::=             INTEGER (-50..33)


UE-TransmittedPowerTDD-List ::=     SEQUENCE (SIZE (1..maxTS)) OF
                                        UE-TransmittedPower

UTRA-CarrierRSSI ::=                INTEGER (-95..-30)


UTRAN-ReferenceTime ::=             SEQUENCE {
    gps-TOW                             GPS-TOW-1usec,
    sfn                                 INTEGER (0..4095)
}

VarianceOfRLC-BufferPayload ::=     ENUMERATED {
                                        plv0, plv4, plv8, plv16, plv32, plv64,
                                        plv128, plv256, plv512, plv1024,
                                        plv2k, plv4k, plv8k, plv16k }

-- Actual value = IE value * 0.1
W ::=                               INTEGER (0..20)

END
```

3GPP TSG RAN WG2#15
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***Document* R2-001725**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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25.331	**CR**	517	Current Version:	3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG-RAN #9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from:* ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: TSG-RAN WG2 **Date:** 2000-08-21

Subject: PRACH info

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change:

The size of the PRACH info is modified in order to reduce the amount of information in IE “PRACH info”. This CR proposes to change the IE types of “Available Signature” and “Available Sub Number” to bitstring.

- If there are more than 4 available signatures (max16), it saves bits to use bitstring.
- If there are more than 3 available sub channel numbers (max12), it saves bits to use bitstring.

Clauses affected: 10.3.6.44, 11.3.6

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

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<--------- double-click here for help and instructions on how to create a CR.

10.3.6.44 PRACH info (for RACH)

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *mode*	MP			
>FDD				
~~>>Available Signature~~	~~MP~~	~~1 to <maxSig>~~		
~~>>>Signature~~	~~MP~~		~~Integer (0..15)~~	
>> Available Signature	MP		Bitstring(16)	(Note1) 0000000000000001:Signature 0 0000000000000010:Signature 1 0000000000000011:Signature 0&1 : 1111111111111111:Signature 0to15
>>Available SF	MP		Integer (32,64,128,256)	In chips per symbol Defines the smallest permitted SF (i.e. the maximum rate)
>>Scrambling code number	MP		Integer (0 .. 15)	Identification of scrambling code see TS 25.213
>>Puncturing Limit	MP		Real(0.40..1.00 by step of 0.04)	
~~>>Available Sub Channel number~~	~~MP~~	~~1 to < maxSubCh >~~		
~~>>>Sub Channel number~~	~~MP~~		~~Integer (0..11)~~	
>> Available Sub Channel Number	MP		Bitstring(12)	(Note2) 000000000001:SubChNumber 0 000000000010:SubChNumber 1 000000000011:SubChNumber 0&1 : 111111111111:SubChNumber 0to11
>TDD				
>>Timeslot	MP		Timeslot number 10.3.6.72	
>>PRACH Channelisation Code	MP		PRACH Channelisation Code 10.3.6.43	
>>PRACH Midamble	OP		Enumerated (Direct, Direct/Inverted)	Direct or direct and inverted midamble are used for PRACH

Note 1 : Each bit is 0 or 1 to indicate available signature_x, x= 0 to 15.
Note 2 : Each bit is 0 or 1 to indicate available sub channel number _x, x= 0 to 11.

11.3.6 Physical channel information elements

AvailableAP-Signatures~~List~~ ::= BITSTRING(SIZE(16))~~SEQUENCE (SIZE (1..maxPCPCH-APsig)) OF AP-Signature~~

~~AvailableSubChannelNumber ::= INTEGER (0..11)~~

```
AvailableSubChannelNumbersList ::=  BITSTRING(SIZE(12))SEQUENCE (SIZE (1..maxSubCh)) OF
                                        AvailableSubChannelNumber

PRACH-RACH-Info ::=                 SEQUENCE {
    modeSpecificInfo                    CHOICE {
        fdd                                 SEQUENCE {
            availableSignaturesList             AvailableSignaturesList,
            availableSF                         SF-PRACH,
            scramblingCodeWordNumber            ScramblingCodeWordNumber,
            puncturingLimit                     PuncturingLimit,
            availableSubChannelNumbersList      AvailableSubChannelNumbersList
        },
        tdd                                 SEQUENCE {
            timeslot                            TimeslotNumber,
            channelisationCode                  TDD-PRACH-CCodeList,
            prach-Midamble                      PRACH-Midamble              OPTIONAL
        }
    }
}
```

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CHANGE REQUEST

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25.331 CR 518r1 Current Version: 3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-RAN #9
list expected approval meeting # here ↑

for approval	X	strategic		*(for SMG use only)*
for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from:* ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]
(at least one should be marked with an X)

Source: TSG-RAN WG2 **Date:** 2000-08-21

Subject: Uplink DPCH power control info

Work item:

Category:
(only one category shall be marked with an X)

F	Correction	X	
A	Corresponds to a correction in an earlier release		
B	Addition of feature		
C	Functional modification of feature		
D	Editorial modification		

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: The description in case of not receiving the IE "Uplink DPCH power control info"(OP) was missing. Texts are added.

Clauses affected: 8.5.7.6.10

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

8.5.7.6.10 Uplink DPCH power control info

In FDD~~,~~;

- if the IE "Uplink DPCH power control info" is included the UE shall:
  - calculate and set an initial uplink transmission power;
  - start inner loop power control as specified in 8.5.3;
  - for the UL inner loop power control use the parameters specified in the IE.

In TDD,;

- if the IE "Uplink DPCH power control info" is included the UE shall:
  - use the parameters specified in the IE for open loop power control as defined in 8.5.9.

Both in FDD and TDD;

- if the IE "Uplink DPCH power control info" is not included, the UE shall use the current uplink transmission power.

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***Document* R2-001734**

CHANGE REQUEST

25.331	**CR**	**519**	Current Version: 3.3.0

For submission to: TSG-RAN #9

for approval	X	strategic	
for information		non-strategic	

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]

Source:	TSG-RAN WG2	**Date:**	22nd Aug. 2000
Subject:	AICH power offset value range		
Work item:			

Category:

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change:

The current lower limit of the AICH power range is too tight to allow enough flexibility for different network scenarios. It is proposed that the value range of the AICH power offset should be 12dB lower than currently defined in TS 25.331.

The AICH power offset is defined as power per transmitted Acquisition Indicator minus power of the Primary CPICH. The transmission power of the AICH will vary depending on how many acquisition indicators are transmitted. If all AIs are transmitted then AICH power is 12dB (10*log10(16))greater than power for each transmitted AI.

Currently, the AI power minus CPICH power is defined in the range -10 to 5dB, which means that worst case the total AICH power (when all AIs are transmitted) minus CPICH power is 2 to 17dB. Consequently, unless CPICH_Ec/Ior is very low then the contribution to Ior from AICH (for most of the AICH/CPICH ratios and when most of the AI's are transmitted) will be significant, and Ior will change significantly as the number of transmitted acquisition indicators changes. This is not acceptable in all network scenarios.

Clauses affected: 10.3.6.3, 11.3.6

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

10.3.6.3 AICH Power offset

NOTE: Only for FDD.

This is the power per transmitted Acquisition Indicator minus power of the Primary CPICH.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
AICH Power offset	MP		Integer(-22~~10~~..+5)	Offset in dB

11.3.6 Physical channel information elements

```
AICH-Info ::=                   SEQUENCE {
    secondaryScramblingCode         SecondaryScramblingCode         OPTIONAL,
    channelisationCode256           ChannelisationCode256,
    sttd-Indicator                  BOOLEAN,
    aich-TransmissionTiming         AICH-TransmissionTiming
}

AICH-PowerOffset ::=            INTEGER (-2210..5)

AICH-TransmissionTiming ::=     ENUMERATED {
                                    e0, e1 }
```

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Document ***R2-001831***

CHANGE REQUEST

25.331	**CR**	**520r2**	Current Version:	3.3.0

For submission to:	TSG-RAN #9	for approval	X	strategic	
		for information		non-strategic	

Proposed change affects:	(U)SIM		ME	X	UTRAN / Radio	X	Core Network	

Source:	TSG-RAN WG2	**Date:**	24th Aug. 2000
Subject:	Direct paging of RRC connected UE in CELL_PCH/URA_PCH		
Work item:			

Category:	F	Correction	X	**Release:**	Phase 2	
	A	Corresponds to a correction in an earlier release			Release 96	
	B	Addition of feature			Release 97	
	C	Functional modification of feature			Release 98	
	D	Editorial modification			Release 99	X
					Release 00	

Reason for change:

The usage of PAGING TYPE 1 message for paging an RRC connected UE in CELL_PCH/URA_PCH state has been restricted unnecessarily in the current specification text. The UE is currently not able to receive CN pages on the PCH whilst in connected mode.

There are two ways of conveying a CN originated page to a connected mode UE:

1) The UTRAN first pages the connected mode UE with PAGING TYPE 1 and paging originator = UTRAN (without indicating any information on a CN page) on the PCH. This results in the UE making a cell update and a transition to CELL_FACH state. The UTRAN then forwards the CN originated page in PAGING TYPE 2 on the FACH.

2) The UTRAN directly pages the connected mode UE with PAGING TYPE 1 and with paging originator = UTRAN on the PCH and includes CN page information (CN domain identity and CN paging cause).

The second method is simple and efficient and introduces less signalling. The possibility of using the first method is, of course, not restricted.

Changes are introduces to the paging record IE and the procedure description text.

Clauses affected: 8.1.2.3, 10.3.3.24, 11.3.3

Other specs affected:	Other 3G core specifications		→ List of CRs:	
	Other GSM core specifications		→ List of CRs:	
	MS test specifications		→ List of CRs:	
	BSS test specifications		→ List of CRs:	

	O&M specifications		→ List of CRs:

Other comments:	

8.1.2.3 Reception of an PAGING TYPE 1 message by the UE

The UE shall in idle mode, CELL_PCH state and URA_PCH state receive the paging information for all its monitored paging occasions. For an UE in idle mode, the paging occasions are specified in TS 25.304 and depend on the IE "CN domain specific DRX cycle length coefficient", as specified in 8.5.7.1.1. For an UE in CELL_PCH state and URA_PCH state the paging occasions depend also on the IE "UTRAN DRX Cycle length coefficient" and the IE "DRX indicator", as specified in subclauses 8.5.7.3.2 and 8.5.7.3.3 respectively.

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

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

An idle mode UE shall:

- if the IE "Used paging ~~originator~~identity" is a CN identity, compare the included identities of type CN UE identity with all of its allocated CN UE identities.
- for each match, forward the identity and paging cause to the upper layer entity indicated by the IE "CN domain identity".
- if the IE " Used paging identity ~~paging originator~~" is a UTRAN identity, ignore that paging record.

A connected mode UE shall;

- if the IE "Used paging ~~originator~~identity" is a UTRAN identity, compare the included ~~identities of type~~ U-RNTIs~~"UTRAN originator"~~ with its allocated U-RNTI.
- ~~for each~~ if a match is found,~~,~~ the UE shall enter CELL_FACH state and perform a cell update procedure with cause "paging response" as specified in subclause 8.3.1.2.
- If optional IEs "paging cause", " paging record type identifier" and " CN domain identity " are included in the message for a UTRAN originated page, the UE shall indicate paging and forward the paging cause and the paging record type identifier to the upper layer entity indicated by the CN domain identity.
- if the IE " Used paging identity ~~paging originator~~" is a CN identity, ignore that paging record.

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

10.3.3.24 Paging record

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE Used ~~P~~paging ~~originator~~identity	MP			
> CN ~~originator~~identity				
>> Paging cause	MP		Paging cause 10.3.3.23	
>> CN domain identity	MP		CN domain identity 10.3.1.1	
>>CHOICE UE Identity	MP			At least 3 spare choice, Criticality: reject, are needed
>>>IMSI (GSM-MAP)			IMSI (GSM-MAP) 10.3.1.6	
>>>TMSI (GSM-MAP)			TMSI (GSM-MAP) 10.3.1.18	
>>>P-TMSI (GSM-MAP)			P-TMSI (GSM-MAP) 10.3.1.13	
>>>IMSI (DS-41)			TIA/EIA/IS-2000-4	
>>>TMSI (DS-41)			TIA/EIA/IS-2000-4	
> UTRAN ~~originator~~identity				
>>U-RNTI	MP		U-RNTI 10.3.3.45	
>> CN originated page to connected mode UE	OP			
>>> Paging cause	MP		Paging cause 10.3.3.23	
>>> CN domain identity	MP		CN domain identity 10.3.1.1	
>>> Paging Record Type Identifier	MP		Paging Record Type Identifier 10.3.1.10	

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

11.3.3 User equipment information elements

```
UserEquipment-IEs DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    CN-DomainIdentity,
    IMEI,
    IMSI-GSM-MAP,
    LAI,
    P-TMSI-GSM-MAP,
    PagingRecordTypeID,
    RAI,
    TMSI-GSM-MAP
FROM CoreNetwork-IEs

CN-OriginatedToConnectedMode ::=    SEQUENCE {
    pagingCause                         PagingCause,
    cn-DomainIdentity                   CN-DomainIdentity,
    pagingRecordTypeID                  PagingRecordTypeID
}

PagingRecord ::=                    CHOICE {
    cn-Page                             SEQUENCE {
        pagingCause                         PagingCause,
        cn-DomainIdentity                   CN-DomainIdentity,
        cn-pagedUE-Identity                 CN-PagedUE-Identity
    },
    utran-Page                          SEQUENCE {
        u-RNTI                              U-RNTI,
        cn-OriginatedToConnectedMode        CN-OriginatedToConnectedMode    OPTIONAL
        pagingCause                         PagingCause,
        cn-DomainIdentity                   CN-DomainIdentity,
    }
}
```

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Sophia Antipolis, France, 21 - 25 August 2000

Document R2-001737
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CHANGE REQUEST

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25.331	**CR**	**521**	Current Version:	3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ ↑ *CR number as allocated by MCC support team*

For submission to:	TSG-RAN #9	for approval	X	strategic		*(for SMG*
list expected approval meeting # here ↑		for information		non-strategic		*use only)*

Form: CR cover sheet, version 2 for 3GPP and SMG   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

X

Proposed change affects:	(U)SIM		ME	X	UTRAN / Radio	X	Core Network	

(at least one should be marked with an X)

Source: TSG-RAN WG2   **Date:** 20.07.00

Subject: Corrections to sections 1 – 7

Work item:

Category: *(only one category shall be marked with an X)*

				Release:	
F	Correction	X		Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: Cleanup according to review during WG2#14

Clauses affected: 1, 2, 3.2, 4, 5, 6.1, 6.2, 7

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

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<--------- double-click here for help and instructions on how to create a CR.

1 Scope

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

The scope of this specification contains also:

- the information to be transported in a transparent container between source RNC and target RNC in connection to SRNC relocation~~ as defined in [4].~~
- the information to be transported in a transparent container between a target RNC and another system

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] 3G TR 21.905~~3G TR 25.990~~: " Vocabulary for 3GPP Specifications ~~Vocabulary for the UTRAN~~".

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

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

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

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

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

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

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

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

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

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

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

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

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

[15] 3G TS 25.321: " MAC protocol specification".

[16] 3G TS 25.322: " RLC Protocol Specification"

[17] 3G TS 24.007: " Mobile radio interface signalling layer 3"

3 Definitions and abbreviations

3.1 Definitions

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

3.2 Abbreviations

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

ACK	Acknowledgement
AICH	Acquisition Indicator CHannel
AM	Acknowledged Mode
AS	Access Stratum
ASN.1	Abstract Syntax Notation.1
BCCH	Broadcast Control Channel
BCFE	Broadcast Control Functional Entity
BER	Bite Error Rate
BLER	BLock Error Rate
BSS	Base Station Sub-system
CH	Conditional on history
CV	Conditional on value
CCPCH	Common Control Physical CHannel
CCCH	Common Control Channel
CN	Core Network
CM	Connection Management
CPCH	Common Packet CHannel
C-RNTI	Cell RNTI
DCA	Dynamic Channel Allocation
DCCH	Dedicated Control Channel
DCFE	Dedicated Control Functional Entity
DCH	Dedicated Channel
DC-SAP	Dedicated Control SAP
DL	Downlink
DRAC	Dynamic Resource Allocation Control
DSCH	Downlink Shared Channel
DTCH	Dedicated Traffic Channel
FACH	Forward Access Channel
FAUSCH	Fast Uplink Signalling Channel
FDD	Frequency Division Duplex
FFS	For Further Study
GC-SAP	General Control SAP
ID	Identifier
IETF	Internet Engineering Task Force
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IE	Information element
IP	Internet Protocol
ISCP	Interference on Signal Code Power
LAI	Location Area Identity
L1	Layer 1
L2	Layer 2
L3	Layer 3
MD	Mandatory default
MP	Mandatory present
MAC	Media Access Control
MCC	Mobile Country Code
MM	Mobility Management
MNC	Mobile Network Code

MS	Mobile Station
NAS	Non Access Stratum
Nt-SAP	Notification SAP
NW	Network
OP	Optional
ODMA	Opportunity Driven Multiple Access
PCCH	Paging Control Channel
PCH	Paging Channel
PDCP	Packet Data Convergence Protocol
PDSCH	Physical Downlink Shared Channel
PDU	Protocol Data Unit
PLMN	Public Land Mobile Network
PNFE	Paging and Notification Control Functional Entity
PRACH	Physical Random Access CHannel
P-TMSI	Packet Temporary Mobile Subscriber Identity
PUSCH	Physical Uplink Shared Channel
QoS	Quality of Service
RAB	Radio access bearer
RB	Radio Bearer
RAI	Routing Area Identity
RACH	Random Access CHannel
RB	Radio Bearer
RFE	Routing Functional Entity
RL	Radio Link
RLC	Radio Link Control
RNTI	Radio Network Temporary Identifier
RNC	Radio Network Controller
RRC	Radio Resource Control
RSCP	Received Signal Code Power
RSSI	Received Signal Strength Indicator
SAP	Service Access Point
SCFE	Shared Control Function Entity
SF	Spreading Factor
SHCCH	Shared Control Channel
SIR	Signal to Interference Ratio
SSDT	Site Selection Diversity Transmission
S-RNTI	SRNC - RNTI
tbd	to be decided
TDD	Time Division Duplex
TF	Transport Format
TFCS	Transport Format Combination Set
TFS	Transport Format Set
TME	Transfer Mode Entity
TMSI	Temporary Mobile Subscriber Identity
Tr	Transparent
Tx	Transmission
UE	User Equipment
UL	Uplink
UM	Unacknowledged Mode
UMTS	Universal Mobile Telecommunications System
~~UNACK~~	~~Unacknowledgement~~
URA	UTRAN Registration Area
U-RNTI	UTRAN-RNTI
USCH	Uplink Shared Channel
UTRAN	UMTS Terrestrial Radio Access Network

4 General

The functional entities of the RRC layer are described below:

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

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

- Paging of ~~idle mode~~ UEs~~(s)~~, that do not have an RRC connection, is controlled by the paging and notification control function entity (**PNFE**). The PNFE is used to deliver the RRC services that are required at the Nt-SAP. The PNFE can use the lower layer services provided by the Tr-SAP and UM-SAP.

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

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

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

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

Figure 1 shows the RRC model for the UE side and Figure 2 and Figure 3 show the RRC model for the UTRAN side.

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

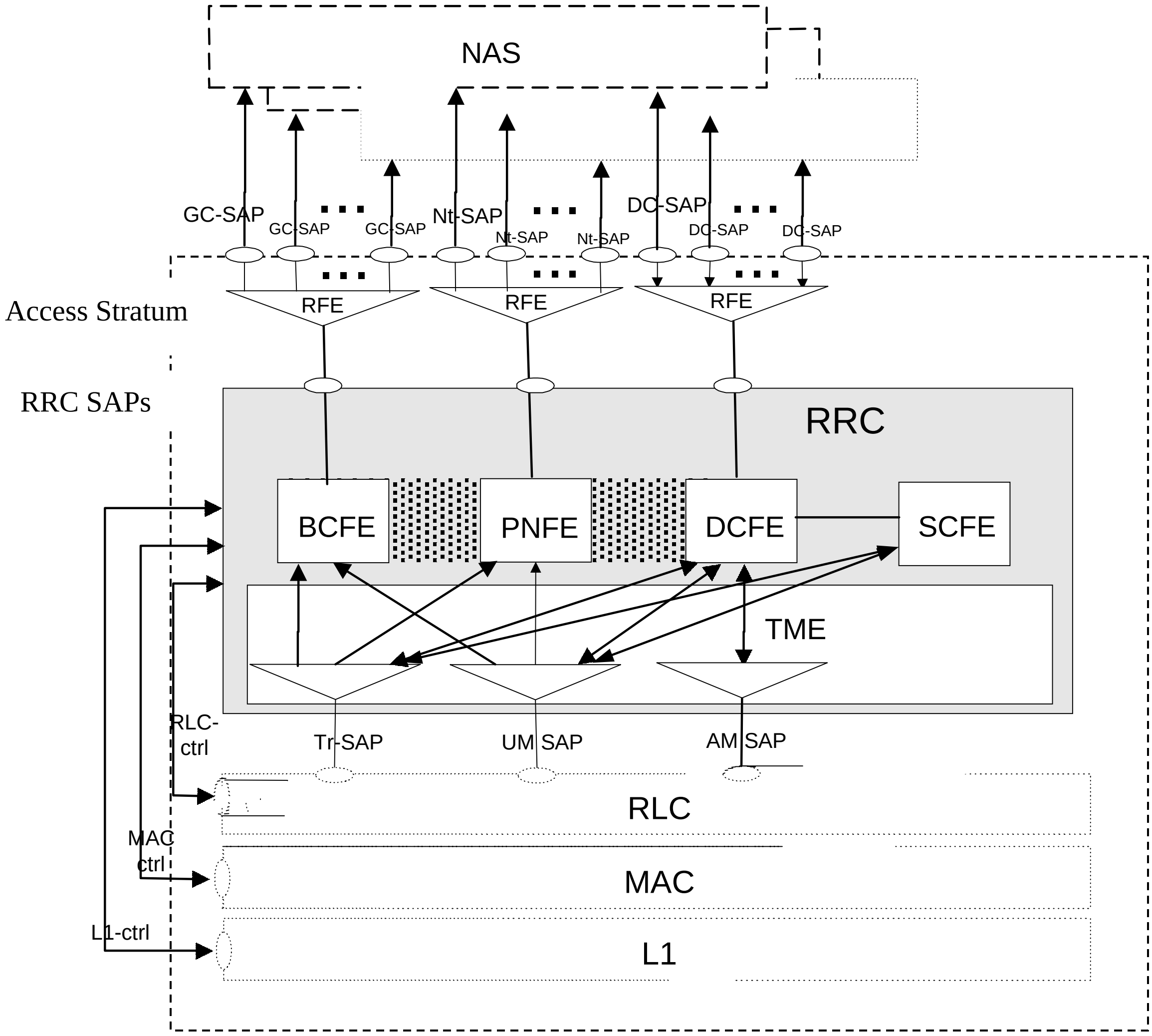

Figure 1: UE side model of RRC

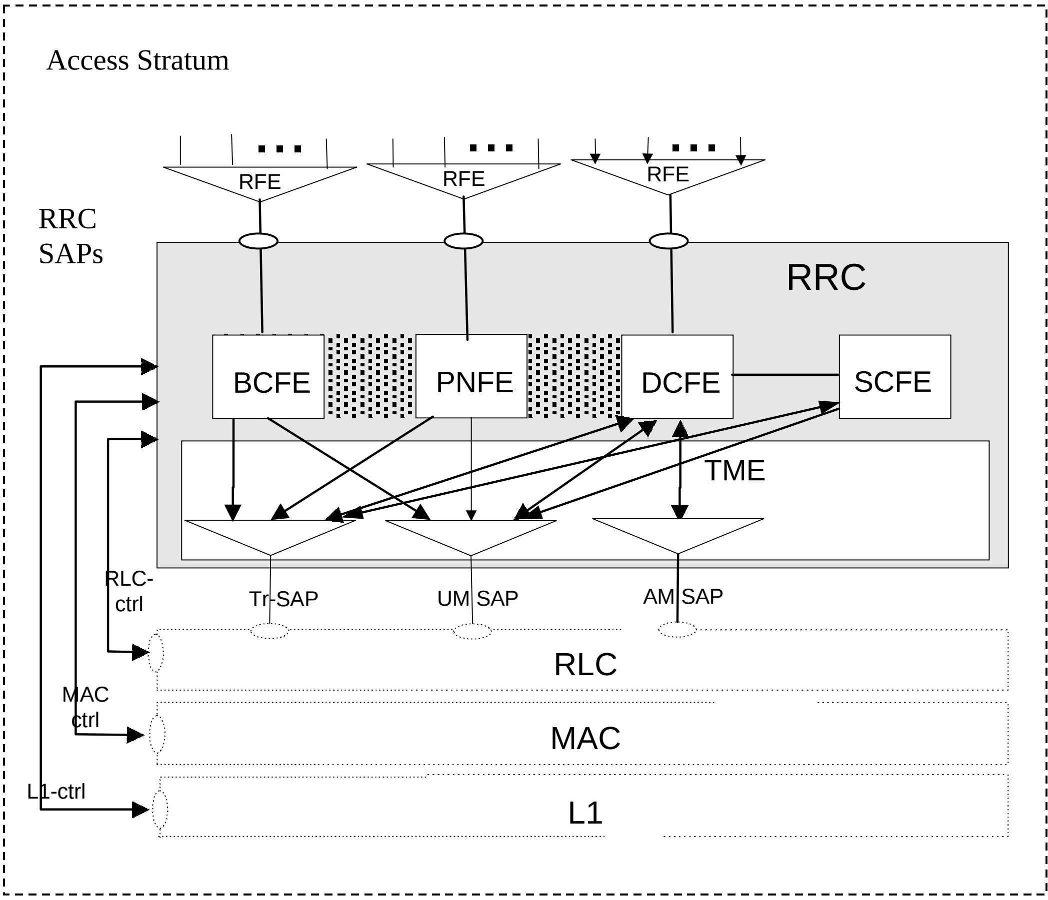

Figure 2: UTRAN side RRC model (DS-MAP system)

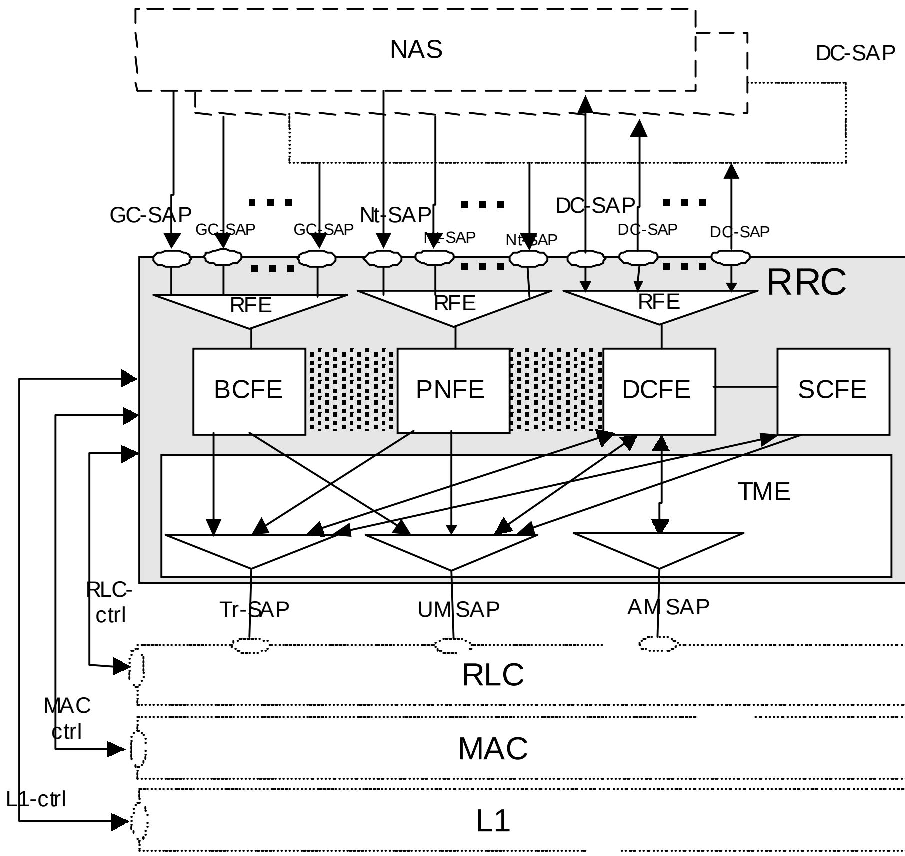

Figure 3: UTRAN side RRC model (DS-41 System)

5 RRC Services provided to upper layers

The RRC offers the following services to upper layers, a description and primitives of these services ~~is~~are provided in [2], [17].

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

- General Control;
- Notification;
- Dedicated control.

6 Services expected from lower layers

6.1 Services expected from Layer 2

~~Void.~~The services provided by layer 2 are described in [2], [15] and [16].

6.2 Services expected from Layer 1

~~Void.~~The services provided by layer 1 are described in [2].

7 Functions of RRC

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

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

- ~~Interworking between the Gateway ODMA relay node and the UTRAN;~~
- ~~Contention resolution (TDD mode);~~
- Paging~~/notification;~~
- Initial cell selection and re-selection~~ in idle mode~~;
- Arbitration of radio resources on uplink DCH;
- RRC message integrity protection;
- Timing advance (TDD mode).
- CBS control

~~The following functions are regarded as further study items:~~

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

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25.331	**CR**	**522**	Current Version:	3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑   *↑ CR number as allocated by MCC support team*

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Form: CR cover sheet, version 2 for 3GPP and SMG   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio	X	Core Network

Source: TSG-RAN WG2   **Date:** 22/08/2000

Subject: Error handling for Uplink Physical Channel Control procedure

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: A subclause was missing in the UPLINK PHYSICAL CHANNEL CONTROL procedure, describing error handling for the case that an invalid UPLINK PHYSICAL CHANNEL CONTROL message is received by the UE.
Additionally, duplicated information elements are removed from the UPLINK PHYSICAL CHANNEL CONTROL message.

Clauses affected: 8.2.10, 8.2.10.x (NEW), 10.2.63, 11.2

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

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8.2.10 Uplink Physical Channel Control [TDD only]

Figure 37: Uplink Physical Channel Control

8.2.10.1 General

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

8.2.10.2 Initiation

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

8.2.10.3 Reception of UPLINK PHYSICAL CHANNEL CONTROL message by the UE

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

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

8.2.10.x Invalid UPLINK PHYSICAL CHANNEL CONTROL message

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

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

10.2.63 UPLINK PHYSICAL CHANNEL CONTROL

NOTE: Only for TDD.

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

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
Integrity check info	OP		Integrity check info 10.3.3.15	
PhyCH information elements				
CCTrCH power control info	OP		CCTrCH power control info 10.3.6.6	Power control information for one CCTrCH
Timing Advance	OP		UL Timing Advance 10.3.6.82	
~~Timeslot List~~	~~OP~~	~~1 to <maxTS>~~		
~~>Individual UL Timeslot interference~~	~~MP~~		~~Individual Timeslot interference 10.3.6.32~~	
PRACH Constant Value	OP		Constant value 10.3.6.8	Operator controlled PRACH Margin
~~DPCH Constant Value~~	~~OP~~		~~Constant value 10.3.6.8~~	~~Operator controlled UL DPCH Margin~~
PUSCH Constant Value	OP		Constant value 10.3.6.8	Operator controlled PUSCH Margin

11.2 PDU definitions

```
...
-- ***************************************************
--
-- UPLINK PHYSICAL CHANNEL CONTROL
--
-- ***************************************************

UplinkPhysicalChannelControl ::= SEQUENCE {
    -- Physical channel IEs
        ccTrCH-PowerControlInfo         CCTrCH-PowerControlInfo             OPTIONAL,
        timingAdvance                   UL-TimingAdvance                    OPTIONAL,
        individualTS-InterferenceList   IndividualTS-InterferenceList       OPTIONAL,
        prach-ConstantValue             ConstantValue                       OPTIONAL,
        dpch-ConstantValue              ConstantValue                       OPTIONAL,
        pusch-ConstantValue             ConstantValue                       OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}
...

END
```

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25.331	**CR**	**523**	Current Version:	3.3.0

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Proposed change affects:
(at least one should be marked with an X)

(U)SIM	ME	UTRAN / Radio	Core Network
	X		

Source: TSG-RAN WG2 **Date:** 21/08/2000

Subject: Corrections to downlink outer loop power control in compressed mode

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	
A	Corresponds to a correction in an earlier release		
B	Addition of feature		
C	Functional modification of feature		
D	Editorial modification		

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change:

The current description of downlink outer loop power control in compressed mode does not fully describe the behaviour of the UE when several compressed mode patterns are activated in parallel i.e. how should the UE apply the DeltaSIR and DeltaSIR after parameters signalled for each compressed mode pattern.

In IE “DPCH compressed mode info” parameter DeltaSIRafter2 was missing due to erroneous implementation of CR 228r5 (Tdoc 1216). The ASN.1 description is correct.

Clauses affected: 10.3.6.27, 14.7.2

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

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10.3.6.27 DPCH compressed mode info

NOTE: Only for FDD.

This information element indicates the parameters of the downlink compressed mode to be used by the UE in order to perform inter-frequency measurements.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Transmission gap pattern sequence		1 to <MaxTGPS>		
> TGPSI	MP		Integer(1..< MaxTGPS>)	Transmission Gap Pattern Sequence Identifier Establish a reference to the compressed mode pattern sequence. Up to <MaxTGPS> simultaneous compressed mode pattern sequences can be used.
>TGPS Status Flag	MP		Enumerated(active, inactive)	This flag indicates the current status of the Transmission Gap Pattern Sequence, whether it shall be activated or deactivated.
>Transmission gap pattern sequence configuration parameters	OP			
>> TGMP	MP		Enumerated(TDD measurement, FDD measurement, GSM measurement, Other)	Transmission Gap pattern sequence Measurement Purpose.
>> TGPRC	MP		Integer (1..63, Infinity)	The number of transmission gap patterns within the Transmission Gap Pattern Sequence.
>> TGCFN	MP		Integer (0..255)	Connection Frame Number of the first frame of the first pattern within the Transmission Gap Pattern Sequence.
>> TGSN	MP		Integer (0..14)	Transmission Gap Starting Slot Number The slot number of the first transmission gap slot within the TGCFN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>TGL1	MP		Integer(1..14)	The length of the first Transmission Gap within the transmission gap pattern expressed in number of slots
>> TGL2	MD		Integer (1..14)	The length of the second Transmission Gap within the transmission gap pattern. If omitted, then TGL2=TGL1.
>>TGD	MP		Integer(15..269, undefined)	Transmission gap distance indicates the number of slots between starting slots of two consecutive transmission gaps within a transmission gap pattern. If there is only one transmission gap in the transmission gap pattern, this parameter shall be set to zero.
>> TGPL1	MP		Integer (1..144)	The duration of transmission gap pattern 1.
>> TGPL2	MD		Integer (1..144)	The duration of transmission gap pattern 2. If omitted, then TGPL2=TGPL1.
>>RPP	MP		Enumerated (mode 0, mode 1).	Recovery Period Power control mode during the frame after the transmission gap within the compressed frame. Indicates whether normal PC mode or compressed PC mode is applied
>>ITP	MP		Enumerated (mode 0, mode 1).	Initial Transmit Power is the uplink power control method to be used to compute the initial transmit power after the compressed mode gap.
>>UL/DL mode	MP		Enumerated (UL only, DL only, UL/DL)	Defines whether only DL, only UL, or combined UL/DL compressed mode is used.
>> Downlink compressed mode method	CV DL		Enumerated (puncturing, SF/2, higher layer scheduling)	Method for generating downlink compressed mode gap
>> Uplink compressed mode method	CV UL		Enumerated (SF/2, none, higher layer scheduling)	Method for generating uplink compressed mode gap
>>Downlink frame type	MP		Enumerated (A, B)	
>>DeltaSIR1	MP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE during the compressed frames corresponding to the first transmission gap in the transmission gap pattern (without including the effect of the bit-rate increase)
>>DeltaSIRafter1	MP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE one frame after the compressed frames corresponding to the first transmission gap in the transmission gap pattern.
>>DeltaSIR2	OP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE during the compressed frames

Information Element/Group name	Need	Multi	Type and reference	Semantics description
				corresponding to the second transmission gap in the transmission gap pattern (without including the effect of the bit-rate increase) When omitted, DeltaSIR2 = DeltaSIR1.
DeltaSIRafter2	OP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE one frame after the compressed frames corresponding to the second transmission gap in the transmission gap pattern. When omitted, DeltaSIRafter2 = DeltaSIRafter1.

Range Bound	Explanation
MaxTGPS	Maximum number of transmission gap pattern sequences. Value 6.

Condition	Explanation
UL	This information element is only sent when the value of the "UL/DL mode" IE is "UL only" or "UL/DL".
DL	This information element is only sent when the value of the "UL/DL mode" IE is "DL only" or "UL/DL".

14.7 Downlink power control

14.7.1 Generalities

This function is implemented in the UE in order to set the SIR target value on each CCTrCH used for the downlink power control. This SIR value shall be adjusted according to an autonomous function in the UE in order to achieve the same measured quality as the quality target set by UTRAN. The quality target is set as the transport channel BLER value for each transport channel as signalled by UTRAN. For CPCH the quality target is set as the BER of the DL DPCCH as signalled by UTRAN.

When transport channel BLER is used the UE shall run a quality target control loop such that the quality requirement is met for each transport channel, which has been assigned a BLER target.

When DL DPCCH BER is used the UE shall run a quality target control loop such that the quality requirement is met for each CPCH transport channel, which has been assigned a DL DPCCH BER target.

The UE shall set the SIR target when the physical channel has been set up or reconfigured. It shall not increase the SIR target value before the power control has converged on the current value. The UE may estimate whether the power control has converged on the current value, by comparing the averaged measured SIR to the SIR target value.

If the UE has received a DL outer loop control message from UTRAN indicating that the SIR target value shall not be increased above the current value, it shall record the current value as the maximum allowed value for the power control function, until it receives a new DL outer loop control message from UTRAN indicating that the restriction is removed.

14.7.2 Downlink power control in compressed mode

In compressed mode, the target SIR needs to be changed during compressed frames and one frame after compressed frames (recovery frame), compared to normal mode. For this purpose, four values DeltaSIR1, DeltaSIRafter1, DeltaSIR2 and DeltaSIRafter2 are signalled by the UTRAN to the UE (see section 10.2.9).

For each frame, the target SIR offset during compressed mode, compared to normal mode is:

$$\Delta SIR = \max (\Delta SIR1\_compression, \ldots , \Delta SIRn\_compression) + \Delta SIR\_coding$$

where n is the number of TTI lengths for all TrChs of the CCTrCh, F_i is the length in number of frames of the i-th TTI and where ΔSIR_coding fulfils:

- ΔSIR_coding= DeltaSIR1 for compressed frames corresponding to the first transmission gap in the transmission gap pattern.
- ΔSIR_coding= DeltaSIRafter1 for recovery frames corresponding to the first transmission gap in the transmission gap pattern.
- ΔSIR_coding= DeltaSIR2 for compressed frames corresponding to the second transmission gap in the transmission gap pattern.
- ΔSIR_coding= DeltaSIRafter2 for recovery frames corresponding to the second transmission gap in the transmission gap pattern.
- ΔSIR_coding= 0 otherwise.

and ΔSIRi_compression is defined by :

- If the frames are compressed by reducing the spreading factor by 2 ("Compressed mode method" IE is equal to "SF/2"):
  - ΔSIRi_compression= 3 dB for each compressed frame, where TGL is the gap length in number of slots (either from one gap or a sum of gaps) in the frame.
  - ΔSIRi_compression= 0 otherwise.

- If the frames are compressed by puncturing ("Compressed mode method" IE is equal to "puncturing"):
  - ΔSIRi_compression= 10 log ($15*F_i$ / ($15*F_i$ - TGL_i)) if there is a transmission gap within the current TTI of length F_i frames, where TGL_i is the gap length in number of slots (either from one gap or a sum of gaps) in the current TTI of length F_i frames.
  - ΔSIRi_compression= 0 otherwise.
- If the frames are compressed by upper layer scheduling ("Compressed mode method" IE is equal to "upper layer scheduling"):
  - ΔSIRi_compression= 0 for all frames.

In the particular case where a transmission gap overlaps two frames (double-frame method), the second compressed frame (with the second part of the transmission gap) must be considered as the recovery frame (ΔSIR_coding = DeltaSIRafter1 or ΔSIR_coding = DeltaSIRafter2). Thus, in this case, the first frame following the two consecutive compressed frames is not considered as a recovery frame (ΔSIR_coding=0).

Several compressed mode patterns applying to the same frames should be avoided as much as possible.

In particular; several simultaneous patterns by puncturing applying to the same frames shall be considered as a protocol error by the UE. The handling of this error is described in the procedure descriptions in clause 8

~~In case a frame or TTI is simultaneously compressed by puncturing and by reduction of the spreading factor, or~~ In case several compressed mode patterns apply to the same frame or in case a frame is simultaneously a compressed frame in one pattern and a recovery frame in the same pattern or in another pattern, all offsets must be added and the total target SIR offset is applied to the frame.

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25.331	**CR**	**524r1**	Current Version:	3.3.0

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Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio	X	Core Network	

Source:	TSG-RAN WG2	**Date:**	2000-08-21
Subject:	Clarification on measurement procedure using compressed mode		
Work item:			

Category:	F	Correction	X	**Release:**	Phase 2	
	A	Corresponds to a correction in an earlier release			Release 96	
(only one category	B	Addition of feature			Release 97	
shall be marked	C	Functional modification of feature			Release 98	
with an X)	D	Editorial modification			Release 99	X
					Release 00	

Reason for change:	The presence of the IE "DPCH compressed mode status info" in the MEASUREMENT CONTROL needs to be clarified
Clauses affected:	8.4.1.3

Other specs Affected:	Other 3G core specifications		→ List of CRs:	
	Other GSM core specifications		→ List of CRs:	
	MS test specifications		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other comments:	

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8.4.1.3 Reception of MEASUREMENT CONTROL by the UE

Upon reception of a MEASUREMENT CONTROL message the UE shall perform actions specified in 8.~~5.7~~6 unless otherwise specified below.

The UE shall:

- Read the IE "Measurement command".

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

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

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

  - begin measurements according to the stored control information for this measurement identity number, optionally with the use of compressed mode if at least one compressed mode pattern sequence is simultaneously activated with inclusion of the IE "DPCH compressed mode status info" ~~on condition that the corresponding compressed mode pattern sequence stored in variable TGPS_IDENTITY is active or unless it is simultaneously activated;~~ or

  For any other measurement type,

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

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

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

- retrieve the stored measurement information associated with the identity indicated in the IE "measurement identity number";
- if any of the IEs "measurement object", IE "measurement quantity", IE "reporting quantity", IE "measurement reporting criteria", IE "measurement validity", IE "reporting mode" or IE "Additional measurement identity number" are present in the MEASUREMENT CONTROL message, the control information defined by that IE shall replace the corresponding stored information;
- store the new set of IEs and associate them with the measurement identity number; and
- resume the measurements according to the new stored measurement control information.

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

- terminate the measurement associated with the identity given in the IE "measurement identity number";
- clear all stored measurement control information related associated to this measurement identity number.

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

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

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

3GPP TSG RAN WG2 meeting #15
Sophia Antipolis, France, 21-25 Aug. 2000

Document R2-001833

CHANGE REQUEST

25.331	**CR**	**525r1**	Current Version: 3.3.0

For submission to: TSG-RAN #9

for approval	X	strategic	
for information		non-strategic	

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]

Source:	TSG-RAN WG2
Date:	24th Aug. 2000
Subject:	Updates to cell and URA update procedures based on RRC ad hoc
Work item:	

Category:

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: Editorial corrections are introduced according to the procedure review in the RAN WG2 RRC ad hoc in Paris (16.-17.8.00)

Clauses affected: 8.3.1, 8.3.1.1, 8.3.1.2, 8.3.1.3, 8.3.1.3.1, 8.3.1.5, 8.3.1.7, 8.3.1.8, 8.3.2, 8.3.2.2, 8.3.2.3, 8.3.2.5, 8.3.2.8, 8.3.2.9

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

8.3.1 Cell update

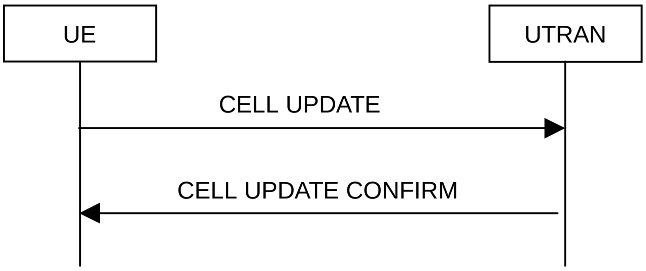

Figure 38: Cell update procedure, basic flow

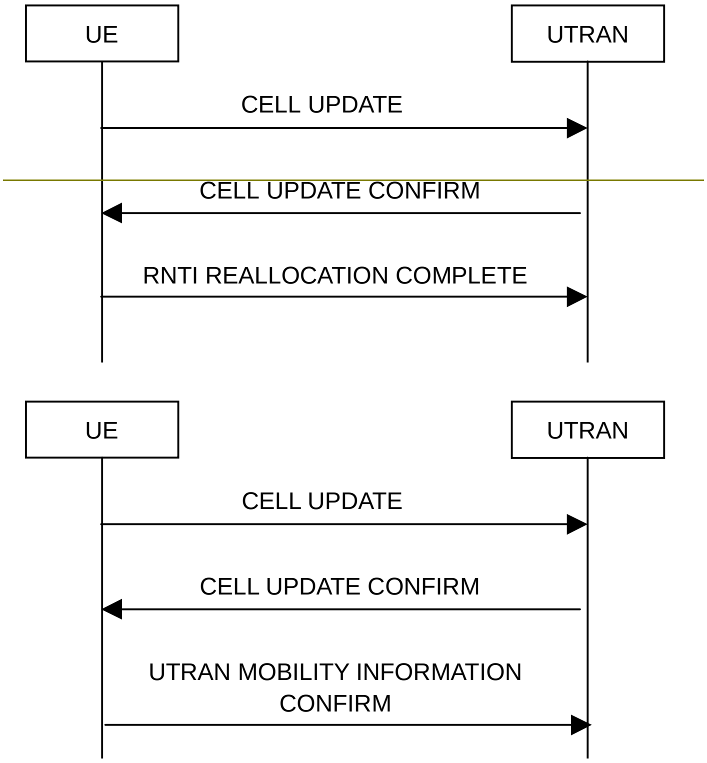

Figure 39: Cell update procedure with ~~RNTI reallocation~~UTRAN mobility information

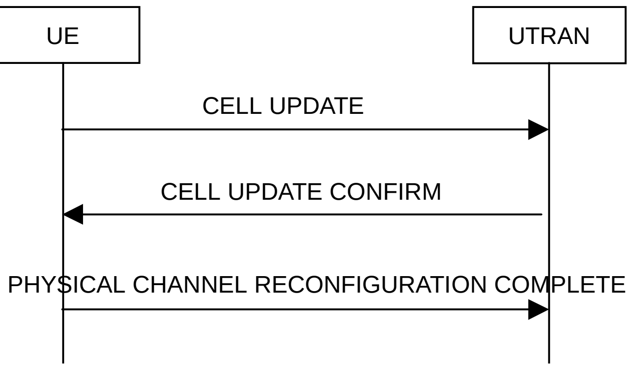

Figure 40: Cell update procedure with physical channel reconfiguration

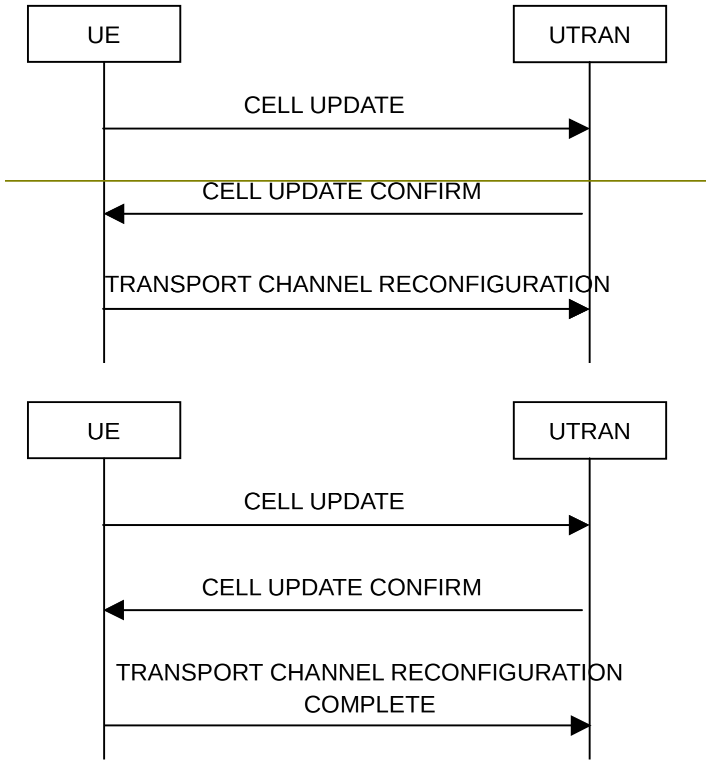

Figure 41: Cell update procedure with transport channel reconfiguration

8.3.1.1 General

The main purpose of the cell update procedure is to update UTRAN with the current cell of the UE after cell reselection in CELL_FACH or CELL_PCH state. Secondly, the procedure may be used by the UE to indicate to the UTRAN a transition from URA_PCH or CELL_PCH state to CELL_FACH state prior to transmitting uplink data.~~ It~~ Thirdly, the procedure may also be used for supervision of the RRC connection, even if no cell reselection takes place. The cell update procedure can ~~also be used to~~ include the resetting of the AM RLC entities for the signalling link and the u-plane link. The UE can use a CELL UPDATE message to notify the unrecoverable error (Amount of the retransmission of RESET PDU reaches the value of Max DAT and receives no ACK) in an AM RLC entity for the signalling link.

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

8.3.1.2 Initiation

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

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

- Cell reselection: In CELL_FACH or CELL_PCH state, the UE ~~shall perform the cell update procedure when~~ selects~~ing~~ another cell~~ (cell reselection)~~.

- Periodic cell update:In CELL_FACH and CELL_PCH state, ~~the UE shall perform the cell update procedure upon expiry of~~ the timer T305 expires while the UE is in the service area and ~~. The UE shall only perform this~~ periodic cell updating ~~if~~ has been ~~configured~~ required ~~by means of the~~ in IE "Information for periodical cell and URA update" in System Information Block Type 2. ~~The UE shall initially start timer T305 upon entering CELL_FACH or CELL_PCH state (periodic cell update).~~

- RB control response: The UE receives an RB control message initiating a ~~In~~ transition ~~to~~ from CELL_DCH to CELL_FACH state, ~~by~~ but the message does not indicate ~~receiving RB control message with no indication~~ which cell to camp on. Consequently~~,~~ the UE ~~should~~ selects a cell autonomously~~ and perform the cell update procedure (RB control response)~~.

- UL data transmission: In CELL_PCH state and URA_PCH state, the UE makes a state transition to CELL_FACH state in order to ~~shall initiate the cell update procedure if it wants to~~ transmit UL data ~~(UL data transmission)~~.
- Paging response: In CELL_PCH and URA_PCH state, the UE ~~shall perform the cell update procedure when~~ receives~~ing~~ a PAGING TYPE 1 message as in subclause 8.1.2.3 ~~(paging response)~~.

In order to initiate the cell update procedure, the UE shall :

- set the variable PROTOCOL_ERROR_INDICATOR to FALSE
- move~~ing~~ to CELL_FACH state, if not already in that state.
- consider the stored C-RNTI to be invalid until CELL UPDATE CONFIRM message is received. when UE detects a new cell.
- suspend data transmission on RB 3 and upward, if RLC-AM or RLC-UM is used on those radio bearers.
- ~~sending~~ transmit a CELL UPDATE message on the uplink CCCH.
- start~~ing~~ timer T302 and resetting counter V302.

The UE shall set the IEs in the CELL UPDATE as follows:

The UE shall set the IE "cell update cause" ~~shall be used~~ as follows:

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

- If the value of the variable PROTOCOL_ERROR_INDICATOR is TRUE, the UE shall set the IE "Protocol error indicator" to TRUE and include the IE "Protocol error information" set to the value of the variable PROTOCOL_ERROR_INFORMATION.
- If the value of the variable PROTOCOL_ERROR_INDICATOR is FALSE, the UE shall set the IE "Protocol error indicator" to FALSE.
- ~~The IE "AM_RLC error indication" shall be set when~~ If the UE detects unrecoverable error (amount of the retransmission of RESET PDU reaches the value of Max DAT and receives no ACK) in an AM RLC entity for the signalling link, the UE shall set the IE "AM_RLC error indication".If ~~The IE "AM_RLC error indication (for u-plane)" shall be set when~~ the UE detects unrecoverable error in an AM RLC entity (for u-plane) for for u-plane link, the UE shall set the IE "AM_RLC error indication (for u-plane)".
- The UE shall include "the maximum value in the currently used HFNs among CS and PS domains" + "1" in IE "HFN" in CELL UPDATE message.
- The UE shall include an intra-frequency measurement report in IE "Measured results on RACH" ~~in the CELL UPDATE message~~, as specified in the IE "Intra-frequency reporting quantity for RACH reporting" and the IE "Maximum number of reported cells on RACH" in system information block type 12.

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

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

- start timer T307;
- re-select to a new cell, as described in [4].~~search for cell to camp.~~

8.3.1.3.1 Re-entering of service area

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

- transmit a CELL UPDATE message on the uplink CCCH.

8.3.1.3.2 Expiry of timer T307

When the T307 expires, the UE shall:

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

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

8.3.1.4 Reception of an CELL UPDATE message by the UTRAN

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

When the UTRAN detects AM_RLC unrecoverable error (Amount of the retransmission of RESET PDU reaches the value of Max DAT and receives no ACK), it waits for CELL UPDATE message from the UE and when the UTRAN receives it, UTRAN commands the UE to reset AM_RLC by sending CELL UPDATE CONFIRM message. This procedure can be used not only in the case of AM_RLC unrecoverable error but also in the case that UTRAN wants to reset AM_RLC for other reasons such as in the case when SRNC Relocation is initiated without keeping RLC status (current counters) from old SRNC to new SRNC.

8.3.1.5 Reception of the CELL UPDATE CONFIRM message by the UE

Upon receiving the CELL UPDATE CONFIRM message (old C-RNTI or U-RNTI may be used for MAC header), the UE shall stop timer T302.

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

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

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

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

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

If the CELL UPDATE CONFIRM message does not include IE "new C-RNTI", IE "new U-RNTI", IE "PRACH info" nor IE "Secondary CCPCH info", following actions are taken;

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

- No case for cell update due to "cell reselection" or "RB control response".

If the CELL UPDATE CONFIRM message includes the IE "new C-RNTI" and optionally the IE "new U-RNTI" but does not include IE "PRACH info" or IE "Secondary CCPCH info", the UE shall update its identities and following actions are taken:

- If cell update is due to "periodical cell update", transmit an ~~RNTI REALLOCATION~~UTRAN MOBILITY INFORMATION CONFIRM ~~COMPLETE~~ message on the uplink DCCH using the PRACH stored in the UE.

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

- If cell update is due to "UL data transmission" or "paging response" and if there is a difference in TFS and/or TFCS stored in UE compared to PRACH/SCCPCH indicated in the broadcast system information,, TRANSPORT CHANNEL RECONFIGURATION COMPLETE message is sent to the UTRAN using the PRACH indicated in the broadcast system information.

- If cell update is due to "RB control response", transmit a RB control response message on the uplink DCCH using the PRACH indicated in the broadcast system information.

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

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

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

- Perform the actions stated in subclauses 8.5.7.6.2 and 8.5.7.6.3.

- Update its identities if the CELL UPDATE CONFIRM message includes the IE new C-RNTI" and optionally the IE "new U-RNTI".

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

- If cell update is due to "RB control response", transmit a RB control response message on the uplink DCCH using the PRACH indicated in the broadcast system information.

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

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

In case the UE does not end in CELL_FACH state, it shall delete its C-RNTI and PRACH/SCCPCH information.

If the UE remains in CELL_FACH state and the CELL UPDATE CONFIRM message includes the IE "New C-RNTI" the UE shall then resume data transmission on RB 3 and upward, if RLC-AM or RLC-UM is used on those radio bearers.

8.3.1.6 Invalid CELL UPDATE CONFIRM message

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

The UE shall check the value of V302 and

- If V302 is smaller or equal than N302, the UE shall set the variable PROTOCOL_ERROR_INDICATOR to TRUE, retransmit a CELL UPDATE message on the uplink CCCH, restart timer T302 and increase counter

V302. The IE "Cell update cause" shall be set to the event causing the transmission of the CELL UPDATE message, see subclause 8.3.1.2.

- If V302 is greater than N302, the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2.

8.3.1.7 T302 expiry or cell reselection

- Upon expiry of timer T302; and/or
- upon reselection to ~~of~~ another UTRA cell (including the previously serving cell) when waiting for the CELL UPDATE CONFIRM message,

the UE shall check the value of V302 and:

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

8.3.1.8 Reception of the ~~RNTI REALLOCATION~~UTRAN MOBILITY INFORMATION CONFIRM ~~COMPLETE~~ message by the UTRAN

See subclause 8.3.3.4.

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

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

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

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

8.3.2 URA update

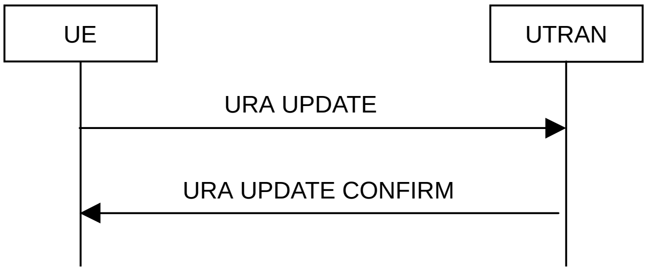

Figure 42: URA update procedure, basic flow

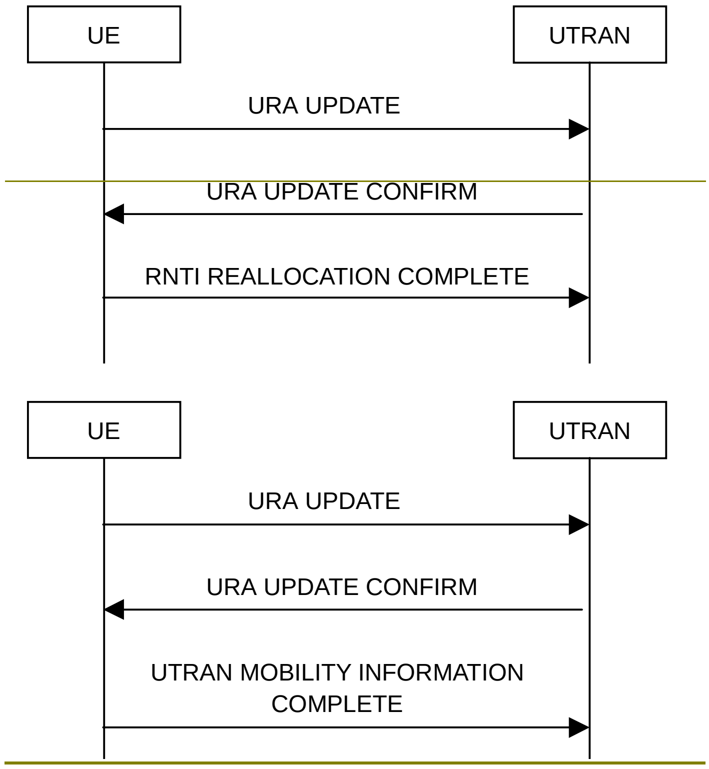

Figure 43: URA update procedure with ~~RNTI reallocation~~UTRAN mobility information update

8.3.2.1 General

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

8.3.2.2 Initiation

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

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

- URA reselection: In URA_PCH state, the UE ~~shall perform the URA update procedure when~~ detects that the current URA assigned to the UE is not present in the list of URA IDs broadcast in a cell.

- Periodic URA update: In URA_PCH state, ~~the UE shall perform the URA update procedure upon expiry of~~ the timer T306 expires while the UE is in the service area and~~. The UE shall only perform this~~ periodic URA updating ~~if configured by means of~~ has been required in the IE "Information for periodical cell and URA update" in System Information Block Type 2. The UE shall initially start timer T306 upon entering URA_PCH state.

~~The~~ In order to initiate the URA update *procedure*, the UE shall ~~start the URA update procedure by~~:

- set the variable PROTOCOL_ERROR_INDICATOR to FALSE;

- ~~temporarily storing the list of URA IDs broadcast in a cell;~~

- move~~ing~~ to CELL_FACH state;

- transmit~~sending~~ a URA UPDATE message on the uplink CCCH;

- start~~ing~~ timer T303 and reset~~ting~~ counter V303.

The UE shall set the IEs in the URA UPDATE message as follows:

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

- ~~in case of URA reselection, to: "URA reselection";~~

- ~~in case of periodic URA updating, to: "periodic URA update".~~

- The UE shall indicate the reason for URA update in the IE "URA update cause" corresponding to the initiation cause as listed above.

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

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

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

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

- start timer T307;

- re-select to a new cell, as described in [4].~~- search for cell to camp.~~

8.3.2.3.1 Re-entering of service area

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

- transmit URA UPDATE message on the uplink CCCH.

8.3.2.3.2 Expiry of timer T307

When the T307 expires, the UE shall:

- move to idle state;

- release all dedicated resources;

- indicate a RRC connection failure to the non-access stratum.

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

8.3.2.4 Reception of an URA UPDATE message by the UTRAN

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

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

8.3.2.5 Reception of an URA UPDATE CONFIRM message by the UE

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

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

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

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

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

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

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

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

If the UE ~~does not end up in the CELL_FACH state~~transits back to URA_PCH state, the UE shall~~, after other possible actions~~:

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

8.3.2.6 Confirmation error of URA ID list

- When indicated URA ID is not included in the list of URA IDs; or
- when the URA ID is not indicated and the list of URA IDs includes more than one URA ID,

the UE shall check the value of V303, and:

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

8.3.2.7 Invalid URA UPDATE CONFIRM message

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

The UE shall check the value of V303 and:

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

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

8.3.2.8 T303 expiry or URA reselection

- Upon expiry of timer T303; and/or

- upon reselection ~~of~~ to another UTRA cell (including the previously serving cell) when waiting for the URA UPDATE CONFIRM message,

the UE shall check the value of V303 and:

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

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

8.3.2.9 Reception of the ~~RNTI REALLOCATION~~UTRAN MOBILITY INFORMATION ~~COMPLETE~~CONFIRM message by the UTRAN

See subclause 8.3.3.4.

3GPP TSG RAN WG2 meeting #15
Sophia Antipolis, France, 21-25 Aug. 2000

Document R2-001832

CHANGE REQUEST

25.331 CR 526r1

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for approval	X	strategic	
for information		non-strategic	

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]

Source: TSG-RAN WG2

Date: 24th Aug. 2000

Subject: Updates to RNTI allocation procedure based on RRC ad hoc

Work item:

Category:

F	Correction	X	
A	Corresponds to a correction in an earlier release		
B	Addition of feature		
C	Functional modification of feature		
D	Editorial modification		

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: Corrections are introduced according to the procedure review in the RAN WG2 RRC ad hoc in Paris (16.-17.8.00). In particular, the RNTI reallocation is renamed to UTRAN mobility information. In revision 1 of this CR other occurrences of RNTI reallocation in clauses 10 and 11 have been corrected.

Clauses affected: 8.3.3, 8.3.3.1. 8.3.3.2, 8.3.3.3, 8.3.3.4, 8.3.3.5, 10.1.1.2, 10.2.34, 10.2.35, 10.2.36, 11.1, 11.2

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

8.3.3 ~~RNTI reallocation~~UTRAN mobility information

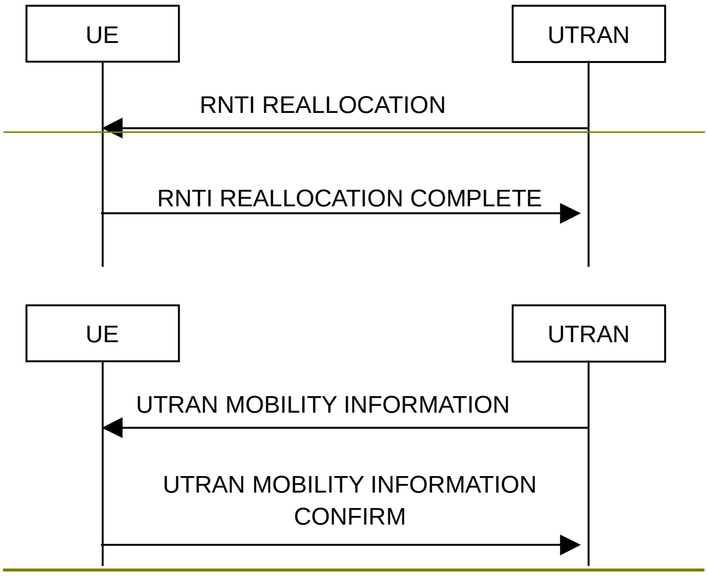

Figure 44: ~~RNTI reallocation~~ UTRAN mobility information procedure, normal flow

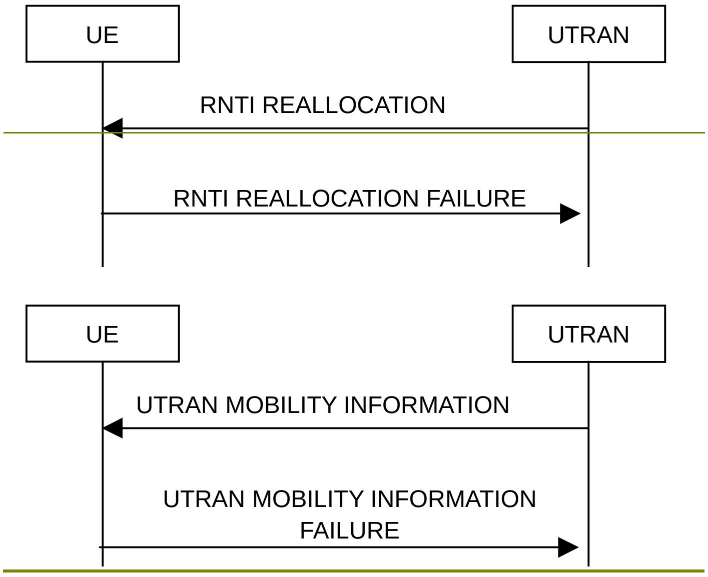

Figure 45: ~~RNTI reallocation~~ UTRAN mobility information procedure, failure case

8.3.3.1 General

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

8.3.3.2 Initiation

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

8.3.3.3 Reception of ~~RNTI REALLOCATION~~ UTRAN MOBILITY INFORMATIONmessage by the UE

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

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

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

If neither IE "new U-RNTI" nor IE "new C-RNTI" are present, the UE shall retain previously allocated U-RNTI and C-RNTI values.

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

Other information elements are handled as specified in section 8.5.7.

8.3.3.4 Reception of an ~~RNTI REALLOCATION~~ UTRAN MOBILITY INFORMATION ~~COMPLETE~~CONFIRM message by the UTRAN

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

8.3.3.5 Invalid ~~RNTI REALLOCATION~~ UTRAN MOBILITY INFORMATIONmessage

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

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

10.1.1.2 Extension of a message with additional information elements

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

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

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

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

10.2.34 ~~RNTI REALLOCATION~~UTRAN MOBILITY INFORMATION

This message is used by UTRAN to allocate a new RNTI and to convey other UTRAN mobility related information to a UE.

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UTRAN→UE

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

10.2.35 ~~RNTI REALLOCATION~~ UTRAN MOBILITY INFORMATION ~~COMPLETE~~CONFIRM

This message is used to confirm the new ~~RNTI~~ UTRAN mobility information for the UE.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

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

10.2.36 ~~RNTI REALLOCATION~~ UTRAN MOBILITY INFORMATION FAILURE

This message is sent to indicate a failure to act on a received ~~RNTI REALLOCATION~~ UTRAN MOBILITY INFORMATIONmessage.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

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

11.1 General message structure

