

TSG-RAN Meeting #16
Marco Island, FL, USA, 4 - 7 June 2002

RP-020335

Title: Agreed CRs (Release '99 and Rel-4/Rel-5 category A) to TS 25.331 (6)

Source: TSG-RAN WG2

Agenda item: 7.2.3

Doc-1st-	Status-	Spec	CR	Rev	Phase	Subject	Cat	Version	Versio
R2-021372	agreed	25.331	1463		R99	Correction to RB Mapping Info	F	3.10.0	3.11.0
R2-021373	agreed	25.331	1464		Rel-4	Correction to RB Mapping Info	A	4.4.0	4.5.0
R2-021374	agreed	25.331	1465		Rel-5	Correction to RB Mapping Info	A	5.0.0	5.1.0
R2-021376	agreed	25.331	1466		R99	Ciphering activation for TM bearers	F	3.10.0	3.11.0
R2-021482	agreed	25.331	1467	1	Rel-4	Ciphering activation for TM bearers	A	4.4.0	4.5.0
R2-021483	agreed	25.331	1468	1	Rel-5	Ciphering activation for TM bearers	A	5.0.0	5.1.0
R2-021386	agreed	25.331	1469		R99	TFCS selection guideline correction	F	3.10.0	3.11.0
R2-021387	agreed	25.331	1470		Rel-4	TFCS selection guideline correction	A	4.4.0	4.5.0
R2-021388	agreed	25.331	1471		Rel-5	TFCS selection guideline correction	A	5.0.0	5.1.0
R2-021428	agreed	25.331	1484		R99	Traffic Volume Measurement clarifications	F	3.10.0	3.11.0
R2-021429	agreed	25.331	1485		Rel-4	Traffic Volume Measurement clarifications	A	4.4.0	4.5.0
R2-021430	agreed	25.331	1486		Rel-5	Traffic Volume Measurement clarifications	A	5.0.0	5.1.0
R2-021434	agreed	25.331	1487		R99	Correction to handling of IE 'Downlink information for each RL'	F	3.10.0	3.11.0
R2-021435	agreed	25.331	1488		Rel-4	Correction to handling of IE 'Downlink information for each RL'	A	4.4.0	4.5.0
R2-021436	agreed	25.331	1489		Rel-5	Correction to handling of IE 'Downlink information for each RL'	A	5.0.0	5.1.0

CHANGE REQUEST

⌘ **25.331 CR 1463** ⌘ rev **-** ⌘ Current version: **3.10.0** ⌘

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

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

Title:	⌘ Correction to RB Mapping Info		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘ TEI	Date:	⌘ 13 th - May 2002
Category:	⌘ F	Release:	⌘ R99
	<i>Use one of the following categories:</i> F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		<i>Use one of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ The selection of the RB multiplexing option applicable in the target RRC state is ambiguously specified.
	The specification in section 8.6.4.8 of the "select and configure the multiplexing options applicable for the transport channels to be used" is not clear to which transport channel refers to.
	Isolated impact analysis:
	Corrected functionality is RB multiplexing option selection
	<ul style="list-style-type: none"> • « Correction to a function where the specification was : <ul style="list-style-type: none"> ○ ambiguous or not sufficiently explicit.
	Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.
Summary of change:	⌘ In section 7.2.2 it is clarified that the UE selects the multiplexing option to be used in the RRC state where the UE will be at the end of a procedure.
	In section 8.6.4.8 it is clarified that the transport channels to be used refers to the transport channels used in the target RRC state.
Consequences if not approved:	⌘ Ambiguous specification of which multiplexing option is to be used in the target RRC state

Clauses affected: ⌘ 7.2.2.2, 7.2.2.3, 8.3.1.2, 8.6.4.8

Other specs	⌘	<input type="checkbox"/>	Other core specifications	⌘	25.331 v4.4.0, CR 1464 25.331 v5.0.0, CR 1465
affected:		<input type="checkbox"/>	Test specifications		
		<input type="checkbox"/>	O&M Specifications		
Other comments:	⌘	<input type="text"/>			

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

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

7.2.2 UTRA RRC Connected mode

In this specification unless otherwise mentioned "connected mode" shall refer to "UTRA RRC connected mode".

7.2.2.1 URA_PCH or CELL_PCH state

In the URA_PCH or CELL_PCH state the UE shall perform the following actions:

NOTE: Neither DCCH nor DTCH are available in these states.

1> if the UE is "in service area":

- 2> maintain up-to-date system information as broadcast by the serving cell as specified in the subclause 8.1.1;
- 2> perform cell reselection process as specified in [4];
- 2> perform a periodic search for higher priority PLMNs as specified in [25];

NOTE: If the DRX cycle length is 80ms, then a search for higher priority PLMNs may not identify all the available PLMNs due to the paging occasion on the current serving cell coinciding with the MIB of the cell of interest.