```
Class-definitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    ActiveSetUpdate,
    ActiveSetUpdateComplete,
    ActiveSetUpdateFailure,
    CellUpdate,
    CellUpdateConfirm,
    CounterCheck,
    CounterCheckResponse,
    DownlinkDirectTransfer,
    DownlinkOuterLoopControl,
    HandoverToUTRANCommand,
    HandoverToUTRANComplete,
    InitialDirectTransfer,
    InterSystemHandoverCommand,
    InterSystemHandoverFailure,
    MeasurementControl,
    MeasurementControlFailure,
    MeasurementReport,
    PagingType1,
    PagingType2,
    PhysicalChannelReconfiguration,
    PhysicalChannelReconfigurationComplete,
    PhysicalChannelReconfigurationFailure,
    PhysicalSharedChannelAllocation,
    PUSCHCapacityRequest,
    RadioBearerReconfiguration,
    RadioBearerReconfigurationComplete,
    RadioBearerReconfigurationFailure,
    RadioBearerRelease,
    RadioBearerReleaseComplete,
    RadioBearerReleaseFailure,
    RadioBearerSetup,
    RadioBearerSetupComplete,
    RadioBearerSetupFailure,
    RNTIReallocation,
    RNTIReallocationComplete,
    RNTIReallocationFailure,
    RRCConnectionReEstablishment,
    RRCConnectionReEstablishment-CCCH,
    RRCConnectionReEstablishmentComplete,
    RRCConnectionReEstablishmentRequest,
    RRCConnectionReject,
    RRCConnectionRelease,
    RRCConnectionRelease-CCCH,
    RRCConnectionReleaseComplete,
    RRCConnectionReleaseComplete-CCCH,
    RRCConnectionRequest,
    RRCConnectionSetup,
    RRCConnectionSetupComplete,
    RRCStatus,
    SecurityModeCommand,
    SecurityModeComplete,
    SecurityModeFailure,
    SignallingConnectionRelease,
    SignallingConnectionReleaseRequest,
    SystemInformation-BCH,
    SystemInformation-FACH,
    SystemInformationChangeIndication,
    TransportChannelReconfiguration,
    TransportChannelReconfigurationComplete,
    TransportChannelReconfigurationFailure,
    TransportFormatCombinationControl,
    TransportFormatCombinationControlFailure,
    UECapabilityEnquiry,
    UECapabilityInformation,
    UECapabilityInformationConfirm,
    UplinkDirectTransfer,
    UplinkPhysicalChannelControl,
    URAUpdate,
```

```
    URAUpdateConfirm,
    URAUpdateConfirm-CCCH,
    UTRANMobilityInformation,
    UTRANMobilityInformationComplete,
    UTRANMobilityInformationFailure
FROM PDU-definitions

    IntegrityCheckInfo
FROM UserEquipment-IEs;

--**************************************************************
--
-- Downlink DCCH messages
--
--**************************************************************

DL-DCCH-Message ::= SEQUENCE {
    integrityCheckInfo      IntegrityCheckInfo      OPTIONAL,
    message                 DL-DCCH-MessageType
}

DL-DCCH-MessageType ::= CHOICE {
    activeSetUpdate                     ActiveSetUpdate,
    cellUpdateConfirm                   CellUpdateConfirm,
    counterCheck                        CounterCheck,
    downlinkDirectTransfer              DownlinkDirectTransfer,
    downlinkOuterLoopControl            DownlinkOuterLoopControl,
    interSystemHandoverCommand          InterSystemHandoverCommand,
    measurementControl                  MeasurementControl,
    pagingType2                         PagingType2,
    physicalChannelReconfiguration      PhysicalChannelReconfiguration,
    physicalSharedChannelAllocation     PhysicalSharedChannelAllocation,
    radioBearerReconfiguration          RadioBearerReconfiguration,
    radioBearerRelease                  RadioBearerRelease,
    radioBearerSetup                    RadioBearerSetup,
    rntiReallocation                    RNTIReallocation,
    rrcConnectionReEstablishment        RRCConnectionReEstablishment,
    rrcConnectionRelease                RRCConnectionRelease,
    securityModeCommand                 SecurityModeCommand,
    signallingConnectionRelease         SignallingConnectionRelease,
    transportChannelReconfiguration     TransportChannelReconfiguration,
    transportFormatCombinationControl   TransportFormatCombinationControl,
    ueCapabilityEnquiry                 UECapabilityEnquiry,
    ueCapabilityInformationConfirm      UECapabilityInformationConfirm,
    uplinkPhysicalChannelControl        UplinkPhysicalChannelControl,
    uraUpdateConfirm                    URAUpdateConfirm,
    utranMobilityInformation            UTRANMobilityInformation,
    extension                           NULL
}

--**************************************************************
--
-- Uplink DCCH messages
--
--**************************************************************

UL-DCCH-Message ::= SEQUENCE {
    integrityCheckInfo      IntegrityCheckInfo      OPTIONAL,
    message                 UL-DCCH-MessageType
}

UL-DCCH-MessageType ::= CHOICE {
    activeSetUpdateComplete             ActiveSetUpdateComplete,
    activeSetUpdateFailure              ActiveSetUpdateFailure,
    counterCheckResponse                CounterCheckResponse,
    handoverToUTRANComplete             HandoverToUTRANComplete,
    initialDirectTransfer               InitialDirectTransfer,
    interSystemHandoverFailure          InterSystemHandoverFailure,
    measurementControlFailure           MeasurementControlFailure,
    measurementReport                   MeasurementReport,
    physicalChannelReconfigurationComplete
                                        PhysicalChannelReconfigurationComplete,
    physicalChannelReconfigurationFailure
                                        PhysicalChannelReconfigurationFailure,
    radioBearerReconfigurationComplete  RadioBearerReconfigurationComplete,
    radioBearerReconfigurationFailure   RadioBearerReconfigurationFailure,
    radioBearerReleaseComplete          RadioBearerReleaseComplete,
    radioBearerReleaseFailure           RadioBearerReleaseFailure,
```

```
    radioBearerSetupComplete            RadioBearerSetupComplete,
    radioBearerSetupFailure             RadioBearerSetupFailure,
    rntiReallocationComplete            RNTIReallocationComplete,
    rntiReallocationFailure             RNTIReallocationFailure,
    rrcConnectionReEstablishmentComplete
                                        RRCConnectionReEstablishmentComplete,
    rrcConnectionReleaseComplete        RRCConnectionReleaseComplete,
    rrcConnectionSetupComplete          RRCConnectionSetupComplete,
    rrcStatus                           RRCStatus,
    securityModeComplete                SecurityModeComplete,
    securityModeFailure                 SecurityModeFailure,
    signallingConnectionReleaseRequest  SignallingConnectionReleaseRequest,
    transportChannelReconfigurationComplete
                                        TransportChannelReconfigurationComplete,
    transportChannelReconfigurationFailure
                                        TransportChannelReconfigurationFailure,
    transportFormatCombinationControlFailure
                                        TransportFormatCombinationControlFailure,
    ueCapabilityInformation             UECapabilityInformation,
    uplinkDirectTransfer                UplinkDirectTransfer,
    utranMobilityInformationConfirm     UTRANMobilityInformationConfirm,
    utranMobilityInformationFailure     UTRANMobilityInformationFailure,
    extension                           NULL
}
```

11.2 PDU definitions

```
-- ***************************************************
--
-- RNTI REALLOCATIONUTRAN MOBILITY INFORMATION
--
-- ***************************************************

-- NOTE TO EDITOR: To be moved in the correct place
RNTIReallocation UTRANMobilityInformation ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
    -- CN information elements
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- UTRAN mobility IEs
        ura-Identity                    URA-Identity                        OPTIONAL,
    -- Radio bearer IEs
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RNTI REALLOCATIONUTRAN MOBILITY INFORMATION CONFIRM COMPLETE
--
-- ***************************************************

-- NOTE TO EDITOR: To be moved in the correct place
RNTIReallocationComplete UTRANMobilityInformationConfirm ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
    -- Radio bearer IEs
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfo               OPTIONAL,
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RNTI REALLOCATIONUTRAN MOBILITY INFORMATION FAILURE
--
-- ***************************************************

-- NOTE TO EDITOR: To be moved in the correct place
RNTIReallocationFailure UTRANMobilityInformationFailure ::= SEQUENCE {
```

```
    -- UE information elements
        failureCause                    FailureCauseWithProtErr,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}
```

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Sophia Antipolis, France, 21 – 25 August, 2000

Document R2-001773
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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25.331 CR 528 Current Version: 3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-RAN #9
list expected approval meeting # here ↑

for approval	X
for information	

strategic		*(for SMG use only)*
non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects:
(at least one should be marked with an X)

(U)SIM	ME	UTRAN / Radio	Core Network
	X	X	

Source: TSG-RAN WG2 **Date:** 2000-08-21

Subject: PRACH constant value

Work item:

Category:
(only one category shall be marked with an X)

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: This CR corrects the range of the PRACH Constant Value information element..

Clauses affected: 10.3.6.8, 11.3.6

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

10.3.6.8 Constant value

This constant value is used by the UE to calculate the initial output power on PRACH according to the Open loop power control procedure.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Constant value	MP		Integer (-35~~41~~..- -10)	At least 6~~11~~ spare values needed Criticality: reject is needed

----

NEXT SECTION TO CHANGE

11.3.6 Physical channel information elements

```
PhysicalChannel-IEs DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

.
.
.
.
.
.
.
.
.
.


-- Values from -35~~10~~ to -10~~10~~ are used in Release 99
ConstantValue ::=                   INTEGER (-41~~10~~..-10~~21~~)
```

3GPP TSG RAN WG2#15
Sophia Antipolis, France, Aug 21st-25th, 2000

Document ***R2-001780***
e.g. for 3GPP use the format TP-99xxx
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CHANGE REQUEST

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25.331	**CR**	**530**	Current Version:	3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-RAN #9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑	for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from:* ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio	X	Core Network	

Source:	TSG-RAN WG2	**Date:**	2000-08-21
Subject:	Corrections to the paging procedure		
Work item:			

Category:	F	Correction	X	**Release:**	Phase 2	
	A	Corresponds to a correction in an earlier release			Release 96	
(only one category	B	Addition of feature			Release 97	
shall be marked	C	Functional modification of feature			Release 98	
with an X)	D	Editorial modification			Release 99	X
					Release 00	

Reason for change:

This CR contains the corrections of the paging procedure according to the outcome of the RAN2 RRC ad-hoc meeting on Aug 16-17, 2000.

- More than one Paging Record for the same UE in the same PAGING TYPE 1 message is allowed
- Editorial changes

Clauses affected: 8.1.2.2, 8.1.2.3

Other specs affected:	Other 3G core specifications		→ List of CRs:
	Other GSM core specifications		→ List of CRs:
	MS test specifications		→ List of CRs:
	BSS test specifications		→ List of CRs:
	O&M specifications		→ List of CRs:

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

8.1.2 Paging

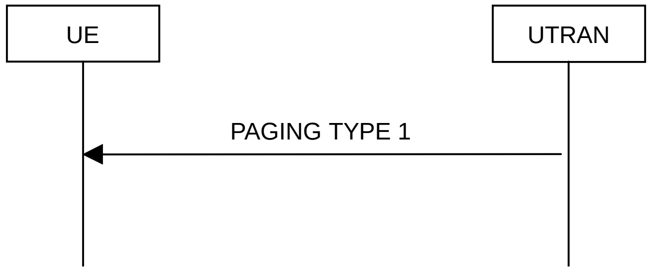

Figure 6: Paging

8.1.2.1 General

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

8.1.2.2 Initiation

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

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

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

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

8.1.2.3 Reception of an PAGING TYPE 1 message by the UE

The UE shall in idle mode, CELL_PCH state and URA_PCH state receive the paging information for all its monitored paging occasions. For an UE in idle mode, the paging occasions are specified in TS 25.304 and depend on the IE "CN domain specific DRX cycle length coefficient", as specified in 8.5.7.1.1. For an UE in CELL_PCH state and URA_PCH state the paging occasions depend also on the IE "UTRAN DRX Cycle length coefficient" and the IE "DRX indicator", as specified in subclauses 8.5.7.3.2 and 8.5.7.3.3 respectively.

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

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

An idle mode UE shall:

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

A connected mode UE shall;

- if the IE "paging originator" is UTRAN, compare the included identities of type "UTRAN originator" with its allocated U-RNTI.

- ~~for each match~~if there is at least one match~~,~~, the UE shall ~~enter CELL_FACH state and~~ perform a cell update procedure with cause "paging response" as specified in subclause 8.3.1.2.

- if the IE "paging originator" is CN, ignore that paging record.

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

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or for SMG, use the format P-99-xxx

CHANGE REQUEST

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25.331 CR 532r1 Current Version: 3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-RAN #9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑	for information		non-strategic		

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Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: TSG-RAN WG2 **Date:** 2000-08-21

Subject: Miscellaneous corrections and moving of text from 3G TS 25.304

Work item:

Category:

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

(only one category shall be marked with an X)

Reason for change:

This CR corrects a number of minor errors in the specification.
1.Identations are corrected to allow for easy visibility of "set of actions".

2.Text relevant to RRC transitions has been moved from 3G TS 25.304.

3.Corrections to subclauses 8.1.6, 8.1.8, 8.1.11, 8.1.13 and 8.1.14 per the RRC AdHoc.

4. A number of other miscellaneous editorial corrections.

Clauses affected: 3.2, 7, 8, 9, 10.2.51, 11.2

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

3.2 Abbreviations

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

ACK	Acknowledgement
AICH	Acquisition Indicator CHannel
AM	Acknowledged Mode
AS	Access Stratum
ASN.1	Abstract Syntax Notation.1
BCCH	Broadcast Control Channel
BCFE	Broadcast Control Functional Entity
BER	Bite Error Rate
BLER	BLock Error Rate
BSS	Base Station Sub-system
C	Conditional
CCPCH	Common Control Physical CHannel
CCCH	Common Control Channel
CN	Core Network
CM	Connection Management
CPCH	Common Packet CHannel
C-RNTI	Cell RNTI
DCA	Dynamic Channel Allocation
DCCH	Dedicated Control Channel
DCFE	Dedicated Control Functional Entity
DCH	Dedicated Channel
DC-SAP	Dedicated Control SAP
DL	Downlink
DRAC	Dynamic Resource Allocation Control
DSCH	Downlink Shared Channel
DTCH	Dedicated Traffic Channel
FACH	Forward Access Channel
FAUSCH	Fast Uplink Signalling Channel
FDD	Frequency Division Duplex
FFS	For Further Study
GC-SAP	General Control SAP
HCS	Hierarchical Cell Structure
ID	Identifier
IETF	Internet Engineering Task Force
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IE	Information element
IP	Internet Protocol
ISCP	Interference on Signal Code Power
LAI	Location Area Identity
L1	Layer 1
L2	Layer 2
L3	Layer 3
M	Mandatory
MAC	Media Access Control
MCC	Mobile Country Code
MM	Mobility Management
MNC	Mobile Network Code
MS	Mobile Station
NAS	Non Access Stratum
Nt-SAP	Notification SAP
NW	Network
O	Optional
ODMA	Opportunity Driven Multiple Access

PCCH	Paging Control Channel
PCH	Paging Channel
PDCP	Packet Data Convergence Protocol
PDSCH	Physical Downlink Shared Channel
PDU	Protocol Data Unit
PLMN	Public Land Mobile Network
PNFE	Paging and Notification Control Functional Entity
PRACH	Physical Random Access CHannel
P-TMSI	Packet Temporary Mobile Subscriber Identity
PUSCH	Physical Uplink Shared Channel
QoS	Quality of Service
RAB	Radio access bearer
RB	Radio Bearer
RAI	Routing Area Identity
RACH	Random Access CHannel
RB	Radio Bearer
RFE	Routing Functional Entity
RL	Radio Link
RLC	Radio Link Control
RNTI	Radio Network Temporary Identifier
RNC	Radio Network Controller
RRC	Radio Resource Control
RSCP	Received Signal Code Power
RSSI	Received Signal Strength Indicator
SAP	Service Access Point
SCFE	Shared Control Function Entity
SF	Spreading Factor
SHCCH	Shared Control Channel
SIR	Signal to Interference Ratio
SSDT	Site Selection Diversity Transmission
S-RNTI	SRNC - RNTI
~~tbd~~	~~to be decided~~
TDD	Time Division Duplex
TF	Transport Format
TFCS	Transport Format Combination Set
TFS	Transport Format Set
TME	Transfer Mode Entity
TMSI	Temporary Mobile Subscriber Identity
Tr	Transparent
Tx	Transmission
UE	User Equipment
UL	Uplink
UM	Unacknowledged Mode
UMTS	Universal Mobile Telecommunications System
UNACK	Unacknowledgement
URA	UTRAN Registration Area
U-RNTI	UTRAN-RNTI
USCH	Uplink Shared Channel
UTRAN	UMTS Terrestrial Radio Access Network

4 General

The functional entities of the RRC layer are described below:

- Routing of higher layer messages to different MM/CM entities (UE side) or different core network domains (UTRAN side) is handled by the Routing Function Entity (**RFE**).
- Broadcast functions are handled in the broadcast control function entity (**BCFE**). The BCFE is used to deliver the RRC services, which are required at the GC-SAP. The BCFE can use the lower layer services provided by the Tr-SAP and UM-SAP.

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

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

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

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

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

Figure 1 shows the RRC model for the UE side and Figure 2 and Figure 3 show the RRC model for the UTRAN side.

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

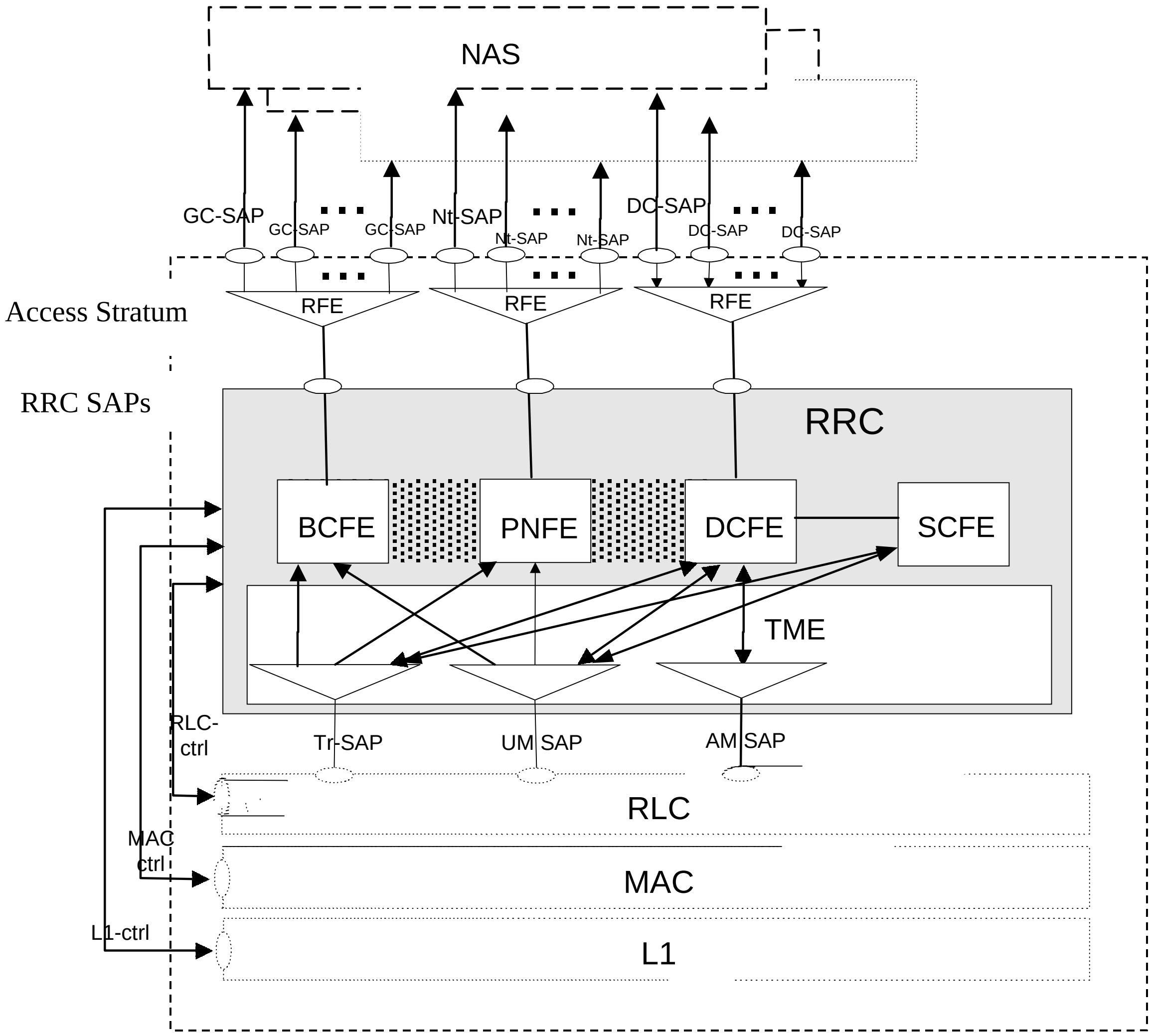


Figure 1: UE side model of RRC

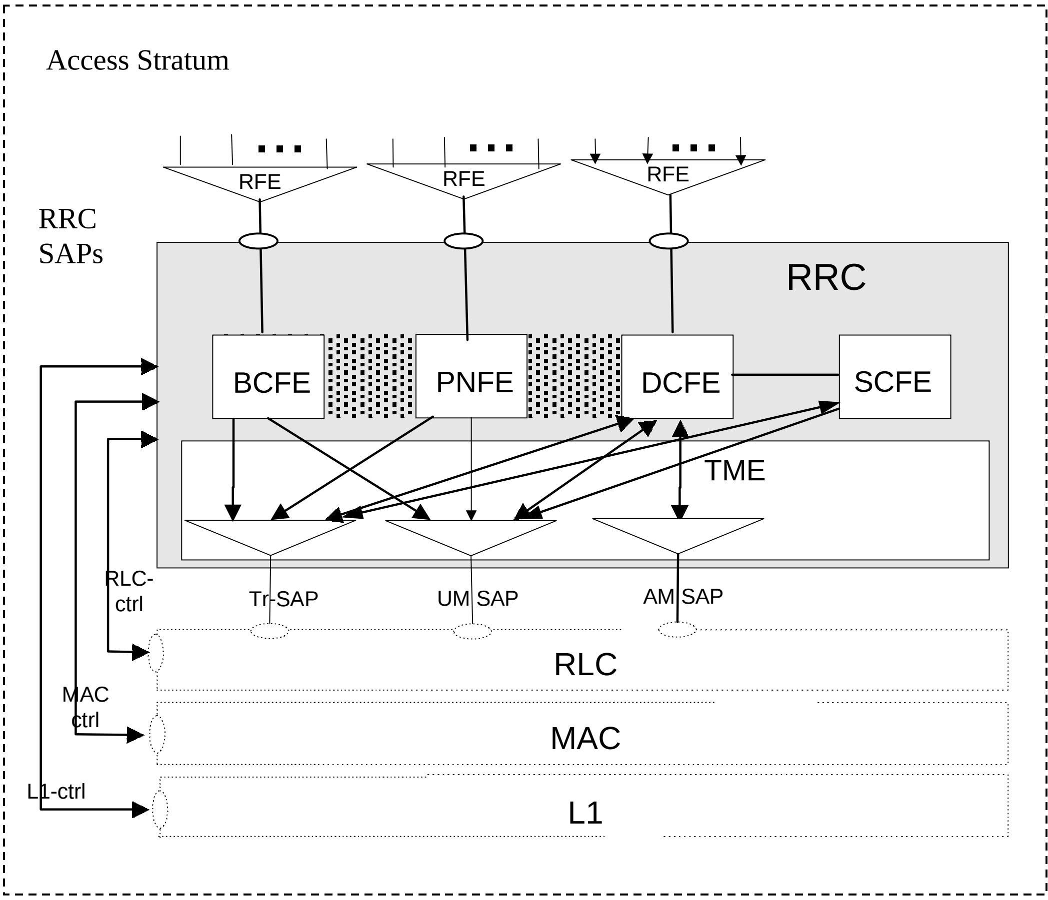


Figure 2: UTRAN side RRC model (DS-MAP system)

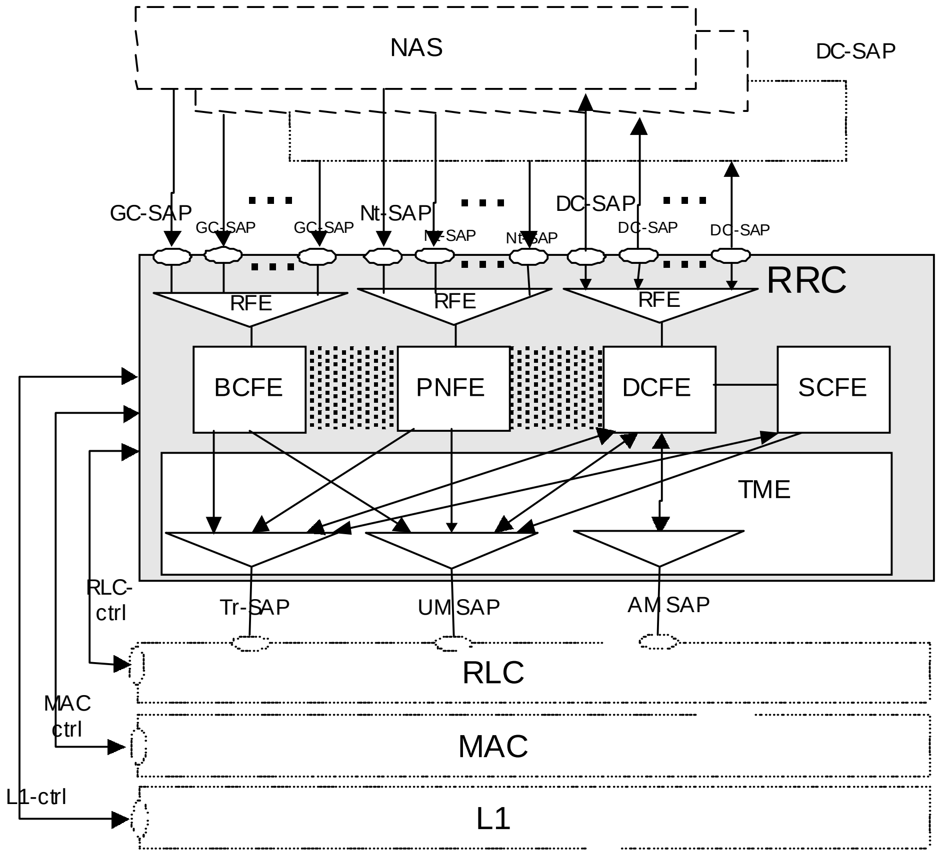


Figure 3: UTRAN side RRC model (DS-41 System)

5 RRC Services provided to upper layers

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

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

- General Control;
- Notification;
- Dedicated control.

6 Services expected from lower layers

6.1 Services expected from Layer 2

Void.

6.2 Services expected from Layer 1

Void.

7 Functions of RRC

The RRC performs the functions listed below.~~,~~ A~~a~~ more detailed description of these functions is provided in 3G TS 25.301:

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

- Interworking between the Gateway ODMA relay node and the UTRAN;
- Contention resolution (TDD mode);
- Paging/notification;
- Initial cell selection and re-selection in idle mode;
- Arbitration of radio resources on uplink DCH;
- RRC message integrity protection;
- Timing advance (TDD mode).

The following functions are regarded as further study items:

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

8 RRC procedures

8.1 RRC Connection Management Procedures

8.1.1 Broadcast of system information

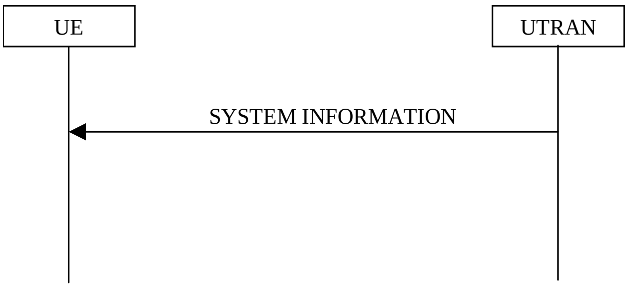


Figure 4: Broadcast of system information

8.1.1.1 General

The purpose of this procedure is to broadcast system information from the UTRAN to idle mode- and connected mode UEs in a cell.

8.1.1.1.1 System information structure

The system information elements are broadcast in *system information blocks*. A system information block groups together system information elements of the same nature. Different system information blocks may have different characteristics, e.g. regarding their repetition rate and the requirements on UEs to re-read the system information blocks.

The system information is organised as a tree. A *master information block* gives references to a number of system information blocks in a cell, including scheduling information for those system information blocks. The system information blocks contain the actual system information and optionally references to other system information blocks including scheduling information for those system information blocks. The referenced system information blocks must have the same area scope and use the same update mechanism as the parent system information block.

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

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

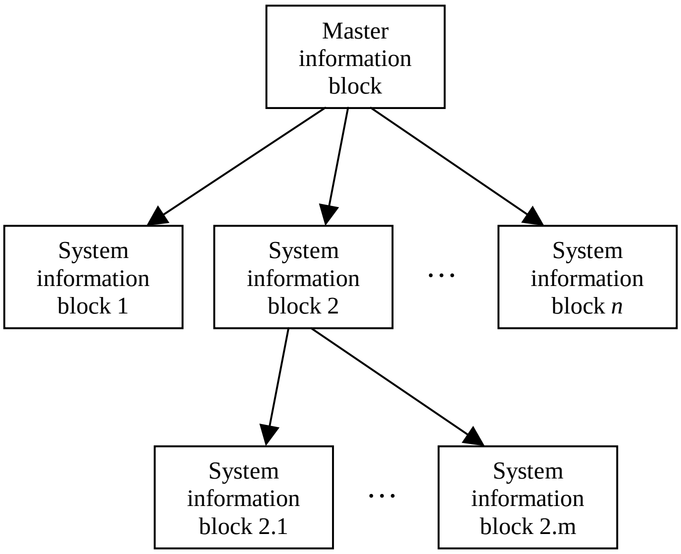


Figure 5: The overall structure of system information

8.1.1.1.2 System information blocks

Table 8.1.1 specifies all system information blocks and their characteristics.

The *area scope column* in table 8.1.1 specifies the area where a system information block is valid. If the area scope is *cell*, the UE shall read the system information block every time a new cell is selected. If system information blocks ~~are~~ have been previously stored for this cell, the UE shall check whether the value tag for the system information block in the entered cell is different compared to the stored value tag. If the area scope is *PLMN*, the UE shall check the value tag for the system information block when a new cell is selected. If the value tag for the system information block in the new cell is different compared to the value tag for the system information block~~ in the old cell~~stored in the UE, the UE shall re-read the system information block.

System information blocks of which there are multiple occurrences each have their own independent value tag. The UE shall re-read a particular occurrence ~~n ~~if the value tag of this occurrence has changed compared to that stored in the UE.

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

The *Transport channel* column in table 8.1.1 specifies whether the system information block is broadcast on a BCH or a FACH transport channel.

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

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

Table 8.1.1: Specification of system information block characteristics

System information block	Area scope	UE mode/state	Transport channel	Scheduling information	Modification of system information	Additional requirements
Master information block	Cell	Idle mode, CELL_FACH, CELL_PCH, URA_PCH	BCH	SIB_POS = 0 FDD: SIB_REP = [8] TDD: SIB_REP = [8, 16, 32, 64] [SIB_OFF=2]	Value tag	
		CELL_FACH	FACH	Scheduling not applicable	Value tag	
System information block type 1	PLMN	Idle mode	BCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 2	PLMN	CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 3	Cell	Idle mode, (CELL_FACH, CELL_PCH, URA_PCH)	BCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 4	Cell	CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Value tag	If System information block type 4 is not broadcast in a cell, the connected mode UE shall read System information block type 3
System information block type 5	Cell	Idle mode, (CELL_FACH, CELL_PCH, URA_PCH)	BCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 6	Cell	CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Value tag	If system information block type 6 is not broadcast in a cell, the connected mode UE shall read System information block type 5. If some of the optional IEs are not included in System information block type 6, the UE shall read the corresponding IEs in System information block type 5
System information block type 7	Cell	Idle mode, CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Expiration timer = SIB_REP	
System information block type 8	Cell	CELL_FACH, CELL_PCH, URA_PCH	BCH	Specified by the IE "Scheduling information"	Value tag	
System information block type 9	Cell	Connected mode	BCH	Specified by the IE "Scheduling information"	Expiration timer = SIB_REP	

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

8.1.1.1.3 Segmentation and concatenation of system information blocks

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

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

Four different segment types are defined:

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

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

Each segment consists of a header and a data field. The data field carries the encoded system information elements. The header contains the following parameters:

- The number of segments in the system information block (SEG_COUNT). This parameter is only included in the header if the segment type is "First segment".
- SIB type. The SIB type uniquely identifies the master information block or a system information block.
- Segment index. This parameter is only included in the header if the segment type is "Subsequent segment" or "Last segment".

UTRAN may combine one or several segments of variable length in the same SYSTEM INFORMATION message. The following combinations are allowed:

1. No segment
2. First segment;
3. Subsequent segment;
4. Last segment;
5. Last segment + First segment;
6. Last segment + one or several Complete;
7. Last segment + one or several Complete + First segment;
8. One or several Complete;
9. One or several Complete + First segment..

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

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

8.1.1.1.4 Re-assembly of segments

The RRC layer in the UE shall perform re-assembly of segments. All segments belonging to the same master information block or system information block shall be assembled in ascending order with respect to the segment index. When all segments of the master information block or a system information block have been received, the UE shall perform decoding of the complete master information block or system information block. For system information blocks ~~of~~ which have multiple occurrences ~~are used~~, each occurrence shall be re-assembled independently.

8.1.1.1.5 Scheduling of system information

Scheduling of system information blocks is performed by the RRC layer in UTRAN. If segmentation is used, it should be possible to schedule each segment separately.

To allow the mixing of system information blocks with short repetition period and system information blocks with segmentation over many frames, UTRAN may multiplex segments from different system information blocks. Multiplexing and de-multiplexing is performed by the RRC layer.

The scheduling of each system information block broadcast on a BCH transport channel is defined by the following parameters:

- the number of segments (SEG_COUNT);
- the repetition period (SIB_REP). The same value applies to all segments;
- the position (phase) of the first segment within the repetition period (SIB_POS(0));
- the ~~O~~offset of the subsequent segments in ascending index order (SIB_OFF(i), i=1, 2, … SEG_COUNT-1) The position of the subsequent segments ~~are~~ is calculated using the following~~as~~: SIB_POS(i) = SIB_POS(i-1) + SIB_OFF(i).

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

- SFN mod SIB_REP = SIB_POS(i)

NOTE: SIB_POS must be less than SIB_REP for all segments of a given system information block.

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

8.1.1.2 Initiation

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

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

8.1.1.3 Reception of SYSTEM INFORMATION messages by the UE

The UE shall ~~receive~~ read SYSTEM INFORMATION messages broadcast on a BCH transport channel in idle mode as well as in states CELL_FACH, CELL_PCH and URA_PCH. Further, the UE shall ~~receive~~ read SYSTEM INFORMATION messages broadcast on a FACH transport channel when in CELL_FACH state. In addition, UEs ~~with~~ which support ~~for~~ simultaneous reception of one SCCPCH and one DPCH shall ~~receive~~ read system information on a FACH transport channel when in CELL_DCH state.

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

The UE may store system information blocks (including their value tag) for different cells and different PLMNs, to be used if the UE returns to these cells. The UE shall consider the information to be invalid after a maximum of 6 hours have elapsed since storing it. ~~This information is valid for a period of 6 hours after reception.~~ All stored system information blocks shall be considered as invalid after the UE has been switched off.

~~When~~ After selecting a new PLMN, the UE shall consider all current system information blocks to be invalid. If the UE has previously stored valid system information blocks for the selected cell of the new PLMN, the UE may set those as current system information blocks. ~~By~~ On selection of a new PLMN the UE shall store information about the new PLMN in the variable SELECTED_PLMN.

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

When selecting a new cell, the UE shall read the master information block. The UE may use the pre-defined scheduling information to locate the master information block in the cell.

On reception of the master information block, the UE shall:

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

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

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

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

The master information block is not broadcast regularly on FACH. The master information block on FACH indicates the changes of system information block contents broadcast on BCH.

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

8.1.1.4 Modification of system information

Different rules apply for the updating of different types of system information blocks. If the system information block has a "value tag" in the master information block or higher level system information block, UTRAN shall indicate when any of the information elements are modified by changing the value of the corresponding "value tag". ~~[Even if the value tag does not change, the UE shall consider the system information block to be invalid after a period of 6 hours from reception.]~~ In addition to this, there are system information block types that contain information elements which are changing too frequently to be indicated by change in value tag. This type of system information blocks is not linked to a value tag in the master information block or higher-level system information block. ~~All stored system information blocks shall be considered as invalid after the UE has been switched off~~.

8.1.1.4.1 Modification of system information blocks using a value tag

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

- update the actual system information in the corresponding system information block;
- ~~If~~ if the updated system information block is linked to a higher level system information block, update the higher level system information block with the "value tag" of the modified system information block;
- update the master information block with the "value tag" of the modified system information block or higher level system information block and change the "value tag" of the master information block;
- start to send the first new master information block on the BCCH mapped on BCH instead of the old master information block and then the updated system information block on the BCCH instead of the old system information block;
- send the new master information block on the BCCH mapped on FACH in order to reach all UEs in state CELL_FACH. UTRAN may repeat the new master information block on the FACH to increase the probability of proper reception in all UEs needing the information;
- send the PAGING TYPE 1 message on the PCCH in order to reach idle mode UEs as well as connected mode UEs in state CELL_PCH and URA_PCH. In the IE "BCCH Modification Information" in the PAGING TYPE 1 message, UTRAN shall indicate the new value tag for the master information block. The PAGING TYPE 1 message should be sent in all paging occasions;
- ~~it should be noted that for the proper operation of the BCCH Modification Information sent on the PCH, the System Information should not be changed more frequently than can be accommodated by mobile stations operating at the maximum DRX cycle length supported by the UTRAN.~~

It should be noted that for the proper operation of the BCCH Modification Information sent on the PCH, the System Information should not be changed more frequently than can be accommodated by mobile stations operating at the maximum DRX cycle length supported by the UTRAN.

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

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

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

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

8.1.1.4.2 Modification of system information without value tag

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

8.1.1.4.3 Time critical modification of system information blocks

For modification of some system information elements, e.g. reconfiguration of the channels, it is important for the UE to know exactly when a change occurs. ~~If~~ In such cases, the UTRAN should perform~~s~~ the following actions to indicate the change to the UEs:

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

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

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

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

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

- at the indicated ~~time~~SFN, ~~start to~~ send ~~first~~ the new master information block on the BCCH mapped on BCH instead of the old master information block ~~and then~~followed by the updated system information block on the BCCH instead of the old system information block.

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

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

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

- store the new "value tag" of the master information block;

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

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

8.1.1.5 Actions upon reception of system information blocks

8.1.1.5.1 System Information Block type 1

If in idle mode, the UE should store all relevant IEs included in this system information block if the "PLMN Type" in the variable SELECTED_PLMN has the value "GSM-MAP" and the IE "PLMN type" in the Master Information Block has the value "GSM-MAP" or "GSM-MAP and ANSI-41". The UE shall also:

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

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

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

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

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

8.1.1.5.2 System Information Block type 2

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

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

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

8.1.1.5.3 System Information Block type 3

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

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

8.1.1.5.4 System Information Block type 4

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

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

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

8.1.1.5.5 System Information Block type 5

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

- if IEs containing scheduling information for other system information blocks are included, ~~the UE shall~~ act on those IEs in a similar manner as specified for the scheduling information contained within the master information block;~~.~~
- replace the TFS of the transport channel ~~which has a same~~with the identical transport ~~CH~~ channel identity with the one stored in the UE if any;~~.~~
- let the physical channel(s) of type PRACH given by the IE(s) "PRACH info" be the default in uplink for the PRACH.
- start to receive the physical channel of type AICH using the parameters given by the IE "AICH info" (FDD only) ~~if~~ when ~~given~~ allocated PRACH is used;~~.~~
- start to receive the physical channel of type PICH using the parameters given by the IE "PICH info" if UE is in Idle mode or in CELL_PCH or ~~/~~URA_PCH state;~~.~~
- start to monitor its paging occasions on the PICH if UE is in Idle mode or in CELL_PCH or ~~/~~URA_PCH state;~~.~~
- start to receive the physical channel(s) of type Secondary CCPCH using the parameters given by the IE(s) "Secondary CCPCH info" if UE is in CELL_FACH state;~~.~~
- in TDD: use the IE "Midamble configuration" for receiver configuration;~~.~~

8.1.1.5.6 System Information Block type 6

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

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

- replace the TFS of the transport channel with the identical transport channel ~~which has a same transport CH~~ identity with the one stored in the UE if any;~~.~~
- let the physical channel(s) of type PRACH given by the IE(s) "PRACH info" be the default in uplink. If the IE "PRACH info" is not included, the UE shall read the corresponding IE(s) in system information block type 5 and use that information to configure the PRACH;~~.~~
- start to receive the physical channel of type AICH using the parameters given by the IE "AICH info" ~~if given~~when associated PRACH is used. If the IE "AICH info" is not included, the UE shall read the corresponding IE in system information block type 5 and use that information (FDD only);~~.~~
- start to receive the physical channel of type PICH using the parameters given by the IE "PICH info" if the UE is in CELL~~/~~_PCH or URA_PCH state. If the IE "PICH info" is not included, the UE shall read the corresponding IE in system information block type 5 and use that information;~~.~~
- start to monitor its paging occasions on the PICH if the UE is in CELL_PCH or ~~/~~URA_PCH state;~~.~~
- start to receive the physical channel(s) of type Secondary CCPCH using the parameters given by the IE(s) "Secondary CCPCH info" if the UE is in CELL_FACH state. If the IE "Secondary CCPCH info" is not included, the UE shall read the corresponding IE(s) in system information block type 5 and use that information;~~.~~

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

8.1.1.5.7 System Information Block type 7

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

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

8.1.1.5.8 System Information Block type 8

This system information block type is used only for FDD.

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

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

8.1.1.5.9 System Information Block type 9

This system information block type is used only for FDD.

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

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

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

8.1.1.5.10 System Information Block type 10

This system information block type is used only for FDD.

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

- start a timer set to the value given by the repetition period (SIB_REP) for that system information block;
- perform actions defined in subclause 14.6.

If in idle mode, state CELL_FACH, state CELL_PCH or state URA_PCH, the UE shall not use the values of the IEs in this system information block.

8.1.1.5.11 System Information Block type 11

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

- if IEs containing scheduling information for other system information blocks are included, ~~the UE shall~~ act on those IEs in a similar manner as specified for the scheduling information contained within the master information block;~~.~~
- for each measurement type, start a measurement using the set of IEs specified for that measurement type;~~.~~
- associate each measurement with the identity number given by the IE "Measurement identity number";~~.~~
- if included, store the IE "Intra-frequency reporting quantity" and the IE "Intra-frequency measurement reporting criteria" or "Periodical reporting criteria" in order to activate reporting when state CELL_DCH is entered;~~.~~
- If IE "HCS Serving cell information" is included~~, this indicates~~ indicating that HCS is used, ~~and UE shall~~ do the following:
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Intra-frequency Cell Information", ~~UE shall~~ use the default values specified for the IE "HCS neighbouring cell information" for that cell;~~.~~
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Intra-frequency Cell Information", ~~UE shall~~ for that cell use the same parameter values as used for the preceding IE "Intra-frequency Cell Information";~~.~~
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-frequency Cell Information", ~~UE shall~~ use the default values specified for the IE "HCS neighbouring cell information" for that cell;~~.~~
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-frequency Cell Information", ~~UE shall~~ for that cell use the same parameter values as used for the preceding IE "Inter-frequency Cell Information";~~.~~
  - If IE "HCS neighbouring cell information" is not included in the first occurrence of IE "Inter-system Cell Information", ~~UE shall~~ use the default values specified for the IE "HCS neighbouring cell information" for that cell;~~.~~
  - If IE "HCS neighbouring cell information" is not included in other occurrence of IE "Inter-system Cell Information", ~~UE shall~~ for that cell use the same parameter values as used for the preceding IE "Inter-system Cell Information";~~.~~
- If IE "HCS Serving cell information" is not included, ~~this indicates~~indicating that HCS is not used,~~ and~~ any occurrences of IE "HCS neighbouring cell information" in System Information Block Type 11 shall be neglected by the UE.

8.1.1.5.12 System Information Block type 12

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

- if IEs containing scheduling information for other system information blocks are included, ~~the UE shall~~ act on those IEs in a similar manner as specified for the scheduling information contained within the master information block;~~.~~
- for each measurement type, start (or continue) a measurement using the set of IEs specified for that measurement type;~~.~~
- remove the intra-frequency cells given by the IE "Removed intra-frequency cells" from the list of intra-frequency cells specified in system information block type 11~~. A~~and add the intra-frequency cells given by the IE "New intra-frequency cells" to the list of intra-frequency cells specified in system information block type 11;~~.~~
- if any of the IEs "Intra-frequency measurement quantity", "Intra-frequency reporting quantity for RACH reporting", "Maximum number of reported cells on RACH" or "Reporting information for state CELL_DCH" are not included in the system information block, read the corresponding IE(s) in system information block type 11 and use that information for the intra-frequency measurement;~~.~~
- if included in this system information block or in system information block type 11, store the IE "Intra-frequency reporting quantity" and the IE "Intra-frequency measurement reporting criteria" or "Periodical reporting criteria" in order to activate reporting when state CELL_DCH is entered;~~.~~

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

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

8.1.1.5.13 System Information Block type 13

If in idle or connected mode, the UE should store all relevant IEs included in this system information block except for the IEs "CN domain specific DRX cycle length coefficient", "UE timers in idle mode" and "Capability update requirement" which shall be stored only in the idle mode case. The UE shall read SIB type 13 and the associated SIB type 13.1, 13.2, 13.3 and 13.4 only when the "PLMN Type" in the variable SELECTED_PLMN has the value "ANSI-41" and the IE "PLMN type" in the Master Information Block has the value "ANSI-41" or " GSM-MAP and ANSI-41". The UE shall also:

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

8.1.1.5.14 System Information Block type 14

This system information block type is used only for TDD.

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

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

8.1.1.5.15 System Information Block type 15

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

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

8.1.1.5.15.1 System Information Block type 15.1

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

- interpret a value of "1" of "UTRAN Time Flag" to mean that UTRAN timing information value (SFN) is present, and "0" to mean that only the Reference GPS TOW field value is provided.
- interpret a value of "1" of "NODE B Clock Drift Flag" to mean that NODE B Clock Drift information value is present, and "0" to mean that this IE value is not provided.
- if the IE "NODE B Clock Drift" is included,
  - use it as an estimate of the drift rate of the NODE B clock relative to GPS time.
- if the IE "NODE B Clock Drift" is not included
  - assume the value 0

~~- if NODE B Clock Drift is included:~~
~~use it as an estimate of the drift rate of the NODE B clock relative to GPS time.~~
~~If this IE is not included:~~
~~assume the value 0.~~

- use IE "Reference Location" as a prior knowledge of the approximate location of the UE.

~~- if SFN is included:~~
- if SFN is included,
  - use it as the relationship between GPS time and air-interface timing of the NODE B transmission in the serving cell.

- use "Reference GPS TOW" as GPS Time of Week which is the start of the frame with SFN=0.
- use "Status/Health" to indicate the status of the differential corrections.
- act on IE group"DGPS information" ~~IEs~~ in a similar manner as specified in [13] except that the scale factors for PRC and RRC are different. In addition, the IE group "DGPS information" ~~IEs~~ also include Delta PRC2 and Delta RRC2. Delta PRC2 is the difference in the pseudorange correction between the satellite's ephemeris identified by IODE and the previous ephemeris two issues ago IODE –2. Delta RRC2 is the difference in the pseudorange rate-of-change correction between the satellite's ephemeris identified by IODE and IODE-2. These two additional IEs shall extend the life of the raw ephemeris data up to 6 hours.

8.1.1.5.15.2 System Information Block type 15.2

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

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

8.1.1.5.15.3 System Information Block type 15.3

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

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

8.1.1.5.16 System Information Block type 16

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

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

~~- store the predefined configurations for later use e.g. during handover to UTRAN.~~

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

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

8.1.2 Paging

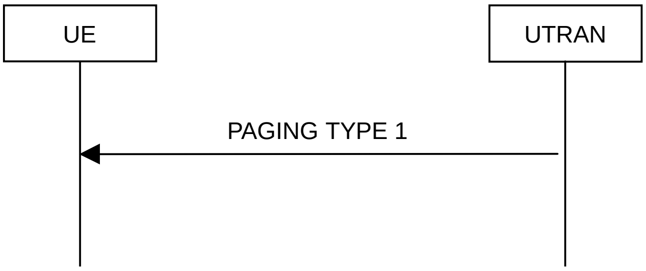


Figure 6: Paging

8.1.2.1 General

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

8.1.2.2 Initiation

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

UTRAN may repeat ~~paging~~ transmission of a PAGING TYPE 1 message ~~of~~ to a UE in several paging occasions to increase the probability of proper reception of a page.

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

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

8.1.2.3 Reception of an PAGING TYPE 1 message by the UE

The UE shall in idle mode, CELL_PCH state and URA_PCH state receive the paging information for all its monitored paging occasions. For an UE in idle mode, the paging occasions are specified in TS 25.304 and depend on the IE "CN domain specific DRX cycle length coefficient", as specified in 8.5.7.1.1. For an UE in CELL_PCH state and URA_PCH state the paging occasions depend also on the IE "UTRAN DRX Cycle length coefficient" and the IE "DRX indicator", as specified in subclauses 8.5.7.3.2 and 8.5.7.3.3 respectively.

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

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

An idle mode UE shall:

- if the IE "paging originator" is CN, compare the included identities of type CN UE identity with all of its allocated CN UE identities;~~.~~

- for each match, forward the identity and paging cause to the upper layer entity indicated by the IE "CN domain identity";~~.~~
- if the IE "paging originator" is UTRAN, ignore that paging record~~.~~

A connected mode UE shall;

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

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

8.1.3 RRC connection establishment

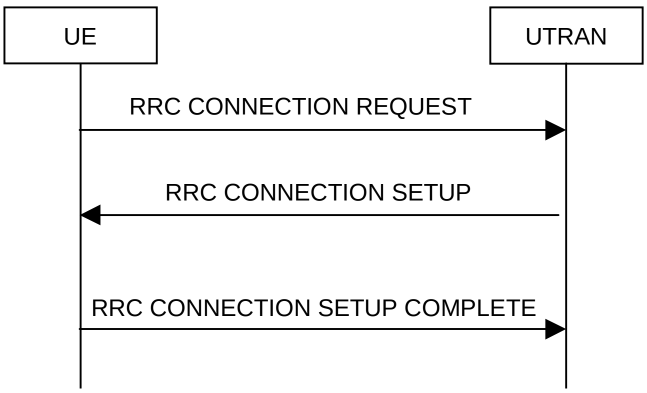


Figure 7: RRC Connection Establishment, network accepts RRC connection

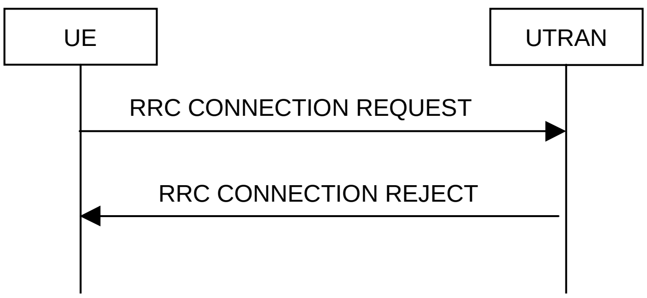


Figure 8: RRC Connection Establishment, network rejects RRC connection

8.1.3.1 General

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

8.1.3.2 Initiation

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

Upon initiation of the procedure, the UE shall:

- set the variable PROTOCOL_ERROR_INDICATOR to FALSE;

- transmit an RRC CONNECTION REQUEST message on the uplink CCCH, reset counter V300, and start timer T300;
- perform the mapping of the Access Class to an Access Service Class as specified in subclause 8.5.15, and shall apply the given Access Service Class when accessing the RACH;~~.~~
- set the IE "Establishment cause" according to indications from the upper layers;
- set the IE "Initial UE identity" according to subclause 8.5.1;
- set the IE "Protocol error indicator" to the value of the variable PROTOCOL_ERROR_INDICATOR;
- include a measurement report, as specified in the IE "Intra-frequency reporting quantity for RACH reporting" and the IE "Maximum number of reported cells on RACH" in system information block type 11.

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

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

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

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

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

~~The UE shall include a measurement report, as specified in the IE "Intra-frequency reporting quantity for RACH reporting" and the IE "Maximum number of reported cells on RACH" in system information block type 11.~~

8.1.3.3 Reception of an RRC CONNECTION REQUEST message by the UTRAN

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

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

8.1.3.4 Reception of an RRC CONNECTION SETUP message by the UE

The UE shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION SETUP message with the value of the IE "Initial UE identity" in the most recent RRC CONNECTION REQUEST message sent by the UE.~~:~~

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

~~- if the values are different, the UE shall ignore the rest of the message.~~

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

If the values are identical, the UE shall stop timer T300~~. The UE shall~~ and act upon all received information elements as specified in subclause 8.5.7, unless specified otherwise in the following.

- The UE shall:
  - store the value of the IE "U-RNTI"; and
  - initiate the signalling link parameters according to the IE "RB mapping info".
  - If the IE "C-RNTI" is included, the UE shall:
    - use that C-RNTI on common transport channels in the current cell.
  - If neither the IE "PRACH info (for RACH)", nor the IE "Uplink DPCH info" is included, the UE shall:

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

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

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

The UE shall enter a state according to subclause 8.5.8.

The UE shall transmit an RRC CONNECTION SETUP COMPLETE message on the uplink DCCH after successful state transition per subclause 8.5.8, with the contents set as specified below:~~.~~

- ~~The UE shall~~ include START [3G TS 33.102] values to be used in ciphering and integrity protection for each CN domain.

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

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

~~When the transmission~~When the successful delivery of the RRC CONNECTION SETUP COMPLETE message has been confirmed by RLC the UE shall:

- update its variable UE_CAPABILITY_TRANSFERRED ~~which~~ with the UE capabilities it has transmitted to the UTRAN,

- set the "Status" in the variable INTEGRITY_ PROTECTION_INFO to "Not started",

- and the procedure ends.

8.1.3.5 Physical channel failure or T300 timeout

~~- Upon expiry of timer T300; or~~

~~- if the UE failed to establish the physical channel(s) indicated in the RRC CONNECTION SETUP message.~~

Upon expiry of timer T300; or, if the UE failed to establish the physical channel(s) according to subclause 8.5.4 indicated in the RRC CONNECTION SETUP message:

- The UE shall check the value of V300, and shall:

  - if V300 is equal to or smaller than N300, ~~the UE shall~~ transmit a new RRC CONNECTION REQUEST message on the uplink CCCH, restart timer T300 and increase counter V300. The UE shall set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.2;

  - if V300 is greater than N300, ~~the UE shall~~ enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2.

8.1.3.6 Invalid RRC CONNECTION SETUP message

If the UE receives an RRC CONNECTION SETUP message:

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

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

  - The UE shall check the value of V300, and shall:

    ~~- if V300 is equal to or smaller than N300, the UE shall~~

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

8.1.3.7 Reception of an RRC CONNECTION REJECT message by the UE

When the UE receives an RRC CONNECTION REJECT message on the downlink CCCH, it shall compare the value of the IE "Initial UE identity" in the received RRC CONNECTION REJECT message with the value of the IE "Initial UE identity" in the last RRC CONNECTION REQUEST message sent by the UE:

- if the values are different, the UE shall ignore the rest of the message;
- if the values are identical, the UE shall stop timer T300 and perform the following actions:
  - If the IE "wait time" <> '0', and
    - If the IE "frequency info" is present and~~:~~
      - if V300 is equal to or smaller than N300, ~~the UE shall~~ initiate cell selection on the designated UTRA carrier. After having selected and camped on a cell, the UE shall re-initiate the RRC connection establishment procedure. The UE shall ~~suppress~~ not initiate cell reselection to another carrier for ~~at least~~ the time stated in the IE "wait time";
      - if a cell selection on the designated carrier fails, ~~the UE shall~~ wait ~~at least the~~for the time stated in the IE "wait time", and then transmit a new RRC CONNECTION REQUEST message on the uplink CCCH of the original serving cell, restart timer T300 and increase counter V300. UE shall set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.2;
      - if V300 is greater than N300 ~~the UE shall~~ enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2.
    - If the IE "inter-system info" is present and:
      - If V300 is equal to or smaller than N300, the UE shall perform cell selection in the designated system. After having camped on a cell, the UE shall re-initiate the RRC connection establishment procedure. The UE shall ~~suppress~~ not initiate cell reselection to the original system for ~~at least~~ the time stated in the IE " wait time".
      - If cell selection in the designated system fails, the UE shall wait ~~at least~~for the time stated in the IE "wait time", and then transmit a new RRC CONNECTION REQUEST message on the uplink CCCH, restart timer T300 and increase counter V300. The UE shall set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.2.
      - if V300 is greater than N300 the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2.
    - If neither the IEs "frequency info" nor "inter-system info" are present and:
      - If V300 is equal to or smaller than N300, the UE shall wait ~~at least~~for the time stated in the IE "wait time", transmit a new RRC CONNECTION REQUEST message on the uplink CCCH, restart timer

T300 and increase counter V300. UE shall set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.2.

- If V300 is greater than N300 the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2

- If the IE "wait time" = '0', the UE shall:

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

8.1.3.8 Invalid RRC CONNECTION REJECT message

If the UE receives an RRC CONNECTION REJECT message:

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

- If the IE "wait time" is <> 0, and:

  - If V300 is equal to or smaller than N300, ~~the UE shall~~ wait ~~at least~~for the time stated in the IE "wait time", transmit a new RRC CONNECTION REQUEST message on the uplink CCCH, restart timer T300 and increase counter V300. UE shall set the IEs in the RRC CONNECTION REQUEST message according to subclause 8.1.3.2, except for the IE "Protocol error indicator" which shall be set to TRUE.

  - If V300 is greater than N300 ~~the UE shall~~ enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2

- If the IE "wait time" is = 0 ~~the UE shall~~:

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

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

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

8.1.4 RRC connection release

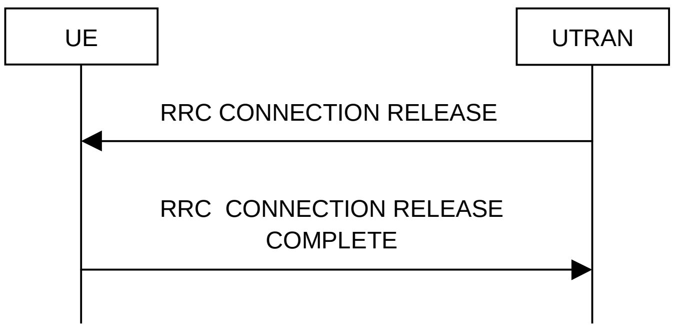


Figure 9: RRC Connection Release procedure

8.1.4.1 General

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

8.1.4.2 Initiation

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

UTRAN may transmit several RRC CONNECTION RELEASE messages to increase the probability of proper reception of the message by the UE. The number of repeated messages and the interval between the messages is a network option.

8.1.4.3 Reception of an RRC CONNECTION RELEASE message by the UE

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

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

- ~~When~~ in state CELL_DCH;
  - initialise the counter V308 with the value of the IE "Number of RRC Message Transmissions", which indicates the number of times the RRC CONNECTION RELEASE COMPLETE message shall be sent, and
  - ~~,~~ transmit an RRC CONNECTION RELEASE COMPLETE message using ~~unacknowledged mode~~UM RLC to the UTRAN and start timer T308.
- ~~When~~ in state CELL_FACH, transmit an RRC CONNECTION RELEASE COMPLETE message using ~~acknowledged mode~~AM RLC to the UTRAN.

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

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

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

8.1.4.4 Invalid RRC CONNECTION RELEASE message

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

- Ignore the invalid RRC CONNECTION RELEASE message;
- Transmit an RRC STATUS message on the uplink DCCH using AM RLC;
- Include the IE "Protocol error information" with contents according to clause 16;
- ~~When the transmission~~When the successful delivery of the RRC STATUS message has been confirmed by RLC, ~~the UE shall~~ resume normal operation as if the invalid RRC CONNECTION RELEASE message has not been received.

8.1.4.5 Expiry of timer T308 in CELL_DCH state

When in state CELL_DCH and the timer T308 expires, the UE shall decrease V308 by one. If V308 is greater than zero, the UE shall retransmit the RRC CONNECTION RELEASE COMPLETE message.

If V308 is equal to zero, the UE shall release all its radio resources, enter idle mode and the procedure ends on the UE side. Actions the UE shall perform when entering idle mode are given in subclause 8.5.2

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

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

8.1.4.7 Reception of an RRC CONNECTION RELEASE COMPLETE message by UTRAN

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

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

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

8.1.4.9 Detection of loss of dedicated physical channel ~~release~~ by UTRAN in CELL_DCH state

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

8.1.4.10 No reception of an RRC CONNECTION RELEASE COMPLETE message by UTRAN

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

8.1.5 RRC connection re-establishment

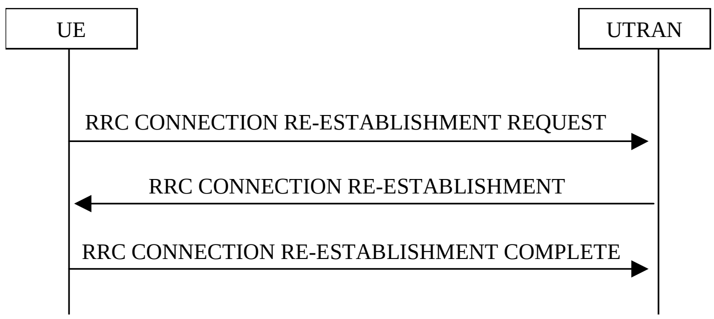


Figure 10: RRC Connection Re-establishment, successful case

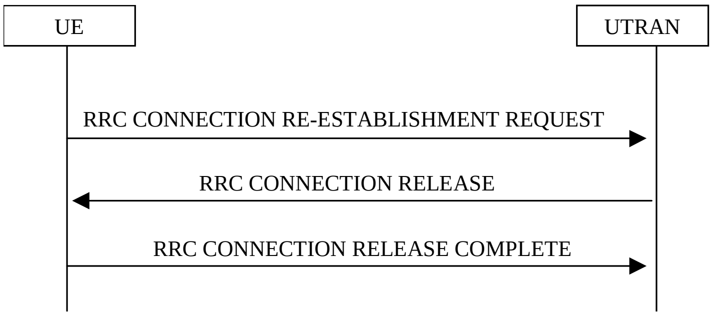


Figure 11: RRC Connection Re-establishment, failure case

8.1.5.1 General

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

8.1.5.2 Initiation

When a UE loses the radio connection in CELL_DCH due to e.g. radio link failure (see subclause 8.5.6), detection of RLC unrecoverable error (amount of the retransmission of RESET PDU reaches the value of Max DAT and receives no ACK)~~ in CELL_DCH state~~, the UE may initiate a new cell selection by transiting to CELL_FACH state.

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

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

If timer T314=0 the UE shall:

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

If timer T315=0 the UE shall:

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

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

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

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

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

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

8.1.5.3 Detection of "in service area"

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

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

- If the value of the variable PROTOCOL_ERROR_INDICATOR is FALSE, set the IE "Protocol error indicator" to FALSE.
- Include an IE "Measured Results on RACH", as specified in the IE "Intra-frequency reporting quantity for RACH reporting" and the IE "Maximum number of reported cells on RACH" in system information block type 12.
- Transmit an RRC CONNECTION RE-ESTABLISHMENT REQUEST message on the uplink CCCH and start timer T301.

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

UTRAN may either:

- initiate the RRC connection re-establishment procedure and transmit an RRC CONNECTION RE-ESTABLISHMENT message on the downlink DCCH on FACH or CCCH; or
- initiate the RRC connection release procedure on the downlink CCCH on FACH.

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

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

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

- ~~Stop timer T301;~~
- ~~Re-establish the RRC connection according to the IEs included in the RRC CONNECTION RE-ESTABLISHMENT message as specified below;~~
- ~~Transmit a RRC CONNECTION RE-ESTABLISHMENT COMPLETE message on the uplink DCCH using AM RLC;~~
- ~~If the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO is set, the UE shall include and set the IE "Radio bearer uplink ciphering activation time info" to the value of that variable;~~
- ~~When the transmission of the RRC CONNECTION RE-ESTABLISHMENT COMPLETE message has been confirmed by RLC, the UE shall clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO and the procedure ends.~~

Upon reception of the RRC CONNECTION RE-ESTABLISHMENT message the UE shall stop timer T301, and~~The UE shall~~ use the contents of the RRC CONNECTION RE-ESTABLISHMENT message as specified in subclause 8.5.7, unless specified otherwise in the following:

- For each reconfigured radio bearer use the mapping option applicable for the transport channels used according to the IE "RB mapping info";
- Configure MAC multiplexing if that is needed in order to use ~~said~~ appropriate transport channel(s);
- Use MAC logical channel priority when selecting TFC in MAC.

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

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

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

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

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

- Use the TFS given in system information.

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

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

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

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

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

- update its identity.

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

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

The UE shall enter a state according to 8.5.8.

After successful state transition, the UE shall:

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

- transmit an RRC CONNECTION RE-ESTABLISHMENT COMPLETE message on the uplink DCCH using AM RLC

When the successful delivery of the RRC CONNECTION RE-ESTABLISHMENT COMPLETE message has been confirmed by RLC, the UE shall clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO and the procedure ends.

8.1.5.6 T314 timeout

Upon expiry of timer T314 the UE shall:

- If timer T301 is running,
  - Continue awaiting response message from UTRAN
- If timer T301 is not running and timer T315 is running,
  - Release locally all radio bearers (except Signalling Radio Bearers) which are associated with T314. An indication may be sent to the non-access stratum.
- If timers T301 and T315 are not running,
  - Enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2

~~If timer T301 is running,~~

~~- Continue awaiting response message from UTRAN~~

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

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

~~If timers T301 and T315 are not running,~~

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

8.1.5.7 T315 timeout

Upon expiry of timer T315 the UE shall:

- If timer T301 is running,
  - Continue awaiting response message from UTRAN.
- If timer T301 is not running and timer T314 is running,
  - Release locally all radio bearers (except Signalling Radio Bearers) which are associated with T315. An indication may be sent to the non-access stratum.
- If timers T301 and T314 are not running,
  - Enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2.

~~If timer T301 is running,~~

- ~~Continue awaiting response message from UTRAN.~~

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

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

~~If timers T301 and T314 are not running,~~

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

8.1.5.8 Invalid RRC CONNECTION RE-ESTABLISHMENT message

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

The UE shall check the value of V301, and

- If V301 is equal to or smaller than N301, the UE shall set the variable PROTOCOL_ERROR_INDICATOR to TRUE, transmit a new RRC CONNECTION RE-ESTABLISHMENT REQUEST message on the uplink CCCH, restart timer T301 and increase counter V301. The UE shall set the IEs in the RRC CONNECTION RE-ESTABLISHMENT REQUEST message according to subclause 8.1.5.2.
- If V301 is greater than N301, the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2

8.1.5.9 T301 timeout or DPCH failure

Upon expiry of timer T301, or if the UE failed to re-establish the RRC Connection indicated in the RRC CONNECTION RE-ESTABLISHMENT message the UE shall:

- If timers T314 and T315 are not running,
  - Enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2.
- If timer T314 has expired during the last T301 cycle and T315 is still running,

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

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

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

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

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

  - Set the IEs in the RRC CONNECTION RE-ESTABLISHMENT REQUEST message according to subclause 8.1.5.3.

  - Transmit a new RRC CONNECTION RE-ESTABLISHMENT REQUEST message on the uplink CCCH and restart timer T301.

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

  - Continue searching for "in service area".

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

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

8.1.6 Transmission of UE capability information

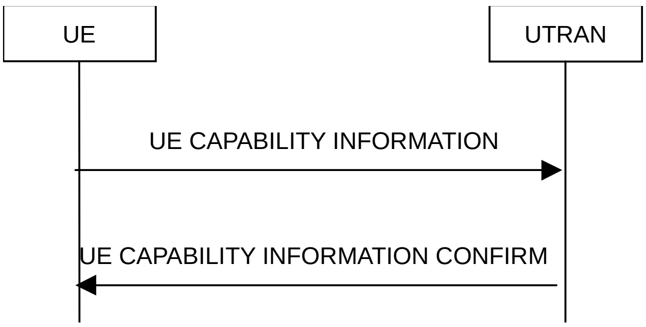


Figure 12: Transmission of UE capability information, normal flow

8.1.6.1 General

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

8.1.6.2 Initiation

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

- After the UE has received a UE CAPABILITY ENQUIRY message from the UTRAN;

- If UE capabilities stored in the variable UE_CAPABILITY_TRANSFERRED change during the RRC connection.

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

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

- include the UTRAN-specific UE capability information elements into the IE "UE radio capability", according to the requirement given in the IE "Capability update requirement" in the UE CAPABILITY ENQUIRY message;

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

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

If the UE CAPABILITY INFORMATION message is sent because one or more of the UE capabilities stored in the variable UE_CAPABILITY_TRANSFERRED has changed, the UE shall include the information elements associated with the capabilities that have changed in the UE CAPABILITY INFORMATION message.

8.1.6.3 Reception of an UE CAPABILITY INFORMATION message by the UTRAN

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

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

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

8.1.6.5 Invalid UE CAPABILITY INFORMATION CONFIRM message

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

- Stop timer T304;

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

- ~~When the transmission~~When the successful delivery of the RRC STATUS message has been confirmed by RLC, the UE shall restart timer T304 and resume normal operation as if the invalid UE CAPABILITY INFORMATION CONFIRM message has not been received.

8.1.6.6 T304 timeout

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

- If V304 is smaller or equal than N304, the UE shall retransmit a UE CAPABILITY INFORMATION message, restart timer T304 and increase counter V304;

- If V304 is greater than N304, the UE shall assume that radio link failure has occurred and initiate the RRC connection re-establishment procedure.

8.1.7 UE capability enquiry

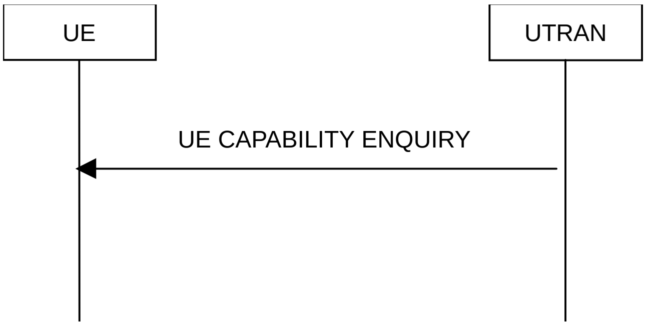


Figure 13: UE capability enquiry procedure, normal flow

8.1.7.1 General

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

8.1.7.2 Initiation

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

8.1.7.3 Reception of an UE CAPABILITY ENQUIRY message by the UE

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

8.1.7.4 Invalid UE CAPABILITY ENQUIRY message

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

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

8.1.8 Initial Direct transfer

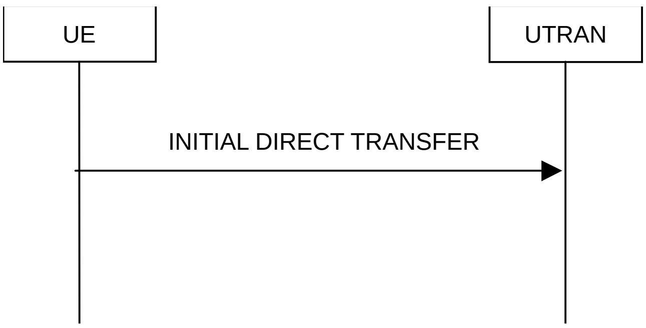


Figure 14: Initial Direct transfer in the uplink, normal flow

8.1.8.1 General

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

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

8.1.8.2 Initiation of Initial direct transfer procedure in the UE

In the UE, the initial direct transfer procedure shall be initiated, when the upper layers request the initialisation of a new flow. This request also includes a request for the transfer of a NAS message. When not stated otherwise elsewhere, the UE may also initiate the initial direct transfer procedure when another procedure is ongoing, and in that case the state of the latter procedure shall not be affected. The UE shall transmit the INITIAL DIRECT TRANSFER message on the uplink DCCH using AM RLC on RB 2.

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

In CELL_FACH state, the UE shall include IE "Measured results on RACH" into the INITIAL DIRECT TRANSFER message if RACH measurement reporting has been requested in the IE "Intra-frequency reporting quantity for RACH reporting" and the IE "Maximum number of reported cells on RACH" in "system information block type 12" (or "System Information Block type 11").

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

8.1.8.3 Reception of INITIAL DIRECT TRANSFER message by the UTRAN

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

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

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

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

8.1.9 Downlink Direct transfer

Figure 15: Downlink Direct transfer, normal flow

8.1.9.1 General

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

8.1.9.2 Initiation of downlink direct transfer procedure in the UTRAN

In the UTRAN, the direct transfer procedure is initiated when the upper layers request the transfer of a NAS message after the initial signalling connection is established. The UTRAN may also initiate the downlink direct transfer procedure when another RRC procedure is ongoing, and in that case the state of the latter procedure shall not be affected. The UTRAN shall transmit the DOWNLINK DIRECT TRANSFER message on the downlink DCCH using AM RLC on RB 3 or RB 4. The UTRAN should select the RB according to the following:

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

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

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

8.1.9.3 Reception of a DOWNLINK DIRECT TRANSFER message by the UE

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

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

8.1.9.4 Invalid DOWNLINK DIRECT TRANSFER message

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

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

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

8.1.10 Uplink Direct transfer

Figure 16: Uplink Direct transfer, normal flow

8.1.10.1 General

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

8.1.10.2 Initiation of uplink direct transfer procedure in the UE

In the UE, the uplink direct transfer procedure shall be initiated when the upper layers request a transfer of a NAS message after the initial signalling connection is established and upper layer indication is provided indicating that the NAS message belongs to an on-going signalling flow. When not stated otherwise elsewhere, the UE may ~~also~~ initiate the uplink direct transfer procedure when another procedure is ongoing, and in that case the state of the latter procedure shall not be affected. The UE shall transmit the UPLINK DIRECT TRANSFER message on the uplink DCCH using AM RLC on RB 3 or RB 4. The UE shall select the RB according to the following:

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

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

8.1.10.3 Reception of UPLINK DIRECT TRANSFER message by the UTRAN

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

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

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

8.1.11 UE dedicated paging

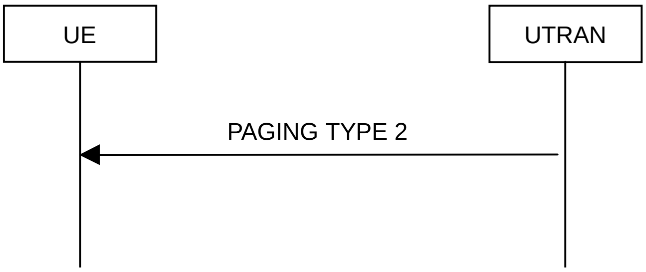


Figure 17: UE dedicated paging

8.1.11.1 General

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

8.1.11.2 Initiation

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

8.1.11.3 Reception of an PAGING TYPE 2 message by the UE

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

The UE shall indicate that a Paging message has been received ~~paging~~ and forward the paging cause and the paging record type identifier to the upper layer entity indicated by the CN domain identity.

8.1.11.4 Invalid PAGING TYPE 2 message

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

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

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

8.1.12 Security mode control

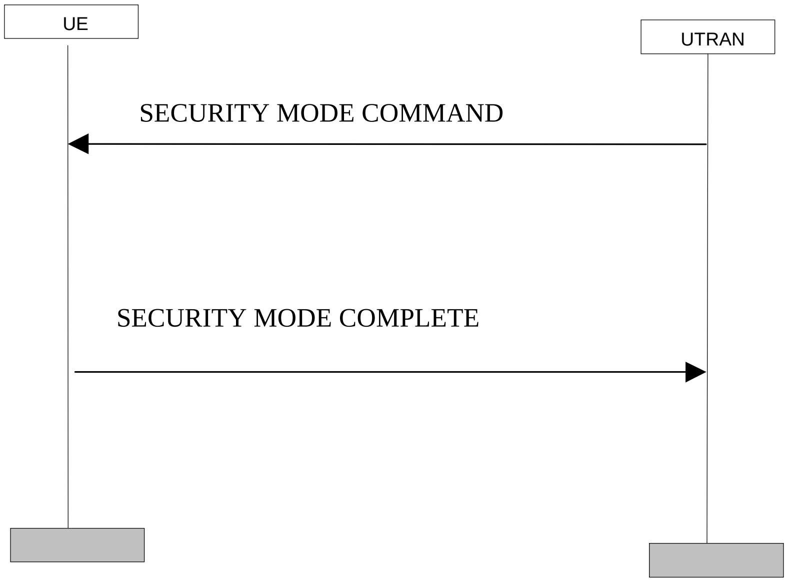


Figure 18: Security mode control procedure

8.1.12.1 General

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

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

8.1.12.2 Initiation

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

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

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

~~When the transmission~~When the successful delivery of the SECURITY MODE COMMAND has been confirmed by RLC, and if the security mode control procedure is used to control ciphering, UTRAN should resume all the suspended radio bearers using RLC-AM or RLC-UM, that use the old ciphering configuration for the transmission of RLC PDUs with RLC sequence number less than the RLC sequence number indicated in the IE "Radio bearer downlink ciphering activation time info" sent to the UE, and the new ciphering configuration for the transmission of RLC PDUs with RLC sequence number greater than or equal to the RLC sequence number indicated in the IE "Radio bearer downlink ciphering activation time info" sent to the UE.

8.1.12.3 Reception of SECURITY MODE COMMAND message by the UE

Upon reception of the SECURITY MODE COMMAND message, the UE shall perform the actions for the received information elements according to 8.5.7.

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

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

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

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

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

8.1.12.4 Cipher activation time too short

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

8.1.12.5 Unsuccessful verification of IE 'UE ciphering capabilities'

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

8.1.12.6 Reception of SECURITY MODE COMPLETE message by the UTRAN

UTRAN should apply integrity protection on the received SECURITY MODE COMPLETE message and all subsequent messages. When UTRAN has received a SECURITY MODE COMPLETE message and the integrity protection has successfully been applied, UTRAN shall use

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

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

for radio bearers using RLC-TM:

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

and the procedure ends.

8.1.12.7 Invalid SECURITY MODE COMMAND message

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

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

8.1.13 Signalling ~~connection~~ flow release procedure

Figure 19: Signalling ~~connection~~ flow release procedure, normal case

8.1.13.1 General

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

8.1.13.2 Initiation of SIGNALLING CONNECTION RELEASE by the UTRAN

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

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

The UTRAN should identify the signalling flows to be released using the IE "Flow Identifier" ~~indicates the signalling flow identities that are released when the CN domain releases the signalling connection to the UE~~.

8.1.13.3 Reception of SIGNALLING ~~CONNECTION~~ FLOW RELEASE by the UE

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

8.1.13.4 Invalid SIGNALLING ~~CONNECTION~~ FLOW RELEASE message

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

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

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

8.1.14 Signalling connection release request procedure

Figure 20: Signalling connection release request procedure, normal case

8.1.14.1 General

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

8.1.14.2 Initiation

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

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

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

8.1.14.3 Reception of SIGNALLING CONNECTION RELEASE REQUEST by the UTRAN

Upon reception of a SIGNALLING CONNECTION RELEASE REQUEST message, the UTRAN may initiate the RRC connection release procedure, if the UE has requested the release of all its remaining signalling connections. If all remaining signalling connections are not requested to be released, the UTRAN should~~may~~ initiate the signalling ~~connection~~ flow release procedure. In the latter case the UTRAN should include all the signalling flows identified by the "Flow identifiers", associated with the signalling connection being released

8.1.15 Counter check

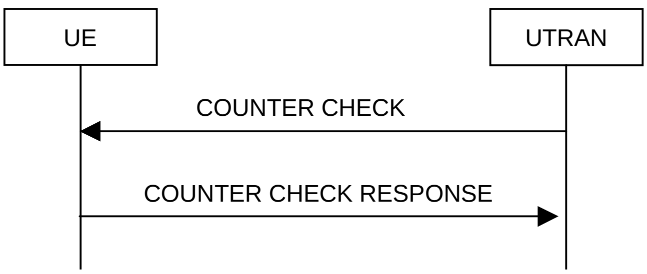


Figure 21: Counter check procedure

8.1.15.1 General

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

8.1.15.2 Initiation

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

8.1.15.3 ~~Timer expiry at UTRAN~~Void

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

8.1.15.4 Reception of a COUNTER CHECK message by the UE

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

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

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

8.1.15.5 Reception of the COUNTER CHECK RESPONSE message by UTRAN

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

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

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

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

8.1.15.6 Invalid COUNTER CHECK message

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

- Transmit an RRC STATUS message on the uplink DCCH using AM RLC and include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.
- ~~When the transmission~~When the successful delivery of the RRC STATUS message has been confirmed by RLC, the UE shall resume normal operation as if the invalid COUNTER CHECK message has not been received.

8.2 Radio Bearer control procedures

8.2.1 Radio bearer establishment

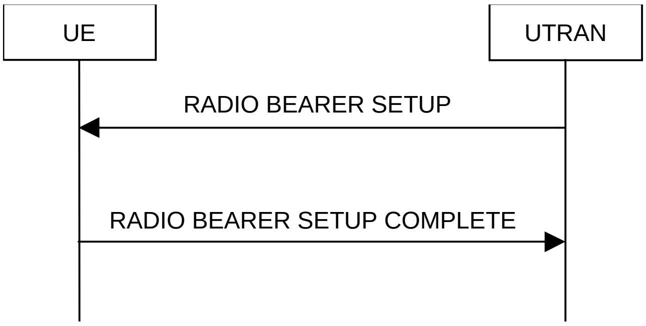


Figure 22: Radio Bearer Establishment, normal case

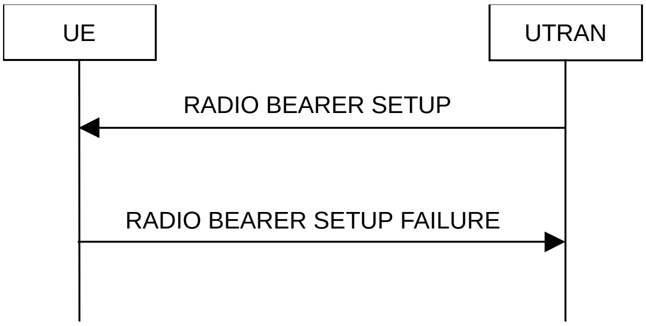


Figure 23: Radio Bearer Establishment, UE reverts to old configuration

8.2.1.1 General

The purpose ~~with~~ of this procedure is to establish new radio bearer(s) or re-configure previously established radio bearers. Each radio bearer established by the procedure belongs to one of the following categories:

- a signalling radio bearer, i.e. used for control plane signalling;
- a radio bearer that implements a radio access bearer (RAB) or RAB subflow(s) in the user plane.

While establishing radio bearers, the procedure may perform a hard handover, see 8.3.5. The procedure may also be used to establish a transport channel for the transparent transfer of signalling.

8.2.1.2 Initiation

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

To initiate the procedure, UTRAN should:

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

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

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

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

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

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

8.2.1.3 Reception of a RADIO BEARER SETUP message by the UE

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

Upon reception of a RADIO BEARER SETUP message the UE shall perform actions as specified below and transmit a RADIO BEARER SETUP COMPLETE message on the uplink DCCH using AM RLC.

- If the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO is set, the UE shall include and set the IE "Radio bearer uplink ciphering activation time info" to the value of that variable.
- ~~When the transmission~~When the successful delivery of the RADIO BEARER SETUP COMPLETE message has been confirmed by RLC the UE shall
    - resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers,
    - ~~the UE shall~~ clear the variable ORDERED_CONFIG,
    - clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO and the procedure ends.

The UE shall store the received UE Information Elements, RB Information Elements, TrCH Information Elements and PhyCH information elements in the variable ORDERED_CONFIG.

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

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

The UE shall:

- for the new radio bearer(s), use the multiplexing option applicable for the transport channels used according to the IE "RB mapping info";
- for the new radio bearer(s), if the variable CIPHERING_STATUS is set to "Started", initialise ciphering on those radio bearers using the current hyperframe number. For non-transparent mode radio bearers this hyperframe number is the highest used HFN (during the lifetime of the current cipher/integrity key set) incremented by one. All transparent mode radio bearers have a common hyperframe number (in the MAC layer), which is not incremented due to addition of new transparent radio bearer(s);
- in case of non-transparent mode radio bearers transmit the current hyperframe number to UTRAN in RADIO BEARER SETUP COMPLETE message;
- for radio bearer(s) existing prior to the message, use the multiplexing option applicable for the transport channels used, according to their IE "RB mapping info" or their previously stored multiplexing options;
- configure MAC multiplexing if that is needed in order to use ~~said~~ appropriate transport channel(s);
- use MAC logical channel priority when selecting TFC in MAC;
- suspend data transmission on RB 3 and upward, if RLC-AM or RLC-UM is used on those radio bearers.

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

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

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

- Associate the new radio bearers with the radio access bearer that is identified by the IE "RAB info".

- Check whether that radio ~~acces~~ access bearer exists in the variable ESTABLISHED_RABS.

  If the radio access bearer exists the UE shall:

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

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

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

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

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

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

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

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

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

In FDD, if the IE 'PDSCH code mapping' is included but the IE 'PDSCH with SHO DCH Info' is not included and if the DCH has only one link in its active set then the UE shall act upon the 'PDSCH code mapping' IE as specified in subclause 8.5.7 and:

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

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

- Use the TFS given in system information.

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

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

The UE shall enter a state according to 8.5.8.

8.2.1.4 Unsupported ~~or unacceptable~~ configuration in the UE

If UTRAN instructs the UE to use a configuration, which it does not support or if the variable UNACCEPTABLE_CONFIGURATION is set to TRUE, the UE shall transmit a RADIO BEARER SETUP FAILURE message on the DCCH using AM RLC and set the IE "failure cause" to the cause value "configuration unacceptable". If the radio bearer setup procedure affects several radio bearers, the UE may include the identities of the radio bearers for which the procedure would have been ~~succesful~~successful in~~to~~ the RADIO BEARER SETUP FAILURE message.

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

8.2.1.5 Physical channel failure

If the UE failed to establish the physical channel(s) indicated in the RADIO BEARER SETUP message according to the criteria in subclause 8.5.4 the UE shall:

- Revert to the configuration prior to the reception of the RADIO BEARER SETUP message (old configuration) and transmit a RADIO BEARER SETUP FAILURE message on the DCCH using AM RLC. The procedure ends and the UE shall resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers and resumes the normal operation as if no radio bearer establishment attempt had occurred.

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

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

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

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

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

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

8.2.1.7 Reception of RADIO BEARER SETUP FAILURE by the UTRAN

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

8.2.1.8 Subsequently received RADIO BEARER SETUP messages

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

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

8.2.1.9 Incompatible simultaneous reconfiguration

If the variable ORDERED_CONFIG is set (because of any message other than RADIO BEARER SETUP) upon the reception of the RADIO BEARER SETUP message, the UE shall:

- keep the old configuration as before the RADIO BEARER SETUP message was received;
- transmit a RADIO BEARER SETUP FAILURE message on the DCCH using AM RLC. The UE shall set the IE "failure cause" to "incompatible simultaneous reconfiguration". ~~When the transmission~~When the successful delivery of RADIO BEARER SETUP FAILURE message has been confirmed by RLC the procedure ends.

8.2.1.10 Invalid RADIO BEARER SETUP message

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

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

8.2.2 Radio bearer reconfiguration

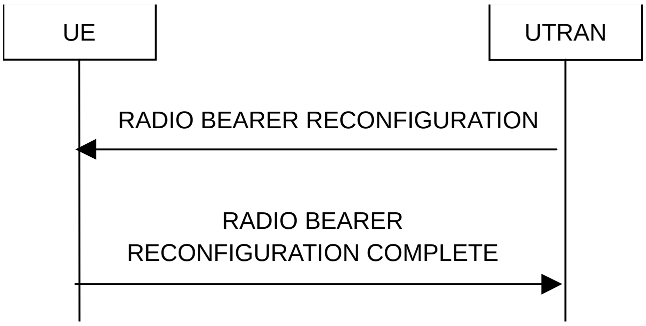


Figure 24: Radio bearer reconfiguration, normal flow

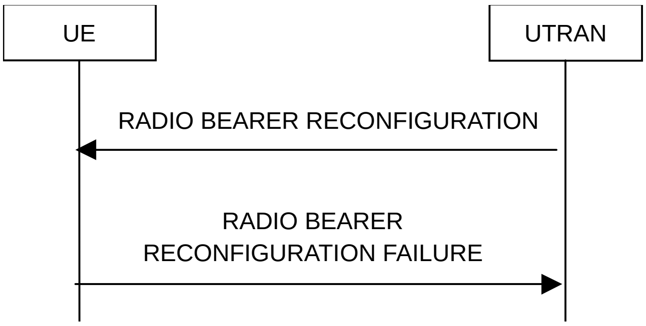


Figure 25: Radio bearer reconfiguration, failure case

8.2.2.1 General

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

8.2.2.2 Initiation

To initiate the procedure, UTRAN should:

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

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

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

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

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

- Send the RB Mapping Info for the new configuration

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

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

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

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

8.2.2.3 Reception of RADIO BEARER RECONFIGURATION by the UE in CELL_DCH state

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

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

- The UE shall store the received UE Information Elements, RB Information Elements, TrCH Information Elements and PhyCH information elements in the variable ORDERED_CONFIG.
- The UE shall act upon all received information elements as specified in 8.5.7, unless specified otherwise in the following.
  - The UE shall:
    - For each reconfigured radio bearer or signalling link, use the multiplexing option applicable for the transport channels used according to the IE "RB mapping info";
    - Configure MAC multiplexing if that is needed in order to use ~~said~~ appropriate transport channel(s);
    - Use MAC logical channel priority when selecting TFC in MAC;
    - Suspend or resume uplink transmission for each radio bearer, as indicated by the IE "RB suspend/resume" information element;
    - Suspend data transmission on RB 3 and upward, if RLC-AM or RLC-UM is used on those radio bearers.

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

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

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

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

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

In FDD, if the IE ~~'PDSCH~~ "PDSCH code ~~mapping'~~ mapping" is included but the IE ~~'PDSCH with SHO DCH Info'~~ "PDSCH with SHO DCH Info" is not included, and if the DCH has only one link in its active set then the UE shall act upon the ~~'PDSCH code mapping'~~ IE "PDSCH code mapping" as specified in subclause 8.5.7 and:

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

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

- Use the TFS given in system information.

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

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

If the IE "Primary CCPCH info" in TDD or "Primary CPICH info" in FDD, and the IE "New C-RNTI" are included, the UE shall:

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

The UE shall enter a state according to 8.5.8.

The UE shall transmit a RADIO BEARER RECONFIGURATION COMPLETE message on the uplink DCCH using AM RLC after setting the contents as follows:~~.~~

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

~~When the transmission~~When the successful delivery of the RADIO BEARER RECONFIGURATION COMPLETE message has been confirmed by RLC, the UE shall:

- ~~-~~clear the variable ORDERED_CONFIG,
- ~~-~~clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO and the UE shall
- resume data transmission on each radio bearer fulfilling the following criteria:
  - The radio bearer identity is RB 3 and upward;
  - RLC-AM or RLC-UM is used; and
  - The radio bearers was not indicated to be suspended by the IE "RB suspend/resume" information element in the RADIO BEARER RECONFIGURATION message~~.~~ and the procedure ends.

~~The procedure ends.~~

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

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

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

The UE shall store the received UE Information Elements, RB Information Elements, TrCH Information Elements and PhyCH information elements in the variable ORDERED_CONFIG.

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

The UE shall:

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

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

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

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

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

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

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

~~In FDD, if the IE 'PDSCH code mapping' is included but the IE 'PDSCH with SHO DCH Info' is not included then the UE shall act upon the 'PDSCH code mapping' IE as specified in Subclause 8.5.7 and:~~

In FDD, if the IE "PDSCH code mapping" is included but the IE "PDSCH with SHO DCH Info" is not included, then the UE shall act upon the IE "PDSCH code mapping" as specified in subclause 8.5.7 and

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

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

- Use the TFS given in system information.

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

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

The UE shall enter a state according to 8.5.8.

The UE shall transmit a RADIO BEARER RECONFIGURATION COMPLETE message on the uplink DCCH using AM RLC after setting the contents as follows:~~.~~

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

~~When the transmission~~When the successful delivery of the RADIO BEARER RECONFIGURATION COMPLETE message has been confirmed by RLC, the UE shall:

- clear the variable ORDERED_CONFIG,

- clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO and the procedure ends.

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

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

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

8.2.2.6 Unsupported or unacceptable configuration in the UE