- 2> monitor the paging occasions and PICH monitoring occasions determined according to subclauses 8.6.3.1a and 8.6.3.2 and receive paging information on the PCH mapped on the S-CCPCH selected by the UE according to the procedure in subclause 8.5.19;
- 2> act on RRC messages received on PCCH and BCCH;
- 2> perform measurements process according to measurement control information as specified in subclause 8.4 and in subclause 14.4;
- 2> maintain up-to-date BMC data if it supports Cell Broadcast Service (CBS) as specified in [37];
- 2> run timer T305 for periodical URA update if the UE is in URA_PCH or for periodical cell update if the UE is in CELL_PCH.

1> if the UE is "out of service area":

- 2> perform cell reselection process as specified in [4];
- 2> run timer T316;
- 2> run timer T305.

7.2.2.2 CELL_FACH state

In the CELL_FACH state the UE shall perform the following actions:

NOTE: DCCH and, if configured, DTCH are available in this state.

1> if the UE is "in service area":

- 2> maintain up-to-date system information as broadcast by the serving cell as specified in subclause 8.1.1;
- 2> perform cell reselection process as specified in [4];
- 2> perform measurements process according to measurement control information as specified in subclause 8.4 and in subclause 14.4;
- 2> run timer T305 (periodical cell update);

2> select and configure the RB multiplexing options applicable for the transport channels to be used in this RRC state;

- 2> listen to all FACH transport channels mapped on the S-CCPCH selected by the UE according to the procedure in subclause 8.5.19;
 - 2> act on RRC messages received on BCCH, CCCH and DCCH;
 - 2> act on RRC messages received on, if available, SHCCH (TDD only).
- 1> if the UE is "out of service area":
- 2> perform cell reselection process as specified in [4];
 - 2> run timers T305 (periodical cell update), and T317 (cell update when re-entering "in service") or T307 (transition to Idle mode).

7.2.2.3 CELL_DCH state

In the CELL_DCH state the UE shall perform the following actions:

NOTE: DCCH and, if configured, DTCH are available in this state.

- 1> read system information broadcast on FACH as specified in subclause 8.1.1.3 (applicable only to UEs with certain capabilities and in FDD mode);
- 1> read the system information as specified in subclause 8.1.1 (for UEs in TDD mode);
- 1> perform measurements process according to measurement control information as specified in subclause 8.4 and in clause 14;
- 1> select and configure the RB multiplexing options applicable for the transport channels to be used in this RRC state;
- 1> act on RRC messages received on DCCH;
- 1> act on RRC messages received on BCCH (applicable only to UEs with certain capabilities and in FDD mode);
- 1> act on RRC messages received on BCCH (TDD only) and, if available, SHCCH (TDD only).