If the UTRAN instructs the UE to use a configuration, which it does not support or if the variable UNACCEPTABLE_CONFIGURATION is set to TRUE, the UE shall:

- transmit a RADIO BEARER RECONFIGURATION FAILURE message on the DCCH using AM RLC;
- set the cause value in IE "failure cause" to "configuration unacceptable";
- if the radio bearer reconfiguration procedure affects several radio bearers, the UE may include the identities of the radio bearers for which the procedure would have been succesful into the RADIO BEARER RECONFIGURATION FAILURE message.

~~When the transmission~~When the successful delivery of the RADIO BEARER RECONFIGURATION FAILURE message has been confirmed by RLC, the UE shall clear the variable ORDERED_CONFIG and the UE shall resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers. It shall resume the normal operation as if no radio bearer reconfiguration attempt had occurred and the procedure ends.

8.2.2.7 Physical channel failure

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

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

- revert to the configuration prior to the reception of the RADIO BEARER RECONFIGURATION message (old configuration);
- transmit a RADIO BEARER RECONFIGURATION FAILURE message on the DCCH using AM RLC;
- set the cause value in IE "failure cause" to "physical channel failure";
- if the radio bearer reconfiguration procedure affects several radio bearers, the UE may include the identities of the radio bearers for which the procedure would have been succesful into the RADIO BEARER RECONFIGURATION FAILURE message;
- ~~when the transmission~~When the successful delivery of the RADIO BEARER RECONFIGURATION FAILURE message has been confirmed by RLC, the UE shall resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers. The procedure ends and the UE resumes the normal operation as if no radio bearer reconfiguration attempt had occurred.

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

- Initiate an RRC connection re-establishment procedure according to subclause 8.1.5.

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

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

8.2.2.9 No response from the UE in CELL DCH_state

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

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

8.2.2.10 No response from the UE in CELL_FACH state

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

8.2.2.11 Physical channel failure during transmission from CELL_DCH to CELL_FACH

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

8.2.2.12 Suspension of signalling bearer

In order to facilitate error recovery, ~~If~~ the RADIO BEARER RECONFIGURATION message may include~~s~~ a request to suspend the signalling link with the IE "RB suspend/resume". In this case, the UE shall:

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

8.2.2.13 Subsequently received RADIO BEARER RECONFIGURATION messages

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

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

8.2.2.14 Incompatible simultaneous reconfiguration

If the variable ORDERED_CONFIG is set (because of any message other than RADIO BEARER RECONFIGURATION) upon the reception of the RADIO BEARER RECONFIGURATION message, the UE shall:

- keep the old configuration ~~as~~ existing before the RADIO BEARER RECONFIGURATION message was received;
- transmit a RADIO BEARER RECONFIGURATION FAILURE message on the DCCH using AM RLC. The UE shall set the IE "failure cause" to "incompatible simultaneous reconfiguration". ~~When the transmission~~When the successful delivery of RADIO BEARER RECONFIGURATION FAILURE message has been confirmed by RLC the procedure ends.

8.2.2.15 Invalid RADIO BEARER RECONFIGURATION message

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

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

8.2.3 Radio bearer release

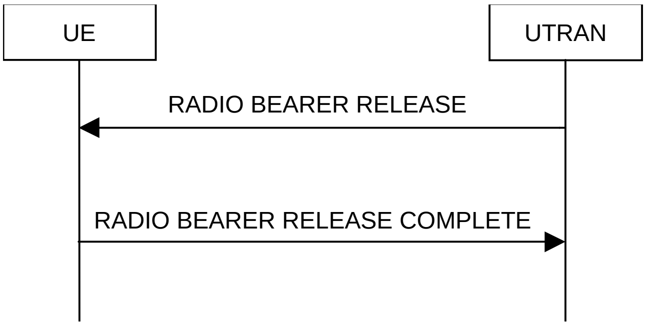


Figure 26: Radio Bearer Release, normal case

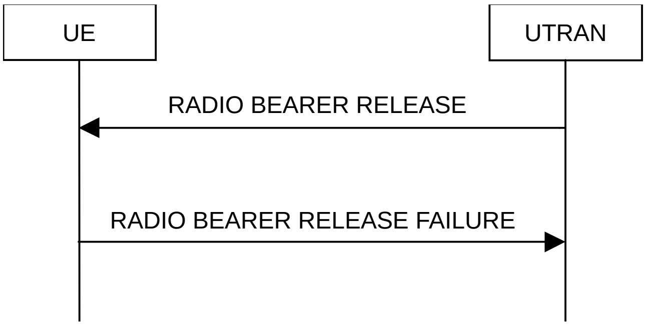


Figure 27: Radio Bearer Release, UE reverts to old configuration

8.2.3.1 General

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

8.2.3.2 Initiation

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

To initiate the procedure, UTRAN:

- may configure~~s~~ new radio links in any new physical channel configuration and if configured start transmission and reception on the new radio links;
- transmits a RADIO BEARER RELEASE message on the downlink DCCH using AM or UM RLC.

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

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

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

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

8.2.3.3 Reception of RADIO BEARER RELEASE by the UE

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

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

- The UE shall store the received UE Information Elements, RB Information Elements, TrCH Information Elements and PhyCH information elements in the variable ORDERED_CONFIG.

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

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

  - The UE shall:

    - For the released radio bearer(s),

      - delete all stored multiplexing options;

      - indicate release of the RAB subflow stored in the variable ESTABLISHED_RABS to the upper layer entity corresponding to the CN domain identity stored in the variable ESTABLISHED_RABS;

      - delete the information about the radio bearer from the variable ESTABLISHED_RABS.

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

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

        - delete all information about the radio access bearer from the variable ESTABLISHED_RABS.

    - For all remaining radio bearer(s):

      - use the multiplexing option applicable for the transport channels used according to their IE "RB mapping info" or their previously stored multiplexing options;

      - configure MAC multiplexing if that is needed in order to use ~~said~~ appropriate transport channel(s);

      - use MAC logical channel priority when selecting TFC in MAC;

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

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

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

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

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

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

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

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

In FDD, if the IE "PDSCH code mapping" is included but the IE "PDSCH with SHO DCH Info" is not included, and if the DCH has only one link in its active set then the UE shall act upon the IE "PDSCH code mapping" as specified in subclause 8.5.7 and:~~In FDD, if the IE 'PDSCH code mapping' is included but the IE 'PDSCH with SHO DCH Info' is not included and if the DCH has only one link in its active set then the UE shall act upon the 'PDSCH code mapping' IE as specified in subclause 8.5.7 and:~~

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

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

- Use the TFS given in system information.

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

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

- If the RADIO BEARER RELEASE message is used to initiate a state transition to the CELL_FACH state and if an IE "Primary CCPCH info" in TDD or "Primary CPICH info" in FDD and C-RNTI to a given cell is included, ~~the UE shall~~ select the cell indicated by the IE "Primary CCPCH info" in TDD or "Primary CPICH info" in FDD.
- Use the C-RNTI when using common transport channels of type RACH, FACH and CPCH in that given cell after having completed the transition to that cell.

The UE shall enter a state according to 8.5.8.

The UE shall transmit a RADIO BEARER RELEASE COMPLETE message on the uplink DCCH using AM RLC. If the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO is set, the UE shall include and set the IE "Radio bearer uplink ciphering activation time info" to the value of that variable.

~~When the transmission~~When the successful delivery of the RADIO BEARER RELEASE COMPLETE message has been confirmed by RLC the UE shall

- clear the variable ORDERED_CONFIG,
- clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO, ~~the UE shall~~
- resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers and the procedure ends.

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

8.2.3.4 Unsupported or unacceptable configuration in the UE

If UTRAN instructs the UE to use a configuration, which it does not support or if the variable UNACCEPTABLE_CONFIGURATION is set to TRUE, the UE shall Transmit a RADIO BEARER RELEASE FAILURE message on the DCCH using AM RLC and set the value of the IE "failure cause" to "configuration unacceptable". If the radio bearer release procedure affects several radio bearers, the UE may include the identities of the radio bearers for which the procedure would have been succesful into the RADIO BEARER RELEASE FAILURE message.

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

8.2.3.5 Physical channel failure

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

- Revert to the configuration prior to the reception of the RADIO BEARER RELEASE message (old configuration) and transmit a RADIO BEARER RELEASE FAILURE message on the DCCH using AM RLC and set the value of the IE "failure cause" to "physical channel failure". If the radio bearer release procedure affects several radio bearers, the UE may include the identities of the radio bearers for which the procedure would have been successful into the RADIO BEARER RELEASE FAILURE message. ~~When the transmission~~When the successful delivery of the RADIO BEARER RELEASE FAILURE message has been confirmed by RLC, the UE shall resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers. The procedure ends and the UE resumes the normal operation as if no radio bearer release attempt had occurred;
- ~~if the radio bearer release procedure affects several radio bearers, the UE may include the identities of the radio bearers for which the procedure would have been succesful into the RADIO BEARER RELEASE FAILURE message.~~

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

- Initiate an RRC connection re-establishment procedure according to subclause 8.1.5.

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

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

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

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

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

8.2.3.8 Physical channel failure during transition from CELL_DCH to CELL_FACH

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

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

8.2.3.9 Subsequently received RADIO BEARER RELEASE messages

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

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

8.2.3.10 Incompatible simultaneous reconfiguration

If the variable ORDERED_CONFIG is set (because of any message other than RADIO BEARER RELEASE) upon the reception of the RADIO BEARER RELEASE message, the UE shall:

- keep the old configuration existing~~as~~ before the RADIO BEARER RELEASE message was received,. and~~;~~
- transmit a RADIO BEARER RELEASE FAILURE message on the DCCH using AM RLC. The UE shall set the IE "failure cause" to "incompatible simultaneous reconfiguration". ~~When the transmission~~When the successful delivery of RADIO BEARER RELEASE FAILURE message has been confirmed by RLC the procedure ends.

8.2.3.11 Invalid RADIO BEARER RELEASE message

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

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

8.2.4 Transport channel reconfiguration

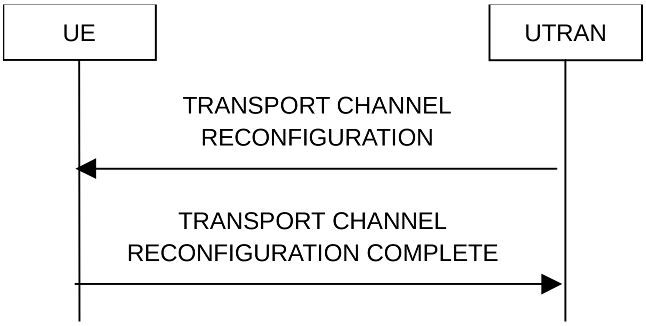


Figure 28: Transport channel reconfiguration, normal flow

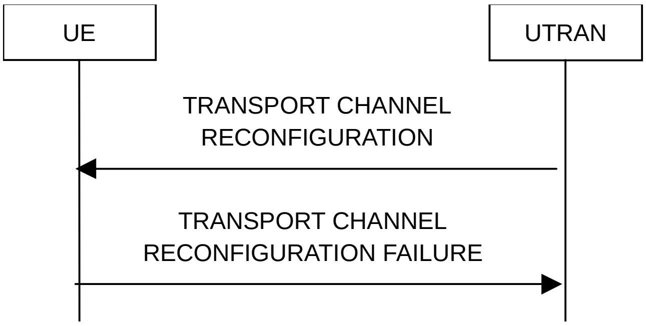


Figure 29: Transport channel reconfiguration, failure case

8.2.4.1 General

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

8.2.4.2 Initiation

To initiate the procedure, UTRAN ~~should~~:

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

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

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

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

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

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

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

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

The UE shall store the received UE Information Elements, RB Information Elements, TrCH Information Elements and PhyCH information elements in the variable ORDERED_CONFIG.

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

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

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

The UE shall suspend data transmission on RB 3 and upward, if RLC-AM or RLC-UM is used on those radio bearers.

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

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

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

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

In FDD, if the IE "PDSCH code mapping" is included but the IE "PDSCH with SHO DCH Info" is not included, and if the DCH has only one link in its active set then the UE shall act upon the IE "PDSCH code mapping" as specified in subclause 8.5.7 and:~~In FDD, if the IE 'PDSCH code mapping' is included but the IE 'PDSCH with SHO DCH Info' is not included and if the DCH has only one link in its active set then the UE shall act upon the 'PDSCH code mapping' IE as specified in subclause 8.5.7 and:~~

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

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

- Use the TFS given in system information.

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

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

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

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

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

The UE shall enter a state according to 8.5.8.

The UE shall transmit a TRANSPORT CHANNEL RECONFIGURATION COMPLETE message on the uplink DCCH using AM RLC.

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

If the TRANSPORT CHANNEL RECONFIGURATION message is used to initiate a transition from CELL_DCH to CELL_FACH state, the TRANSPORT CHANNEL RECONFIGURATION COMPLETE message shall be transmitted on the RACH after the UE has completed the state transition. ~~When the transmission~~When the successful delivery of the TRANSPORT CHANNEL RECONFIGURATION COMPLETE message has been confirmed by RLC, the UE shall clear the variable ORDERED_CONFIG, the UE shall resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers and the procedure ends.

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

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

The UE shall store the received UE Information Elements, RB Information Elements, TrCH Information Elements and PhyCH information elements in the variable ORDERED_CONFIG.

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

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

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

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

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

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

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

In FDD, if the IE "PDSCH code mapping" is included but the IE "PDSCH with SHO DCH Info" is not included, then the UE shall act upon the IE "PDSCH code mapping" as specified in subclause 8.5.7 and:~~In FDD, if the IE 'PDSCH code mapping' is included but the IE 'PDSCH with SHO DCH Info' is not included then the UE shall act upon the 'PDSCH code mapping' IE as specified in subclause 8.5.7 and:~~

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

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

- Use the TFS given in system information.

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

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

The UE shall enter a state according to 8.5.8.

The UE shall transmit a TRANSPORT CHANNEL RECONFIGURATION COMPLETE message on the uplink DCCH using AM RLC.

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

~~When the transmission~~When the successful delivery of the TRANSPORT CHANNEL RECONFIGURATION COMPLETE message has been confirmed by RLC, the UE shall clear the variable ORDERED_CONFIG, clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO and the procedure ends.

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

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

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

8.2.4.6 Unsupported or unacceptable configuration in the UE

If the UTRAN instructs the UE to use a configuration, which it does not support or if the variable UNACCEPTABLE_CONFIGURATION is set to TRUE, the UE shall:

- transmit a TRANSPORT CHANNEL RECONFIGURATION FAILURE message on the DCCH using AM RLC and set the cause value in IE "Failure Cause" to "configuration unacceptable".
- ~~When the transmission~~When the successful delivery of the TRANSPORT CHANNEL RECONFIGURATION FAILURE message has been confirmed by RLC, the UE shall clear the variable ORDERED_CONFIG, the UE shall resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers and the procedure ends.

8.2.4.7 Physical channel failure

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

- Revert to the configuration prior to the reception of the TRANSPORT CHANNEL RECONFIGURATION message (old configuration) and transmit a TRANSPORT CHANNEL RECONFIGURATION FAILURE message on the DCCH using AM RLC and set the cause value in IE "Failure Cause" to "physical channel failure". ~~When the transmission~~When the successful delivery of the TRANSPORT CHANNEL RECONFIGURATION FAILURE message has been confirmed by RLC, the UE shall resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers. The procedure ends and the UE resumes the normal operation as if no transport channel reconfiguration attempt had occurred.

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

- Initiate an RRC connection re-establishment procedure according to subclause 8.1.5.

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

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

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

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

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

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

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

8.2.4.11 Physical channel failure during transition from CELL_DCH to CELL_FACH

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

8.2.4.12 Subsequently received TRANSPORT CHANNEL RECONFIGURATION messages

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

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

8.2.4.13 Incompatible simultaneous reconfiguration

If the variable ORDERED_CONFIG is set (because of any message other than TRANSPORT CHANNEL RECONFIGURATION) upon the reception of the TRANSPORT CHANNEL RECONFIGURATION message, the UE shall:

- keep the old configuration as before the TRANSPORT CHANNEL RECONFIGURATION message was received;
- transmit a TRANSPORT CHANNEL RECONFIGURATION FAILURE message on the DCCH using AM RLC. The UE shall set the IE "failure cause" to "incompatible simultaneous reconfiguration". ~~When the transmission~~When the successful delivery of TRANSPORT CHANNEL RECONFIGURATION FAILURE message has been confirmed by RLC the procedure ends.

8.2.4.14 Invalid TRANSPORT CHANNEL RECONFIGURATION message

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

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

8.2.5 Transport format combination control

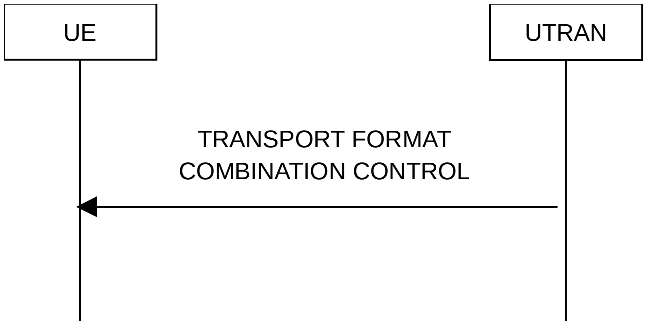


Figure 30: Transport format combination control, normal flow

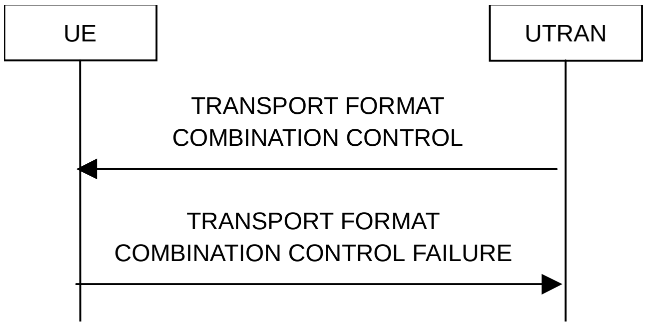


Figure 31: Transport format combination control, failure case

8.2.5.1 General

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

8.2.5.2 Initiation

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

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

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

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

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

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

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

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

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

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

- The specified TFC set or sub-set shall be applied for the number of (10 ms) frames specified in the IE "TFC Control duration".
- If no further TFC Control messages are received during this interval then:
  - At the end of the defined period the UE shall change the TFC (sub)set back to the 'default TFC (sub)set'.
- If further TFC Control messages are received during the 'TFC Control duration' period then the UE shall
  - re-configure itself in accordance with the TFC (sub)set defined in the most recently received message.

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

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

8.2.5.4 Incompatible simultaneous reconfiguration

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

- keep the TFC subset ~~as~~ existing before the TRANSPORT FORMAT COMBINATION CONTROL message was received;
- transmit a TRANSPORT FORMAT COMBINATION CONTROL FAILURE message on the DCCH using AM RLC. The UE shall set the IE "failure cause" to "incompatible simultaneous reconfiguration". ~~When the transmission~~When the successful delivery of TRANSPORT FORMAT COMBINATION CONTROL FAILURE message has been confirmed by RLC the procedure ends.

8.2.5.5 Invalid TRANSPORT FORMAT COMBINATION CONTROL message

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

- Transmit a TRANSPORT FORMAT COMBINATION CONTROL FAILURE message on the uplink DCCH using AM RLC and set the IE "failure cause" to the cause value "protocol error".
- Include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.
- ~~When the transmission~~When the successful delivery of the TRANSPORT FORMAT COMBINATION CONTROL FAILURE message has been confirmed by RLC, the UE shall resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers. The UE shall resume normal operation as if

the invalid TRANSPORT FORMAT COMBINATION CONTROL message has not been received and the procedure ends.

8.2.6 Physical channel reconfiguration

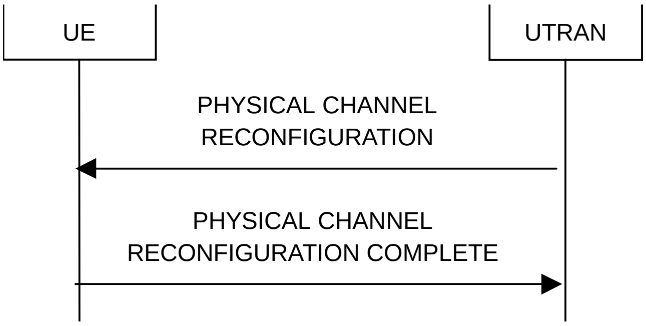


Figure 32: Physical channel reconfiguration, normal flow

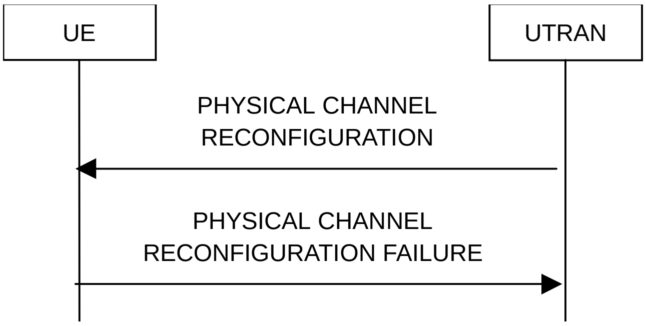


Figure 33: Physical channel reconfiguration, failure case

8.2.6.1 General

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

8.2.6.2 Initiation

To initiate the procedure, the UTRAN should:

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

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

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

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

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

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

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

- The UE shall store the received UE Information Elements, RB Information Elements, TrCH Information Elements and PhyCH information elements in the variable ORDERED_CONFIG.

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

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

  - The UE shall suspend data transmission on RB 3 and upward, if RLC-AM or RLC-UM is used on those radio bearers.

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

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

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

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

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

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

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

In FDD, if the IE 'PDSCH code mapping' is included but the IE 'PDSCH with SHO DCH Info' is not included and if the DCH has only one link in its active set then the UE shall act upon the 'PDSCH code mapping' IE as specified in subclause 8.5.7 and:

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

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

- Use the TFS given in system information.

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

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

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

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

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

The UE shall enter a state according to 8.5.8.

The UE shall transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on the uplink DCCH using AM RLC.

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

~~When the transmission~~When the successful delivery of the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message has been confirmed by RLC, the UE shall:

- clear the variable ORDERED_CONFIG,

- clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO,~~ the UE shall~~
- resume data transmission on RB 3 and upwards if RLC-AM or RLC-UM is used on those radio bearers and the procedure ends.

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

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

The UE shall store the received UE Information Elements, RB Information Elements, TrCH Information Elements and PhyCH information elements in the variable ORDERED_CONFIG.

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

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

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

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

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

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

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

In FDD, if the IE 'PDSCH code mapping' is included but the IE 'PDSCH with SHO DCH Info' is not included then the UE shall act upon the 'PDSCH code mapping' IE as specified in subclause 8.5.7 and:

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

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

- Use the TFS given in system information.

If none of the TFS stored is compatible with the physical channel to be used, the UE shall:

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

The UE shall transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on the uplink DCCH using AM RLC.

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

~~When the transmission~~When the successful delivery of the PHYSICAL CHANNEL RECONFIGURATION COMPLETE message has been confirmed by RLC, the UE shall

- enter a state according to subclause 8.5.8 applied on the PHYSICAL CHANNEL RECONFIGURATION message,~~.~~
- ~~If~~ if the UE ~~ends up in~~ transitions to the CELL_PCH or URA_PCH state, ~~it shall~~ delete its C-RNTI,~~.~~
- ~~The UE shall~~ clear the variable ORDERED_CONFIG,
- clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO and the procedure ends.

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

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

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

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

8.2.6.6 Unsupported or unacceptable configuration in the UE

If the ~~UE~~ UTRAN instructs the UE to use a configuration, which it does not support or if the variable UNACCEPTABLE_CONFIGURATION is set to TRUE, the UE shall

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

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

8.2.6.7 Physical channel failure

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

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

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

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

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

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

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

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

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

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

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

8.2.6.11 Physical channel failure during transition from CELL_DCH to CELL_FACH

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

8.2.6.12 Subsequently received PHYSICAL CHANNEL RECONFIGURATION messages

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

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

8.2.6.13 Incompatible simultaneous reconfiguration

If the variable ORDERED_CONFIG ~~is~~ has been previously set (because of any message other than PHYSICAL CHANNEL RECONFIGURATION) ~~upon~~ prior to the reception of the PHYSICAL CHANNEL RECONFIGURATION message, the UE shall

- keep the old configuration ~~exisitng~~existing~~as~~ before the PHYSICAL CHANNEL RECONFIGURATION message was received
- transmit a PHYSICAL CHANNEL RECONFIGURATION FAILURE message on the DCCH using AM RLC. The UE shall set the IE "failure cause" to "incompatible simultaneous reconfiguration". ~~When the transmission~~When the successful delivery of PHYSICAL CHANNEL RECONFIGURATION FAILURE message has been confirmed by RLC the procedure ends.

8.2.6.14 Invalid PHYSICAL CHANNEL RECONFIGURATION message

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

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

8.2.7 Physical Shared Channel Allocation [TDD only]

Figure 34: Physical Shared Channel Allocation

8.2.7.1 General

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

8.2.7.2 Initiation

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

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

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

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

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

- decode the IE " Allocation Activation Time" and the IE "Allocation Duration", to determine the time interval for which the allocation shall be valid;
- configure Layer 1 according to the PDSCH information received in allocation message or in BCCH SIB#6 (as default if not specified in allocation message), for the specified time interval received in allocation message;
- start receiving the PDSCH where the TFCI is included;
- receive the PDSCHs, and decode and demultiplex them into the respective DSCH channels according to the TFCI.

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

- decode the IE " Allocation Activation Time" and the IE "Allocation Duration", to determine the time interval for which the allocation shall be valid;
- configure Layer 1 according to the PUSCH information received in allocation message or in BCCH SIB#6 (as default if not specified in allocation message), for the specified time interval received in allocation message;
- determine the TFCS subset and hence the TFCI values which are possible given the PUSCH allocation for that CCTrCH;
- configure the MAC-c/sh in the UE with this TFCS restriction if necessary;
- transmit USCH Transport Block Sets as required, within the TFCS limits given by the PUSCH allocation.

In addition, the UE shall evaluate the IE "PUSCH Allocation Pending" parameter:

If its value is "pending", the UE starts a timer T311. As long as this timer is running, the UE is not allowed to use the RACH for potential USCH capacity requests. See the USCH CAPACITY REQUEST procedure.

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

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

8.2.8 PUSCH capacity request [TDD only]

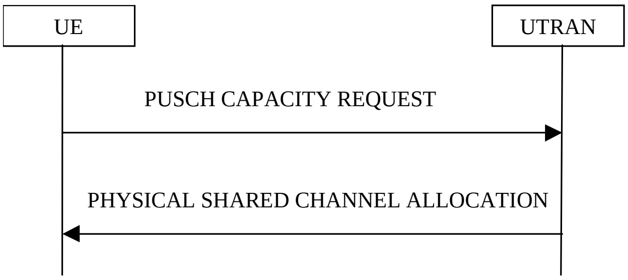


Figure 35: PUSCH Capacity request procedure

8.2.8.1 General

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

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

NOTE: Triggering of the capacity request is controlled by the measurement control procedure.

8.2.8.2 Initiation

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

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

- Timer T311 is not running.
- The timer T310 (capacity request repetition timer) is not running.

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

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

- C-RNTI to be used as UE identity if the message is sent on RACH;
- Radio Bearer ID, for each radio bearer requiring capacity on USCH;
- RLC buffer payload for these radio bearers.

As an option, the message may include "Timeslot ISCP" and "Primary CCPCH RSCP".

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

8.2.8.3 Reception of a PUSCH CAPACITY REQUEST message by the UTRAN

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

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

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

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

If the PUSCH capacity allocated in this message is not sufficient for all the USCH transmission requests which the UE may have, the RRC in the UE may decide to issue further PUSCH Capacity Requests - provided timer T311 is not running.

8.2.8.5 T310 time out

Upon expiry of timer T310, the UE shall

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

8.2.8.6 Maximum number of re-attempts exceeded

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

8.2.9 Downlink outer loop control

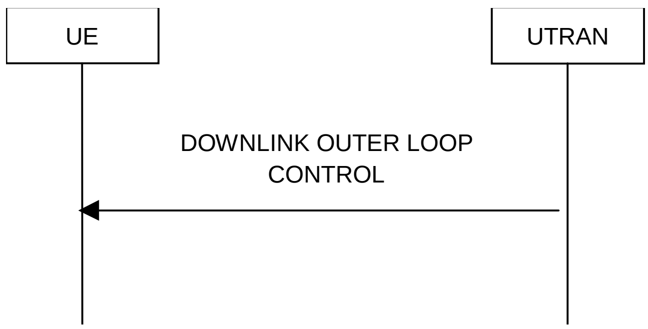


Figure 36: Downlink Outer Loop Control, normal flow

8.2.9.1 General

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

8.2.9.2 Initiation

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

To prevent the UE from increasing its DL SIR target value above its current value, the UTRAN should set the "Downlink Outer Loop Control" ~~IE~~ to the value "Increase not allowed".

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

8.2.9.3 Reception of DOWNLINK OUTER LOOP CONTROL message by the UE

Upon reception of the DOWNLINK OUTER LOOP CONTROL message, the UE shall perform actions specified in 8.5.7 unless otherwise specified below.

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

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

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

8.2.9.4 Invalid DOWNLINK OUTER LOOP CONTROL message

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

- Transmit an RRC STATUS message on the uplink DCCH using AM RLC and include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.
- ~~When the transmission~~When the successful delivery of the RRC STATUS message has been confirmed by RLC, the UE shall resume normal operation as if the invalid DOWNLINK OUTER LOOP CONTROL message has not been received.

8.2.10 Uplink Physical Channel Control

Figure 37: Uplink Physical Channel Control

8.2.10.1 General

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

8.2.10.2 Initiation

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

8.2.10.3 Reception of UPLINK PHYSICAL CHANNEL CONTROL message by the UE

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

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

8.3 RRC connection mobility procedures

8.3.1 Cell update

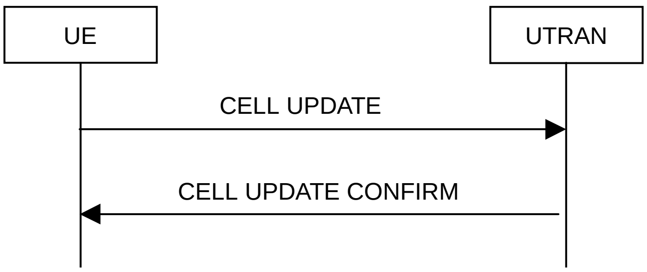


Figure 38: Cell update procedure, basic flow

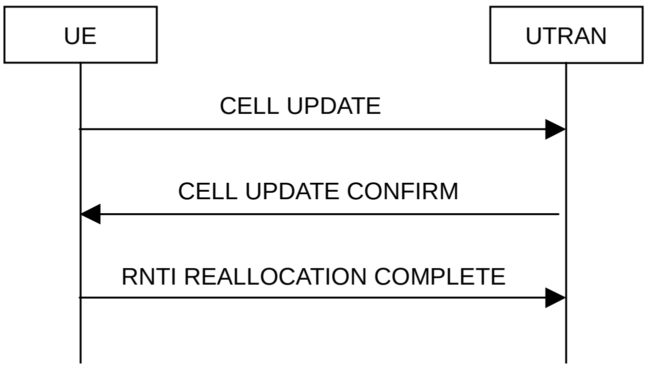


Figure 39: Cell update procedure with RNTI reallocation

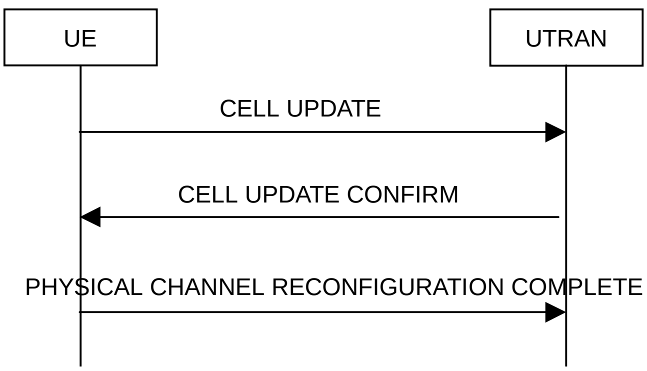


Figure 40: Cell update procedure with physical channel reconfiguration

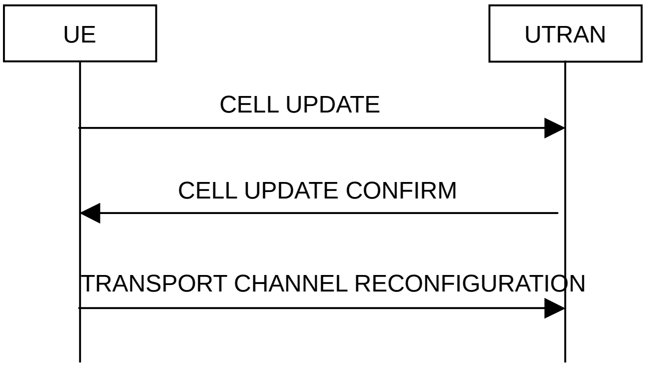


Figure 41: Cell update procedure with transport channel reconfiguration

8.3.1.1 General

The main purpose of the cell update procedure is to update UTRAN with the current cell of the UE after cell reselection in CELL_FACH or CELL_PCH state. It may also be used for supervision of the RRC connection, even if no cell reselection takes place. The cell update procedure can also be used to reset the AM RLC entities for the signalling link and the u-plane link. The UE can use a CELL UPDATE message to notify the unrecoverable error (Amount of the retransmission of RESET PDU reaches the value of Max DAT and receives no ACK) in an AM RLC entity for the signalling link.

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

8.3.1.2 Initiation

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

- Upon initiation of the procedure, the UE shall set the variable PROTOCOL_ERROR_INDICATOR to FALSE.
- In CELL_FACH or CELL_PCH state, the UE shall perform the cell update procedure when selecting another cell (cell reselection).
- In CELL_FACH and CELL_PCH state, the UE shall perform the cell update procedure upon expiry of T305 while the UE ~~is~~ detects "in the service area" (as specified in 8.5.10). The UE shall only perform this periodic cell updating if configured by means of the IE "Information for periodical cell and URA update" in System Information Block Type 2. The UE shall initially start timer T305 upon entering CELL_FACH or CELL_PCH state (periodic cell update).
- In transition ~~to~~ from CELL_DCH to CELL_FACH by receiving RB control message with no indication which cell to camp, the UE should select a cell and perform the cell update procedure (RB control response).
- In CELL_PCH state and URA_PCH state, the UE shall initiate the cell update procedure if it wants to transmit UL data (UL data transmission).
- In CELL_PCH and URA_PCH state, the UE shall perform the cell update procedure when receiving a PAGING TYPE 1 message as in subclause 8.1.2.3 (paging response).
- ~~moving~~ move to CELL_FACH state, if not already in that state.
- consider stored C-RNTI to be invalid until CELL UPDATE CONFIRM message is received when UE detects a new cell.
- suspend data transmission on RB 3 and upward, if RLC-AM or RLC-UM is used on those radio bearers.
- ~~sending~~ send a CELL UPDATE message on the uplink CCCH.
- ~~starting~~ start timer T302 and reset~~ting~~ counter V302.

The IE "cell update cause" shall be ~~used~~ set as follows:

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

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

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

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

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

The UE shall include an intra-frequency measurement report in the CELL UPDATE message, as specified in the IE "Intra-frequency reporting quantity for RACH reporting" and the IE "Maximum number of reported cells on RACH" in system information block type 12.

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

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

- start timer T307;
- search for cell to camp.

8.3.1.3.1 Re-entering of service area

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

- transmit a CELL UPDATE message on the uplink CCCH

8.3.1.3.2 Expiry of timer T307

When the T307 expires, the UE shall:

- move to idle mode;
- release all dedicated resources;
- indicate an RRC connection failure to the non-access stratum.

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

8.3.1.4 Reception of an CELL UPDATE message by the UTRAN

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

When the UTRAN detects AM_RLC unrecoverable error (Amount of the retransmission of RESET PDU reaches the value of Max DAT and receives no ACK), it waits for CELL UPDATE message from the UE and when the UTRAN receives it, UTRAN commands the UE to reset AM_RLC by sending CELL UPDATE CONFIRM message. This procedure can be used not only in the case of AM_RLC unrecoverable error but also in the case that UTRAN wants to reset AM_RLC for other reasons such as in the case when SRNC Relocation is initiated without keeping RLC status (current counters) from old SRNC to new SRNC.

8.3.1.5 Reception of the CELL UPDATE CONFIRM message by the UE

Upon receiving the CELL UPDATE CONFIRM message (old C-RNTI or U-RNTI may be used for MAC header), the UE shall stop timer T302.

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

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

- If the CELL UPDATE CONFIRM message includes the IE "CN domain identity" and the IE "NAS system information", the UE shall forward the content of the IE "NAS system information" to the non-access stratum entity of the UE identified by the IE "CN domain identity".
- If the CELL UPDATE CONFIRM message includes the IE "URA-Id" the UE shall store this URA identity.
- If IE "DRX indicator" in the CELL UPDATE CONFIRM message is not set to "no DRX", no RRC response message is sent to the UTRAN.
- If the CELL UPDATE CONFIRM message does not include IE "new C-RNTI", IE "new U-RNTI", IE "PRACH info" nor IE "Secondary CCPCH info", following actions are taken;
    - If cell update is due to "periodical cell update", no RRC response message is sent to the UTRAN.
    - If cell update is due to "UL data transmission" or "paging response" and if there is no difference in TFS and/or TFCS stored in UE compared to that for the PRACH/SCCPCH indicated in the broadcast system information, PHYSICAL CHANNEL RECONFIGURATION COMPLETE message is sent to the UTRAN using the PRACH indicated in the broadcast system information.
    - If cell update is due to "UL data transmission" or "paging response" and if there is a difference in TFS and/or TFCS stored in UE compared to PRACH/SCCPCH indicated in the broadcast system information,, TRANSPORT CHANNEL RECONFIGURATION COMPLETE message is sent to the UTRAN using the PRACH indicated in the broadcast system information.
    - No case for cell update due to "cell reselection" or "RB control response".
- If the CELL UPDATE CONFIRM message includes the IE "new C-RNTI" and optionally the IE "new U-RNTI" but does not include IE "PRACH info" or IE "Secondary CCPCH info", the UE shall update its identities and following actions are taken:
    - If cell update is due to "periodical cell update", transmit an RNTI REALLOCATION COMPLETE message on the uplink DCCH using the PRACH stored in the UE.
    - If cell update is due to "cell reselection", "UL data transmission" or "paging response" and if there is no difference in TFS and/or TFCS stored in UE compared to PRACH/SCCPCH indicated in the broadcast system information, PHYSICAL CHANNEL RECONFIGURATION COMPLETE message is sent to the UTRAN using the PRACH indicated in the broadcast system information.
    - If cell update is due to "UL data transmission" or "paging response" and if there is a difference in TFS and/or TFCS stored in UE compared to PRACH/SCCPCH indicated in the broadcast system information,, TRANSPORT CHANNEL RECONFIGURATION COMPLETE message is sent to the UTRAN using the PRACH indicated in the broadcast system information.
    - If cell update is due to "RB control response", transmit a RB control response message on the uplink DCCH using the PRACH indicated in the broadcast system information.
- If the CELL UPDATE CONFIRM message includes the IE "RLC reset indicator (for C-plane)" the UE shall reset the AM RLC entities on C-plane.

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

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

  - Perform the actions stated in subclauses 8.5.7.6.2 and 8.5.7.6.3.

  - Update its identities if the CELL UPDATE CONFIRM message includes the IE new C-RNTI" and optionally the IE "new U-RNTI".

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

  - If cell update is due to "RB control response", transmit a RB control response message on the uplink DCCH using the PRACH indicated in the broadcast system information.

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

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

In case the UE does not ~~end in~~transition to CELL_FACH state, it shall delete its C-RNTI and PRACH/SCCPCH information.

If the UE remains in CELL_FACH state and the CELL UPDATE CONFIRM message includes the IE "New C-RNTI" the UE shall then resume data transmission on RB 3 and upward, if RLC-AM or RLC-UM is used on those radio bearers.

8.3.1.6 Invalid CELL UPDATE CONFIRM message

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

The UE shall check the value of V302 and

- If V302 is ~~smaller or~~ equal to or smaller than N302, the UE shall set the variable PROTOCOL_ERROR_INDICATOR to TRUE, retransmit a CELL UPDATE message on the uplink CCCH, restart timer T302 and increase counter V302. The IE "Cell update cause" shall be set to the event causing the transmission of the CELL UPDATE message, see subclause 8.3.1.2.

- If V302 is greater than N302, the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2.

8.3.1.7 T302 expiry or cell reselection

~~- Upon expiry of timer T302; and/or~~

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

Upon expiry of timer T302; and/or upon reselection of another UTRA cell when waiting for the CELL UPDATE CONFIRM message, the UE shall check the value of V302 and:

- If V302 is ~~smaller or~~ equal to or smaller than N302, the UE shall retransmit a CELL UPDATE message on the uplink CCCH, restart timer T302 and increase counter V302. The IE "Cell update cause" shall be set to the event causing the transmission of the CELL UPDATE message, see subclause 8.3.1.2.

- If V302 is greater than N302, the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2

8.3.1.8 Reception of the RNTI REALLOCATION COMPLETE message by the UTRAN

See subclause 8.3.3.4.

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

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

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

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

8.3.2 URA update

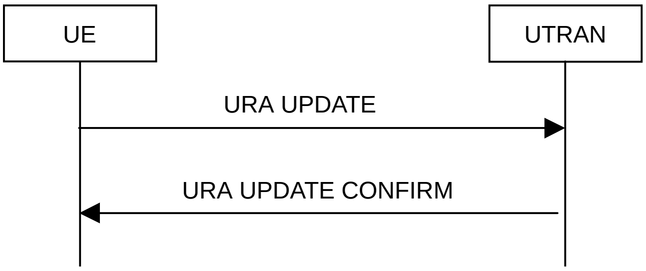


Figure 42: URA update procedure, basic flow

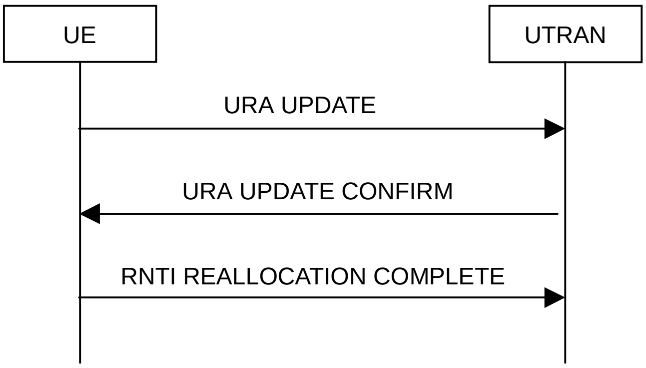


Figure 43: URA update procedure with RNTI reallocation

8.3.2.1 General

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

8.3.2.2 Initiation

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

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

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

The UE shall start the URA update procedure by:

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

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

- in case of URA reselection, to: "URA reselection";
- in case of periodic URA updating, to: "periodic URA update".

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

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

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

When the T306 expires and the UE detects that it is out of service area, which is specified in subclause 8.5.5, the UE shall:

- start timer T307;
- search for cell to camp.

8.3.2.3.1 Re-entering of service area

When the UE detects that it is no longer out of service area before the expiry of T307, the UE shall:

- transmit URA UPDATE message on the uplink CCCH.

8.3.2.3.2 Expiry of timer T307

When the T307 expires, the UE shall:

- move to idle state;
- release all dedicated resources;
- indicate an RRC connection failure to the non-access stratum.

Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2.

8.3.2.4 Reception of an URA UPDATE message by the UTRAN

When the UTRAN receives a URA UPDATE message, it should transmit a URA UPDATE CONFIRM message on the downlink CCCH or DCCH.

The UTRAN should assign the URA ID to the UE in the URA UPDATE CONFIRM message in a cell where multiple URAs are valid.

8.3.2.5 Reception of an URA UPDATE CONFIRM message by the UE

Upon receiving the URA UPDATE CONFIRM message, the UE shall stop timer T303 and restart timer T306. If the URA UPDATE CONFIRM message includes the IEs "new C-RNTI" and optionally IE "new U-RNTI", the UE shall:

- update its identities and transmit an RNTI REALLOCATION COMPLETE message on the uplink DCCH using the PRACH indicated in the broadcast system information.

If the URA UPDATE CONFIRM message includes the IE "URA ID", the UE shall:

- confirm whether indicated URA ID is in the list of URA IDs which is temporarily stored in the UE and if it is present;
  - update the variable URA ID~~ and store in itself~~.

If the URA UPDATE CONFIRM message does not include the IE "URA ID", the UE shall:

- confirm whether only one URA ID exists in the list of URA IDs which is temporarily stored in the UE and if so confirmed;
  - update the variable URA ID ~~and stored in itself~~ .

If the URA UPDATE CONFIRM message includes the IEs "CN domain identity" and "NAS system information", the UE shall forward the content of the IE to the non-access stratum entity of the UE indicated by the IE "CN domain identity".

The UE shall enter a state according to subclause 8.5.8 applied on the URA UPDATE CONFIRM message, unless otherwise specified below.

If the UE does not ~~end up in~~ transition to the CELL_FACH state, the UE shall, after other possible actions:

- retrieve secondary CCPCH info (for PCH) from the SYSTEM INFORMATION broadcast from the new cell;
- delete its C-RNTI; and
- the procedure ends.

8.3.2.6 Confirmation error of URA ID list

- When indicated URA ID is not included in the list of URA IDs; or
- when the URA ID is not indicated and the list of URA IDs includes more than one URA ID,

the UE shall check the value of V303, and:

- If V303 is smaller or equal than N303, the UE shall retransmit a URA UPDATE message on the uplink CCCH, restart timer T303 and increase counter V303. The UE shall set the IEs in the URA UPDATE message according to subclause 8.3.2.2. If V303 is greater than N303, the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2

8.3.2.7 Invalid URA UPDATE CONFIRM message

If the UE receives an URA UPDATE CONFIRM message, which contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

The UE shall check the value of V303 and:

- If V303 is smaller or equal than N303, the UE shall set the variable PROTOCOL_ERROR_INDICATOR to TRUE, retransmit a URA UPDATE message on the uplink CCCH, restart timer T303 and increase counter V303. The UE shall the IEs in the URA UPDATE message according to subclause 8.3.2.2.

- If V303 is greater than N303, the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2.

8.3.2.8 T303 expiry or URA reselection

- Upon expiry of timer T303; and/or
- upon reselection of another UTRA cell when waiting for the URA UPDATE CONFIRM message,

the UE shall check the value of V303 and:

- If V303 is smaller or equal than N303, the UE shall retransmit a URA UPDATE message on the uplink CCCH, restart timer T303 and increase counter V303. The UE shall set the IEs in the URA UPDATE message according to subclause 8.3.2.2.
- If V303 is greater than N303, the UE shall enter idle mode. The procedure ends and a connection failure may be indicated to the non-access stratum. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2.

8.3.2.9 Reception of the RNTI REALLOCATION COMPLETE message by the UTRAN

See subclause 8.3.3.4.

8.3.3 RNTI reallocation

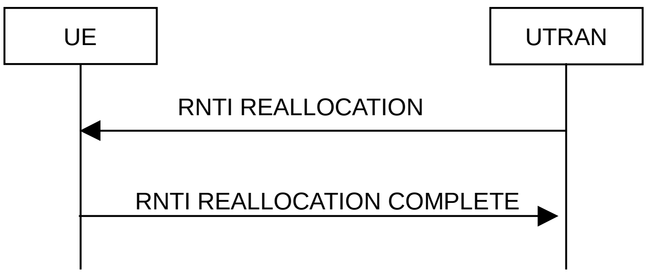


Figure 44: RNTI reallocation procedure, normal flow

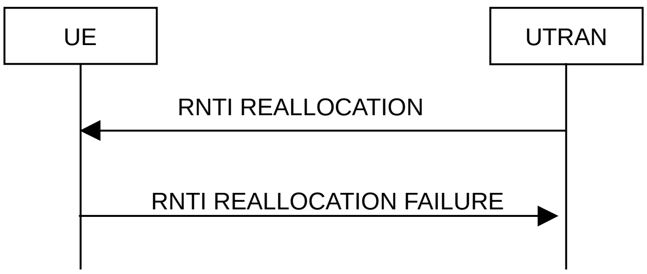


Figure 45: RNTI reallocation procedure, failure case

8.3.3.1 General

The purpose of this procedure is to allocate a new C-RNTI and/or U-RNTI to an UE in connected mode.

8.3.3.2 Initiation

To initiate the procedure UTRAN transmits an RNTI REALLOCATION message to the UE on the downlink DCCH.

8.3.3.3 Reception of RNTI REALLOCATION message by the UE

When the UE receives an RNTI REALLOCATION message, it shall take the following actions and then transmit an RNTI REALLOCATION COMPLETE message on the uplink DCCH. The procedure ends ~~when the transmission~~When the successful delivery of the RNTI REALLOCATION COMPLETE message has been confirmed by RLC.

If the IE "new U-RNTI" is present, the UE shall store and start to use the values of these IEs as the current U-RNTI.

If the IE "new C-RNTI" is present, the UE shall store and start to use the value of this IE.

If the IE "CN domain identity" and the IE "NAS system information" are included, the UE shall forward the content of the IE to the non-access stratum entity of the UE indicated by the IE "CN domain identity".

8.3.3.4 Reception of an RNTI REALLOCATION COMPLETE message by the UTRAN

When the network receives RNTI REALLOCATION COMPLETE message, UTRAN may delete any old C-RNTI and old U-RNTI. The procedure ends.

8.3.3.5 Invalid RNTI REALLOCATION message

If the RNTI REALLOCATION message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- transmit a RNTI REALLOCATION FAILURE message on the uplink DCCH using AM RLCand set the IE "failure cause" the cause value "protocol error";
- include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.
- ~~When the transmission~~When the successful delivery of the RNTI REALLOCATION FAILURE message has been confirmed by RLC, the UE shall resume normal operation as if the invalid RNTI REALLOCATION message has not been received and the procedure ends.

8.3.4 Active set update ~~in soft handover~~

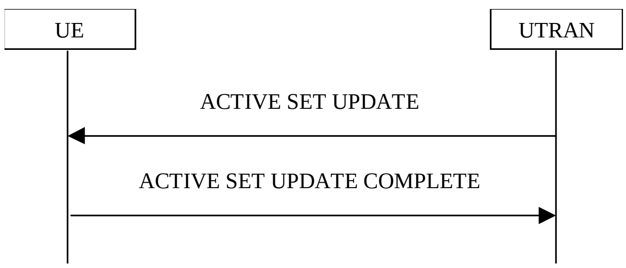


Figure 46: Active Set Update procedure, successful case

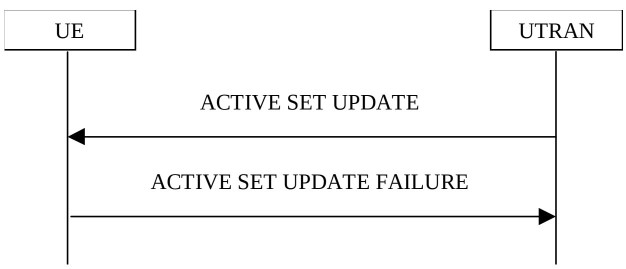


Figure 47: Active Set Update procedure, failure case

8.3.4.1 General

The purpose of the active set update procedure is to update the active set of the connection between the UE and UTRAN. This procedure shall be used in CELL_DCH state. The UE should keep on using the old RLs while ~~allocating~~ configuring the new RLs. Also the UE should keep ~~on using~~ the transmitter turned on during the ~~reallocation process~~procedure. This procedure is only used in FDD mode.

8.3.4.2 Initiation

The procedure is initiated when UTRAN orders a UE in CELL_DCH state, to make the following modifications of the active set of the connection:

a) Radio link addition;

b) Radio link removal;

c) Combined radio link addition and removal.

In case a) and c), UTRAN should:

- prepare new additional radio link(s) in the UTRAN prior to the command to the UE.

In all cases, UTRAN should:

- send an ACTIVE SET UPDATE message on downlink DCCH using AM or UM RLC.

UTRAN should include the following information:

- IE "Radio Link Addition Information": Downlink DPCH information and other optional parameters relevant for the additional radio links with the IE "Primary CPICH info" used for the reference ID to indicate which radio link to add. This IE is need in case a) and c);

- IE "Radio Link Removal Information": IE "Primary CPICH info" used for the reference ID to indicate which radio link to remove. This IE is need in case b) and c).

If SRNS~~SRNC~~ relocation is performed simultaneously during active set update procedure when all radio links are replaced simultaneously, the UTRAN shall include the IE "U-RNTI" and IE "CN domain identity" and IE "NAS system information" in the ACTIVE SET UPDATE messages.

8.3.4.3 Reception of an ACTIVE SET UPDATE message by the UE

- Upon reception of an ACTIVE SET UPDATE message the UE shall ~~s tore~~store the received IE "Radio Link Addition Information" and the IE "Radio Link Removal Information" ~~to~~ in the variable ORDERED_ASU.

The UE shall act upon all received information elements as specified in 8.5.7, unless specified otherwise in the following.

- ~~—~~The UE shall:

  - ~~at~~ shall first~~,~~ add the RLs indicated in the IE "Radio Link Addition Information";

- ~~—~~shall remove the RLs indicated in the IE "Radio Link Removal Information" . If the UE active set is full or becomes full, a~~n~~ RL, which is included in the IE "Radio Link Removal Information" for removal~~indicated to remove~~, shall be removed before adding RL, which is included in the IE "Radio Link Addition Information" for addition~~indicated to add~~;

  - shall, if the ACTIVE SET UPDATE message includes the IE "U-RNTI", ~~-~~update its identity;

  - shall, if the ACTIVE SET UPDATE message includes the IE "CN domain identity" and the IE "NAS system information", the UE shall forward the content of the IE to the non-access stratum entity of the UE indicated by the IE "CN domain identity";

  - if the ACTIVE SET UPDATE message includes the IE 'TFCI combining indicator' associated with a radio link to be added~~, then the UE should~~ configure Layer 1 to soft combine TFCI (field 2) of this new link with those links already in the TFCI (field 2) combining set;

- shall, transmit an ACTIVE SET UPDATE COMPLETE message on the uplink DCCH using AM RLC;
- shall, if the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO is set, ~~the UE shall~~ include and set the IE "Radio bearer uplink ciphering activation time info" to the value of that variable;
- shall, ~~when the transmission~~When the successful delivery of the ACTIVE SET UPDATE COMPLETE message has been confirmed by RLC clear the contents of the variable ORDERED_ASU ~~shall be cleared~~, ~~the UE shall~~ clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO and the procedure ends on the UE side.

8.3.4.4 Abnormal case: Unsupported configuration in the UE

- ~~If UTRAN instructs the UE to use a configuration that it does not support; or~~
- ~~If a radio link in the IE "Radio Link Removal Information" in the ACTIVE SET UPDATE message is not part of the active set,~~

If UTRAN instructs the UE to use a configuration that it does not support; or if a radio link in the IE "Radio Link Removal Information" in the ACTIVE SET UPDATE message is not part of the active set, the UE shall:

- keep the active set and the contents of the variable ORDERED_ASU, as it was before the ACTIVE SET UPDATE message was received;
- transmit an ACTIVE SET UPDATE FAILURE message on the DCCH using AM RLC;
- set the IE "failure cause" to "configuration unacceptable";

~~- when~~ ~~When the transmission~~When the successful delivery of the ACTIVE SET UPDATE FAILURE message has been confirmed by RLC the procedure ends on the UE side.

8.3.4.5 Reception of the ACTIVE SET UPDATE COMPLETE message by the UTRAN

When the UTRAN has received the ACTIVE SET UPDATE COMPLETE message,

- the UTRAN may remove radio link(s) that are indicated to remove to the UE in case b) and c); and
- the procedure ends on the UTRAN side.

8.3.4.6 Reception of the ACTIVE SET UPDATE FAILURE message by the UTRAN

When the UTRAN has received the ACTIVE SET UPDATE FAILURE message, the UTRAN may delete radio links that ~~are~~ were included in the IE "Radio Link Addition Information" for addition~~indicated to add to the UE~~. The procedure ends on the UTRAN side.

8.3.4.7 Subsequently received ACTIVE SET UPDATE messages

If the variable ORDERED_CONFIG is set because of an ACTIVE SET UPDATE message previously received, the UE shall

- ignore the subsequently received ACTIVE SET UPDATE message
- keep the configuration as before the subsequent ACTIVE SET UPDATE message was received.

8.3.4.8 Incompatible simultaneous reconfiguration

If any of the variables ORDERED_CONFIG or ORDERED_ASU are set because of any message other than ACTIVE SET UPDATE, the UE shall:

- Transmit an ACTIVE SET UPDATE FAILURE message on the DCCH using AM RLC. The UE shall set the IE "failure cause" to "incompatible simultaneous reconfiguration".

- ~~When the transmission~~When the successful delivery of the ACTIVE SET UPDATE FAILURE message has been confirmed by RLC the procedure ends and the UE shall keep the active set and the contents of the variable ORDERED_ASU, as it was before the ACTIVE SET UPDATE message was received.

8.3.4.9 Invalid ACTIVE SET UPDATE message

If none of the variables ORDERED_CONFIG or ORDERED_ASU are set and the ACTIVE SET UPDATE message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Transmit a ACTIVE SET UPDATE FAILURE message on the uplink DCCH using AM RLCand set the IE "failure cause" the cause value "protocol error".
- Include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.
- ~~When the transmission~~When the successful delivery of the ACTIVE SET UPDATE FAILURE message has been confirmed by RLC, the UE shall resume normal operation as if the invalid ACTIVE SET UPDATE message has not been received and the procedure ends.

8.3.5 Hard handover

8.3.5.1 General

The purposes of the hard handover procedure are;

- to change the frequency of the connection between the UE and UTRAN;
- to change cell in a network that does not support macro diversity; and
- to change the mode between TDD and FDD.

This procedure may be used in CELL_DCH state.

8.3.5.2 Initiation

Hard handover initiated by the network is normally performed by the procedure "Physical channel reconfiguration" (8.2.6), but may also be performed by the procedures "radio bearer establishment" (8.2.1), "Radio bearer reconfiguration" (8.2.2), "Radio bearer release" (8.2.3) or "Transport channel reconfiguration" (8.2.4).

8.3.6 Inter-system handover to UTRAN

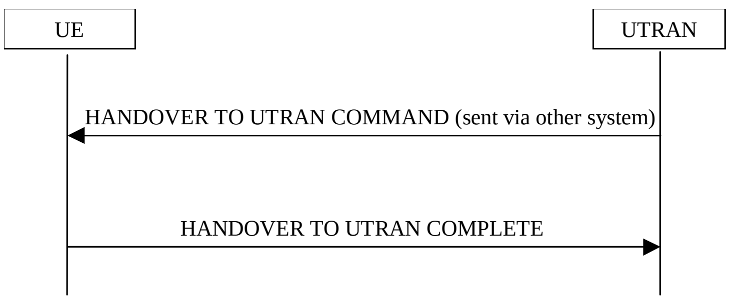


Figure 48: Inter system handover to UTRAN, successful case

8.3.6.1 General

The purpose of the inter system handover procedure is to, under the control of the network, transfer a connection between the UE and another radio access system (e.g. GSM) to UTRAN.

8.3.6.2 Initiation

The procedure is initiated when a radio access system other than UTRAN, e.g. GSM, ~~and,~~ using system specific procedures, orders the UE to make a handover to UTRAN.

A HANDOVER TO UTRAN COMMAND message is sent to the UE via the system from which inter- system handover is performed.

UTRAN should include the following information in the HANDOVER TO UTRAN COMMAND message.

- the IE "U-RNTI" to be assigned;
- the IE "Predefined radio configuration identity", to indicate which pre-defined configuration of RB, traffic channel and physical channel parameters shall be used;
- PhyCH information elements.

NOTE: During handover to UTRAN, UTRAN can only assign values of IEs "U-RNTI" and "scrambling code" that are within the special subranges defined exclusively for this procedure. UTRAN may re- assign other values after completion of the handover procedure.

8.3.6.3 Reception of HANDOVER TO UTRAN COMMAND message by the UE

The UE shall be able to receive a HANDOVER TO UTRAN COMMAND message and perform an inter-system handover, even if no prior UE measurements have been performed on the target UTRAN cell and/or frequency.

The UE shall act upon all received information elements as specified in 8.5.7, unless specified otherwise in the following.

- The UE shall:
  - store the value of the IE "U-RNTI"; and
  - initiate the signalling link, the RB(s) and traffic channel(s) in accordance with the predefined parameters identified by the IE "Predefined radio configuration identity";
  - initiate the physical channels in accordance with the predefined parameters identified by the IE "Predefined radio configuration identity" and the received physical channel information elements;
  - perform an open loop estimation to determine the UL transmission power, taking into account the received IE "Maximum allowed UL TX power" and move to CELL_DCH state;
  - apply the same ciphering (ciphered/ unciphered, algorithm) as prior to inter system handover, unless a change of algorithm is requested by means of the "Ciphering algorithm".

~~The UE shall be able to receive a HANDOVER TO UTRAN COMMAND message and perform an inter-system handover, even if no prior UE measurements have been performed on the target UTRAN cell and/or frequency.~~

If the UE succeeds ~~to~~ in establishing~~establish~~ the connection to UTRAN, it shall transmit a HANDOVER TO UTRAN COMPLETE message on the uplink DCCH. ~~When the transmission~~When the successful delivery of the HANDOVER TO UTRAN COMPLETE message has been confirmed by RLC, the procedure ends.

8.3.6.4 Invalid Handover to UTRAN command message

If the UE receives a HANDOVER TO UTRAN COMMAND message, which contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Resume the connection used before the handover to the source radio access system;
- Indicate a failure to the source radio access system, using "protocol error" as cause for the failure;
- If possible, transmit an RRC STATUS message to the other radio access system, and include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION;

- Other details may be specified in the specifications related to the source radio access system.

8.3.6.5 UE fails to perform handover

If the UE does not succeed to establish the connection to UTRAN, it shall terminate the procedure including release of the associated resources, resume the connection used before the handover and indicate the failure to the other radio access system.

Upon receiving an indication about the failure from the other radio access system, UTRAN should release the associated resources and the context information concerning this UE.

8.3.6.6 Reception of message HANDOVER TO UTRAN COMPLETE by the UTRAN

Upon receiving a HANDOVER TO UTRAN COMPLETE message, UTRAN should consider the inter- system handover procedure as completed successfully and indicate this to the CN.

8.3.7 Inter-system handover from UTRAN

Figure 49: Inter system handover from UTRAN, successful case

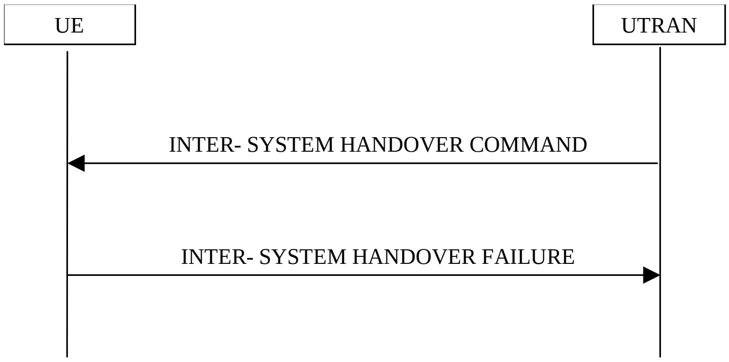


Figure 50: Inter system handover from UTRAN, failure case

8.3.7.1 General

The purpose of the inter system handover procedure is to, ~~controlled by~~under the control of the network, transfer a connection between the UE and UTRAN to another radio access system (e.g. GSM). This procedure may be used in CELL_DCH and CELL_FACH state.

8.3.7.2 Initiation

The procedure is initiated when UTRAN orders a UE in CELL_DCH or CELL_FACH state, to make a handover to ~~another~~ a radio access system other than UTRAN, e.g. GSM.

To initiate the procedure, UTRAN sends an INTER- SYSTEM HANDOVER COMMAND message.

8.3.7.3 Reception of an INTER- SYSTEM HANDOVER COMMAND message by the UE

The UE shall take the following actions:

- Establish the connection to the other radio access system, by using the contents of the IE "Inter system message". This IE contains candidate/ target cell identifier(s) and radio parameters relevant for the other radio access system.
- For each IE "Remaining radio access bearer", associate the radio access bearer given by the IE "RAB info" to the radio resources in the target system given by the IE "Inter system message". Other information for making the association may be included in the IE "Inter system message" and requirements may be stated in the specifications relevant for the target system [FFS].
- Switch the current connection to the other radio access system.

NOTE 1: Requirements concerning the establishment of the radio connection towards the other radio access system and the signalling procedure are outside the scope of this specification.

NOTE 2: The release of the UMTS radio resources is initiated by the other system.

NOTE 3: Currently only one radio access bearer can be associated with the IE "Inter-system message", and this association is limited to the radio acces bearers in the CS domain. It is assumed that all the radio access bearers in the PS domain, if any, remain after the handover.

8.3.7.4 Successful completion of the inter-system handover

Upon successfully completing the handover, UTRAN should release the radio connection and remove all context information for the concerned UE.

8.3.7.5 UE fails to complete requested handover

If the UE does not succeed to establish the connection to the other radio access system, it shall

- resume the connection to UTRAN using the resources used before receiving the INTER-SYSTEM HANDOVER COMMAND message; and
- transmit the INTER-SYSTEM HANDOVER FAILURE message on uplink DCCH using AM RLC. ~~When the transmission~~When the successful delivery of the INTER-SYSTEM FAILURE message has been confirmed by RLC, the procedure ends.

8.3.7.6 Invalid INTER-SYSTEM HANDOVER COMMAND message

If the INTER-SYSTEM HANDOVER COMMAND message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- Transmit a INTER-SYSTEM HANDOVER FAILURE message on the uplink DCCH using AM RLC and set the IE "failure cause" to the cause value "protocol error".
- Include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION.
- ~~When the transmission~~When the successful delivery of the INTER-SYSTEM HANDOVER FAILURE message has been confirmed by RLC, the UE shall resume normal operation as if the invalid INTER-SYSTEM HANDOVER COMMAND message has not been received and the procedure ends.

8.3.7.7 Reception of an INTER-SYSTEM HANDOVER FAILURE message by UTRAN

Upon receiving an INTER-SYSTEM HANDOVER FAILURE message, UTRAN may release the resources in the other radio access system.

8.3.8 Inter-system cell reselection to UTRAN

8.3.8.1 General

The purpose of the inter system cell reselection procedure to UTRAN is to, under the control of the UE and to some extent the other radio access system, transfer a connection between the UE and another radio access system (e.g. GSM/GPRS) to UTRAN.

8.3.8.2 Initiation

When the UE makes an inter-system cell reselection to UTRAN according to the criteria specified in TS 25.304, it shall initiate this procedure. The inter-system cell reselection made by the UE may use system information broadcast from the other radio access system or UE dedicated information.

The UE shall initiate an RRC connection establishment procedure as specified in subclause 8.1.3 except that the IE "establishment cause" in the RRC CONNECTION REQUEST message shall be set to "Inter-system cell reselection". After initiating an RRC connection establishment, the UE shall release all resources specific to the other radio access system.

8.3.8.3 UE fails to complete an inter-system cell reselection

If the inter-system cell reselection fails before the UE has initiated the RRC connection establishment the UE may return back to the other radio access system.

If the RRC connection establishment fails the UE shall enter idle mode.

8.3.9 Inter-system cell reselection from UTRAN

8.3.9.1 General

The purpose of the inter system cell reselection procedure from UTRAN is to, under the control of the UE and to some extent the network, transfer a connection between the UE and UTRAN to another radio access system (e.g. GSM/GPRS).

8.3.9.2 Initiation

This procedure may be initiated in states CELL_FACH, CELL_PCH or URA_PCH.

When the UE based on received system information makes a cell reselection to a radio access system other than UTRAN, e.g. GSM/GPRS, according to the criteria specified in TS 25.304, the UE shall.

- start timer T309;
- initiate the establishment of a connection to the other radio access system according to its specifications.

8.3.9.3 Successful cell reselection

When the UE has succeeded in reselecting a cell in the other radio access system and has initiated an establishment of a connection, it shall stop timer T309 and release all UTRAN specific resources.

UTRAN should release all UE dedicated resources upon indication that the UE has completed a connection establishment to the other radio access system.

8.3.9.4 Expiry of timer T309

If the timer T309 expires before the UE succeeds to initiate an establishment of a connection to the other radio access system, the UE shall resume the connection to UTRAN using the resources used before initiating the inter system cell reselection procedure.

8.4 Measurement procedures

The UE measurements are grouped into 6 different categories, according to what the UE should measure.

The different types of measurements are:

- **Intra-frequency measurements**: measurements on downlink physical channels at the same frequency as the active set. Detailed description is found in subclause 14.1.
- **Inter-frequency measurements**: measurements on downlink physical channels at frequencies that differ from the frequency of the active set. Detailed description is found in subclause 14.2.
- **Inter-system measurements**: measurements on downlink physical channels belonging to another radio access system than UTRAN, e.g. PDC or GSM. Detailed description is found in subclause 14.3.
- **Traffic volume measurements**: measurements on uplink traffic volume. Detailed description is found in subclause 14.4~~2~~.
- **Quality measurements**: Measurements of quality parameters, e.g. downlink transport block error rate.
- **Internal measurements**: Measurements of UE transmission power and UE received signal level. Detailed description is found in subclause 14.5~~3~~.

The same type of measurements may be used as input to different functions in UTRAN. ~~However, the~~The UE shall support a number of measurements running in parallel. The UE shall also support that each measurement is controlled and reported independently of every other measurement.

Cells that the UE is monitoring (e.g. for handover measurements) are grouped in the UE into three different categories:

1. Cells, which belong to the **active set.** User information is sent from all these cells and they are simultaneously demodulated and coherently combined. In FDD, these cells are involved in soft handover. In TDD the active set always comprises of one cell only.
2. Cells, which are not included in the active set, but are monitored according to a neighbour list assigned by the UTRAN belong to the **monitored set.**
3. Cells, which are not included in the active set, and are detected by the UE without receiving a neighbour list from the UTRAN belong to the **detected set.** Intra-frequency measurements of the unlisted set is required only ~~from~~ of UEs in CELL_DCH state.

NOTE: The cells of the monitored set are not excluded from the detected set.

UTRAN may start a measurement in the UE by transmitting a MEASUREMENT CONTROL message. This message includes the following measurement control information:

1. **Measurement type**: One of the types listed above describing what the UE shall measure.
2. **Measurement identity number**: A reference number that should be used by the UTRAN when modifying or releasing the measurement and by the UE in the measurement report.
3. **Measurement command**: One out of three different measurement commands.
   - Setup: Setup a new measurement.
   - Modify: Modify a previously defined measurement, e.g. to change the reporting criteria.
   - Release: Stop a measurement and clear all information in the UE that are related to that measurement.
4. **Measurement objects:** The objects the UE shall measure on, and corresponding object information.
5. **Measurement quantity:** The quantity the UE shall measure. This also includes the filtering of the measurements.
6. **Reporting quantities:** The quantities the UE shall include in the report in addition to the quantities that are mandatory to report for the specific event.

7. **Measurement reporting criteria**: The triggering of the measurement report, e.g. periodical or event-triggered reporting. The events are described for each measurement type in clause 14.

8. **Reporting mode**: This specifies whether the UE shall transmit the measurement report using ~~acknowledged or unacknowledged data transfer of~~AM or UM RLC.

All these measurement parameters depend on the measurement type and are described in more detail in clause 14.

When the reporting criteria are fulfilled, i.e. a specified event occurred or the time since last report indicated for periodical reporting has elapsed, the UE shall send a MEASUREMENT REPORT message to UTRAN.

In idle mode, the UE shall perform measurements according to the measurement control information included in System Information Block Type 11, which is transmitted on the BCCH.

In CELL_FACH, CELL_PCH or URA_PCH state, the UE shall perform measurements according to the measurement control information included in System Information Block Type 12, which is transmitted on the BCCH. If the UE has not received System Information Block Type 12, it shall perform measurements according to the measurement control information included in System Information Block Type 11, which is transmitted on the BCCH.

In CELL_DCH state, the UE shall report radio link related measurements to the UTRAN with a MEASUREMENT REPORT message. The UE may also be requested by the UTRAN to report unlisted cells, which it has detected. The triggering event for the UE to send a MEASUREMENT REPORT message is that a detected cell exceeds an absolute threshold.

In order to receive information for the establishment of immediate macrodiversity (FDD) or to support the DCA algorithm (TDD), the UTRAN may also request the UE to append radio link related measurement reports to the following messages sent on the RACH:

- RRC CONNECTION REQUEST message sent to establish an RRC connection;
- RRC CONNECTION RE-ESTABLISHMENT REQUEST message sent to re-establish an RRC connection;
- INITIAL DIRECT TRANSFER message sent uplink to establish a signalling connection;
- CELL UPDATE message sent to respond to a UTRAN originated page;
- MEASUREMENT REPORT message sent to report uplink traffic volume;
- CAPACITY REQUEST message sent to request PUSCH capacity (TDD only).

NOTE: Whether or not measured results can be appended to other messages and in other scenarios is FFS.

8.4.1 Measurement control

Figure 51: Measurement Control, normal case

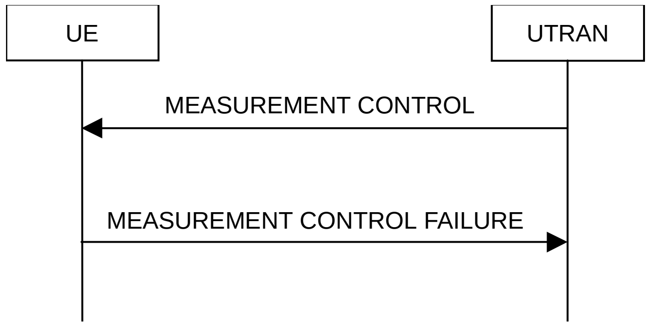


Figure 52: Measurement Control, UE reverts to old measurements

8.4.1.1 General

The purpose of the measurement control procedure is to Setup, modify or release a measurement in the UE.

8.4.1.2 Initiation

The UTRAN may request a measurement ~~in~~ by the UE to be setup, modified or released with a MEASUREMENT CONTROL message, which is transmitted on the downlink DCCH using AM RLC.

When a new measurement is setup, UTRAN should set the IE "Measurement identity number" to a value, which is not used for other measurements. UTRAN may use several "Measurement identity number" within a same "Measurement type". In case of setting several "Measurement identity numbers" within a same "Measurement type", "Measurement object" can be set differently for each measurement with different "Measurement identity numbers". If no "Measurement object" is indicated for additional measurement within a same "Measurement type" in case of "Measurement type" = "Intra-frequency", it implies that only active set cells are the "Measurement objects".

When a current measurement is modified or released, UTRAN should set the IE "Measurement identity number" to a value, which is used for the current measurement. In case of modifying IEs within a "Measurement identity number", it is not needed for UTRAN to indicate the IEs other than modifying IEs, and the UE continuously uses the current values of the IEs which are not modified.

UTRAN should take the UE capabilities into account when a measurement is assigned to the UE.

8.4.1.3 Reception of MEASUREMENT CONTROL by the UE

Upon reception of a MEASUREMENT CONTROL message the UE shall perform actions specified in 8.5.7 unless otherwise specified below.

The UE shall:

- Read the IE "Measurement command".

  - If the IE "measurement command" has the value "setup", the UE shall:

    - store this measurement in the variable MEASUREMENT_IDENTITY according to the IE "measurement identity number";

    - store into the variable MEASUREMENT_IDENTITY the control information defined by IE "Measurement object", the IE "Measurement quantity", the IE "Reporting quantity", the IE "Measurement reporting criteria", the IE "Measurement validity", the IE "Reporting mode" and if present all IEs "Additional measurement identity number", which are valid for this measurement type; and

    For measurement types "inter-system measurement" or "inter-frequency measurement",

      - begin measurements according to the stored control information for this measurement identity number on condition that the corresponding compressed mode pattern sequence stored in variable TGPS_IDENTITY is active or unless it is simultaneously activated; or

    For any other measurement type,

- begin measurements according to the stored control information for this measurement identity number.

~~See clause 14 for detailed description of a measurement object, measurement quantity and measurement reporting criteria for the different types of measurements.~~

- If the IE "Measurement command" has the value "modify", the UE shall:
  - retrieve the stored measurement information associated with the identity indicated in the IE "measurement identity number";
  - if any of the IEs "measurement object", IE "measurement quantity", IE "reporting quantity", IE "measurement reporting criteria", IE "measurement validity", IE "reporting mode" or IE "Additional measurement identity number" are present in the MEASUREMENT CONTROL message, the control information defined by that IE shall replace the corresponding stored information;
  - store the new set of IEs and associate them with the measurement identity number; and
  - resume the measurements according to the new stored measurement control information.
- If the IE "measurement command has the value "release", the UE shall:
  - terminate the measurement associated with the identity given in the IE "measurement identity number";
  - clear all stored measurement control information related associated to this measurement identity number.

- If the IE "DPCH Compressed Mode Status Info" is present, the UE shall:
  - activate the pattern sequence stored in variable TGPS_IDENTITY corresponding to each IE "TGPSI" for which the "TGPS status flag" is set to "activate" and begin the inter-frequency and/or inter-system measurements corresponding to the pattern sequence measurement purpose of each activated pattern sequence;
  - deactivate the pattern sequence stored in variable TGPS_IDENTITY corresponding to each IE "TGPSI" for which the "TGPS status flag" is set to "deactivate" and terminate the inter-frequency and/or inter-system measurements corresponding to the pattern sequence measurement purpose of each deactivated pattern sequence;

After the above actions have been performed, the procedure ~~is complete~~ends.

8.4.1.4 Unsupported measurement in the UE

If UTRAN instructs the UE to perform a measurement that is not supported by the UE, the UE shall:

- retain the measurement configuration that was valid before the MEASUREMENT CONTROL message was received;
- transmit a MEASUREMENT CONTROL FAILURE message on the DCCH using AM RLC.

The UE shall set the cause value in IE "failure cause" to "unsupported measurement".

8.4.1.5 Invalid MEASUREMENT CONTROL message

If the MEASUREMENT CONTROL message contains a protocol error causing the variable PROTOCOL_ERROR_REJECT to be set to TRUE according to clause 16, the UE shall perform procedure specific error handling as follows:

- transmit a MEASUREMENT CONTROL FAILURE message on the uplink DCCH using AM RLCand set the IE "failure cause" the cause value "protocol error";
- include the IE "Protocol error information" with contents set to the value of the variable PROTOCOL_ERROR_INFORMATION;

- ~~when the transmission~~When the successful delivery of the MEASUREMENT CONTROL FAILURE message has been confirmed by RLC, the UE shall resume normal operation as if the invalid MEASUREMENT CONTROL message has not been received and the procedure ends.

8.4.1.6 Reception of the MEASUREMENT CONTROL FAILURE message by the UTRAN

When the UTRAN receives a MEASUREMENT CONTROL FAILURE message the procedure ends.

8.4.1.7 Measurements after transition from CELL_DCH to CELL_FACH state

The UE shall obey the follow rules for different measurement types after transiting from CELL_DCH to CELL_FACH state:

Intra-frequency measurement

The UE shall stop intra-frequency type measurement reporting assigned in a MEASUREMENT CONTROL message.

After transition to CELL_FACH state, the UE shall begin monitoring neighbouring cells listed in the "intra-frequency cell info" received in "System Information Block 12" (or "System Information Block 11").

If the UE has no previously assigned, valid intra-frequency measurement for CELL_DCH state, the UE shall store "intra-frequency measurement reporting criteria", from "System Information Block 12" (or "System Information Block 11"), for use after a subsequent transition to CELL_DCH state.

If the UE receives the "Intra-frequency reporting quantity for RACH Reporting" and "Maximum number of Reported cells on RACH" IEs from "System Information Block 12" (or "System Information Block 11"), the UE use this information for reporting measured results in RACH messages.

Inter-frequency measurement

The UE shall stop the inter-frequency type measurement reporting assigned in a MEASUREMENT CONTROL message.

After transition to CELL_DCH state, the UE shall begin monitoring neighbouring cells listed in the "inter-frequency cell info" received in "System Information Block 12" (or "System Information Block 11").

The UE shall not measure on other frequencies except at the measurement occasions given in 8.5.13.

Inter-system measurement

The UE shall stop the inter-system type measurement reporting assigned in a MEASUREMENT CONTROL message.

After transition to CELL_DCH state, the UE shall begin monitoring neighbouring cells listed in the "inter-system" cell info" received in "System Information Block 12" (or "System Information Block 11").

The UE shall not measure on other systems except at the measurement occasions given in 8.5.13.

Quality measurement

The UE shall stop the quality type measurement reporting assigned in a MEASUREMENT CONTROL message after transition from CELL_DCH to CELL_FACH state.

UE internal measurement

The UE shall stop the UE internal measurement reporting type of measurement assigned in a MEASUREMENT CONTROL message.

Traffic volume measurement

The UE shall stop or continue traffic volume type measurement reporting assigned in a MEASUREMENT CONTROL message according to the following rules:

- If the IE "measurement validity" for this measurement has been assigned to value "release", the UE shall delete the measurement associated with the variable MEASUREMENT IDENTITY.

- If the IE "measurement validity" for the measurement has been assigned to value "resume", and the IE "UE state for reporting" has been assigned to value "CELL_DCH", the UE shall stop measurement reporting and save the measurement associated with the variable MEASUREMENT IDENTITY to be used after the next transition to CELL_DCH state.

- If the IE "measurement validity" for the measurement has been assigned to value "resume", and the IE "UE state for reporting" has been assigned to value "all states", the UE shall continue measurement reporting.

- If the UE has previously stored a measurement, for which the IE "measurement validity" has been assigned to value "resume" and for which the IE "UE state for reporting" has been assigned to value "all states except CELL_DCH", the UE shall resume this measurement and associated reporting.

If no traffic volume type measurement has been assigned to the UE with a MEASUREMENT CONTROL message when transiting to CELL_FACH state, the UE shall begin a traffic volume type measurement according to traffic volume measurement type information received in "System Information Block 12" (or "System Information Block 11").

8.4.1.8 Measurements after transition from CELL_FACH to CELL_DCH state

The UE shall obey the follow rules for different measurement types after transiting from CELL_FACH to CELL_DCH state:

Intra-frequency measurement

If the UE has previously in CELL_DCH state stored an intra-frequency measurement, for which the IE "measurement validity" has been assigned to value "resume" and for which the IE "UE state for reporting" has been assigned to value "CELL_DCH", the UE shall resume this measurement and associated reporting. If the UE has performed cell reselection whilst out of CELL_DCH state, the UE shall not resume the measurement.

If the UE has no previously assigned measurement, it shall continue monitoring the list of neighbouring cells assigned in the "intra-frequency cell info" IE in "System Information Block 12" (or "System Information Block 11"). If the "intra-frequency measurement reporting criteria" IE was included in "System Information Block 12" (or "System Information Block 11"), the UE shall send the MEASUREMENT REPORT message when reporting criteria are fulfilled. When the UE receives a MEASUREMENT CONTROL message including an intra-frequency measurement type assignment, the UE shall stop monitoring and measurement reporting for the list of neighbouring cells assigned in the "intra-frequency cell info" IE in "System Information Block 12" (or "System Information Block 11"). It shall also delete the measurement reporting criteria received in "System Information Block 12" (or "System Information Block 11").

Inter-frequency measurement

The UE shall stop monitoring the list of neighbouring cells assigned in the "inter-frequency cell info" IE in "System Information Block 12" (or "System Information Block 11"). If the UE has previously stored an inter-frequency measurement, for which the IE "measurement validity" has been assigned to value "resume" and for which the IE "UE state for reporting" has been assigned to value "CELL_DCH", the UE shall resume this measurement and associated reporting.

Inter-system measurement

The UE shall stop monitoring the list of neighbouring cells assigned in the "inter-frequency system info" IE in "System Information Block 12" (or "System Information Block 11"). If the UE has previously stored an inter-system measurement, for which the IE "measurement validity" has been assigned to value "resume" and for which the IE "UE state for reporting" has been assigned to value "CELL_DCH", the UE shall resume this measurement and associated reporting.

Traffic volume measurement

The UE shall stop or continue traffic volume type measurement reporting assigned in a MEASUREMENT CONTROL message sent on the FACH according to the following rules:

- If the IE "measurement validity" for this measurement has been assigned to value "release", the UE shall delete the measurement associated with the variable MEASUREMENT IDENTITY.

- If the IE "measurement validity" for the measurement has been assigned to value "resume", and the IE "UE state for reporting" has been assigned to value "CELL_FACH", the UE shall stop measurement reporting and save the measurement associated with the variable MEASUREMENT IDENTITY to be used after the next transition to CELL_FACH state.

- If the IE "measurement validity" for the measurement has been assigned to value "resume", and the IE "UE state for reporting" has been assigned to value "all states", the UE shall continue measurement reporting.

If the UE has previously stored a measurement, for which the IE "measurement validity" has been assigned to value "resume" and for which the IE "UE state for reporting" has been assigned to value "CELL_DCH", the UE shall resume this measurement and associated reporting.

If no traffic volume type measurement has been assigned to the UE with a MEASUREMENT CONTROL message when transiting to CELL_DCH state, the UE shall continue an ongoing traffic volume type measurement, which was assigned in "System Information Block 12" (or "System Information Block 11")

Traffic volume type measurement control parameters assigned in a MEASUREMENT CONTROL message shall always supersede parameters conveyed in "System Information Block 12" (or "System Information Block 11"). If the UE receives a MEASUREMENT CONTROL message including an traffic volume measurement type assignment, the UE shall delete the traffic volume measurement control information received in "System Information Block 12" (or "System Information Block 11").

8.4.1.9 Measurements after transition from idle mode to CELL_DCH state

The UE shall obey the follow rules for different measurement types after transiting from idle mode to CELL_DCH state:

Intra-frequency measurement

The UE shall continue monitoring the list of neighbouring cells assigned in the "intra-frequency cell info" IE in "System Information Block 12" (or "System Information Block 11"). If the "intra-frequency measurement reporting criteria" IE was included in "System Information Block 12" (or "System Information Block 11"), the UE shall send the MEASUREMENT REPORT message when reporting criteria are fulfilled.

When the UE receives a MEASUREMENT CONTROL message including an intra-frequency measurement type assignment, the UE shall stop monitoring and measurement reporting for the list of neighbouring cells assigned in the "intra-frequency cell info" IE in "System Information Block 12" (or "System Information Block 11"). It shall also delete the measurement reporting criteria received in "System Information Block 12" (or "System Information Block 11").

Inter-frequency measurement

The UE shall stop monitoring the list of neighbouring cells assigned in the "inter-frequency cell info" IE in "System Information Block 12" (or "System Information Block 11").

Inter-system measurement

The UE shall stop monitoring the list of neighbouring cells assigned in the "inter-frequency system info" IE in "System Information Block 12" (or "System Information Block 11").

Traffic volume measurement

The UE shall begin a traffic volume type measurement, which was assigned in "System Information Block 12" (or "System Information Block 11").

8.4.1.10 Measurements after transition from idle mode to CELL_FACH state

The UE shall obey the follow rules for different measurement types after transiting from idle mode to CELL_FACH state:

Intra-frequency measurement

The UE shall begin monitoring neighbouring cells listed in the "intra-frequency cell info" received in "System Information Block 12" (or "System Information Block 11").

If the UE receives "intra-frequency measurement reporting criteria", from "System Information Block 12" (or "System Information Block 11"), the UE shall store this information to use after a subsequent transition to CELL_DCH state.

If the UE receives the "Intra-frequency reporting quantity for RACH Reporting" and "Maximum number of Reported cells on RACH" IEs from "System Information Block 12" (or "System Information Block 11"), the UE use this information for reporting measured results in RACH messages.

Inter-frequency measurement

The UE shall begin monitoring neighbouring cells listed in the "inter-frequency cell info" received in "System Information Block 12" (or "System Information Block 11").

The UE shall not measure on other frequencies except at the measurement occasions given in 8.5.13.

Inter-system measurement

The UE shall begin monitoring neighbouring cells listed in the "inter-system" cell info" received in "System Information Block 12" (or "System Information Block 11").

The UE shall not measure on other systems except at the measurement occasions given in 8.5.13.

Traffic volume measurement

The UE shall begin a traffic volume type measurement according to traffic volume measurement type information received in "System Information Block 12" (or "System Information Block 11").

8.4.1.11 Measurements when measurement object is no longer valid

Traffic volume measurement

If UE is no longer using the transport channel that is specified in "traffic volume measurement object", UE shall ignore any measurements that are assigned to that transport channel. If none of the transport channels that are specified in "traffic volume measurement object" is being used, UE shall release that particular measurement and its measurement ID.

8.4.2 Measurement report

Figure 53: Measurement report, normal case

8.4.2.1 General

The purpose of the measurement reporting procedure is to transfer measurement results from the UE to UTRAN.

8.4.2.2 Initiation

In CELL_DCH state, the UE shall transmit a MEASUREMENT REPORT message on the uplink DCCH when the reporting criteria stored in variable MEASUREMENT_IDENTITY are fulfilled for any ongoing measurements that are being performed in the UE.

In CELL_FACH state, the UE shall transmit a MEASUREMENT REPORT message on the uplink DCCH when the reporting criteria stored in variable MEASUREMENT_IDENTITY are fulfilled for an ongoing traffic volume measurement which is being performed in the UE.

In CELL_PCH or URA_PCH state, the UE shall first perform the cell update procedure in order to transit to CELL_FACH state and then transmit a MEASUREMENT REPORT message on the uplink DCCH when the reporting criteria stored in variable MEASUREMENT_IDENTITY are fulfilled for an ongoing traffic volume measurement which is being performed in the UE.

The reporting criteria ~~Criteria~~ are fulfilled if either:

- The time indicated in the stored IE "Periodical reporting" has elapsed for a given measurement that was either initiated or since the last measurement report related to this measurement was transmitted.
- An event in stored IE "Measurement reporting criteria" was triggered. Events and triggering of reports for different measurement types are described in detail in clause 14.

The UE shall transmit the MEASUREMENT REPORT message using either AM or UM RLC according to the stored IE "measurement reporting mode" associated with the measurement identity number that triggered the report.

For the measurement, which triggered the MEASUREMENT REPORT message, the UE shall:

- Set the IE "measurement identity number " to the measurement identity number which is associated with that measurement in variable MEASUREMENT_IDENTITY.
- Set the IE "measured results" to include measurements according to the IE "reporting quantity" of that measurement stored in variable MEASUREMENT_IDENTITY.
- Set the IE "Measured results" in the IE "Additional measured results" according to the IE "reporting quantity" for all measurements associated with the measurement identities included in the IE "additional measurements" stored in variable MEASUREMENT_IDENTITY of the measurement that triggered the measurement report. If several additional measured results are to be included, the UE shall sort them in ascending order according to their IE "measurement identity number" in the MEASUREMENT REPORT message.

If the MEASUREMENT REPORT message was triggered by an event (i.e. not a periodical report), the UE shall:

- Set the measurement event results according to the event that triggered the report.

8.4.2.3 Reception of a MEASUREMENT REPORT message by the UTRAN

When the UTRAN receives the MEASUREMENT REPORT message, the measurement reporting procedure ends.

8.5 General procedures

8.5.1 Selection of initial UE identity

The purpose of the IE "Initial UE identity" is to provide a unique UE identification at the establishment of an RRC connection. The type of identity shall be selected by the UE according to the following.

Upper layers shall set the variable SELECTED_PLMN. If the variable SELECTED_~~CN~~ PLMN in the UE has the value "GSM-MAP", the UE shall choose "UE id type" in the IE "Initial UE identity" with the following priority:

1. TMSI (GSM-MAP): The TMSI (GSM-MAP) shall be chosen if available. The IE "LAI" in the IE "Initial UE identity" shall also be present when TMSI (GSM-MAP) is used, for making it unique.
2. P-TMSI (GSM-MAP): The P-TMSI (GSM-MAP) shall be chosen if available and no TMSI (GSM-MAP) is available. The IE "RAI" in the IE "Initial UE identity" shall in this case also be present when P-TMSI (GSM-MAP) is used, for making it unique.
3. IMSI (GSM-MAP): The IMSI (GSM-MAP) shall be chosen if available and no TMSI (GSM-MAP) or P-TMSI is available.
4. IMEI: The IMEI shall be chosen when none of the above three conditions are fulfilled.

When being used, the IEs "TMSI (GSM-MAP)," "P-TMSI (GSM-MAP)", "IMSI (GSM-MAP)", "LAI" and "RAI" shall be set equal to the values of the corresponding identities stored in the USIM or SIM.

If the variable SELECTED_~~CN~~ PLMN in the UE has the value "ANSI-41", the UE shall choose "UE id type" in the IE "Initial UE identity" according to the procedure specified in the 3GPP2 document "3GPP2 C.P0004-A".

8.5.2 Actions when entering idle mode from connected mode

When entering idle mode from connected mode, the UE shall attempt to select a suitable cell to camp on. The UE shall perform cell selection when leaving connected mode according to 3G TS 25.304.~~[25.304].~~

While camping on a cell, the UE shall acquire system information according to the system information procedure in subclause 8.1, perform measurements according to the measurement control procedure specified in subclause 8.4 and, if registered, be prepared to receive paging ~~and notification~~ messages according to the paging procedure in subclause 8.2.

If IE "PLMN identity" within variable SELECTED_PLMN has the value "GSM-MAP", the UE shall delete any NAS system information received in connected mode, acquire the NAS system information in system information block type 1, and proceed according to 8.5.7.1.2.

The UE shall compare the 20 most significant bits of the hyper frame numbers for each radio bearer (including signalling radio bearers) in each CN domain ~~for each radio bearer (including signalling radio bearers)~~ that have~~s~~ existed during the connection, after possible authentication and ciphering/integrity key change. Even if a radio bearer has been released, its HFN must be temporarily saved until another HFN instance (of the radio bearers towards the same CN domain) exceeds the saved value or until ciphering/integrity keys for this domain are changed. The UE shall store into the USIM the 20 most significant bits of the highest HFN in each CN domain.

8.5.3 Open loop power control upon establishment of DPCCH

This procedure is used in FDD mode only.

When establishing the first DPCCH the UE shall start the UL inner loop power control at a power level according to:

- DPCCH_Initial_power = DPCCH_Power_offset – CPICH_RSCP

Where

DPCCH_Power_offset shall have the value of IE "DPCCH Power offset" in IE "Uplink DPCH power control info

The value for the CPICH_RSCP shall be measured by the UE.

8.5.4 Physical channel establishment criteria

When a physical dedicated channel establishment is initiated by the UE, the UE shall start a timer T312 and wait for layer 1 to indicate N312 successive "in sync" indications. ~~At this occasion~~On receiving N312 successive "in sync" indications, the physical channel is considered established and the timer T312 is stopped and reset.

If the timer T312 expires before the physical channel is established, the UE shall consider this as a "physical channel establishment failure".

8.5.5 Detection of out of service area

When a suitable cell is not found based on the description in subclause 5.2.2.1 of TS 25.304, the UE considers it as an "out of service area".

8.5.6 Radio link failure criteria

In CELL_DCH State the UE shall start timer T313 after receiving N313 consecutive "out of sync" indications for the established DPCCH physical channel from layer 1. The UE shall stop and reset timer T313 upon receiving successive N315 "in sync" indications from layer 1 and upon change of ~~RRC~~ UE state. If T313 expires, the UE shall consider it as a "Radio link failure".

8.5.7 Generic actions on receipt of an information element

8.5.7.1 CN information elements

8.5.7.1.1 CN domain specific DRX cycle length coefficient

UE updates CN domain specific DRX cycle length coefficient as specified in [4]. The UE shall use it to calculate the CN domain specific DRX cycle length, according to the following:

- Set k to the value of the IE "CN domain specific DRX cycle length coefficient".
- Store the result of 2^k *PBP, where PBP is the Paging Block Periodicity, as the CN domain specific DRX cycle length for ~~that~~ the CN domain ~~as~~ indicated by the IE "CN domain identity".

The UE shall determine its idle mode paging occasions and PICH monitoring occasions for that CN domain, according to TS 25.304, based on the stored CN domain specific DRX cycle length, when using DRX in idle mode.

8.5.7.1.2 NAS system information

If the IE "CN related information"."CN domain identity" and the IE "CN related information"."NAS system information" are present in a message, the UE shall forward the content of the IE "NAS system information" to the non-access stratum entity of the UE indicated by the IE "CN domain identity".

8.5.7.2 UTRAN mobility information elements

Void.

8.5.7.3 UE information elements

8.5.7.3.1 Activation time

If the IE "Activation time" is present, the UE shall:

- activate the new configuration present in the same message as this IE at the indicated time.

NOTE: The new configuration is typically a dedicated physical channel present in the same message as the IE "Activation time" ~~IE~~.

8.5.7.3.2 UTRAN DRX Cycle length coefficient

If the IE "UTRAN DRX cycle length coefficient" is present, the UE shall use it to calculate the UTRAN DRX cycle length, according to the following:

- Set k to the value of the IE "UTRAN DRX cycle length coefficient".
- Store the result of 2^k *PBP, where PBP is the Paging Block Periodicity, as the DRX cycle length.

The UE shall determine its connected mode paging occasions and PICH monitoring occasions in the same way as for idle mode, according to TS 25.304.

The DRX cycle length to use in connected mode is the ~~shortest~~ shorter of the following two parameters:

- UTRAN DRX cycle length;
- CN domain specific DRX cycle length stored for any CN domain, when using Discontinuous Reception (DRX) in CELL_PCH and URA_PCH state.

The CN domain specific DRX cycle length stored for any CN domain is only used in Cell_PCH state and URA_PCH state if the UE is registered to that CN domain and no signalling connection ~~exist~~ exists to that CN domain.

8.5.7.3.3 DRX Indicator

If the IE "DRX Indicator" is set to 'DRX with cell updating', the UE shall:

- if the IE "UTRAN DRX cycle length coefficient" is included in the same message, use the value in the IE "UTRAN DRX Cycle length coefficient" for calculating Paging Occasion and PICH Monitoring Occasion as specified in 8.5.7.3.2 in CELL_PCH state.

If the IE "DRX Indicator" is set to 'DRX with URA updating', the UE shall:

- if the IE "UTRAN DRX cycle length coefficient" is included in the same message, use the value in the IE "UTRAN DRX Cycle length coefficient" for calculating Paging occasion and PICH Monitoring Occasion as specified in ~~8.7.3.2~~8.5.7.3.2 in URA_PCH state.

If the IE "DRX Indicator" set to 'no DRX' the UE shall:

- ~~if~~ ignore the IE "UTRAN DRX cycle length coefficient" ~~is~~ if included in the same message~~, ignore that IE~~;
- stop using DRX.

8.5.7.3.4 Ciphering mode info

If the IE "Ciphering mode info" is present, the UE shall check the IE "Ciphering mode command" as part of the IE "Ciphering mode info", and perform the following:

- If IE "Ciphering mode command" has the value "start/restart", the UE shall:
  - Start or restart ciphering, using the ciphering algorithm (UEA [TS 33.102]) indicated by the IE "Ciphering algorithm" as part of the new ciphering configuration. The new ciphering configuration shall be applied as specified below.
  - Set the variable CIPHERING_STATUS to "Started".
- If the IE "Ciphering mode command" has the value "stop", the UE shall
  - Stop ciphering. The new ciphering configuration shall be applied as specified below
  - Set the variable CIPHERING_STATUS to "Not started".
- In case the IE "Ciphering mode command" has the value "start/restart" or "stop", the new ciphering configuration shall be applied as follows:
  - If the IE "Activation time for DPCH" is present in the IE "Ciphering mode info", the UE shall apply the new configuration at that time for radio bearers using RLC-TM.
  - If the IE "Radio bearer downlink ciphering activation time info" is present in the IE "Ciphering mode info", the UE shall apply the following procedure for each radio bearer using RLC-AM and RLC-UM indicated by the IE "RB identity":
    - Suspend data transmission on the radio bearer
    - Store the current RLC send state variable, VT(S), for that radio bearer in the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO.
    - When the data transmission of that radio bearer is resumed, the UE shall switch to the new ciphering configuration according to the following:
      - Use the old ciphering configuration for the transmitted and~~resp.~~ received RLC PDUs with RLC sequence number smaller than the corresponding RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent to UTRAN respectively in the received IE "Radio bearer downlink ciphering activation time info" received from UTRAN.
      - Use the new ciphering configuration for the transmitted and~~resp.~~ received RLC PDUs with RLC sequence number greater than or equal to the corresponding RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent to UTRAN respectively in the received IE "Radio bearer downlink ciphering activation time info" received from UTRAN

- For a radio bearer using RLC-AM, when the RLC sequence number indicated in the IE "Radio bearer downlink ciphering activation time info" is not included in the RLC transmission window, the UE may release the old ciphering configuration for that radio bearer.

~~1. If IE "Ciphering mode command" has the value "start/restart", the UE shall:~~

~~1.1 Start or restart ciphering, using the ciphering algorithm (UEA [TS 33.102]) indicated by the IE "Ciphering algorithm" as part of the new ciphering configuration. The new ciphering configuration shall be applied as specified below.~~

~~1.2 Set the variable CIPHERING_STATUS to "Started".~~

~~2. If the IE "Ciphering mode command" has the value "stop", the UE shall:~~

~~2.1 Stop ciphering. The new ciphering configuration shall be applied as specified below.~~

~~2.2 Set the variable CIPHERING_STATUS to "Not started".~~

~~3. The new ciphering configuration, in case of the IE "Ciphering mode command" has the value "start/restart" or "stop", shall be applied as follows:~~

~~3.1 If the IE "Activation time for DPCH" is present in the IE "Ciphering mode info", the UE shall apply the new configuration at that time for radio bearers using RLC-TM.~~

~~3.2 If the IE "Radio bearer downlink ciphering activation time info" is present in the IE "Ciphering mode info", the UE shall apply the following procedure for each radio bearer using RLC-AM and RLC-UM indicated by the IE "RB identity":~~

~~3.2.1 Suspend data transmission on the radio bearer~~

~~3.2.2 Store the current RLC send state variable, VT(S), for that radio bearer in the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO.~~

~~3.2.3 When the data transmission of that radio bearer is resumed, the UE shall switch to the new ciphering configuration according to the following:~~

~~3.2.3.1 Use the old ciphering configuration for the transmitted resp. received RLC PDUs with RLC sequence number less than the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent to UTRAN resp. in the received IE "Radio bearer downlink ciphering activation time info" received from UTRAN.~~

~~3.2.3.2 Use the new ciphering configuration for the transmitted resp. received RLC PDUs with RLC sequence number greater than or equal to the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent to UTRAN resp. in the received IE "Radio bearer downlink ciphering activation time info" received from UTRAN.~~

~~3.2.3.3 For a radio bearer using RLC-AM, when the RLC sequence number indicated in the IE "Radio bearer downlink ciphering activation time info" is not included in the RLC transmission window, the UE may release the old ciphering configuration for that radio bearer.~~

If the IE "Ciphering mode info" is not present, the UE shall not change the ciphering configuration.

8.5.7.3.5 Integrity protection mode info

If the IE "Integrity protection mode info" is present, the UE shall check the IE "Integrity protection mode command" as part of the IE "Integrity protection mode info", and perform the following:

- If IE "Integrity protection mode command" has the value "start" and the "Status" in the variable INTEGRITY_ PROTECTION_INFO has the value "Not started", the UE shall:
  - set the "Status" in the variable INTEGRITY_ PROTECTION_INFO to the value "Started";
  - perform integrity protection on the received message as ~~descibed~~ described in subclause 8.5.12.1;
  - use the algorithm (UIA [TS 33.102]) indicated by the IE "Integrity protection algorithm" contained in the IE "Integrity protection mode info";

- use the IE "Integrity protection initialisation number", contained in the IE "Integrity protection mode info" as the value of FRESH [TS 33.102].

- If IE "Integrity protection mode command" has the value "modified" and the "Status" in the variable INTEGRITY_ PROTECTION_INFO has the value "Started", the UE shall:

  - restart integrity protection in the downlink at the RRC sequence number indicated by the IE "Signalling radio bearer integrity protection activation info", included in the IE "Integrity protection mode info";

  - perform integrity protection on the received message as described in subclause 8.5.12.1;

  - if present, use the algorithm indicated by the IE "Integrity protection algorithm" (UIA [TS 33.102]);

  - set the values of the IE "Uplink integrity protection activation info";

If the IE "Integrity protection mode info" is not present, the UE shall not change the integrity protection configuration.

8.5.7.3.6 Configuration of CTCH occasions

A CTCH is mapped onto only one S-CCPCH, which is the same as carrying the PCH.

The CTCH occasions are identified by the first radio frame of the TTI which can contain CTCH data. The CTCH occasions are fixed on the system frame number cycle 0 .. 4095 (i.e. no modulo calculation) and thus repeated cyclically.

The CTCH occasions are determined by a set of parameters.

M_{TTI}: number of radio frames within the TTI of the FACH used for CTCH

N: period of CTCH allocation on S-CCPCH, integer number of radio frames,
$M_{TTI} \leq N \leq$ MaxSFN – K, where N is a multiple of M_{TTI} (~~cf. 3G~~see 3G TS 25.212 and ~~3G~~ 3G TS 25.222).

MaxSFN: maximum system frame number = 4096 (~~cf. 3G~~see 3G TS 25.402).

K: CBS frame offset, integer number of radio frames $0 \leq K \leq N-1$ where K is a multiple of M_{TTI} .

The CTCH occasions are calculated as follows:

SFN = (K + m N), m = 0, 1,..., M, M chosen that K+~~m~~MN ≤ MaxSFN.

The parameters N and K are broadcast as system information.

8.5.7.3.7 UL Timing Advance

If the IE "UL Timing Advance" is present, the UE shall:

- evaluate and apply the timing advance value for UL transmissions.

8.5.7.3.8 Integrity check info

If the IE "Integrity check info is present" the UE shall act as described in subclause 8.5.12.1.

8.5.7.4 Radio bearer information elements

8.5.7.4.1 RB mapping info

If the IE "RB identity" and the IE "RB mapping info" are included, the UE shall:

- ~~If any,~~ delete all previously stored multiplexing options, if any, for that radio bearer;
- Store each new multiplexing option for that radio bearer.

8.5.7.4.2 RLC Info

If the IE "RB identity" and the IE "RLC Info" are included, the UE shall:

- Configure the transmitting and receiving RLC entities in the UE for that radio bearer accordingly.

8.5.7.4.3 PDCP Info

If the IEs "RB identity" and "PDCP info" are included, the UE shall:

- Configure the PDCP entity for that radio bearer accordingly.

8.5.7.5 Transport channel information elements

8.5.7.5.1 Transport Format Set

If the IE "transport channel identity" and the IE "Transport format set" is included, the UE shall:

- store the transport format set for that transport channel.

If the IE "Transport format Set" has the choice "Transport channel type" set to "Dedicated transport channel", the UE shall:

- Calculate the transport block size for all transport formats in the TFS using the following~~as~~
  - TB size = RLC PDU size + MAC header size, where,

    ~~where,~~

    MAC header size is calculated according to 3G TS 25.321 if MAC multiplexing is used. Otherwise it is 0 bits.

8.5.7.5.2 Transport format combination set

If the IE "Transport format combination set" is included, the UE shall:

- start to respect those transport format combinations.

For downlink CCTrCHs if no TFCS is stored in the UE the UE shall consider all possible transport format combinations and calculate the possible TFCI values according to the IE transport format combination set.

For downlink CCTrCHs if a TFCS is stored in the UE and

- if the IE "Transport format combination set" is not included and transport channels are deleted in the message, the UE shall:
  - remove the affected transport format combinations from the transport format combination set, recalculate the TFCI values and start to respect those transport format combinations
- if the IE "Transport format combination set" is not included and transport channels are added in the message, the UE shall:
  - consider all possible new combinations to be valid and recalculate the TFCI values and start to respect those transport format combinations. In TDD the new transport format combinations are considered to belong to the TFCS with the ID 1 of DCH type.
- if the IE "Transport format combination set" is not included and transport channels are replaced the UE shall:
  - consider all possible transport format combinations to be valid and calculate the TFCI values accordingly.

8.5.7.5.3 Transport format combination subset

If the IE "Transport format combination subset" is included, the UE shall:

- restrict the transport format combination set to that transport format combination subset. If the transport format combination subset indicates the "full transport format combination set" any restriction on transport format combination set is released and the UE may use the full transport format combination set.

8.5.7.6 Physical channel information elements

8.5.7.6.1 Frequency info

If the IE "Frequency info" is included the UE shall:

- Store that frequency as the active frequency; and
- Tune to that frequency.

If the IE "Frequency info" is not included and the UE has a stored active frequency, the UE shall

- Continue to use the stored active frequency.

If the IE "Frequency info" is not included and the UE has no stored active frequency, it shall:

- map any used physical channels on the frequency given in system information as default.

8.5.7.6.2 PRACH info

If the IE "PRACH info" is included, the UE shall:

- release any active dedicated physical channels in the uplink; and
- let the PRACH be the default in the uplink for RACH.

8.5.7.6.3 Secondary CCPCH info

If the IE "Secondary CCPCH info" is ~~indicated by~~ included within a dedicated message, the UE shall start to receive that Secondary CCPCH in the downlink. If the IE "Secondary CCPCH info" is not ~~indicated by~~included within a dedicated message, the UE selects a SCCPCH from the broadcast SCCPCHs on BCH which are set to "Selection indicator"="On" based on "Initial UE identity" in idle mode or "old U-RNTI" in connected mode and the UE shall start to receive that Secondary CCPCH in the downlink.

The UE selects one SCCPCH based on the following algorithm:~~.~~

- In idle mode
  - Selected SCCPCH = (Initial UE Identity) mod (listed SCCPCHs with "Selection Indicator"="on") ~~(idle mode)~~
- In connected mode
  - Selected SCCPCH = (old U-RNTI) mod (listed SCCPCHs with "Selection Indicator"="on")~~(connected mode)~~

8.5.7.6.4 Uplink DPCH info

If the IE "Uplink DPCH info" is included, the UE shall:

- release any active uplink physical channels and activate the given physical channels.

8.5.7.6.5 Downlink DPCH info

If the IE "Downlink DPCH info" is included, the UE shall:

- Activate the dedicated physical channels indicated by that IE.

8.5.7.6.6 Maximum allowed UL TX power

If the IE "Maximum allowed UL TX power" is included, the UE shall:

- Keep the UE uplink transmit power below the indicated power value. If the current UE uplink transmit power is above the indicated power value, the UE shall decrease the power to a level below the power value.

The maximum UE transmitter power is defined as the lower of the maximum output power of the UE power class and the maximum allowed UL TX power indicated in this IE. The maximum UE transmitter power shall not be exceeded.

8.5.7.6.7 Gated transmission control info

If the IE "Gated transmission control info" is included and the gating rate equals "Full", then UE shall:

- Stop gated transmission of uplink(if supported) and downlink DPCCH at activation time.

Otherwise, UE shall:

- Start gated transmission of uplink(if supported) and downlink DPCCH at activation time with given gating rate and pattern.

8.5.7.6.8 PDSCH with SHO DCH Info (FDD only)

If the IE "PDSCH with SHO DCH Info" ~~'PDSCH with SHO DCH Info'~~ is included, the UE shall:

- Configure itself such that when an allocation on the DSCH is made it will receive the PDSCH from the specified BS within the active set.

and in cases where the TFCI for the user in question has a 'hard' split (meaning that TFCI(field 1) and TFCI (field 2) have their own individual block coding):

- Configure the Layer 1 to only soft combine the DPCCH TFCI(field 2) of the radio links within the associated DCH active set which are specified;

- Infer that the set of radio links for which TFCI (field 2) should be soft combined will include all radio links within the active set if the IE "~~'~~TFCI combining set"~~'~~ is not included and the sending of the message in which the IE "~~'~~PDSCH with SHO DCH Info"~~'~~ is being used will result in a transport channel switch from a state in which the DSCH transport channel was not available to a state in which it is available.

8.5.7.6.9 PDSCH code mapping (FDD only)

If the ~~IE 'PDSCH code mapping'~~ IE "PDSCH code mapping" is included, the UE shall:

- Configure Layer 1 to support the mapping of TFCI(field 2) values to PDSCH channelisation codes as specified in the IE.

8.5.7.6.10 Uplink DPCH power control info

In FDD, if the IE "Uplink DPCH power control info" is included the UE shall:

- start inner loop power control as specified in 8.5.3;

- for the UL inner loop power control use the parameters specified in the IE.

In TDD, if the IE "Uplink DPCH power control info" is included the UE shall:

- use the parameters specified in the IE for open loop power control as defined in 8.5.9.

8.5.7.6.11 Secondary CPICH info

If the IE Secondary CPICH info is included, the UE:

- May use the channelisation code according to IE "channelisation code", with scrambling code according to IE "DL scrambling code" in the IE "Secondary CPICH info", for channel estimation of that radio link;

- May use the pilot bits on DPCCH for channel estimation.

8.5.7.6.12 Primary CPICH usage for channel estimation

If the IE "Primary CPICH usage for channel estimation" is included and has the value "Primary CPICH may be used" the UE:

- may use the Primary CPICH for channel estimation;
- may use the pilot bits on DPCCH for channel estimation.

If the IE "Primary CPICH usage for channel estimation" is included and has the value "Primary CPICH shall not be used" the UE:

- shall not use the Primary CPICH for channel estimation;
- may use the Secondary CPICH for channel estimation
- may use the pilot bits on DPCCH for channel estimation.

8.5.7.6.13 DPCH frame offset

If the IE "DPCH frame offset" is included the UE shall:

- use its value to determine the beginning of the DPCH frame

8.5.7.6.14 DPCH Compressed mode info

If the IE "DPCH compressed mode info" is included, and if the IE group "transmission gap pattern sequence configuration parameters" are included, the UE

- shall check, that none of the parallel transmission gap pattern sequences create transmission gaps in the same frame by using the compressed mode method 'puncturing'.

If the configuration creates this kind of overlap, the UE

- shall set the variable UNACCEPTABLE_CONFIGURATION to TRUE;
- shall retain all previously stored compressed mode pattern sequences.

Otherwise, the UE

- shall set the variable UNACCEPTABLE_CONFIGURATION to FALSE;
- shall delete all previously stored compressed mode pattern sequences;
- shall store each pattern sequence to the variable TGPS_IDENTITY according to the IE "TGPSI";
- shall store into the variable TGPS_IDENTITY the configuration information defined by IE group" transmission gap pattern sequence configuration parameters "; and
- shall activate the stored pattern sequence corresponding to each IE "TGPSI" for which the "TGPS status flag" is set to "activate" and begin the inter-frequency and/or inter-system measurements corresponding to the pattern sequence measurement purpose of each activated pattern sequence;

  If the IE "DPCH compressed mode info" is included, and if the IE group "transmission gap pattern sequence configuration parameters" is not included, the UE shall

  - ~~shall~~ activate the stored pattern sequence corresponding to each IE "TGPSI" for which the "TGPS status flag" is set to "activate" and begin the inter-frequency and/or inter-system measurements corresponding to the pattern sequence measurement purpose of each activated pattern sequence;
  - ~~shall~~ deactivate the stored pattern sequence corresponding to each IE "TGPSI" for which the "TGPS status flag" is set to "deactivate" and terminate the inter-frequency and/or inter-system measurements corresponding to the pattern sequence measurement purpose of each deactivated pattern sequence;

8.5.7.6.15 Repetition period, Repetition length, Offset

The following description applies to TDD only.

The frame allocation can be derived by following rules:

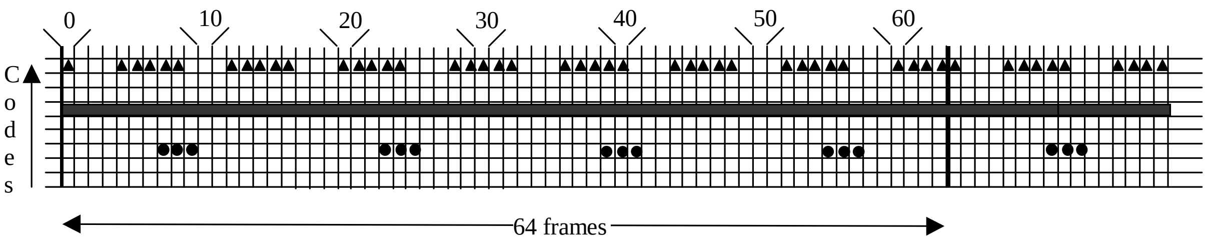
If no IE "Offset" is explicitely given, the parameter "Offset" to be used is calculated by the following equation:

Activation time mod Repetition period = Offset.

Frames from CFN CFN_{off} to CFN_{off} + Repetition length belong to the allocation with CFN_{off} fulfilling the following equation:

CFN_{off} mod Repetition period = Offset.

Example of usage:



▲ physic. channel (Code 7; Repetition period=8; Repetition length=5; Activation time = 4 => Offset = 4 => CFN_{off} = 4, 12, 20, 28, 36, 44, 52, 60)

■ physic. channel (Code 5; Repetition Period=1 => Repetition length=0; Offset = 0 => CFN_{off} = 0, 1, 2, 3, 4, ... (continuous allocation))

● physic. channel (Code 3; Repetition period=16; Repetition length=3; Activation time = 23 =>Offset = 7 => CFN_{off} = 7, 23, 39, 55)

Figure 54: Examples for frame allocations in TDD

8.5.7.7 Measurement information elements

8.5.7.7.1 Measurement validity

If the IE "measurement validity" for a given measurement has been assigned to value "release", the UE shall delete the measurement associated with the variable MEASUREMENT IDENTITY after the UE makes a transition to a new state.

If the IE "measurement validity" for this measurement has been assigned to value "resume", the UE shall save the measurement associated with the variable MEASUREMENT IDENTITY .The IE "UE state" defines the scope of resuming the measurement.

If the "UE state" is defined as ~~'all states'~~"all states", the UE shall continue the measurement after making a transition to a new state. This scope is assigned only for traffic volume type measurements.

If the "UE state" is defined as "~~'~~all states except CELL_DCH"~~'~~, the UE shall store the measurement to be resumed after a subsequent transition from CELL_DCH state to any of the other states in connected mode. This scope is assigned only for traffic volume type measurements.

If the "UE state" is defined as "CELL_DCH", the UE shall store the measurement to be resumed after a subsequent transition to CELL_DCH state. After cell re-selection, the UE shall delete an ongoing measurement intra-frequency or inter-frequency and inter-system type measurement associated with the variable MEASUREMENT IDENTITY. Other measurement types shall, however, be continued regardless of cell reselection.

8.5.7.7.2 Filter coefficient

If the IE "Filter coefficient" is received the UE shall apply filtering of the measurements for that measurement quantity according to the formula below. This filtering shall be performed by the UE before UE event evaluation. The UE shall also filter the measurements reported in the IE "Measured results" or the IE "Measurement results on RACH". The filtering shall not be performed for cell-reselection in connected or idle mode.

The filtering shall be performed according to the following formula.

$$F_n = (1-a) \cdot F_{n-1} + a \cdot M_n$$

The variables in the formula are defined as follows:

F_n is the updated filtered measurement result

F_{n-1} is the old filtered measurement result

M_n is the latest received measurement result from physical layer measurements, the unit used for M_n is the same unit as the reported unit in the MEASUREMENT REPORT message or the unit used in the event evaluation.

$a = 1/2^{(k/2)}$, where k is the parameter received in the IE "Filter coefficient". ~~Nota~~ Note that if a is set to 1 that will mean no layer 3 filtering.

In order to initialize the averaging filter, F_0 is set to M_1 when the first measurement result from the physical layer measurement is received.

The physical layer measurement results are sampled once every measurement period. The measurement period and the accuracy for a certain measurement is defined in ~~3G~~ TS 25.133.

8.5.7.7.3 Intra-frequency/Inter-frequency/Inter-system cell info list

If one of these IEs is received, and "Removed ***** cells" or/and "New ****** cells" is present in the received IE, UE shall update measurement objects for that measurement accordingly.

If one of these IEs is included, but neither "Removed ***** cells" nor "New ****** cells" is included, UE shall not change the information on that measurement object. (This case is applied only when Measurement Command = "Modify".)

If one of these IEs is not received when IE is absent, UE shall re-order same measurement type by measurement ID in ascending order, and use the preceding ID's measurement object information. (For example, suppose UE is assigned 3 measurement IDs (suppose they were ID10, 11, and 15) for intra-frequency measurement, and UE did not receive "Intra-frequency cell info" for Measurement ID 15. When performing the measurement assigned with 15, UE shall use the measurement object information associated with Measurement ID 11).

8.5.7.7.4 Inter-system measurement quantity

If the IE "Inter-system measurement quantity" is received and CHOICE system is GSM, the UE shall check the parameter "BSIC verification required".

If BSIC verification required is set to "required" the UE shall only report measurement quantities for GSM cells with a "verified" BSIC.

If BSIC verification required is set to "not required" the UE shall report measurement quantities for GSM cells both with "verified" and "non-verified" BSIC.

The requirements for a cell to be considered "verified" or "non-verified" can be found in TS 25.133.

8.5.7.8 Other information elements

Void.

8.5.8 Generic state transition rules depending on received information elements

The state the UE shall move to depends on the presence of a number of IEs as follows:

IF ~~either~~ IE "Uplink DPCH info" OR IE "Downlink DPCH info" is included THEN

The UE shall move to CELL_DCH state

ELSEIF—"DRX indicator" is set to "DRX with Cell updating" THEN

The UE shall move to CELL_PCH state

ELSEIF "DRX indicator" is set to "DRX with URA updating" THEN

The UE shall move to URA_PCH state

ELSEIF "DRX indicator" is set to "noDRX" .OR. "DRX indicator" does not exist in message THEN

The UE shall move to CELL_FACH state

END

8.5.9 Open loop power control

For FDD and prior to PRACH or PCPCH transmission the UE shall calculate the power for the first preamble as:

Preamble_Initial_Power = Primary CPICH DL TX power – CPICH_RSCP + UL interference + Constant Value

Where

Primary CPICH DL TX power shall have the value of IE "Primary CPICH DL TX power",

UL interference shall have the value of IE "UL interference"; and

Constant Value shall have the value of IE "Constant Value".

The IEs "Primary CPICH DL TX power", "UL interference" and "Constant value" shall be read on system information in system information block 6 and system information block 7.

The value for the CPICH_RSCP shall be measured by the UE.

As long as the physical layer is configured for PRACH or PCPCH transmission, the UE shall continuously recalculate the Preamble_Initial_Power when any of the broadcast parameters used in the above formula changes. The new Preamble_Initial_Power shall then be resubmitted to the physical layer.

For TDD the UE shall calculate the UL transmit power according to the following formulas for the PRACH, DPCH and USCH continuously while the physical channel is active:

- $P_{PRACH} = L_{PCCPCH} + I_{BTS}$ + RACH Constant value

And for uplink dedicated physical channels:

- $P_{DPCH} = \alpha L_{PCCPCH} + (1-\alpha)L_0 + I_{BTS} + SIR_{TARGET}$ + DPCH Constant value

And for uplink shared physical channels:

- $P_{USCH} = \alpha L_{PCCPCH} + (1-\alpha)L_0 + I_{BTS} + SIR_{TARGET}$ + USCH Constant value

Where:

- P_{PRACH}, P_{DPCH}, & P_{USCH}: Transmitter power level in dBm,

- L_{PCCPCH}: Measurement representing path loss in dB (reference transmit power "Primary CCPCH Tx Power" is broadcast on BCH in system information block 14).
- L_0: Long term average of path loss in dB
- I_{BTS}: Interference signal power level at cell's receiver in dBm ("UL Interference" is broadcast on BCH in system information block 14 for each active uplink timeslot).
- α: α is a weighting parameter, which represents the quality of path loss measurements. α may be a function of the time delay between the uplink time slot and the most recent down link PCCPCH time slot. α is calculated at the UE.
- SIR_{TARGET}: Target SNR in dB. This value is individually signaled to UEs in UL DPCH Power Control Info and PUSCH Power Control Info IEs.
- RACH Constant value: This value is broadcast on BCH and shall be read on system information block 14.
- DPCH Constant value: This value is broadcast on BCH and shall be read on system information block 14.
- USCH Constant Value: This value is broadcast on BCH and shall be read on system information block 14.

8.5.10 Detection of in service area

When a suitable cell is found based on the description in subclause 5.2.2.1 of ~~TS25~~3G TS 25.304, the UE considers it as an "in service area".

8.5.11 Hyper Frame Number

The hyper frame number (HFN) in the IE "Hyper frame number" is used to initialise both the ciphering sequence number (COUNT-C) and the integrity sequence number (COUNT-I) for the ciphering and integrity protection algorithms, respectively. There is a COUNT-C per radio bearer (uplink/downlink) and a COUNT-I per signalling radio bearer (uplink/downlink). COUNT-C and COUNT-I are defined in Security Architecture, TS 33.102.

COUNT-C is initialised: COUNT-C = HFN (the LSB not part of the HFN in COUNT-C are set to zero).

COUNT-I is initialised: COUNT-I = HFN (the LSB not part of the HFN in COUNT-I are set to zero).

8.5.12 Integrity protection

Integrity protection shall be performed on all RRC messages, with the following exceptions:

HANDOVER TO UTRAN COMPLETE

PAGING TYPE 1

PUSCH CAPACITY REQUEST

PHYSICAL SHARED CHANNEL ALLOCATION

RRC CONNECTION REQUEST

RRC CONNECTION SETUP

RRC CONNECTION SETUP COMPLETE

RRC CONNECTION REJECT

SYSTEM INFORMATION (BROADCAST INFORMATION)

SYSTEM INFORMATION CHANGE INDICATION

TRANSPORT FORMAT CONTROL

NOTE: MEASUREMENT REPORT needs to be studied when used on UM as in some cases there could be synchronisation problems with the RRC SN.

For CCCH and each signalling radio bearer, the UE shall use two integrity protection hyper frame numbers,

- "Uplink HFN";
- "Downlink HFN".

and two message sequence numbers,

- "Uplink RRC Message sequence number";
- "Downlink RRC Message sequence number".

The above information is stored in the variable INTEGRITY_PROTECTION_INFO per CCCH and signalling radio bearer (RB 0-4).

8.5.12.1 Integrity protection in downlink

If the UE receives an RRC message on signalling radio bearer with RB identity n, the "Status" in the variable INTEGRITY_ PROTECTION_INFO has the value "Started" and the IE 'Integrity check info' is present the UE shall:

- check the value of the IE "RRC message sequence number" included in the IE "Integrity check info". If the RRC message sequence number is lower than or equal to the "Downlink RRC Message sequence number" for RB#n in the variable INTEGRITY_PROTECTION_INFO, the UE shall increment "Downlink HFN" for RB#n in the variable INTEGRITY_PROTECTION_INFO with one.
- calculate an expected message authentication code in accordance with subclause 8.5.12.3.
- compare the expected message authentication code with the value of the received IE "message authentication code" contained in the IE 'Integrity check info'.
  - If the expected message authentication code and the received message authentication code are the same, the integrity check is successful.
  - If the calculated expected message authentication code and the received message authentication code differ, the message shall be discarded.

If the UE receives an RRC message on signalling radio bearer with identity n, the "Status" in the variable INTEGRITY_ PROTECTION_INFO has the value "Started" and the IE 'Integrity check info' is not present the UE shall discard the message.

8.5.12.2 Integrity protection in uplink

Upon transmitting an RRC message using the signalling radio bearer with radio bearer identity n, and the "Status" in the variable INTEGRITY_ PROTECTION_INFO has the value "Started" the UE shall:

- increment "Uplink RRC Message sequence number" for RB#n in the variable INTEGRITY_PROTECTION_INFO with 1. When "Uplink RRC Message sequence number" for RB#n in the variable INTEGRITY_PROTECTION_INFO becomes 0, the UE shall increment "Uplink HFN" for RB#n in the variable INTEGRITY_PROTECTION_INFO with 1
- calculate the message authentication code in accordance with subclause 8.5.12.3
- replace the "Message authentication code" in the IE "Integrity check info" in the message with the calculated message authentication code.
- replace the "RRC Message sequence number" in the IE "Integrity check info" in the message with contents set to the new value of the "Uplink RRC Message sequence number" for RB#n in the variable INTEGRITY_PROTECTION_INFO

8.5.12.3 Calculation of message authentication code

The UE shall calculate the message authentication code in accordance with 3G TS 33.102. The input parameter MESSAGE (3G TS 33.102) for the integrity algorithm shall be constructed by:

- setting the "Message authentication code" in the IE "Integrity check info" in the message to the signalling radio bearer identity
- setting the "RRC Message sequence number" in the IE "Integrity check info" in the message to zero
- encoding the message
- appending RRC padding (if any) as a bitstring to the encoded bitstring as the least significant bits

8.5.13 Measurement occasion calculation

When in CELL_FACH state the UE shall perform inter-frequency and inter system measurements during the frame with the SFN value fulfilling the following equation:

- ((SFN div N) mod M_REP = C_RNTI mod M_REP

  where

  - N is the TTI of FACH div 10ms
  - M_REP = 2^k
  - k = k_UTRA – k_Inter_~~Rat~~RAT_tot

    where,

    - k_Inter_RAT_tot is the sum of all the k_Inter_RAT values corresponding to a system that the UE supports in addition to UTRA, and that have neighbours present in the measurement control message on system information sent from the current cell.
    - C_RNTI is the C-RNTI value of the UE
    - k_UTRA and k_Inter_RAT are read on system information in "System Information Block Type 11" or "System Information Block Type 12" in the IE "FACH measurement occasion info".

The UE is allowed to measure on other occasions in case the UE moves "out of service" area or in case it can simultaneously perform the ordered measurements.

~~k_Inter_Rat_tot is the sum of all the k_Inter_Rat values corresponding to a system that the UE supports in addition to UTRA, and that have neighbours present in the measurement control message on system information sent from the current cell.~~

~~C_RNTI is the C-RNTI value of the UE~~

~~k_UTRA and k_Inter_Rat is read on system information in SIB 11 or 12 in the "FACH measurement occasion info" IE.~~

8.5.14 Establishment of Access Service Classes

The PRACH resources (i.e. access slots and preamble signatures for FDD), timeslot (with specific frame allocation~~)~~ and channelisation code for TDD) may be divided between different Access Service Classes in order to provide different priorities of RACH usage. It is possible for more than one ASC or for all ASCs to be assigned to the same access slot/signature space in FDD or frame allocation in TDD.

Access Service Classes shall be numbered in the range $0 \le i \le$ NumASC ≤ 7 (i.e. the maximum number of ASCs is "NumASC+1" = 8). An ASC is defined by an identifier, i, that defines a certain partition of the PRACH resources and an associated persistence value P_i. A set of ASC parameters consists of "NumASC+1" such parameters (i, P_i), i = 0, …, NumASC.

PRACH partitions shall be established using the information element "PRACH partition". The persistence values P_i to be associated with each ASC shall be derived from the dynamic persistence level N = 1,…, 8 which is broadcast in SIB 5, and the persistence scaling factors s_i, broadcast in System Information Block Type~~SIB~~ 5 and possibly also in ~~SIB~~ System Information Block Type 6, as follows:

- $P(N) = 2^{-(N-1)}$

ASC # *i*	0	1	2	3	4	5	6	7
P_i	1	P(N)	s_2 P(N)	s_3 P(N)	s_4 P(N)	s_5 P(N)	s_6P(N)	s_7 P(N)

Scaling factors s_i are provided optionally for $i = 2,\ldots,$ NumASC, where NumASC+1 is the number of ASCs as defined by PRACH partitioning. If no scaling factors are broadcast, default value 1 shall be used if NumASC ≥ 2.

If $k \geq 1$ scaling factors are broadcast and NumASC ≥ k+2 then the last scaling factor s_{k+1} shall be used as default for the ASCs where $i > k$ +1.

The set of ASC parameters is provided to MAC with the CMAC-Config-REQ primitive (see TS 25.321), the PRACH partitioning is provided to PHY using the CPHY-TrCH-Config-REQ primitive (see TS 25.302).

The ASC enumeration shall be such that it corresponds to the order of priority (ASC 0 = highest priority, ASC 7 = lowest priority). ASC 0 shall be used in case of Emergency Call or for reasons with equivalent priority.

At radio bearer setup/reconfiguration each involved logical channel is assigned a MAC Logical channel Priority (MLP) in the range 1,…,8. When the MAC sublayer is configured for RACH transmission in the UE, these MLP levels shall be employed for ASC selection on MAC.

8.5.15 Mapping of Access Classes to Access Service Classes

Access Classes shall only be applied at initial access, i.e. when sending an RRC CONNECTION REQUEST message. A mapping between Access Class (AC) and Access Service Class (ASC) shall be indicated by the information element "AC-to-ASC mapping" in SIB 5. The correspondence between AC and ASC shall be indicated as follows.

AC	0 - 9	10	11	12	13	14	15
ASC	1^{st} IE	2^{nd} IE	3^{rd} IE	4^{th} IE	5^{th} IE	6^{th} IE	7^{th} IE

In the table, "n^{th} IE" designates an ASC number i in the range 0 - 7 to AC.

For the random access, the parameters implied by the respective ASC shall be employed. In case the UE is member of several ACs it shall select the ASC for the highest AC number. In connected mode, AC shall not be applied.

8.5.16 PLMN Type Selection

The UE shall perform PLMN selection and reselection as stated in 3G TS 25.304 and store the identifier of the chosen PLMN in the variable SELECTED_PLMN as follows:

- If a GSM-MAP type of PLMN is selected, the UE shall set the "PLMN Type" in the variable SELECTED_PLMN to "GSM-MAP"and store the PLMN identity of that PLMN.
- If an ANSI-41 type of PLMN is selected, the UE shall set the "PLMN Type" in the variable SELECTED_PLMN to "ANSI-41" and store the System identification (SID) of that PLMN.

9 Protocol states

9.1 RRC States and State Transitions including GSM

Figure 55 shows the RRC states in Connected Mode, including transitions between UTRAN connected mode and GSM connected mode for PSTN/ISDN domain services, and between UTRAN connected mode and GSM/GPRS packet modes for IP domain services. It also shows the transitions between Idle Mode and UTRAN Connected Mode and further the transitions within UTRAN connected Mode.

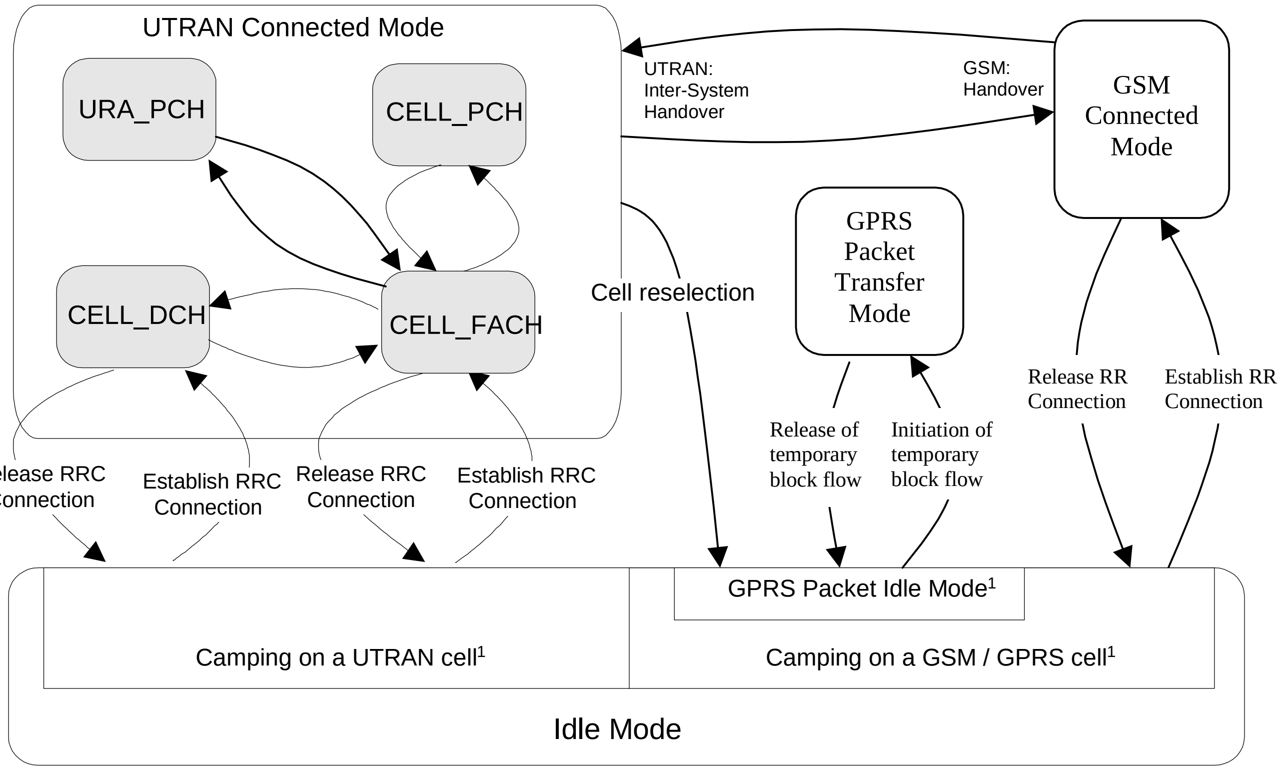


Figure 55: RRC States and State Transitions including GSM
[1: The indicated division within Idle Mode is only included for clarification and shall not be interpreted as states.]

It shall be noted that not all states may be applicable for all UE connections. For a given QoS requirement on the UE connection, only a subset of the states may be relevant.

After power on, the UE stays in Idle Mode until it transmits a request to establish an RRC Connection. In Idle Mode the connection of the UE is closed on all layers of the access stratum. In Idle Mode the UE is identified by non-access stratum identities such as IMSI, TMSI and P-TMSI. In addition, the UTRAN has no own information about the individual Idle Mode UEs, and it can only address e.g. all UEs in a cell or all UEs monitoring a paging occasion. The UE behaviour within this mode is described in [4].

The UTRAN Connected Mode is entered when the RRC Connection is established. The UE is assigned a radio network temporary identity (RNTI) to be used as UE identity on common transport channels.

NOTE: The exact definition of RRC connection needs further refinement.

The RRC states within UTRAN Connected Mode reflect the level of UE connection and which transport channels that can be used by the UE.

For inactive stationary data users the UE may fall back to PCH on both the Cell and URA levels. That is, upon the need for paging, the UTRAN shall check the current level of connection of the given UE, and decide whether the paging message shall be sent within the URA, or should it be sent via a specific cell.

9.2 Transition from Idle Mode to UTRAN Connected Mode

The transition to the UTRAN Connected Mode from the Idle Mode can only be initiated by the UE by transmitting a request for an RRC Connection. The event is triggered either by a paging request from the network or by a request from upper layers in the UE.

When the UE receives a message from the network that confirms the RRC connection establishment, the UE enters the CELL_FACH or CELL_DCH state of UTRAN Connected Mode.

In the case of a failure to establish the RRC Connection the UE goes back to Idle Mode. Possible causes are radio link failure, a received reject response from the network or lack of response from the network (timeout).

9.2.1 Transitions for Emergency Calls

Refer to 3G TS 25.304 for all states and procedures referred to in this subclause. When UE leaves idle mode from state *Camped on any cell* in order to make an emergency call, moving to state *Connected mode (emergency calls only)*, the UE shall use the *Immediate cell evaluation* procedure (UTRA only) in order to select the best cell on the current frequency for the access attempt. If no suitable cell is found, the UE shall use the *Any cell reselection*. When returning to idle mode, the UE shall use the procedure *Cell selection when leaving connected mode* in order to find a suitable cell to camp on, state *Camped on any cell*.

9.3 UTRAN Connected Mode States and Transitions

9.3.1 CELL_DCH state

The CELL_DCH state is characterised by

- A dedicated physical channel is allocated to the UE in uplink and downlink.
- The UE is known on cell level according to its current active set.
- Dedicated transport channels, downlink and uplink (TDD) shared transport channels, and a combination of these transport channels can be used by the UE.

The CELL_DCH-state is entered from the Idle Mode through the setup of an RRC connection, or by establishing a dedicated physical channel from the CELL_FACH state.

A PDSCH may be assigned to the UE in this state, to be used for a DSCH. In TDD a PUSCH may also be assigned to the UE in this state, to be used for a USCH. If PDSCH or PUSCH are used for TDD, a FACH transport channel may be assigned to the UE for reception of physical shared channel allocation messages.

9.3.1.1 Transition from CELL_DCH to Idle Mode

Transition to Idle Mode is realised through the release of the RRC connection.

9.3.1.2 Transition from CELL_DCH to CELL_FACH state

Transition to CELL_FACH state occurs when all dedicated channels have been released, which may be

a) via explicit signalling.

at the end of the time period for which the dedicated channel was allocated (TDD)

9.3.1.3 Radio Resource Allocation tasks (CELL_DCH)

For the DCH, several physical channel allocation strategies may be applied. The allocations can be either permanent (needing a DCH release message) or based on time or amount-of-data.

Resource allocation can be done separately for each packet burst with fast signalling on the DCH

For each radio frame the UE and the network indicate the current data rate (in uplink and downlink respectively) using the transport format combination indicator (TFCI). However, in TDD, DCH and DSCH or USCH may be mapped on different CCTrCHs, their TFCI are totally independent. DCH transmission is not modified by the simultaneous existence of DSCH/USCH. If the configured set of combinations (i.e. transport format set for one transport channel) are found to be insufficient to retain the QoS requirements for a transport channel, the network initiates a reconfiguration of the transport format set (TFS) for that transport channel. This reconfiguration can be done during or in between data transmission. Further, the network can reconfigure the physical channel allowing an increase or decrease of the peak data rate.

For the uplink data transmission, the UE reports the observed traffic volume to the network in order for the network to re-evaluate the current allocation of resources. This report contains e.g. the amount of data to be transmitted or the buffer status in the UE.

9.3.1.4 RRC Connection mobility tasks (CELL_DCH)

Depending on the amount and frequency of data macrodiversity (soft handover) may or may not be applied.

The RRC Connection mobility is handled by measurement reporting, soft handover and hard handover procedures.

9.3.1.5 UE Measurements (CELL_DCH)

The UE shall perform measurements and transmit measurement reports according to the measurement control information.

The UE shall use the connected mode measurement control information received in other states until new measurement control information has been assigned to the UE.

9.3.1.6 Acquisition of system information (CELL_DCH)

FDD UEs with certain capabilities shall read system information broadcast on FACH.

TDD UEs shall read the BCH to acquire valid system information. For each acquisition, the UE may need different combinations of system information broadcast on BCH. The scheduling on the broadcast channel is done in such way that the UE knows when the requested information can be found.

9.3.2 CELL_FACH state

The CELL_FACH state is characterised by:

- No dedicated physical channel is allocated to the UE.
- The UE continuously monitors a FACH in the downlink.
- The UE is assigned a default common or shared transport channel in the uplink (e.g. RACH) that it can use anytime according to the access procedure for that transport channel.
- The position of the UE is known by UTRAN on cell level according to the cell where the UE last made a cell update.
- In TDD mode, one or several USCH or DSCH transport channels may have been established.

In the CELL_FACH substate the UE shall perform the following actions:

- listens to an FACH;
- listens to the BCH transport channel of the serving cell for the decoding of system information messages;
- initiates a cell update procedure on cell change of another UTRA cell;
- use C-RNTI assigned in the current cell as the UE identity on common transport channels except for when a new cell is selected;
- transmits uplink control signals and small data packets on the RACH;
- in FDD mode, transmits uplink control signals and larger data packets on CPCH when resources are allocated to cell and UE is assigned use of those CPCH resources;
- in TDD mode, transmits signalling messages or user data in the uplink and/or the downlink using USCH and/or DSCH when resources are allocated to the cell and the UE is assigned use of those USCH/DSCH resources;
- in TDD mode, transmits measurement reports in the uplink using USCH when resources are allocated to it in order to trigger a handover procedure in the UTRAN.

9.3.2.1 Transition from CELL_FACH to CELL_DCH state

A transition occurs, when a dedicated physical channel is established via explicit signalling.

9.3.2.2 Transition from CELL_FACH to CELL_PCH state

The transition occurs when UTRAN orders the UE to move to CELL_PCH state, which is done via explicit signalling..

9.3.2.3 Transition from CELL_FACH to Idle Mode

Upon release of the RRC connection, the UE moves to the idle mode.

9.3.2.4 Transition from CELL_FACH to URA_PCH State

The transition occurs when UTRAN orders the UE to move to URA _PCH state, which is done via explicit signalling e.g. Upon completion of the URA update procedure.

9.3.2.5 Radio Resource Allocation Tasks (CELL_FACH)

In the CELL_ FACH state the UE will monitor an FACH. It is enabled to transmit uplink control signals and it may be able to transmit small data packets on the RACH.

The network can assign the UE transport channel parameters (e.g. transport format sets) in advance, to be used when a DCH is used. Upon assignment of the physical channel for DCH, the UE shall move to CELL_DCH state and use the pre-assigned TFS for the DCH.

If no UE dedicated physical channel or transport channel configuration has been assigned, the UE shall use the common physical channel and transport channel configuration according to the system information.

For the uplink data transmission, the UE reports the observed traffic volume to the network in order for the network to re-evaluate the current allocation of resources. This report contains e.g. the amount of data to be transmitted or the buffer status in the UE.

When there is either user or control data to transmit, a selection procedure determines whether the data should be transmitted on a common transport channel, or if a transition to CELL_DCH should be executed. The selection is dynamic and depends on e.g. traffic parameters (amount of data, packet burst frequency).

In FDD mode, the UTRAN can assign CPCH resources to the UE in CELL_FACH state. When CPCH resources are assigned, the UE will continue to monitor FACHs. The UE may use the RACH to transmit uplink control signals and small data packets. The UE also may choose to transmit data packets, larger than those carried on the RACH, on the CPCH channel. The UE selects either the RACH or one of the CPCH channels to make maximum use of the capacity available on that channel.

In FDD mode, the UE provides the UTRAN with CPCH measurement data, which includes data, queue depth (current size of data buffers), average access time for each CPCH channel used, and average traffic volume on each CPCH channel used. With these measures, the UTRAN can reallocate network resources on a periodic basis. The UTRAN allocates CPCH Sets to each cell and assigns UEs to one of the cell's CPCH Sets. The UEs can dynamically access the CPCH resources without further UTRAN control.

In the TDD mode, the UTRAN can assign USCH / DSCH resources to the UE in CELL_FACH state. When USCH / DSCH resources are assigned, the UE will continue to monitor FACHs, depending on the UE capability. The UE may use the USCH / DSCH to transmit signalling messages or user data in the uplink and / or the downlink using USCH and / or DSCH when resources are allocated to cell and UE is assigned use of those USCH / DSCH.

For the uplink data transmission on USCH the UE reports to the network the traffic volume (current size of RLC data buffers), The UTRAN can use these measurement reports to re-evaluate the current allocation of the USCH / DSCH resources.

9.3.2.6 RRC Connection mobility tasks (CELL_FACH)

In this state the location of the UE is known on cell level. A cell update procedure is used to report to the UTRAN, when the UE selects a new cell to observe the common downlink channels of a new cell. Downlink data transmission on the FACH can be started without prior paging.

The UE monitors the broadcast channel and system information on BCCH of its own and neighbour cells and from this the need for the updating of cell location is identified.

The UE shall perform cell reselection and upon selecting a new UTRA cell, it shall initiate a cell update procedure. Upon selecting a new cell belonging to another radio access system than UTRA, the UE shall enter idle mode and make an access to that system according to its specifications.

9.3.2.7 UE Measurements (CELL_FACH)

The UE shall perform measurements and transmit measurement reports according to the measurement control information.

By default, the UE shall use the measurement control information broadcast within the system information. However, for measurements for which the network also provides measurement control information within a MEASUREMENT CONTROL message, the latter information takes precedence.

9.3.2.8 Transfer and update of system information (CELL_FACH)

The UE shall read the BCH to acquire valid system information. For each acquisition, the UE may need different combinations of system information broadcast on BCH. The scheduling on the broadcast channel is done in such way that the UE knows when the requested information can be found.

When the system information is modified, the scheduling information is updated to reflect the changes in system information transmitted on BCH. The new scheduling information is broadcast on FACH in order to inform UEs about the changes. If the changes are applicable for the UE, the modified system information is read on BCH.

9.3.3 CELL_PCH state

The CELL_PCH state is characterised by:

- No dedicated physical channel is allocated to the UE.
- The UE uses DRX for monitoring a PCH via an allocated PICH.
- No uplink activity is possible.
- The position of the UE is known by UTRAN on cell level according to the cell where the UE last made a cell update in CELL_FACH state.

In this state the UE shall perform the following actions:

- monitor the paging occasions according to the DRX cycle and receive paging information on the PCH;
- listens to the BCH transport channel of the serving cell for the decoding of system information messages;
- initiates a cell update procedure on cell change;
- a UE supporting Cell Broadcast Service (CBS) shall be capable to receive BMC messages in the CELL_PCH RRC state.

The DCCH logical channel cannot be used in this sub. If the network wants to initiate any activity, it needs to make a paging request on the PCCH logical channel in the known cell to initiate any downlink activity.

9.3.3.1 Transition from CELL_PCH to CELL_FACH state

The UE is transferred to CELL_FACH state either by paging from UTRAN or through any uplink access.

9.3.3.2 Radio Resource Allocation Tasks (CELL_PCH)

In CELL_PCH state no resources have been granted for data transmission. For this purpose, a transition to another state has to be executed.

The UE may use Discontinuous Reception (DRX) in order to reduce power consumption. When DRX is used the UE needs only to receive at one paging occasion per DRX cycle. The UE may be instructed to use a specific DRX cycle length by the network. The UE shall determine its paging occasions in the same way as for Idle Mode, see [4].

9.3.3.3 RRC Connection mobility tasks (CELL_PCH)

In the CELL_PCH state, the UE mobility is performed through cell reselection procedures, which may differ from the one defined in [4].

The UE shall perform cell reselection and upon selecting a new UTRA cell, it shall move to CELL_FACH state and initiate a cell update procedure in the new cell. After the cell update procedure has been performed, the UE shall change its state back to CELL_PCH state if neither the UE nor the network has any more data to transmit.

Upon selecting a new cell belonging to another radio access system than UTRA, the UE shall enter idle mode and make an access to that system according to its specifications.

In case of low UE activity, UTRAN may want to reduce the cell-updating overhead by ordering the UE to move to the URA_PCH State. This transition is made via the CELL_FACH state. UTRAN may apply an inactivity timer, and optionally, a counter, which counts the number of cell updates e.g. UTRAN orders the UE to move to URA_PCH when the number of cell updates has exceeded certain limits (network parameter).

9.3.3.4 UE Measurements (CELL_PCH)

The UE shall perform measurements and transmit measurement reports according to the measurement control information.

The UE shall use the measurement control information according to the system information when no UE dedicated measurement control information has been assigned.

9.3.3.5 Transfer and update of system information (CELL_PCH)

The UE shall read the BCH to acquire valid system information. For each acquisition, the UE may need different combinations of system information broadcast on BCH. The scheduling on the broadcast channel is done in such way that the UE knows when the requested information can be found.

9.3.4 URA_PCH State

The URA_PCH state is characterised by:

- No dedicated channel is allocated to the UE.
- The UE uses DRX for monitoring a PCH via an allocated PICH.
- No uplink activity is possible.
- The location of the UE is known on UTRAN Registration area level according to the URA assigned to the UE during the last URA update in CELL_FACH state.

In this state the UE performs the following actions:

- monitor the paging occasions according to the DRX cycle and receive paging information on the PCH;
- listens to the BCH transport channel of the serving cell for the decoding of system information messages;
- initiates a URA updating procedure on URA change;
- a UE supporting Cell Broadcast Service (CBS) shall be capable to receive BMC messages in the URA_PCH RRC state.

The DCCH logical channel cannot be used in this state. If the network wants to initiate any activity, it needs to make a paging request on the PCCH logical channel within the URA where the location of the UE is known. If the UE needs to transmit anything to the network, it goes to the CELL_FACH state. The transition to URA_PCH State can be controlled with an inactivity timer, and optionally, with a counter which counts the number of cell updates. When the number of cell updates has exceeded certain limits (a network parameter), then the UE changes to the URA_PCH State.

URA updating is initiated by the UE, which, upon the detection of the Registration area, sends the network the Registration area update information on the RACH of the new cell.

9.3.4.1 Transition from URA_PCH State to CELL_FACH State (URA_PCH)

Any activity causes the UE to be transferred to CELL_ FACH State. Uplink access is performed by RACH .

Note that the release of an RRC connection is not possible in the URA_PCH State. The UE will first move to CELL_FACH State to perform the release signalling.

9.3.4.2 Radio Resource Allocation Tasks (URA _PCH)

In URA_PCH State no resources have been granted for data transmission. For this purpose, a transition to CELL_FACH State has to be executed.

The UE may use Discontinuous Reception (DRX) in order to reduce power consumption. When DRX is used the UE needs only to receive at one paging occasion per DRX cycle. The UE may be instructed to use a specific DRX cycle length by the network. The UE shall determine its paging occasions in the same way as for Idle Mode, see [4].

9.3.4.3 RRC Connection mobility tasks (URA_PCH)

In URA_PCH State the location of a UE is known on UTRAN Registration area level.

In this state, the UE mobility is performed through URA reselection procedures, which may differ from the definitions in S2.04. The UE shall perform cell reselection and upon selecting a new UTRA cell belonging to an URA which does not match the URA used by the UE, the UE shall move to CELL_FACH state and initiates a URA update towards the network. After the URA update procedure has been performed, the UE shall change its state back to URA_PCH state if neither the UE nor the network has any more data to transmit.

Upon selecting a new cell belonging to another radio access system than UTRA, the UE shall enter idle mode and make an access to that system according to its specifications (FFS).

9.3.4.4 UE Measurements (URA_PCH)

The UE shall perform measurements and transmit measurement reports according to the measurement control information.

The UE shall use the measurement control information according to the system information when no UE dedicated measurement control information has been assigned.

9.3.4.5 Transfer and update of system information (URA_PCH)

The same mechanisms to transfer and update system information as for state CELL_PCH are applicable for UEs in URA_PCH state.

9.3.x States and Transitions for Cell Reselection in URA_PCH, CELL_PCH, and CELL_FACH

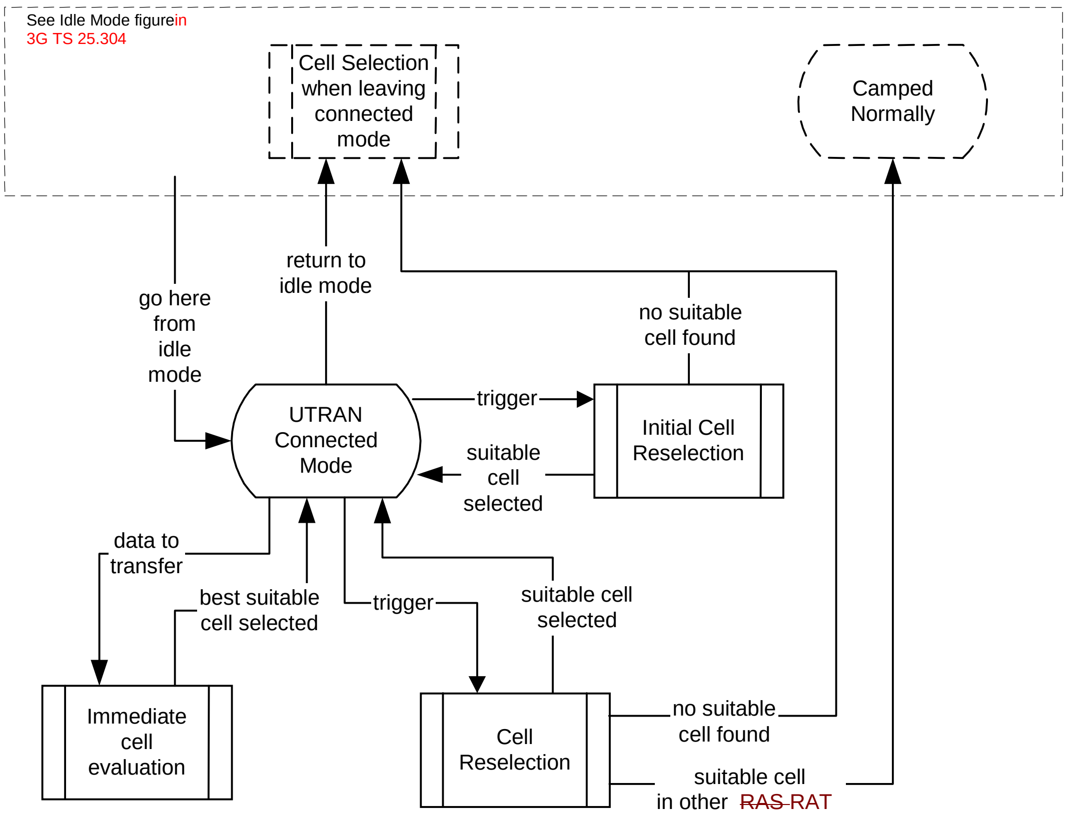


Figure x: UTRAN Connected mode cell reselection for URA_PCH, CELL_PCH, and CELL_FACH

In some states the UE shall perform cell reselection procedures. The UE shall select a suitable cell (defined in 3G TS 25.304) and radio access technology based on connected mode radio measurements and cell reselection criteria.

Figure x shows the states and procedures in the cell reselection process in connected mode.

When a cell reselection is triggered, the UE shall evaluate the cell reselection criteria based on radio measurements, and if a better cell is found that cell is selected, procedure *Cell reselection* (see 3G TS 25.304). If the change of cell implies a change of radio access technology, the RRC connection is released, and the UE enters idle mode of the other RAT. If no suitable cell is found in the cell reselection procedure, the RRC connection is released, and the UE enters idle mode.

,.The UE shall use the *Immediate cell evaluation* procedure (see 3G TS 25.304) to select the best suitable cell prior to any access attempt, according to the immediate cell evaluation criteria. Constraints on the use of this procedure are specified in subclause xxxxxx.

When an Initial cell *reselection* is triggered, the UE shall use the *Initial cell reselection* procedure (see 3G TS 25.304) to find a suitable cell. The cases where this may be triggered are specified in subclause xxxxx. One example where this procedure is triggered is at radio link failure, where the UE may trigger an initial cell reselection in order to request re-establishment of the RRC connection. If the UE is unable to find a suitable cell, the UE shall release the RRC connection and enter idle mode.

9.4 Inter-system handover with PSTN/ISDN domain services

When using PSTN / ISDN domain services, UTRAN is using an Inter-Radio access system Handover Procedure and GSM is using a Handover procedure for the transition from UTRAN Connected Mode to GSM Connected Mode.

9.5 Inter-system handover with IP domain services

When using IP domain services, the UE initiates cell reselection from a GSM/GPRS cell to a UTRAN cell and then uses the RRC Connection Establishment procedure for the transition to UTRAN Connected mode.

When the RRC Connection is established from Idle Mode (GPRS Packet Idle Mode) the RRC CONNECTION REQUEST message contains an indication, that UTRAN needs to continue an already established GPRS UE context from the CN. This indication allows UTRAN to e.g. prioritise the RRC CONNECTION REQUEST from the UE.

In UTRAN connected mode UTRAN is using UE or network initiated cell reselection to change from a UTRAN cell to a GSM/GPRS cell. If the cell reselection was successful the UE enters Idle Mode (GPRS Packet Idle Mode). The UE sends a packet channel request from Idle Mode (GPRS Packet Idle mode) to establish a Temporary Block flow and enter GPRS Packet Transfer Mode. In the GPRS Packet Transfer Mode the UE sends a RA Update request message. The RA Update Request message sent from the UE contains an indication that GSM/GPRS need to continue an already established UTRAN UE context from the CN. This means that the RA Update request is always sent for the transition from UTRAN Connected Mode to GSM/GPRS regardless if the RA is changed or not.

NOTE: The reason for using RA update instead of a new message is to reduce the impact on the existing GSM/GPRS specification.

9.6 Inter-system handover with simultaneous IP and PSTN/ISDN domain services

NOTE: This is an initial assumption that needs to be seen by SMG2 and requiring checking by SMG2, when the work on this item has progressed.

9.6.1 Inter-system handover UTRAN to GSM / BSS

For a UE in CELL_DCH state using both PSTN / ISDN and IP Domain services the Inter-system handover procedure is based on measurement reports from the UE but initiated from UTRAN.

The UE performs the Inter-system handover from UTRAN Connected Mode to GSM Connected Mode first. When the UE has sent handover complete message to GSM / BSS the UE initiates a temporary block flow towards GPRS and sends a RA update request.

If the Inter-system handover from UTRAN Connected Mode to GSM Connected Mode was successful the handover is considered as successful regardless if the UE was able to establish a temporary block flow or not towards GPRS.

In case of Inter-system handover failure the UE has the possibility to go back to UTRAN Connected Mode and re-establish the connection in the state it originated from without attempting to establish a temporary block flow. If the UE has the option to try to establish a temporary block flow towards GSM / GPRS after Inter-system handover failure is FFS.

9.6.2 Inter-system handover GSM / BSS to UTRAN

For a UE in GSM Connected Mode using both PSTN / ISDN and IP domain services the Inter-system handover procedure is based on measurement reports from the UE but initiated from GSM / BSS.

The UE performs the Inter-system handover from GSM Connected Mode to UTRAN Connected Mode.

In UTRAN Connected Mode both services are established in parallel.

If the Inter-System handover from GSM Connected mode to UTRAN Connected Mode was successful the handover is considered as successful.

In case of Inter-system handover failure the UE has the possibility to go back to GSM Connected Mode and re-establish the connection in the state it originated from.

10 Message and information element functional definition and content

10.2.51 SIGNALLING CONNECTION RELEASE REQUEST

This message is used by the UE to request for the release of ~~one or more signalling connections to a CN domain~~ a signalling flow.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Need	Multi	IE type and reference	Semantics description
Message Type	MP		Message type	
CN information elements				
~~Signalling Flow related information~~		~~1 to <maxFlowID>~~		~~Flow identifier to be provided for each signalling flow to be released.~~
~~>~~Flow Identifier	MP		Flow Identifier 10.3.1.4	Flow identifier of signalling flow to be released by UTRAN.~~Allocated by UE for a particular session~~

~~**Multi Bound**~~	~~**Explanation**~~
~~*MaxFlowId*~~	~~Maximum number of flow identifiers~~

11 Message and Information element abstract syntax (with ASN.1)

.
.
.
.
.

11.2 PDU definitions

.
.
.
.
.
.
.
.
.

```
-- ***************************************************
--
-- SIGNALLING CONNECTION RELEASE REQUEST
--
-- ***************************************************
```

```
SignallingConnectionReleaseRequest ::= SEQUENCE {
    -- Core network IEs
        signallingFlowInfoList          SignallingFlowInfoList,
        flowIdentifier                  FlowIdentifier,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL}
```

3GPP TSG RAN WG2 #15
Sophia Antipolis, France, August 21– 25, 2000

***Document* R2-001835**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.331 CR 533r1 Current Version: 3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-RAN #9
list expected approval meeting # here ↑

for approval	X	strategic		*(for SMG use only)*
for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: TSG-RAN WG2 **Date:** 24.08.2000

Subject: Message extensibility

Work item:

Category:
(only one category shall be marked with an X)

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: This CR presents a message extension mechanism which allows the receiver to quickly find out whether the message contains critical extensions that cannot be understood. Also, it offers the possibility to redefine messages partly or completely in future releases. No changes have been made to messages which contain the possibility to include only non-critical extensions. In revision 1 of this CR the OPTIONAL regarding non-critical information elements was removed.

Clauses affected: 11.2, 11.3.8

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

help.doc

<---------- double-click here for help and instructions on how to create a CR.

11.2 PDU definitions

```
--**************************************************************
--
-- TABULAR: The message type and integrity check info are not
-- visible in this module as they are defined in the class module.
-- Also, all FDD/TDD specific choices have the FDD option first
-- and TDD second, just for consistency.
--
--**************************************************************

PDU-definitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

--**************************************************************
--
-- IE parameter types from other modules
--
--**************************************************************

IMPORTS

    CN-DomainIdentity,
    CN-InformationInfo,
    FlowIdentifier,
    NAS-Message,
    PagingRecordTypeID,
    ServiceDescriptor,
    SignallingFlowInfoList
FROM CoreNetwork-IEs

    URA-Identity
FROM UTRANMobility-IEs

    ActivationTime,
    C-RNTI,
    CapabilityUpdateRequirement,
    CellUpdateCause,
    CipheringAlgorithm,
    CipheringModeInfo,
    DRX-Indicator,
    EstablishmentCause,
    FailureCauseWithProtErr,
    HyperFrameNumber,
    InitialUE-Identity,
    IntegrityProtActivationInfo,
    IntegrityProtectionModeInfo,
    PagingCause,
    PagingRecordList,
    ProtocolErrorIndicator,
    ProtocolErrorIndicatorWithInfo,
    Re-EstablishmentTimer,
    RedirectionInfo,
    RejectionCause,
    ReleaseCause,
    RRC-MessageTX-Count,
    SecurityCapability,
    STARTList,
    U-RNTI,
    U-RNTI-Short,
    UE-RadioAccessCapability,
    URA-UpdateCause,
    UTRAN-DRX-CycleLengthCoefficient,
    WaitTime
FROM UserEquipment-IEs

    PredefinedConfigIdentity,
    RAB-Info,
    RAB-InformationSetupList,
    RB-ActivationTimeInfo,
    RB-ActivationTimeInfoList,
    RB-COUNT-C-InformationList,
    RB-COUNT-C-MSB-InformationList,
    RB-IdentityList,
    RB-InformationAffectedList,
```

```
	RB-InformationReconfigList,
	RB-InformationReleaseList,
	RB-InformationSetupList,
	RB-WithPDCP-InfoList,
	SRB-InformationSetupList,
	SRB-InformationSetupList2
FROM RadioBearer-IEs

	CPCH-SetID,
	DL-AddReconfTransChInfo2List,
	DL-AddReconfTransChInfoList,
	DL-CommonTransChInfo,
	DL-DeletedTransChInfoList,
	DRAC-StaticInformationList,
	TFC-Subset,
	UL-AddReconfTransChInfoList,
	UL-CommonTransChInfo,
	UL-DeletedTransChInfoList
FROM TransportChannel-IEs

	AllocationPeriodInfo,
	CCTrCH-PowerControlInfo,
	ConstantValue,
	CPCH-SetInfo,
	DL-CommonInformation,
	DL-CommonInformationPost,
	DL-InformationPerRL,
	DL-InformationPerRL-List,
	DL-InformationPerRL-ListPost,
	DL-DPCH-PowerControlInfo,
	DL-OuterLoopControl,
	DL-PDSCH-Information,
	DPCH-CompressedModeStatusInfo,
	FrequencyInfo,
	IndividualTS-InterferenceList,
	MaxAllowedUL-TX-Power,
	PDSCH-Info,
	PRACH-RACH-Info,
	PrimaryCCPCH-TX-Power,
	PUSCH-CapacityAllocationInfo,
	RL-AdditionInformationList,
	RL-RemovalInformationList,
	SSDT-Information,
	TFC-ControlDuration,
	TimeslotList,
	TX-DiversityMode,
	UL-ChannelRequirement,
	UL-DPCH-Info,
	UL-DPCH-InfoPost,
	UL-TimingAdvance
FROM PhysicalChannel-IEs

	AdditionalMeasurementID-List,
	EventResults,
	MeasuredResults,
	MeasuredResultsList,
	MeasuredResultsOnRACH,
	MeasurementCommand,
	MeasurementIdentityNumber,
	MeasurementReportingMode,
	PrimaryCCPCH-RSCP,
	TimeslotListWithISCP,
	TrafficVolumeMeasuredResultsList
FROM Measurement-IEs

	BCCH-ModificationInfo,
	InterSystemHO-Failure,
	InterSystemMessage,
	ProtocolErrorInformation,
	SegCount,
	SegmentIndex,
	SFN-Prime,
	SIB-Data-fixed,
	SIB-Data-variable,
	SIB-Type
FROM Other-IEs

	maxSIBsegm
```

```
FROM Constant-definitions;

-- ***************************************************
--
-- ACTIVE SET UPDATE (FDD only)
--
-- ***************************************************

ActiveSetUpdate ::= CHOICE {
    v1                              SEQUENCE {
        v1-IEs                          ActiveSetUpdate-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

ActiveSetUpdate-v1-IEs ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        activationTime                  ActivationTime                      OPTIONAL,
        newU-RNTI                       U-RNTI                              OPTIONAL,
    -- Core network IEs
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- Radio bearer IEs
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Physical channel IEs
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
        rl-AdditionInformationList      RL-AdditionInformationList          OPTIONAL,
        rl-RemovalInformationList       RL-RemovalInformationList           OPTIONAL,
        tx-DiversityMode                TX-DiversityMode                    OPTIONAL,
        ssdt-Information                SSDT-Information                    OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- ACTIVE SET UPDATE COMPLETE (FDD only)
--
-- ***************************************************

ActiveSetUpdateComplete ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
    -- Radio bearer IEs
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfo               OPTIONAL,
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- ACTIVE SET UPDATE FAILURE (FDD only)
--
-- ***************************************************

ActiveSetUpdateFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- CELL UPDATE
--
-- ***************************************************

CellUpdate ::= SEQUENCE {
    -- User equipment IEs
        u-RNTI                          U-RNTI,
        hyperFrameNumber                HyperFrameNumber,
        am-RLC-ErrorIndicationC-plane   BOOLEAN,
        am-RLC-ErrorIndicationU-plane   BOOLEAN,
```

```
		cellUpdateCause				CellUpdateCause,
		protocolErrorIndicator			ProtocolErrorIndicatorWithInfo,
		-- TABULAR: Protocol error information is nested in
		-- ProtocolErrorIndicatorWithInfo.
	-- Measurement IEs
		measuredResultsOnRACH			MeasuredResultsOnRACH			OPTIONAL,
	-- Extension mechanism for non- release99 information
		nonCriticalExtensions			SEQUENCE {}				OPTIONAL
}

-- ***************************************************
--
-- CELL UPDATE CONFIRM
--
-- ***************************************************

CellUpdateConfirm ::= CHOICE {
	v1					SEQUENCE {
		v1-IEs					CellUpdateConfirm-v1-IEs,
		nonCriticalExtensions			SEQUENCE {}				OPTIONAL
	},
	criticalExtensions			SEQUENCE {}
}

CellUpdateConfirm-v1-IEs ::= SEQUENCE {
	-- User equipment IEs
		integrityProtectionModeInfo		IntegrityProtectionModeInfo		OPTIONAL,
		cipheringModeInfo			CipheringModeInfo			OPTIONAL,
		new-U-RNTI				U-RNTI					OPTIONAL,
		new-C-RNTI				C-RNTI					OPTIONAL,
		drx-Indicator				DRX-Indicator,
		utran-DRX-CycleLengthCoeff		UTRAN-DRX-CycleLengthCoefficient	OPTIONAL,
		rlc-ResetIndicatorC-Plane		BOOLEAN,
		rlc-ResetIndicatorU-Plane		BOOLEAN,
 -- CN information elements
		cn-InformationInfo			CN-InformationInfo			OPTIONAL,
	-- UTRAN mobility IEs
		ura-Identity				URA-Identity				OPTIONAL,
	-- Radio bearer IEs
		rb-WithPDCP-InfoList			RB-WithPDCP-InfoList			OPTIONAL,
	-- Physical channel IEs
		maxAllowedUL-TX-Power			MaxAllowedUL-TX-Power			OPTIONAL,
		prach-RACH-Info				PRACH-RACH-Info				OPTIONAL,
		dl-InformationPerRL			DL-InformationPerRL			OPTIONAL,
	-- Extension mechanism for non- release99 information
		criticalExtension			SEQUENCE {}				OPTIONAL,
		nonCriticalExtensions			SEQUENCE {}				OPTIONAL
}

-- ***************************************************
--
-- COUNTER CHECK
--
-- ***************************************************

CounterCheck ::= CHOICE {
	v1					SEQUENCE {
		v1-IEs					CounterCheck-v1-IEs,
		nonCriticalExtensions			SEQUENCE {}				OPTIONAL
	},
	criticalExtensions			SEQUENCE {}
}

CounterCheck-v1-IEs ::= SEQUENCE {
	-- Radio bearer IEs
		rb-COUNT-C-MSB-InformationList	RB-COUNT-C-MSB-InformationList,
	-- Extension mechanism for non- release99 information
		criticalExtension			SEQUENCE {}				OPTIONAL,
		nonCriticalExtensions			SEQUENCE {}				OPTIONAL
}

-- ***************************************************
--
-- COUNTER CHECK RESPONSE
--
-- ***************************************************

CounterCheckResponse ::= SEQUENCE {
```

```
    -- Radio bearer IEs
        rb-COUNT-C-InformationList      RB-COUNT-C-InformationList          OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- DOWNLINK DIRECT TRANSFER
--
-- ***************************************************

DownlinkDirectTransfer ::= CHOICE {
    v1                              SEQUENCE {
        v1-IEs                          DownlinkDirectTransfer-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

DownlinkDirectTransfer-v1-IEs ::= SEQUENCE {
    -- Core network IEs
        cn-DomainIdentity               CN-DomainIdentity,
        nas-Message                     NAS-Message,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- DOWNLINK OUTER LOOP CONTROL
--
-- ***************************************************

DownlinkOuterLoopControl ::= CHOICE {
    v1                              SEQUENCE {
        v1-IEs                          DownlinkOuterLoopControl-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

DownlinkOuterLoopControl-v1-IEs ::= SEQUENCE {
    -- Physical channel IEs
        dl-OuterLoopControl             DL-OuterLoopControl,
        dl-DPCH-PowerControlInfo        DL-DPCH-PowerControlInfo            OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- HANDOVER TO UTRAN COMMAND
--
-- ***************************************************

HandoverToUTRANCommand ::= CHOICE {
    v1                              SEQUENCE {
        v1-IEs                          HandoverToUTRANCommand-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

HandoverToUTRANCommand-v1-IEs ::= SEQUENCE {
    -- User equipment IEs
        new-U-RNTI                      U-RNTI-Short,
        activationTime                  ActivationTime                      OPTIONAL,
        cipheringAlgorithm              CipheringAlgorithm                  OPTIONAL,
    -- Radio bearer IEs
        rab-Info                        RAB-Info,
    -- Specification mode information
        specificationMode               CHOICE {
            complete                        SEQUENCE {
                re-EstablishmentTimer           Re-EstablishmentTimer,
                srb-InformationSetupList        SRB-InformationSetupList,
```

```
				rb-InformationSetupList			RB-InformationSetupList,
				ul-CommonTransChInfo			UL-CommonTransChInfo,
				ul-AddReconfTransChInfoList		UL-AddReconfTransChInfoList,
				dl-CommonTransChInfo			DL-CommonTransChInfo,
				dl-AddReconfTransChInfoList		DL-AddReconfTransChInfoList,
				ul-DPCH-Info					UL-DPCH-Info,
				modeSpecificInfo				CHOICE {
					fdd								SEQUENCE {
						dl-CommonInformation			DL-CommonInformation,
						dl-PDSCH-Information			DL-PDSCH-Information OPTIONAL,
						cpch-SetInfo					CPCH-SetInfo		OPTIONAL
					},
					tdd								NULL
				},
				dl-InformationPerRL-List		DL-InformationPerRL-List
			},
			preconfiguration				SEQUENCE {
				predefinedConfigIdentity		PredefinedConfigIdentity,
				ul-DPCH-Info					UL-DPCH-InfoPost,
				modeSpecificInfo				CHOICE {
					fdd								SEQUENCE {
						dl-CommonInformationPost		DL-CommonInformationPost
					},
					tdd								NULL
				},
				dl-InformationPerRL-List		DL-InformationPerRL-ListPost
			}
		},
	-- Physical channel IEs
		frequencyInfo					FrequencyInfo,
		maxAllowedUL-TX-Power			MaxAllowedUL-TX-Power,
		modeSpecificPhysChInfo			CHOICE {
			fdd								NULL,
			tdd								SEQUENCE {
				primaryCCPCH-TX-Power			PrimaryCCPCH-TX-Power
			}
		},
	-- Extension mechanism for non- release99 information
		criticalExtension				SEQUENCE {}						OPTIONAL,
		nonCriticalExtensions			SEQUENCE {}						OPTIONAL
}

-- ***************************************************
--
-- HANDOVER TO UTRAN COMPLETE
--
-- ***************************************************

HandoverToUTRANComplete ::= SEQUENCE {
	-- User equipment IEs
	-- TABULAR: the IE below is conditional on history.
		startList						STARTList						OPTIONAL,
	-- Extension mechanism for non- release99 information
		nonCriticalExtensions			SEQUENCE {}						OPTIONAL
}

-- ***************************************************
--
-- INITIAL DIRECT TRANSFER
--
-- ***************************************************

InitialDirectTransfer ::= SEQUENCE {
	-- Core network IEs
		serviceDescriptor				ServiceDescriptor,
		flowIdentifier					FlowIdentifier,
		cn-DomainIdentity				CN-DomainIdentity,
		nas-Message						NAS-Message,
	-- Measurement IEs
		measuredResultsOnRACH			MeasuredResultsOnRACH			OPTIONAL,
	-- Extension mechanism for non- release99 information
		nonCriticalExtensions			SEQUENCE {}						OPTIONAL
}

-- ***************************************************
--
-- INTER-SYSTEM HANDOVER COMMAND
--
```

```
-- ***************************************************

InterSystemHandoverCommand ::= CHOICE {
    v1                              SEQUENCE {
        v1-IEs                          InterSystemHandoverCommand-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                          OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

InterSystemHandoverCommand-v1-IEs ::= SEQUENCE {
    -- User equipment IEs
        activationTime                  ActivationTime                       OPTIONAL,
    -- Radio bearer IEs
        remainingRAB-Info               RAB-Info                             OPTIONAL,
    -- Other IEs
        interSystemMessage              InterSystemMessage,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                          OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                          OPTIONAL
}

-- ***************************************************
--
-- INTER-SYSTEM HANDOVER FAILURE
--
-- ***************************************************

InterSystemHandoverFailure ::= SEQUENCE {
    -- Other IEs
        interSystemHO-Failure           InterSystemHO-Failure                OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                          OPTIONAL
}

-- ***************************************************
--
-- MEASUREMENT CONTROL
--
-- ***************************************************

MeasurementControl ::= CHOICE {
    v1                              SEQUENCE {
        v1-IEs                          MeasurementControl-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                          OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

MeasurementControl-v1-IEs ::= SEQUENCE {
    -- Measurement IEs
        measurementIdentityNumber       MeasurementIdentityNumber,
        measurementCommand              MeasurementCommand,
        -- TABULAR: The measurement type is included in MeasurementCommand.
        measurementReportingMode        MeasurementReportingMode             OPTIONAL,
        additionalMeasurementList       AdditionalMeasurementID-List         OPTIONAL,
    -- Physical channel IEs
        dpch-CompressedModeStatusInfo   DPCH-CompressedModeStatusInfo        OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                          OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                          OPTIONAL
}

-- ***************************************************
--
-- MEASUREMENT CONTROL FAILURE
--
-- ***************************************************

MeasurementControlFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                          OPTIONAL
}

-- ***************************************************
--
```

```
-- MEASUREMENT REPORT
--
-- ***************************************************

MeasurementReport ::= SEQUENCE {
    -- Measurement IEs
        measurementIdentityNumber       MeasurementIdentityNumber,
        measuredResults                 MeasuredResults                     OPTIONAL,
        additionalMeasuredResults       MeasuredResultsList                 OPTIONAL,
        eventResults                    EventResults                        OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- PAGING TYPE 1
--
-- ***************************************************

PagingType1 ::= SEQUENCE {
    -- User equipment IEs
        pagingRecordList                PagingRecordList                    OPTIONAL,
    -- Other IEs
        bcch-ModificationInfo           BCCH-ModificationInfo               OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- PAGING TYPE 2
--
-- ***************************************************

PagingType2 ::= SEQUENCE {
    -- User equipment IEs
        pagingCause                     PagingCause,
    -- Core network IEs
        cn-DomainIdentity               CN-DomainIdentity,
        pagingRecordTypeID              PagingRecordTypeID,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- PHYSICAL CHANNEL RECONFIGURATION
--
-- ***************************************************

PhysicalChannelReconfiguration ::= CHOICE {
    v1                                  SEQUENCE {
        v1-IEs                          PhysicalChannelReconfiguration-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
    },
    criticalExtensions                  SEQUENCE {}
}

PhysicalChannelReconfiguration-v1-IEs ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        activationTime                  ActivationTime                      OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
    -- Core network IEs
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- Radio bearer IEs
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Physical channel IEs
        frequencyInfo                   FrequencyInfo                       OPTIONAL,
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
        ul-ChannelRequirement           UL-ChannelRequirement               OPTIONAL,
        -- TABULAR: UL-ChannelRequirement contains the choice
        -- between UL DPCH info and PRACH info for RACH.
```

```
		modeSpecificInfo				CHOICE {
			fdd								SEQUENCE {
				dl-CommonInformation			DL-CommonInformation		OPTIONAL,
				dl-PDSCH-Information			DL-PDSCH-Information		OPTIONAL,
				cpch-SetInfo					CPCH-SetInfo				OPTIONAL
			},
			tdd								NULL
		},
		dl-InformationPerRL-List		DL-InformationPerRL-List		OPTIONAL~~,~~
~~	-- Extension mechanism for non- release99 information~~
~~		criticalExtension				SEQUENCE {}						OPTIONAL,~~
~~		nonCriticalExtensions			SEQUENCE {}						OPTIONAL~~
}

-- ***************************************************
--
-- PHYSICAL CHANNEL RECONFIGURATION COMPLETE
--
-- ***************************************************

PhysicalChannelReconfigurationComplete ::= SEQUENCE {
	-- User equipment IEs
		ul-IntegProtActivationInfo		IntegrityProtActivationInfo		OPTIONAL,
		-- TABULAR: UL-TimingAdvance is applicable for TDD mode only.
		ul-TimingAdvance				UL-TimingAdvance				OPTIONAL,
	-- Radio bearer IEs
		rb-UL-CiphActivationTimeInfo	RB-ActivationTimeInfo			OPTIONAL,
		rb-WithPDCP-InfoList			RB-WithPDCP-InfoList			OPTIONAL,
	-- Extension mechanism for non- release99 information
		nonCriticalExtensions			SEQUENCE {}						~~OPTIONAL~~
}

-- ***************************************************
--
-- PHYSICAL CHANNEL RECONFIGURATION FAILURE
--
-- ***************************************************

PhysicalChannelReconfigurationFailure ::= SEQUENCE {
	-- User equipment IEs
		failureCause					FailureCauseWithProtErr,
	-- Extension mechanism for non- release99 information
		nonCriticalExtensions			SEQUENCE {}						~~OPTIONAL~~
}

-- ***************************************************
--
-- PHYSICAL SHARED CHANNEL ALLOCATION (TDD only)
--
-- ***************************************************

PhysicalSharedChannelAllocation ::= SEQUENCE {
	-- User equipment IEs
		c-RNTI							C-RNTI							OPTIONAL,
	-- Physical channel IEs
		ul-TimingAdvance				UL-TimingAdvance				OPTIONAL,
		allocationPeriodInfo			AllocationPeriodInfo			OPTIONAL,
		pusch-CapacityAllocationInfo	PUSCH-CapacityAllocationInfo	OPTIONAL,
		pdsch-Info						PDSCH-Info						OPTIONAL,
		timeslotList					TimeslotList					OPTIONAL,
	-- Extension mechanism for non- release99 information
		nonCriticalExtensions			SEQUENCE {}						~~OPTIONAL~~
}

-- ***************************************************
--
-- PUSCH CAPACITY REQUEST (TDD only)
--
-- ***************************************************

PUSCHCapacityRequest ::= SEQUENCE {
	-- User equipment IEs
		c-RNTI							C-RNTI							OPTIONAL,
	-- Measurement IEs
		trafficVolumeMeasuredResultsList
										TrafficVolumeMeasuredResultsList,
		timeslotListWithISCP			TimeslotListWithISCP			OPTIONAL,
		primaryCCPCH-RSCP				PrimaryCCPCH-RSCP				OPTIONAL,
```

```
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER RECONFIGURATION
--
-- ***************************************************

RadioBearerReconfiguration ::= CHOICE {
    v1                              SEQUENCE {
        v1-IEs                          RadioBearerReconfiguration-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

RadioBearerReconfiguration-v1-IEs ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        activationTime                  ActivationTime                      OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
    -- Core network IEs
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- Radio bearer IEs
        rb-InformationReconfigList      RB-InformationReconfigList,
        rb-InformationAffectedList      RB-InformationAffectedList          OPTIONAL,
    -- Transport channel IEs
        ul-CommonTransChInfo            UL-CommonTransChInfo                OPTIONAL,
        ul-deletedTransChInfoList       UL-DeletedTransChInfoList           OPTIONAL,
        ul-AddReconfTransChInfoList     UL-AddReconfTransChInfoList         OPTIONAL,
        modeSpecificTransChInfo         CHOICE {
            fdd                             SEQUENCE {
                cpch-SetID                      CPCH-SetID                  OPTIONAL,
                addReconfTransChDRAC-Info       DRAC-StaticInformationList  OPTIONAL
            },
            tdd                             NULL
        }                                                                   OPTIONAL,
        dl-CommonTransChInfo            DL-CommonTransChInfo                OPTIONAL,
        dl-DeletedTransChInfoList       DL-DeletedTransChInfoList           OPTIONAL,
        dl-AddReconfTransChInfoList     DL-AddReconfTransChInfo2List        OPTIONAL,
    -- Physical channel IEs
        frequencyInfo                   FrequencyInfo                       OPTIONAL,
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
        ul-ChannelRequirement           UL-ChannelRequirement               OPTIONAL,
        modeSpecificPhysChInfo          CHOICE {
            fdd                             SEQUENCE {
                dl-CommonInformation            DL-CommonInformation        OPTIONAL,
                dl-PDSCH-Information            DL-PDSCH-Information        OPTIONAL,
                cpch-SetInfo                    CPCH-SetInfo                OPTIONAL
            },
            tdd                             NULL
        },
        dl-InformationPerRL-List        DL-InformationPerRL-List,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER RECONFIGURATION COMPLETE
--
-- ***************************************************

RadioBearerReconfigurationComplete ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
        -- TABULAR: UL-TimingAdvance is applicable for TDD mode only.
        ul-TimingAdvance                UL-TimingAdvance                    OPTIONAL,
    -- Radio bearer IEs
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfo               OPTIONAL,
    -- Extension mechanism for non- release99 information
```

```
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER RECONFIGURATION FAILURE
--
-- ***************************************************

RadioBearerReconfigurationFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Radio bearer IEs
        potentiallySuccesfulBearerList  RB-IdentityList                     OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER RELEASE
--
-- ***************************************************

RadioBearerRelease ::= CHOICE {
    v1                                  SEQUENCE {
        v1-IEs                              RadioBearerRelease-v1-IEs,
        nonCriticalExtensions               SEQUENCE {}                     OPTIONAL
    },
    criticalExtensions                  SEQUENCE {}
}

RadioBearerRelease-v1-IEs ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        activationTime                  ActivationTime                      OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
    -- Core network IEs
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- Radio bearer IEs
        rb-InformationReleaseList       RB-InformationReleaseList,
        rb-InformationAffectedList      RB-InformationAffectedList          OPTIONAL,
    -- Transport channel IEs
        ul-CommonTransChInfo            UL-CommonTransChInfo                OPTIONAL,
        ul-deletedTransChInfoList       UL-DeletedTransChInfoList           OPTIONAL,
        ul-AddReconfTransChInfoList     UL-AddReconfTransChInfoList         OPTIONAL,
        modeSpecificTransChInfo         CHOICE {
            fdd                             SEQUENCE {
                cpch-SetID                      CPCH-SetID                  OPTIONAL,
                addReconfTransChDRAC-Info       DRAC-StaticInformationList  OPTIONAL
            },
            tdd                             NULL
        }                                                                   OPTIONAL,
        dl-CommonTransChInfo            DL-CommonTransChInfo                OPTIONAL,
        dl-DeletedTransChInfoList       DL-DeletedTransChInfoList           OPTIONAL,
        dl-AddReconfTransChInfoList     DL-AddReconfTransChInfo2List        OPTIONAL,
    -- Physical channel IEs
        frequencyInfo                   FrequencyInfo                       OPTIONAL,
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
        ul-ChannelRequirement           UL-ChannelRequirement               OPTIONAL,
        modeSpecificPhysChInfo          CHOICE {
            fdd                             SEQUENCE {
                dl-CommonInformation            DL-CommonInformation        OPTIONAL,
                dl-PDSCH-Information            DL-PDSCH-Information        OPTIONAL,
                cpch-SetInfo                    CPCH-SetInfo                OPTIONAL
            },
            tdd                         NULL
        },
        dl-InformationPerRL-List        DL-InformationPerRL-List            OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}
```

```
-- ***************************************************
--
-- RADIO BEARER RELEASE COMPLETE
--
-- ***************************************************

RadioBearerReleaseComplete ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
        -- TABULAR: UL-TimingAdvance is applicable for TDD mode only.
        ul-TimingAdvance                UL-TimingAdvance                    OPTIONAL,
    -- Radio bearer IEs
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfo               OPTIONAL,
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER RELEASE FAILURE
--
-- ***************************************************

RadioBearerReleaseFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Radio bearer IEs
        potentiallySuccesfulBearerList  RB-IdentityList                     OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER SETUP
--
-- ***************************************************

RadioBearerSetup ::= CHOICE {
    v1                                  SEQUENCE {
        v1-IEs                              RadioBearerSetup-v1-IEs,
        nonCriticalExtensions               SEQUENCE {}                     OPTIONAL
    },
    criticalExtensions                  SEQUENCE {}
}

RadioBearerSetup-v1-IEs ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        activationTime                  ActivationTime                      OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
    -- Core network IEs
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- Radio bearer IEs
        srb-InformationSetupList        SRB-InformationSetupList            OPTIONAL,
        rab-InformationSetupList        RAB-InformationSetupList,
        rb-InformationAffectedList      RB-InformationAffectedList          OPTIONAL,
    -- Transport channel IEs
        ul-CommonTransChInfo            UL-CommonTransChInfo                OPTIONAL,
        ul-deletedTransChInfoList       UL-DeletedTransChInfoList           OPTIONAL,
        ul-AddReconfTransChInfoList     UL-AddReconfTransChInfoList         OPTIONAL,
        modeSpecificTransChInfo         CHOICE {
            fdd                             SEQUENCE {
                cpch-SetID                      CPCH-SetID                  OPTIONAL,
                addReconfTransChDRAC-Info       DRAC-StaticInformationList  OPTIONAL
            },
            tdd                             NULL
        }                                                                   OPTIONAL,
        dl-CommonTransChInfo            DL-CommonTransChInfo                OPTIONAL,
        dl-DeletedTransChInfoList       DL-DeletedTransChInfoList           OPTIONAL,
        dl-AddReconfTransChInfoList     DL-AddReconfTransChInfoList         OPTIONAL,
    -- Physical channel IEs
        frequencyInfo                   FrequencyInfo                       OPTIONAL,
```

```
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
        ul-ChannelRequirement           UL-ChannelRequirement               OPTIONAL,
        modeSpecificPhysChInfo          CHOICE {
            fdd                             SEQUENCE {
                dl-CommonInformation            DL-CommonInformation        OPTIONAL,
                dl-PDSCH-Information            DL-PDSCH-Information        OPTIONAL,
                cpch-SetInfo                    CPCH-SetInfo                OPTIONAL
            },
            tdd                             NULL
        },
        dl-InformationPerRL-List        DL-InformationPerRL-List            OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER SETUP COMPLETE
--
-- ***************************************************

RadioBearerSetupComplete ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
        -- TABULAR: UL-TimingAdvance is applicable for TDD mode only.
        ul-TimingAdvance                UL-TimingAdvance                    OPTIONAL,
        hyperFrameNumber                HyperFrameNumber                    OPTIONAL,
    -- Radio bearer IEs
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfo               OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER SETUP FAILURE
--
-- ***************************************************

RadioBearerSetupFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Radio bearer IEs
        potentiallySuccesfulBearerList  RB-IdentityList                     OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RNTI REALLOCATION
--
-- ***************************************************

RNTIReallocation ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
    -- CN information elements
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- Radio bearer IEs
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RNTI REALLOCATION COMPLETE
--
-- ***************************************************

RNTIReallocationComplete ::= SEQUENCE {
```

```
	-- User equipment IEs
		ul-IntegProtActivationInfo		IntegrityProtActivationInfo		OPTIONAL,
	-- Radio bearer IEs
		rb-UL-CiphActivationTimeInfo	RB-ActivationTimeInfo			OPTIONAL,
		rb-WithPDCP-InfoList			RB-WithPDCP-InfoList			OPTIONAL,
	-- Extension mechanism for non- release99 information
		nonCriticalExtensions			SEQUENCE {}						OPTIONAL
}

-- ***************************************************
--
-- RNTI REALLOCATION FAILURE
--
-- ***************************************************

RNTIReallocationFailure ::= SEQUENCE {
	-- UE information elements
		failureCause					FailureCauseWithProtErr,
	-- Extension mechanism for non- release99 information
		nonCriticalExtensions			SEQUENCE {}						OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION RE-ESTABLISHMENT
--
-- ***************************************************

RRCConnectionReEstablishment ::= CHOICE {
	v1								SEQUENCE {
		v1-IEs							RRCConnectionReEstablishment-v1-IEs,
		nonCriticalExtensions			SEQUENCE {}						OPTIONAL
	},
	criticalExtensions				SEQUENCE {}
}

RRCConnectionReEstablishment-v1-IEs ::= SEQUENCE {
	-- User equipment IEs
		integrityProtectionModeInfo		IntegrityProtectionModeInfo		OPTIONAL,
		cipheringModeInfo				CipheringModeInfo				OPTIONAL,
		activationTime					ActivationTime					OPTIONAL,
		new-U-RNTI						U-RNTI							OPTIONAL,
		new-C-RNTI						C-RNTI							OPTIONAL,
		drx-Indicator					DRX-Indicator,
		utran-DRX-CycleLengthCoeff		UTRAN-DRX-CycleLengthCoefficient	OPTIONAL,
		rlc-ResetIndicatorC-plane		BOOLEAN,
		rlc-ResetIndicatorU-plane		BOOLEAN,
	-- Core network IEs
		cn-InformationInfo				CN-InformationInfo				OPTIONAL,
	-- Radio bearer IEs
		srb-InformationSetupList		SRB-InformationSetupList		OPTIONAL,
		rab-InformationSetupList		RAB-InformationSetupList		OPTIONAL,
		rb-InformationReleaseList		RB-InformationReleaseList		OPTIONAL,
		rb-InformationReconfigList		RB-InformationReconfigList		OPTIONAL,
		rb-InformationAffectedList		RB-InformationAffectedList		OPTIONAL,
	-- Transport channel IEs
		ul-CommonTransChInfo			UL-CommonTransChInfo			OPTIONAL,
		ul-deletedTransChInfoList		UL-DeletedTransChInfoList		OPTIONAL,
		ul-AddReconfTransChInfoList		UL-AddReconfTransChInfoList		OPTIONAL,
		modeSpecificTransChInfo			CHOICE {
			fdd								SEQUENCE {
				cpch-SetID						CPCH-SetID						OPTIONAL,
				addReconfTransChDRAC-Info		DRAC-StaticInformationList	OPTIONAL
			},
			tdd								NULL
		},
		dl-CommonTransChInfo			DL-CommonTransChInfo			OPTIONAL,
		dl-DeletedTransChInfoList		DL-DeletedTransChInfoList		OPTIONAL,
		dl-AddReconfTransChInfoList		DL-AddReconfTransChInfoList		OPTIONAL,
	-- Physical channel IEs
		frequencyInfo					FrequencyInfo					OPTIONAL,
		maxAllowedUL-TX-Power			MaxAllowedUL-TX-Power			OPTIONAL,
		ul-ChannelRequirement			UL-ChannelRequirement			OPTIONAL,
		modeSpecificPhysChInfo			CHOICE {
			fdd								SEQUENCE {
				dl-CommonInformation			DL-CommonInformation			OPTIONAL,
				dl-PDSCH-Information			DL-PDSCH-Information			OPTIONAL,
				cpch-SetInfo					CPCH-SetInfo					OPTIONAL
```

```
            },
            tdd                             NULL
        },
        dl-InformationPerRL-List        DL-InformationPerRL-List            OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION RE-ESTABLISHMENT for CCCH
--
-- ***************************************************

RRCConnectionReEstablishment-CCCH ::= CHOICE {
    v1                              SEQUENCE {
        v1-IEs                          RRCConnectionReEstablishment-CCCH-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

RRCConnectionReEstablishment-CCCH-v1-IEs ::= SEQUENCE {
    -- User equipment IEs
        u-RNTI                          U-RNTI,
    -- The rest of the message is identical to the one sent on DCCH.
        rrcConnectionReEstablishment    RRCConnectionReEstablishment-v1-IEs
}

-- ***************************************************
--
-- RRC CONNECTION RE-ESTABLISHMENT COMPLETE
--
-- ***************************************************

RRCConnectionReEstablishmentComplete ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
        -- TABULAR: UL-TimingAdvance is applicable for TDD mode only.
        ul-TimingAdvance                UL-TimingAdvance                    OPTIONAL,
        hyperFrameNumber                HyperFrameNumber,
    -- Radio bearer IEs
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfo               OPTIONAL,
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION RE-ESTABLISHMENT REQUEST
--
-- ***************************************************

RRCConnectionReEstablishmentRequest ::= SEQUENCE {
    -- User equipment IEs
        u-RNTI                          U-RNTI,
        hyperFrameNumber                HyperFrameNumber,
        am-RLC-ErrorIndicationC-plane   BOOLEAN,
        am-RLC-ErrorIndicationU-plane   BOOLEAN,
        protocolErrorIndicator          ProtocolErrorIndicatorWithInfo,
        -- TABULAR: The IE above is MD in tabular, but making a 2-way choice
        -- optional wastes one bit (using PER) and produces no additional
        -- information.
    -- Measurement IEs
        measuredResultsOnRACH           MeasuredResultsOnRACH               OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION REJECT
--
-- ***************************************************

RRCConnectionReject ::= CHOICE {
```

```
    v1                              SEQUENCE {
        v1-IEs                          RRCConnectionReject-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

RRCConnectionReject-v1-IEs ::= SEQUENCE {
    -- User equipment IEs
        initialUE-Identity              InitialUE-Identity,
        rejectionCause                  RejectionCause,
        waitTime                        WaitTime,
        redirectionInfo                 RedirectionInfo                     OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION RELEASE
--
-- ***************************************************

RRCConnectionRelease::= CHOICE {
    v1                              SEQUENCE {
        v1-IEs                          RRCConnectionRelease-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

RRCConnectionRelease-v1-IEs ::= SEQUENCE {
    -- User equipment IEs
        rrc-MessageTX-Count             RRC-MessageTX-Count                 OPTIONAL,
        -- The IE above is conditional on the UE state.
        releaseCause                    ReleaseCause,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION RELEASE for CCCH
--
-- ***************************************************

RRCConnectionRelease-CCCH::= CHOICE {
    v1                              SEQUENCE {
        v1-IEs                          RRCConnectionRelease-CCCH-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

RRCConnectionRelease-CCCH-v1-IEs ::= SEQUENCE {
    -- User equipment IEs
        u-RNTI                          U-RNTI,
    -- The rest of the message is identical to the one sent on DCCH.
        rrcConnectionRelease            RRCConnectionRelease-v1-IEs
}

-- ***************************************************
--
-- RRC CONNECTION RELEASE COMPLETE
--
-- ***************************************************

RRCConnectionReleaseComplete ::= SEQUENCE {
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION RELEASE COMPLETE for CCCH
--
```

```
-- ***************************************************

RRCConnectionReleaseComplete-CCCH ::= SEQUENCE {
    -- User equipment IEs
        u-RNTI                          U-RNTI,
    -- The rest of the message is identical to the one sent on DCCH.
        rrcConnectionReleaseComplete    RRCConnectionReleaseComplete
}

-- ***************************************************
--
-- RRC CONNECTION REQUEST
--
-- ***************************************************

RRCConnectionRequest ::= SEQUENCE {
    -- User equipment IEs
        initialUE-Identity              InitialUE-Identity,
        establishmentCause              EstablishmentCause,
        protocolErrorIndicator          ProtocolErrorIndicator,
        -- The IE above is MD, but for compactness reasons no default value
        -- has been assigned to it.
    -- Measurement IEs
        measuredResultsOnRACH           MeasuredResultsOnRACH               OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION SETUP
--
-- ***************************************************

RRCConnectionSetup::= CHOICE {
    v1                              SEQUENCE {
        v1-IEs                          RRCConnectionSetup-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

RRCConnectionSetup-v1-IEs ::= SEQUENCE {
    -- User equipment IEs
        initialUE-Identity              InitialUE-Identity,
        activationTime                  ActivationTime                      OPTIONAL,
        new-U-RNTI                      U-RNTI,
        new-c-RNTI                      C-RNTI                              OPTIONAL,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient,
        capabilityUpdateRequirement     CapabilityUpdateRequirement         OPTIONAL,
        -- TABULAR: If the IE is not present, the default value defined in 10.3.3.2 shall
        -- be used.
    -- Radio bearer IEs
        srb-InformationSetupList        SRB-InformationSetupList2,
    -- Transport channel IEs
        ul-CommonTransChInfo            UL-CommonTransChInfo                OPTIONAL,
        ul-AddReconfTransChInfoList     UL-AddReconfTransChInfoList,
        dl-CommonTransChInfo            DL-CommonTransChInfo                OPTIONAL,
        dl-AddReconfTransChInfoList     DL-AddReconfTransChInfoList,
    -- Physical channel IEs
        frequencyInfo                   FrequencyInfo                       OPTIONAL,
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
        ul-ChannelRequirement           UL-ChannelRequirement               OPTIONAL,
        modeSpecificInfo                CHOICE {
            fdd                             SEQUENCE {
                dl-CommonInformation            DL-CommonInformation        OPTIONAL
            },
            tdd                             NULL
        },
        dl-InformationPerRL-List        DL-InformationPerRL-List            OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC CONNECTION SETUP COMPLETE
```

```
--
-- ***************************************************

RRCConnectionSetupComplete ::= SEQUENCE {
    -- User equipment IEs
        startList                       STARTList,
        ue-RadioAccessCapability        UE-RadioAccessCapability,
        ue-SystemSpecificCapability     InterSystemMessage                  OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RRC STATUS
--
-- ***************************************************

RRCStatus ::= SEQUENCE {
    -- Other IEs
        protocolErrorInformation        ProtocolErrorInformation,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- SECURITY MODE COMMAND
--
-- ***************************************************

SecurityModeCommand ::= CHOICE {
    v1                              SEQUENCE {
        v1-IEs                          SecurityModeCommand-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

SecurityModeCommand-v1-IEs ::= SEQUENCE {
    -- User equipment IEs
        cipheringAlgorithm              SecurityCapability,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
    -- Core network IEs
        cn-DomainIdentity               CN-DomainIdentity,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- SECURITY MODE COMPLETE
--
-- ***************************************************

SecurityModeComplete ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
    -- Radio bearer IEs
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfoList           OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- SECURITY MODE FAILURE
--
-- ***************************************************

SecurityModeFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}
```

```
-- ***************************************************
--
-- SIGNALLING CONNECTION RELEASE
--
-- ***************************************************

SignallingConnectionRelease::= CHOICE {
    v1                              SEQUENCE {
        v1-IEs                          SignallingConnectionRelease-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

SignallingConnectionRelease-v1-IEs ::= SEQUENCE {
    -- Core network IEs
        signallingFlowInfoList          SignallingFlowInfoList,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}


-- ***************************************************
--
-- SIGNALLING CONNECTION RELEASE REQUEST
--
-- ***************************************************

SignallingConnectionReleaseRequest ::= SEQUENCE {
    -- Core network IEs
        signallingFlowInfoList          SignallingFlowInfoList,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- SYSTEM INFORMATION CHANGE INDICATION
--
-- ***************************************************

SystemInformationChangeIndication ::=   SEQUENCE {
    -- Other IEs
        bcch-ModificationInfo               BCCH-ModificationInfo,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- TRANSPORT CHANNEL RECONFIGURATION
--
-- ***************************************************

TransportChannelReconfiguration::= CHOICE {
    v1                              SEQUENCE {
        v1-IEs                          TransportChannelReconfiguration-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

TransportChannelReconfiguration-v1-IEs ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        activationTime                  ActivationTime                      OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
    -- Core network IEs
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- Radio bearer IEs
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Transport channel IEs
```

```
        ul-CommonTransChInfo            UL-CommonTransChInfo                OPTIONAL,
        ul-AddReconfTransChInfoList     UL-AddReconfTransChInfoList,
        modeSpecificTransChInfo         CHOICE {
            fdd                             SEQUENCE {
                cpch-SetID                      CPCH-SetID                  OPTIONAL,
                addReconfTransChDRAC-Info       DRAC-StaticInformationList  OPTIONAL
            },
            tdd                             NULL
        }                                                                   OPTIONAL,
        dl-CommonTransChInfo            DL-CommonTransChInfo                OPTIONAL,
        dl-AddReconfTransChInfoList     DL-AddReconfTransChInfoList,
    -- Physical channel IEs
        frequencyInfo                   FrequencyInfo                       OPTIONAL,
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
        ul-ChannelRequirement           UL-ChannelRequirement               OPTIONAL,
        modeSpecificPhysChInfo          CHOICE {
            fdd                             SEQUENCE {
                dl-CommonInformation            DL-CommonInformation        OPTIONAL,
                dl-PDSCH-Information            DL-PDSCH-Information        OPTIONAL,
                cpch-SetInfo                    CPCH-SetInfo                OPTIONAL
            },
            tdd                         NULL
        },
        dl-InformationPerRL-List        DL-InformationPerRL-List            OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- TRANSPORT CHANNEL RECONFIGURATION COMPLETE
--
-- ***************************************************

TransportChannelReconfigurationComplete ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
        -- TABULAR: UL-TimingAdvance is applicable for TDD mode only.
        ul-TimingAdvance                UL-TimingAdvance                    OPTIONAL,
    -- Radio bearer IEs
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfo               OPTIONAL,
        rb-WithPDCP-InfoList            RB-WithPDCP-InfoList                OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- TRANSPORT CHANNEL RECONFIGURATION FAILURE
--
-- ***************************************************

TransportChannelReconfigurationFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- TRANSPORT FORMAT COMBINATION CONTROL
--
-- ***************************************************

TransportFormatCombinationControl ::= SEQUENCE {
    dpch-TFCS-InUplink                  TFC-Subset,
    tfc-ControlDuration                 TFC-ControlDuration                 OPTIONAL,
    -- The information element is not included when transmitting the message
    -- on the transparent mode signalling DCCH and is optional otherwise
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- TRANSPORT FORMAT COMBINATION CONTROL FAILURE
```

```
--
-- **************************************************

TransportFormatCombinationControlFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- **************************************************
--
-- UE CAPABILITY ENQUIRY
--
-- **************************************************

UECapabilityEnquiry ::= CHOICE {
    v1                              SEQUENCE {
        v1-IEs                          UECapabilityEnquiry-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

UECapabilityEnquiry-v1-IEs ::= SEQUENCE {
    -- User equipment IEs
        capabilityUpdateRequirement     CapabilityUpdateRequirement,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- **************************************************
--
-- UE CAPABILITY INFORMATION
--
-- **************************************************

UECapabilityInformation ::= SEQUENCE {
    -- User equipment IEs
        ue-RadioAccessCapability        UE-RadioAccessCapability            OPTIONAL,
    -- Other IEs
        ue-SystemSpecificCapability     InterSystemMessage                  OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- **************************************************
--
-- UE CAPABILITY INFORMATION CONFIRM
--
-- **************************************************

UECapabilityInformationConfirm ::= CHOICE {
    v1                              SEQUENCE {
        v1-IEs                          UECapabilityInformationConfirm-v1-IEs,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

UECapabilityInformationConfirm-v1-IEs ::= SEQUENCE {
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- **************************************************
--
-- UPLINK DIRECT TRANSFER
--
-- **************************************************

UplinkDirectTransfer ::= SEQUENCE {
    -- Core network IEs
        flowIdentifier                  FlowIdentifier,
        nas-Message                     NAS-Message,
    -- Measurement IEs
```

```
		measuredResultsOnRACH			MeasuredResultsOnRACH				OPTIONAL,
	-- Extension mechanism for non- release99 information
		nonCriticalExtensions			SEQUENCE {}							OPTIONAL
}

-- ***************************************************
--
-- UPLINK PHYSICAL CHANNEL CONTROL
--
-- ***************************************************

UplinkPhysicalChannelControl ::= CHOICE {
	v1								SEQUENCE {
		v1-IEs							UplinkPhysicalChannelControl-v1-IEs,
		nonCriticalExtensions			SEQUENCE {}							OPTIONAL
	},
	criticalExtensions				SEQUENCE {}
}

UplinkPhysicalChannelControl-v1-IEs ::= SEQUENCE {
	-- Physical channel IEs
		ccTrCH-PowerControlInfo			CCTrCH-PowerControlInfo				OPTIONAL,
		timingAdvance					UL-TimingAdvance					OPTIONAL,
		individualTS-InterferenceList	IndividualTS-InterferenceList		OPTIONAL,
		prach-ConstantValue				ConstantValue						OPTIONAL,
		dpch-ConstantValue				ConstantValue						OPTIONAL,
		pusch-ConstantValue				ConstantValue						OPTIONAL,
	-- Extension mechanism for non- release99 information
		criticalExtension				SEQUENCE {}							OPTIONAL,
		nonCriticalExtensions			SEQUENCE {}							OPTIONAL
}

-- ***************************************************
--
-- URA UPDATE
--
-- ***************************************************

URAUpdate ::= SEQUENCE {
	-- User equipment IEs
		u-RNTI							U-RNTI,
		ura-UpdateCause					URA-UpdateCause,
		protocolErrorIndicator			ProtocolErrorIndicatorWithInfo,
	-- Extension mechanism for non- release99 information
		nonCriticalExtensions			SEQUENCE {}							OPTIONAL
}

-- ***************************************************
--
-- URA UPDATE CONFIRM
--
-- ***************************************************

URAUpdateConfirm ::= CHOICE {
	v1								SEQUENCE {
		v1-IEs							URAUpdateConfirm-v1-IEs,
		nonCriticalExtensions			SEQUENCE {}							OPTIONAL
	},
	criticalExtensions				SEQUENCE {}
}

URAUpdateConfirm-v1-IEs ::= SEQUENCE {
	-- User equipment IEs
		integrityProtectionModeInfo		IntegrityProtectionModeInfo			OPTIONAL,
		cipheringModeInfo				CipheringModeInfo					OPTIONAL,
		new-U-RNTI						U-RNTI								OPTIONAL,
		new-C-RNTI						C-RNTI								OPTIONAL,
		drx-Indicator					DRX-Indicator,
		utran-DRX-CycleLengthCoeff		UTRAN-DRX-CycleLengthCoefficient	OPTIONAL,
	-- CN information elements
		cn-InformationInfo				CN-InformationInfo					OPTIONAL,
	-- UTRAN mobility IEs
		ura-Identity					URA-Identity						OPTIONAL,
	-- Radio bearer IEs
		rb-WithPDCP-InfoList			RB-WithPDCP-InfoList				OPTIONAL,
	-- Extension mechanism for non- release99 information
		criticalExtension				SEQUENCE {}							OPTIONAL,
		nonCriticalExtensions			SEQUENCE {}							OPTIONAL
```

```
}

-- ***************************************************
--
-- URA UPDATE CONFIRM for CCCH
--
-- ***************************************************

URAUpdateConfirm-CCCH ::= CHOICE {
    v1                                  SEQUENCE {
        v1-IEs                              URAUpdateConfirm-CCCH-v1-IEs,
        nonCriticalExtensions               SEQUENCE {}                         OPTIONAL
    },
    criticalExtensions                  SEQUENCE {}
}

URAUpdateConfirm-CCCH-v1-IEs ::= SEQUENCE {
    -- User equipment IEs
        u-RNTI                              U-RNTI,
    -- The rest of the message is identical to the one sent on DCCH.
        uraUpdateConfirm                    URAUpdateConfirm-v1-IEs
}

END
```

11.3.8 Other information elements

```
SysInfoType1 ::=                        SEQUENCE {
    -- Other IEs
        sib-ReferenceList                   SIB-ReferenceList                   OPTIONAL,
    -- Core network IEs
        cn-CommonGSM-MAP-NAS-SysInfo        NAS-SystemInformationGSM-MAP,
        cn-DomainSysInfoList                CN-DomainSysInfoList,
    -- User equipment IEs
        ue-IdleTimersAndConstants           UE-IdleTimersAndConstants,
        ue-DCHTimersAndConstants            UE-DCHTimersAndConstants,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions               SEQUENCE {}                         OPTIONAL
}


SysInfoType2 ::=                        SEQUENCE {
    -- Other IEs
        sib-ReferenceList                   SIB-ReferenceList                   OPTIONAL,
    -- UTRAN mobility IEs
        ura-IdentityList                    URA-IdentityList,
    -- User equipment IEs
        ue-ConnTimersAndConstants           UE-ConnTimersAndConstants,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions               SEQUENCE {}                         OPTIONAL
}


SysInfoType3 ::=                        SEQUENCE {
    -- Other IEs
        sib-ReferenceList                   SIB-ReferenceList                   OPTIONAL,
    -- UTRAN mobility IEs
        cellIdentity                        CellIdentity,
        cellSelectReselectInfo              CellSelectReselectInfoSIB-3-4,
        cellAccessRestriction               CellAccessRestriction,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions               SEQUENCE {}                         OPTIONAL
}


SysInfoType4 ::=                        SEQUENCE {
    -- Other IEs
        sib-ReferenceList                   SIB-ReferenceList                   OPTIONAL,
    -- UTRAN mobility IEs
        cellIdentity                        CellIdentity,
        cellSelectReselectInfo              CellSelectReselectInfoSIB-3-4,
        cellAccessRestriction               CellAccessRestriction,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions               SEQUENCE {}                         OPTIONAL
}


SysInfoType5 ::=                        SEQUENCE {
```

```
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Physical channel IEs
        modeSpecificInfo                CHOICE {
            fdd                             SEQUENCE {
                pich-PowerOffset                PICH-PowerOffset,
                aich-PowerOffset                AICH-PowerOffset
            },
            tdd                             SEQUENCE {
                pusch-SysInfo                   PUSCH-SysInfoList           OPTIONAL,
                pdsch-SysInfo                   PDSCH-SysInfoList           OPTIONAL,
                midambleConfiguration           MidambleConfiguration       OPTIONAL
            }
        },
        primaryCCPCH-Info               PrimaryCCPCH-Info                   OPTIONAL,
        prach-SystemInformationList     PRACH-SystemInformationList,
        sCCPCH-SystemInformationList    SCCPCH-SystemInformationList,
        cbs-DRX-Level1Information       CBS-DRX-Level1Information           OPTIONAL,
        -- Conditional on any of the CTCH indicator IEs in
        -- sCCPCH-SystemInformationList
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}


SysInfoType6 ::=                    SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Physical channel IEs
        modeSpecificInfo                CHOICE {
            fdd                             SEQUENCE {
                pich-PowerOffset                PICH-PowerOffset,
                aich-PowerOffset                AICH-PowerOffset,
                csich-PowerOffset               CSICH-PowerOffset           OPTIONAL
            },
            tdd                             SEQUENCE {
                pusch-SysInfo                   PUSCH-SysInfoList           OPTIONAL,
                pdsch-SysInfo                   PDSCH-SysInfoList           OPTIONAL,
                midambleConfiguration           MidambleConfiguration       OPTIONAL
            }
        },
        primaryCCPCH-Info               PrimaryCCPCH-Info                   OPTIONAL,
        prach-SystemInformationList     PRACH-SystemInformationList,
        sCCPCH-SystemInformationList    SCCPCH-SystemInformationList,
        cbs-DRX-Level1Information       CBS-DRX-Level1Information           OPTIONAL,
        -- Conditional on any of the CTCH indicator IEs in
        -- sCCPCH-SystemInformationList
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}


SysInfoType7 ::=                    SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Physical channel IEs
        modeSpecificInfo                CHOICE {
            fdd                             SEQUENCE {
                ul-Interference                 UL-Interference
            },
            tdd                             NULL
        },
        prach-Information-SIB5-List     DynamicPersistenceLevelList,
        prach-Information-SIB6-List     DynamicPersistenceLevelList         OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}


SysInfoType8 ::=                    SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- User equipment IEs
        cpch-Parameters                 CPCH-Parameters,
    -- Physical channel IEs
        cpch-SetInfoList                CPCH-SetInfoList,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
```

```
}


SysInfoType9 ::=                    SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Physical channel IEs
        cpch-PersistenceLevelsList      CPCH-PersistenceLevelsList,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         ~~OPTIONAL~~
}


SysInfoType10 ::=                   SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- User equipment IEs
        drac-SysInfoList                DRAC-SysInfoList,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         ~~OPTIONAL~~
}

SysInfoType11 ::=                   SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Measurement IEs
        fach-MeasurementOccasionInfo    FACH-MeasurementOccasionInfo        OPTIONAL,
        measurementControlSysInfo       MeasurementControlSysInfo,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         ~~OPTIONAL~~
}

SysInfoType12 ::=                   SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Measurement IEs
        fach-MeasurementOccasionInfo    FACH-MeasurementOccasionInfo        OPTIONAL,
        measurementControlSysInfo       MeasurementControlSysInfo,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         ~~OPTIONAL~~
}

SysInfoType13 ::=                   SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Core network IEs
        cn-DomainSysInfoList            CN-DomainSysInfoList,
    -- User equipment IEs
        ue-IdleTimersAndConstants       UE-IdleTimersAndConstants           OPTIONAL,
        capabilityUpdateRequirement     CapabilityUpdateRequirement         OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         ~~OPTIONAL~~
}

SysInfoType13-1 ::=                 SEQUENCE {
    -- ANSI-41 IEs
        ansi-41-RAND-Information        ANSI-41-RAND-Information,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         ~~OPTIONAL~~
}

SysInfoType13-2 ::=                 SEQUENCE {
    -- ANSI-41 IEs
        ansi-41-UserZoneID-Information  ANSI-41-UserZoneID-Information,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         ~~OPTIONAL~~
}

SysInfoType13-3 ::=                 SEQUENCE {
    -- ANSI-41 IEs
        ansi-41-PrivateNeighborListInfo ANSI-41-PrivateNeighborListInfo,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         ~~OPTIONAL~~
}

SysInfoType13-4 ::=                 SEQUENCE {
    -- ANSI-41 IEs
        ansi-41-GlobalServiceRedirectInfo
```

```
                                        ANSI-41-GlobalServiceRedirectInfo,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}


SysInfoType14 ::=                   SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Physical channel IEs
        primaryCCPCH-TX-Power           PrimaryCCPCH-TX-Power               OPTIONAL,
        individualTS-InterferenceList   IndividualTS-InterferenceList,
        prach-ConstantValue             ConstantValue                       OPTIONAL,
        dpch-ConstantValue              ConstantValue                       OPTIONAL,
        pusch-ConstantValue             ConstantValue                       OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

SysInfoType15 ::=                   SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Measurement IEs
        lcs-GPS-Assistance              LCS-GPS-AssistanceSIB               OPTIONAL,
        lcs-OTDOA-Assistance            LCS-OTDOA-AssistanceSIB             OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

SysInfoType15-1 ::=                 SEQUENCE {
    -- DGPS corrections
        lcs-DGPS-SIB-Data               LCS-DGPS-SIB-Data
}

SysInfoType15-2 ::=                 SEQUENCE {
-- Ephemeris and clock corrections
    lcs-Ephe-SIB-Data               LCS-Ephe-SIB-Data
}

SysInfoType15-3 ::=                 SEQUENCE {
    -- Almanac and other data
        transmissionTOW                 INTEGER (0..1048575),
        satMask                         BIT STRING (SIZE (32)),
        lsbTOW                          BIT STRING (SIZE (8)),
        lcs-Alma-SIB-DataList           LCS-Alma-SIB-DataList
}


SysInfoType16 ::=                   SEQUENCE {
    -- Other IEs
        sib-ReferenceList               SIB-ReferenceList                   OPTIONAL,
    -- Radio bearer IEs
        preDefinedRadioConfiguration    PreDefRadioConfiguration,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}
```

3GPP TSG RAN WG2 meeting #15
Sophia Antipolis, France, 21-25 Aug. 2000

Document R2-001836

CHANGE REQUEST

25.331 CR 534r1 Current Version: 3.3.0

For submission to:	TSG-RAN #9	for approval	X	strategic	
		for information		non-strategic	

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]

Source:	TSG-RAN WG2	**Date:**	23-08-00

Subject: Additions to "State of RRC procedure" in RRC Initialisation Information, source RNC to target RNC

Work item:

Category:	F	Correction	X	**Release:**	Phase 2	
	A	Corresponds to a correction in an earlier release			Release 96	
	B	Addition of feature			Release 97	
	C	Functional modification of feature			Release 98	
	D	Editorial modification			Release 99	X
					Release 00	

Reason for change: Currently in the "State of RRC procedure" only UTRAN initiated procedures have been listed. In this CR, new states for the UE initiated procedures have been added.

Clauses affected: 11.5, 14.10.1

Other specs affected:	Other 3G core specifications		→ List of CRs:
	Other GSM core specifications		→ List of CRs:
	MS test specifications		→ List of CRs:
	BSS test specifications		→ List of CRs:
	O&M specifications		→ List of CRs:

Other comments:

11.5 RRC information between network nodes

```
StateOfRRC ::=                    ENUMERATED {
                                      cell-DCH, cell-FACH,
                                      cell-PCH, ura-PCH }

StateOfRRC-Procedure ::=          ENUMERATED {
                                      awaitNoRRC-Message,
                                      awaitRRC-ConnectionRe-establishmentComplete,
                                      awaitRB-SetupComplete,
                                      awaitRB-ReconfigurationComplete,
                                      awaitTransportCH-ReconfigurationComplete,
                                      awaitPhysicalCH-ReconfigurationComplete,
                                      awaitActiveSetUpdateComplete,
                                      awaitHandoverComplete,
                                      sendCellUpdateConfirm,
                                      sendUraUpdateConfirm,
                                      sendRrcConnectionReestablishment,
                                      otherStates }
```

14.10.1 RRC Initialisation Information, source RNC to target RNC

When relocation of SRNS is decided to be executed, the RRC shall build the state information, which contains the RRC, RLC and MAC related RRC message information elements, which currently specify the state of the RRC including the radio bearer and transport channel configuration. This "RRC initialisation information, source RNC to target RNC" shall be sent by the source RNC to the target RNC to enable transparent relocation of the RRC and lower layer protocols. Correspondingly, the RRC in the target RNC shall receive the "RRC initialisation information, source RNC to target RNC" and update its state parameters accordingly to facilitate a transparent relocation of SRNS for the UE.

Information Element/Group Name	Need	Multi	Type and reference	Semantics description
Non RRC IEs				
State of RRC	MP		Enumerated (CELL_DCH, CELL_FACH,CELL_PCH, URA_PCH)	
State of RRC procedure	MP		Enumerated (await no RRC message, await RRC Connection Re-establishment Complete, await RB Setup Complete, await RB Reconfiguration Complete, await RB Release Complete, await Transport CH Reconfiguration Complete, await Physical CH Reconfiguration Complete, await Active Set Update Complete, await Handover Complete, send Cell Update Confirm, send URA Update Confirm, send RRC Connection Re-establishment, others)	
Ciphering related information				
Ciphering status	MP		Enumerated(Not started, Started)	
Calculation time for ciphering related information	CV *Ciphering*			Time when the ciphering information of the message were calculated, relative to a cell of the target RNC
>Cell Identity	MP		Cell Identity 10.3.2.2	Identity of one of the cells under the target RNC and included in the active set of the current call
>SFN	MP		Integer(0..4095)	
Ciphering info per radio bearer	OP	1 to <maxRB>		
>RB identity	MP		RB identity 10.3.4.13	
>Downlink HFN	MP		Hyperframe number 10.3.3.13	

Information Element/Group Name	Need	Multi	Type and reference	Semantics description
>Uplink HFN	MP		Hyperframe number 10.3.3.13	
Integrity protection related information				
Integrity protection status	MP		Enumerated(Not started, Started)	
Integrity protection failure count	MP		Integer(0..N316)	
Signalling radio bearer specific integrity protection information	CV *IP*	4 to <maxSRBsetup>		Status information for RB#0-4 in that order
> Uplink HFN	MP		Hyper frame number 10.3.3.13	
> Downlink HFN	MP		Hyper frame number 10.3.3.13	
> Uplink RRC Message sequence number	MP		Integer (0.. 15)	
> Downlink RRC Message sequence number	MP		Integer (0.. 15)	
Implementation specific parameters	OP		Bitstring (1..512)	
RRC IEs				
UE Information elements				
U-RNTI	MP		U-RNTI 10.3.3.45	
C-RNTI	OP		C-RNTI 10.3.3.8	
UE radio access Capability	MP		UE radio access capability 10.3.3.40	
Other Information elements				
Inter System message (inter system classmark)	OP		Inter-system message 10.8.6	
UTRAN Mobility Information elements				
URA Identifier	OP		URA identity 10.3.2.6	
CN Information Elements				
CN common GSM-MAP NAS system information	MP		NAS system information (GSM-MAP) 10.3.1.9	
CN domain related information	OP	1 to <MaxCNdomains>		CN related information to be provided for each CN domain
>CN domain identity	MP			
>CN domain specific GSM-MAP NAS system info	MP		NAS system information (GSM-MAP) 10.3.1.9	
Measurement Related Information elements				
For each ongoing measurement reporting	OP	1 to <MaxNoOfMeas>		
>Measurement Identity Number	MP		Measurement identity number 10.3.7.73	
>Measurement Command	MP		Measurement command 10.3.7.71	
>Measurement Type	CV Setup		Measurement type 10.3.7.75	
>Measurement Reporting Mode	OP		Measurement reporting mode	

Information Element/Group Name	Need	Multi	Type and reference	Semantics description
			10.3.7.74	
>Additional Measurements list	OP		Additional measurements list 10.3.7.1	
>CHOICE Measurement	OP			
>>Intra-frequency				
>>>Intra-frequency cell info	OP		Intra-frequency cell info list 10.3.7.33	
>>>Intra-frequency measurement quantity	OP		Intra-frequency measurement quantity 10.3.7.38	
>>>Intra-frequency reporting quantity	OP		Intra-frequency reporting quantity 10.3.7.41	
>>>Reporting cell status	OP		Reporting cell status 10.3.7.86	
>>>Measurement validity	OP		Measurement validity 10.3.7.76	
>>>CHOICE report criteria	OP			
>>>>Intra-frequency measurement reporting criteria			Intra-frequency measurement reporting criteria 10.3.7.39	
>>>>Periodical reporting			Periodical reporting criteria 10.3.7.78	
>>>>No reporting			NULL	
>>Inter-frequency				
>>>Inter-frequency cell info	OP		Inter-frequency cell info list 10.3.7.13	
>>>Inter-frequency measurement quantity	OP		Inter-frequency measurement quantity 10.3.7.18	
>>>Inter-frequency reporting quantity	OP		Inter-frequency reporting quantity 10.3.7.21	
>>>Reporting cell status	OP		Reporting cell status 10.3.7.86	
>>>Measurement validity	OP		Measurement validity 10.3.7.76	
>>>CHOICE report criteria	OP			
>>>>Inter-frequency measurement reporting criteria			Inter-frequency measurement reporting criteria 10.3.7.19	
>>>>Periodical reporting			Periodical reporting criteria 10.3.7.78	
>>>>No reporting			NULL	
>>Inter-system				
>>>Inter-system cell info	OP		Inter-system cell info list 10.3.7.23	
>>>Inter-system measurement quantity	OP		Inter-system measurement quantity 10.3.7.29	
>>>Inter-system reporting quantity	OP		Inter-system reporting quantity 10.3.7.32	
>>>Reporting cell status	OP		Reporting cell status 10.3.7.86	
>>>Measurement validity	OP		Measurement validity 10.3.7.76	

Information Element/Group Name	Need	Multi	Type and reference	Semantics description
>>>CHOICE report criteria	OP			
>>>>Inter-system measurement reporting criteria			Inter-system measurement reporting criteria 10.3.7.30	
>>>>Periodical reporting			Periodical reporting criteria 10.3.7.78	
>>>>No reporting			NULL	
>>Traffic Volume				
>>>Traffic volume measurement Object	OP		Traffic volume measurement object 10.3.7.95	
>>>Traffic volume measurement quantity	OP		Traffic volume measurement quantity 10.3.7.96	
>>>Traffic volume reporting quantity	OP		Traffic volume reporting quantity 10.3.7.99	
>>>CHOICE report criteria	OP			
>>>>Traffic volume measurement reporting criteria			Traffic volume measurement reporting criteria 10.3.7.97	
>>>>Periodical reporting			Periodical reporting criteria 10.3.7.78	
>>>>No reporting			NULL	
>>Quality				
>>>Quality measurement Object	OP		Quality measurement object	
>>>Quality measurement quantity	OP		Quality measurement quantity	
>>>Quality reporting quantity	OP		Quality reporting quantity 10.3.7.84	
>>>CHOICE report criteria	OP			
>>>>Quality measurement reporting criteria			Quality measurement reporting criteria 10.3.7.83	
>>>>Periodical reporting			Periodical reporting criteria 10.3.7.78	
>>>>No reporting			NULL	
>>UE internal				
>>>UE internal measurement quantity	OP		UE internal measurement quantity 10.3.7.104	
>>>UE internal reporting quantity	OP		UE internal reporting quantity 10.3.7.107	
>>>CHOICE report criteria	OP			
>>>>UE internal measurement reporting criteria			UE internal measurement reporting criteria 10.3.7.105	
>>>>Periodical reporting			Periodical reporting criteria 10.3.7.78	
>>>>No reporting			NULL	
Radio Bearer Information Elements				
Signalling radio bearer information	MP	4 to <maxSRBsetup>		For each signalling radio bearer

Information Element/Group Name	Need	Multi	Type and reference	Semantics description
>RB identity	MP		RB identity 10.3.4.13	
>RLC info	MP		RLC info 10.3.4.20	
>RB mapping info	MP		RB mapping info 10.3.4.18	
RAB information	OP	1 to <maxRABsetup>		Information for each RAB
>RAB info	MP		RAB info 10.3.4.8	
>For each Radio Bearer	OP	1 to <maxRB>		Information for each radio bearer belonging to this RAB
>>RB Identity	MP		RB identity 10.3.4.13	
>>RLC Info	MP		RLC info 10.3.4.20	
>>PDCP Info	OP		PDCP info 10.3.4.2	Absent if PDCP is not configured for RB
>>PDCP SN Info	CV PDCP		PDCP SN info 10.3.4.3	
>>RB mapping info	MP		RB mapping info 10.3.4.18	
Transport Channel Information Elements				
TFCS (UL DCHs)	OP		Transport format combination set 10.3.5.20	
TFCS (DL DCHs)	OP		Transport format combination set 10.3.5.20	
TFC subset (UL DCHs)	OP		Transport format combination subset 10.3.5.22	
TFCS (USCHs)	OP		Transport format combination set 10.3.5.20	
TFCS (DSCHs)	OP		Transport format combination set 10.3.5.20	
TFC subset (USCHs)	OP		Transport format combination subset 10.3.5.22	
Uplink transport channels				
For each uplink transport channel	OP	1 to <MaxTrCH>		
>Transport channel identity	MP		Transport channel identity 10.3.5.18	
>TFS	MP		Transport format set 10.3.5.23	
Downlink transport channels				
For each downlink transport channel	OP	1 to <MaxTrCH>		
>Transport channel identity	MP		Transport channel identity 10.3.5.18	
>TFS	MP		Transport format set 10.3.5.23	
Measurement report	OP		MEASUREMENT	

Information Element/Group Name	Need	Multi	Type and reference	Semantics description
			REPORT 10.2.17	

Multi Bound	Explanation
MaxNoOfMeas	Maximum number of active measurements, upper limit 16

Condition	Explanation
Setup	The IE is mandatory when the IE Measurement command has the value "Setup", otherwise the IE is not needed.
Ciphering	The IE is mandatory when the IE Ciphering Status has the value "started" and the ciphering counters need not be reinitialised, otherwise the IE is not needed.
IP	The IE is mandatory when the IE Integrity protection status has the value "started" and the ciphering counters need not be reinitialised, otherwise the IE is not needed.
PDCP	The IE is mandatory when the PDCP Info IE is present, otherwise the IE is not needed.

3GPP TSG-RAN WG2 Meeting #15
Sophia Antipolis, France 21-25, August 2000

***Document* R2-001837**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.331 CR 535r1 Current Version: 3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-RAN #9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑	for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: TSG-RAN WG2 **Date:** 24/08/2000

Subject: Support of codec negotiation

Work item:

Category: *(only one category Shall be marked With an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change:

To be prepared for the negotiation of more than one codec type in R'00, it was decided among CN1, RAN3 and RAN2 that in 3GPP R'99 a mechanism for the transport of codec information has to be provided in the relevant protocols.
Therefore there is a need to allow the transmission of the relevant information.
In the RADIO BEARER RECONFIGURATION message the present value of the Radio bearer information list is changed to optional in order to allow codec negotiation without changing radio bearer parameters.

Clauses affected: 8.5.7.x (new), 10.2.25, 10.2.28, 10.3.4.x (new), 10.3.4.y (new), 11.2, 11.3.1, 11.3.4

Other specs Affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

8.5.7.x RAB NAS Synchronisation Indicator

If the IE “NAS Synchronisation Indicator” is present in a message, the UE shall forward the content to the non-access stratum entity for the associated RAB.

10.2.25 RADIO BEARER RECONFIGURATION

This message is sent from UTRAN to reconfigure parameters related to a change of QoS. This procedure can also change the multiplexing of MAC, reconfigure transport channels and physical channels.

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UTRAN → UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE Information elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Integrity protection mode info	OP		Integrity protection mode info 10.3.3.18	
Ciphering mode info	OP		Ciphering mode info 10.3.3.5	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
New U-RNTI	OP		U-RNTI 10.3.3.45	
New C-RNTI	OP		C-RNTI 10.3.3.8	
DRX Indicator	MP		DRX Indicator 10.3.3.10	
UTRAN DRX cycle length coefficient	MD		UTRAN DRX cycle length coefficient 10.3.3.47	Default value is the existing value of UTRAN DRX cycle length coefficient
CN information elements				
CN Information info	OP		CN Information info 10.3.1.3	
RB information elements				
RAB information to reconfigure list	OP	1 to < maxRABsetup >		
>RAB information to reconfigure	MP		RAB information to reconfigure 10.3.4.9a	
RB information to reconfigure list	~~M~~OP	1to <maxRB>		
>RB information to reconfigure	MP		RB information to reconfigure 10.3.4.15	
RB information to be affected list	OP	1 to <maxRB>		
>RB information to be affected	MP		RB information to be affected 10.3.4.14	

Information Element/Group name	Need	Multi	Type and reference	Semantics description
TrCH Information Elements				
Uplink transport channels				
UL Transport channel information common for all transport channels	OP		UL Transport channel information common for all transport channels 10.3.5.24	
Deleted TrCH information list	OP	1 to <maxTrCH>		
> Deleted UL TrCH information	MP		Deleted UL TrCH information 10.3.5.5	
Added or Reconfigured TrCH information list	OP	1 to <maxTrCH>		
>Added or Reconfigured UL TrCH information	MP		Added or Reconfigured UL TrCH information 10.3.5.2	
CHOICE *mode*	OP			
>FDD				
>>CPCH set ID	OP		CPCH set ID 10.3.5.3	
>> Added or Reconfigured TrCH information for DRAC list	OP	1 to <maxTrCH>		
>>>DRAC static information	MP		DRAC static information 10.3.5.7	
>TDD				(no data)
Downlink transport channels				
DL Transport channel information common for all transport channels	OP		DL Transport channel information common for all transport channels 10.3.5.6	
Deleted TrCH information list	OP	1 to <maxTrCH>		
>Deleted DL TrCH information	MP		Deleted DL TrCH information 10.3.5.4	
Added or Reconfigured TrCH information list	OP	1 to <maxTrCH>		
>Added or Reconfigured DL TrCH information	MP		Added or Reconfigured DL TrCH information 10.3.5.1	
PhyCH information elements				
Frequency info	MD		Frequency info 10.3.6.30	Default value is the existing value of frequency information
Uplink radio resources				
Maximum allowed UL TX power	MD		Maximum allowed UL	Default value is the existing maximum UL TX power

Information Element/Group name	Need	Multi	Type and reference	Semantics description
			TX power 10.3.6.33	
CHOICE *channel requirement*	OP			At least one spare choice (criticality = reject) required
>Uplink DPCH info			Uplink DPCH info 10.3.6.76	
>PRACH Info (for RACH)			PRACH Info (for RACH) 10.3.6.44	
Downlink radio resources				
CHOICE *mode*	MP			
>FDD				
>>Downlink information common for all radio links	OP		Downlink information common for all radio links 10.3.6.20	
>>Downlink PDSCH information	OP		Downlink PDSCH information 10.3.6.26	
>>CPCH SET Info	OP		CPCH SET Info 10.3.6.10	
>TDD				(no data)
Downlink information per radio link list	OP	1 to <maxRL>		
>Downlink information for each radio link	MP		Downlink information for each radio link 10.3.6.23	

10.2.28 RADIO BEARER RELEASE

This message is used by UTRAN to release a radio bearer. It can also include modifications to the configurations of transport channels and/or physical channels.

RLC-SAP: AM or UM

Logical channel: DCCH

Direction: UTRAN → UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE Information Elements				
Integrity check info	CH		Integrity check info 10.3.3.15	
Integrity protection mode info	OP		Integrity protection mode info 10.3.3.18	
Ciphering mode info	OP		Ciphering mode info 10.3.3.5	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
New U-RNTI	OP		U-RNTI 10.3.3.45	
New C-RNTI	OP		C-RNTI 10.3.3.8	
DRX Indicator	MP		DRX Indicator 10.3.3.10	
UTRAN DRX cycle length coefficient	MD		UTRAN DRX cycle length coefficient 10.3.3.47	Default value is the existing value of UTRAN DRX cycle length coefficient
CN Information Elements				
CN Information info	OP		CN Information info 10.3.1.3	
RB Information Elements				
RAB information to reconfigure list	OP	1 to < maxRABsetup >		
>RAB information to reconfigure	MP		RAB information to reconfigure 10.3.4.9a	
RB information to release list	MP	1 to <maxRB>		
>RB information to release	MP		RB information to release 10.3.4.16	
RB information to be affected list	OP	1 to <maxRB>		
>RB information to be affected	MP		RB information to be affected 10.3.4.14	
TrCH Information Elements				
Uplink transport channels				
UL Transport channel information common for all transport channels	OP		UL Transport channel information common for all transport	

Information Element/Group name	Need	Multi	Type and reference	Semantics description
			channels 10.3.5.24	
Deleted TrCH information list	OP	1 to <axTrCH>		
>Deleted UL TrCH information	MP		Deleted UL TrCH information 10.3.5.5	
Added or Reconfigured TrCH information list	OP	1 to <maxTrCH>		
>Added or Reconfigured UL TrCH information	MP		Added or Reconfigured UL TrCH information 10.3.5.2	
CHOICE *mode*	OP			
>FDD				
>>CPCH set ID	OP		CPCH set ID 10.3.5.3	
>> Added or Reconfigured TrCH information for DRAC list	OP	1 to <maxTrCH>		
>>>DRAC static information	MP		DRAC static information 10.3.5.7	
>TDD				(no data)
Downlink transport channels				
DL Transport channel information common for all transport channels	OP		DL Transport channel information common for all transport channels 10.3.5.6	
Deleted TrCH information list	OP	1 to <maxTrCH>		
>Deleted DL TrCH information	MP		Deleted DL TrCH information 10.3.5.4	
Added or Reconfigured TrCH information list	OP	1 to <maxTrCH>		
>Added or Reconfigured DL TrCH information	MP		Added or Reconfigured DL TrCH information 10.3.5.1	
PhyCH information elements				
Frequency info	MD		Frequency info 10.3.6.30	Default value is the existing value of frequency information
Uplink radio resources				
Maximum allowed UL TX power	MD		Maximum allowed UL TX power 10.3.6.33	Default value is the existing maximum UL TX power
CHOICE *channel requirement*	OP			At least one spare choice (criticality = reject) required
>Uplink DPCH info			Uplink DPCH info 10.3.6.76	
>PRACH Info (for RACH)			PRACH Info	

Information Element/Group name	Need	Multi	Type and reference	Semantics description
			(for RACH) 10.3.6.44	
Downlink radio resources				
CHOICE *mode*	MP			
>FDD				
>>Downlink information common for all radio links	OP		Downlink information common for all radio links 10.3.6.20	
>>Downlink PDSCH information	OP		Downlink PDSCH information 10.3.6.26	
>>CPCH SET Info	OP		CPCH SET Info 10.3.6.10	
>TDD				(no data)
Downlink information per radio link list	OP	1 to <maxRL>		Send downlink information for each radio link to be set-up
>Downlink information for each radio link	MP		Downlink information for each radio link 10.3.6.23	

10.3.4.8 RAB info

This IE contains information used to uniquely identify a radio access bearer.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RAB identity	MP		RAB identity 10.3.1.14	
CN domain identity	MP		CN domain identity 10.3.1.1	
RAB NAS Synchronisation Indicator	OP		RAB NAS Synchronisation info 10.3.4.x	
Re-establishment timer	MP		Re-establishment timer 10.3.3.30	

10.3.4.9a RAB information to reconfigure

Information Element/Group name	Need	Multi	Type and reference	Semantics description
RAB identity	MP		RAB Identity 10.3.1.14	
RAB NAS synchronisation indicator	MP		RAB NAS Synchronisation info 10.3.4.x	

10.3.4.x RAB NAS Synchronisation info

This IE contains information used to uniquely identify a radio access bearer.

Information Element/Group name	**Need**	**Multi**	**Type and reference**	**Semantics description**
NAS Synchronisation info	MP		Bitstring(4)	

11.2 PDU definitions

```
--**************************************************************
--
-- TABULAR: The message type and integrity check info are not
-- visible in this module as they are defined in the class module.
-- Also, all FDD/TDD specific choices have the FDD option first
-- and TDD second, just for consistency.
--
--**************************************************************

PDU-definitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

--**************************************************************
--
-- IE parameter types from other modules
--
--**************************************************************

IMPORTS

    CN-DomainIdentity,
    CN-InformationInfo,
    FlowIdentifier,
    NAS-Message,
    PagingRecordTypeID,
    ServiceDescriptor,
    SignallingFlowInfoList
FROM CoreNetwork-IEs

    URA-Identity
FROM UTRANMobility-IEs

    ActivationTime,
    C-RNTI,
    CapabilityUpdateRequirement,
    CellUpdateCause,
    CipheringAlgorithm,
    CipheringModeInfo,
    DRX-Indicator,
    EstablishmentCause,
    FailureCauseWithProtErr,
    HyperFrameNumber,
    InitialUE-Identity,
    IntegrityProtActivationInfo,
    IntegrityProtectionModeInfo,
    PagingCause,
    PagingRecordList,
    ProtocolErrorIndicator,
    ProtocolErrorIndicatorWithInfo,
    Re-EstablishmentTimer,
    RedirectionInfo,
    RejectionCause,
    ReleaseCause,
    RRC-MessageTX-Count,
    SecurityCapability,
    STARTList,
    U-RNTI,
    U-RNTI-Short,
    UE-RadioAccessCapability,
    URA-UpdateCause,
    UTRAN-DRX-CycleLengthCoefficient,
    WaitTime
FROM UserEquipment-IEs

    PredefinedConfigIdentity,
    RAB-Info,
    RAB-InformationSetupList,
    RAB-InformationReconfigList,
    RB-ActivationTimeInfo,
    RB-ActivationTimeInfoList,
    RB-COUNT-C-InformationList,
    RB-COUNT-C-MSB-InformationList,
    RB-IdentityList,
```

```
    RB-InformationAffectedList,
    RB-InformationReconfigList,
    RB-InformationReleaseList,
    RB-InformationSetupList,
    RB-WithPDCP-InfoList,
    SRB-InformationSetupList,
    SRB-InformationSetupList2
FROM RadioBearer-IEs

    CPCH-SetID,
    DL-AddReconfTransChInfo2List,
    DL-AddReconfTransChInfoList,
    DL-CommonTransChInfo,
    DL-DeletedTransChInfoList,
    DRAC-StaticInformationList,
    TFC-Subset,
    UL-AddReconfTransChInfoList,
    UL-CommonTransChInfo,
    UL-DeletedTransChInfoList
FROM TransportChannel-IEs

    AllocationPeriodInfo,
    CCTrCH-PowerControlInfo,
    ConstantValue,
    CPCH-SetInfo,
    DL-CommonInformation,
    DL-CommonInformationPost,
    DL-InformationPerRL,
    DL-InformationPerRL-List,
    DL-InformationPerRL-ListPost,
    DL-DPCH-PowerControlInfo,
    DL-OuterLoopControl,
    DL-PDSCH-Information,
    DPCH-CompressedModeStatusInfo,
    FrequencyInfo,
    IndividualTS-InterferenceList,
    MaxAllowedUL-TX-Power,
    PDSCH-Info,
    PRACH-RACH-Info,
    PrimaryCCPCH-TX-Power,
    PUSCH-CapacityAllocationInfo,
    RL-AdditionInformationList,
    RL-RemovalInformationList,
    SSDT-Information,
    TFC-ControlDuration,
    TimeslotList,
    TX-DiversityMode,
    UL-ChannelRequirement,
    UL-DPCH-Info,
    UL-DPCH-InfoPost,
    UL-TimingAdvance
FROM PhysicalChannel-IEs

    AdditionalMeasurementID-List,
    EventResults,
    MeasuredResults,
    MeasuredResultsList,
    MeasuredResultsOnRACH,
    MeasurementCommand,
    MeasurementIdentityNumber,
    MeasurementReportingMode,
    PrimaryCCPCH-RSCP,
    TimeslotListWithISCP,
    TrafficVolumeMeasuredResultsList
FROM Measurement-IEs

    BCCH-ModificationInfo,
    InterSystemHO-Failure,
    InterSystemMessage,
    ProtocolErrorInformation,
    SegCount,
    SegmentIndex,
    SFN-Prime,
    SIB-Data-fixed,
    SIB-Data-variable,
    SIB-Type
FROM Other-IEs
```

```
    maxSIBsegm
FROM Constant-definitions;


-- ***************************************************
--
-- RADIO BEARER RECONFIGURATION
--
-- ***************************************************

RadioBearerReconfiguration ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        activationTime                  ActivationTime                      OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
    -- Core network IEs
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- Radio bearer IEs
        rab-InformationReconfigList     RAB-InformationReconfigList         OPTIONAL,
        rb-InformationReconfigList      RB-InformationReconfigList,
        rb-InformationAffectedList      RB-InformationAffectedList          OPTIONAL,
    -- Transport channel IEs
        ul-CommonTransChInfo            UL-CommonTransChInfo                OPTIONAL,
        ul-deletedTransChInfoList       UL-DeletedTransChInfoList           OPTIONAL,
        ul-AddReconfTransChInfoList     UL-AddReconfTransChInfoList         OPTIONAL,
        modeSpecificTransChInfo         CHOICE {
            fdd                             SEQUENCE {
                cpch-SetID                      CPCH-SetID                  OPTIONAL,
                addReconfTransChDRAC-Info       DRAC-StaticInformationList  OPTIONAL
            },
            tdd                             NULL
        }                                                                   OPTIONAL,
        dl-CommonTransChInfo            DL-CommonTransChInfo                OPTIONAL,
        dl-DeletedTransChInfoList       DL-DeletedTransChInfoList           OPTIONAL,
        dl-AddReconfTransChInfoList     DL-AddReconfTransChInfo2List        OPTIONAL,
    -- Physical channel IEs
        frequencyInfo                   FrequencyInfo                       OPTIONAL,
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
        ul-ChannelRequirement           UL-ChannelRequirement               OPTIONAL,
        modeSpecificPhysChInfo          CHOICE {
            fdd                             SEQUENCE {
                dl-CommonInformation            DL-CommonInformation        OPTIONAL,
                dl-PDSCH-Information            DL-PDSCH-Information        OPTIONAL,
                cpch-SetInfo                    CPCH-SetInfo                OPTIONAL
            },
            tdd                             NULL
        },
        dl-InformationPerRL-List        DL-InformationPerRL-List,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER RECONFIGURATION COMPLETE
--
-- ***************************************************

RadioBearerReconfigurationComplete ::= SEQUENCE {
    -- User equipment IEs
        ul-IntegProtActivationInfo      IntegrityProtActivationInfo         OPTIONAL,
        -- TABULAR: UL-TimingAdvance is applicable for TDD mode only.
        ul-TimingAdvance                UL-TimingAdvance                    OPTIONAL,
    -- Radio bearer IEs
        rb-UL-CiphActivationTimeInfo    RB-ActivationTimeInfo               OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER RECONFIGURATION FAILURE
--
```

```
-- ***************************************************

RadioBearerReconfigurationFailure ::= SEQUENCE {
    -- User equipment IEs
        failureCause                    FailureCauseWithProtErr,
    -- Radio bearer IEs
        potentiallySuccesfulBearerList  RB-IdentityList                     OPTIONAL,
    -- Extension mechanism for non- release99 information
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

-- ***************************************************
--
-- RADIO BEARER RELEASE
--
-- ***************************************************

RadioBearerRelease ::= SEQUENCE {
    -- User equipment IEs
        integrityProtectionModeInfo     IntegrityProtectionModeInfo         OPTIONAL,
        cipheringModeInfo               CipheringModeInfo                   OPTIONAL,
        activationTime                  ActivationTime                      OPTIONAL,
        new-U-RNTI                      U-RNTI                              OPTIONAL,
        new-C-RNTI                      C-RNTI                              OPTIONAL,
        drx-Indicator                   DRX-Indicator,
        utran-DRX-CycleLengthCoeff      UTRAN-DRX-CycleLengthCoefficient    OPTIONAL,
    -- Core network IEs
        cn-InformationInfo              CN-InformationInfo                  OPTIONAL,
    -- Radio bearer IEs
        rab-InformationReconfigList     RAB-InformationReconfigList         OPTIONAL,
        rb-InformationReleaseList       RB-InformationReleaseList,
        rb-InformationAffectedList      RB-InformationAffectedList          OPTIONAL,
    -- Transport channel IEs
        ul-CommonTransChInfo            UL-CommonTransChInfo                OPTIONAL,
        ul-deletedTransChInfoList       UL-DeletedTransChInfoList           OPTIONAL,
        ul-AddReconfTransChInfoList     UL-AddReconfTransChInfoList         OPTIONAL,
        modeSpecificTransChInfo         CHOICE {
            fdd                             SEQUENCE {
                cpch-SetID                      CPCH-SetID                  OPTIONAL,
                addReconfTransChDRAC-Info       DRAC-StaticInformationList  OPTIONAL
            },
            tdd                             NULL
        }                                                                   OPTIONAL,
        dl-CommonTransChInfo            DL-CommonTransChInfo                OPTIONAL,
        dl-DeletedTransChInfoList       DL-DeletedTransChInfoList           OPTIONAL,
        dl-AddReconfTransChInfoList     DL-AddReconfTransChInfo2List        OPTIONAL,
    -- Physical channel IEs
        frequencyInfo                   FrequencyInfo                       OPTIONAL,
        maxAllowedUL-TX-Power           MaxAllowedUL-TX-Power               OPTIONAL,
        ul-ChannelRequirement           UL-ChannelRequirement               OPTIONAL,
        modeSpecificPhysChInfo          CHOICE {
            fdd                             SEQUENCE {
                dl-CommonInformation            DL-CommonInformation        OPTIONAL,
                dl-PDSCH-Information            DL-PDSCH-Information        OPTIONAL,
                cpch-SetInfo                    CPCH-SetInfo                OPTIONAL
            },
            tdd                         NULL
        },
        dl-InformationPerRL-List        DL-InformationPerRL-List            OPTIONAL,
    -- Extension mechanism for non- release99 information
        criticalExtension               SEQUENCE {}                         OPTIONAL,
        nonCriticalExtensions           SEQUENCE {}                         OPTIONAL
}

END
```

11.3 Information element definitions

11.3.1 Core network information elements

```
NAS-Synchronisation-Indicator   ::=     BIT STRING(SIZE(4))

NAS-SystemInformationGSM-MAP ::=    OCTET STRING (SIZE (1..8))
```

```
P-TMSI-GSM-MAP ::=                  BIT STRING (SIZE (32))

PagingRecordTypeID ::=              ENUMERATED {
                                        imsi-GSM-MAP,
                                        tmsi-GSM-MAP-P-TMSI,
                                        imsi-DS-41,
                                        tmsi-DS-41 }

PLMN-Identity ::=                   SEQUENCE {
    mcc                                 MCC,
    mnc                                 MNC
}

PLMN-Type ::=                       CHOICE {
    gsm-MAP                             SEQUENCE {
        plmn-Identity                       PLMN-Identity
    },
    ansi-41                         SEQUENCE {
        p-REV                               P-REV,
        min-P-REV                           Min-P-REV,
        sid                                 SID,
        nid                                 NID
    },
    gsm-MAP-and-ANSI-41             SEQUENCE {
        plmn-Identity                       PLMN-Identity,
        p-REV                               P-REV,
        min-P-REV                           Min-P-REV,
        sid                                 SID,
        nid                                 NID
    },
    spare                           NULL
}

RAB-Identity ::=                    CHOICE {
    gsm-MAP-RAB-Identity                BIT STRING (SIZE (8)),
    ansi-41-RAB-Identity                BIT STRING (SIZE (8))
}

RAI ::=                             SEQUENCE {
    lai                                 LAI,
    rac                                 RoutingAreaCode
}

RoutingAreaCode ::=                 BIT STRING (SIZE (8))

ServiceDescriptor ::=               CHOICE {
    gsm-MAP                             BIT STRING (SIZE (4)),
    ansi-41                             BIT STRING (SIZE (4))
}

SignallingFlowInfoList ::=          SEQUENCE (SIZE (1..maxSignallingFlow)) OF
                                        FlowIdentifier

TMSI-GSM-MAP ::=                    BIT STRING (SIZE (32))

END
```

11.3.4 Radio bearer information elements

```
RadioBearer-IEs DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    CN-DomainIdentity,
    NAS-Synchronisation-Indicator,
    RAB-Identity
FROM CoreNetwork-IEs

    Re-EstablishmentTimer
FROM UserEquipment-IEs

    PreDefTransChConfiguration,
```

```
    TransportChannelIdentity
FROM TransportChannel-IEs

    PreDefPhyChConfiguration
FROM PhysicalChannel-IEs

    maxLoCHperRLC,
    maxPDCPAlgoType,
    maxRABsetup,
    maxRB,
    maxRBallRABs,
    maxRBMuxOptions,
    maxRBperRAB,
    maxSRBsetup
FROM Constant-definitions;


RAB-InformationSetup ::=            SEQUENCE {
    rab-Info                            RAB-Info,
    nas-SynchronisationIndicator        NAS-SynchronisationIndicator    OPTIONAL,
    rb-InformationSetupList             RB-InformationSetupList
}

RAB-InformationReconfigList ::=     SEQUENCE (SIZE (1.. maxRABsetup)) OF
                                        RAB-InformationReconfig

RAB-InformationReconfig ::=         SEQUENCE {
    rab-Identity                        RAB-Identity,
    nas-SynchronisationIndicator        NAS-SynchronisationIndicator
}

END
```