8.3.1 Cell and URA update procedures

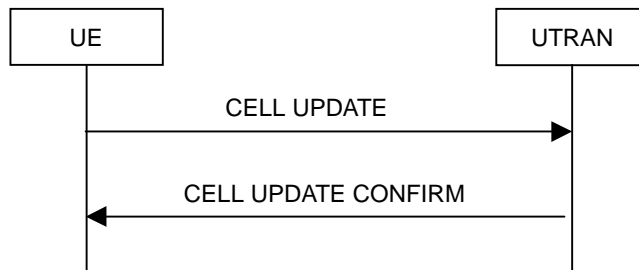


Figure 8.3.1-1: Cell update procedure, basic flow

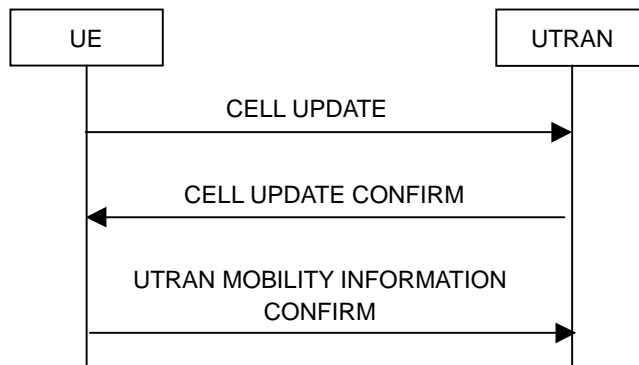


Figure 8.3.1-2: Cell update procedure with update of UTRAN mobility information

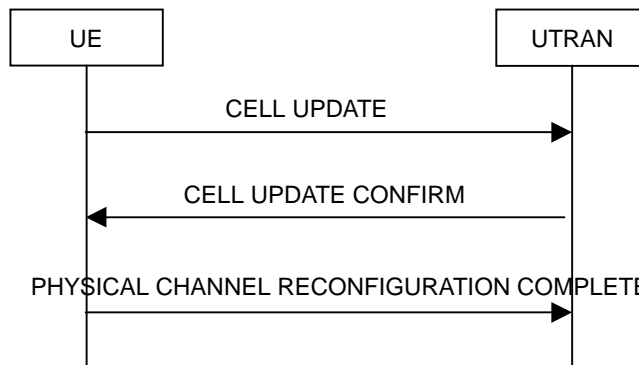


Figure 8.3.1-3: Cell update procedure with physical channel reconfiguration

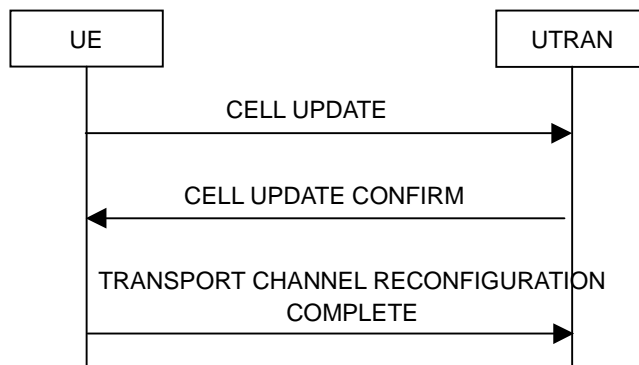


Figure 8.3.1-4: Cell update procedure with transport channel reconfiguration

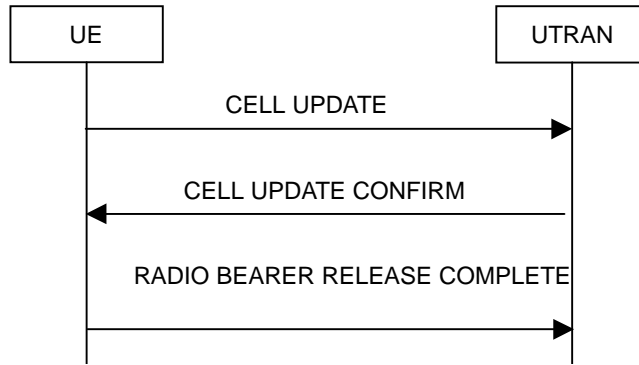


Figure 8.3.1-5: Cell update procedure with radio bearer release

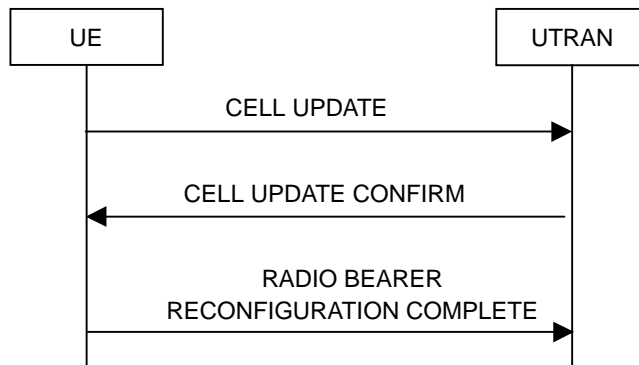


Figure 8.3.1-6: Cell update procedure with radio bearer reconfiguration

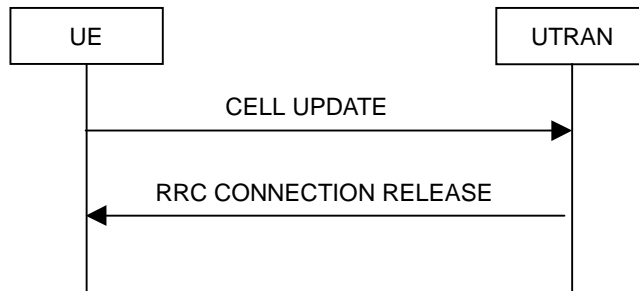


Figure 8.3.1-7: Cell update procedure, failure case

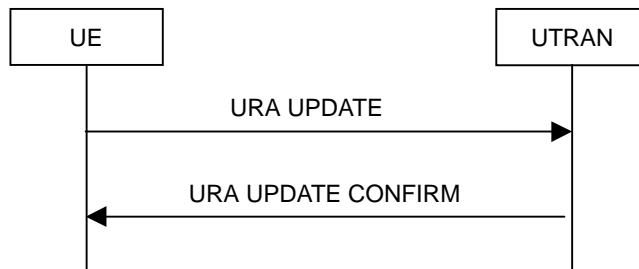


Figure 8.3.1-8: URA update procedure, basic flow

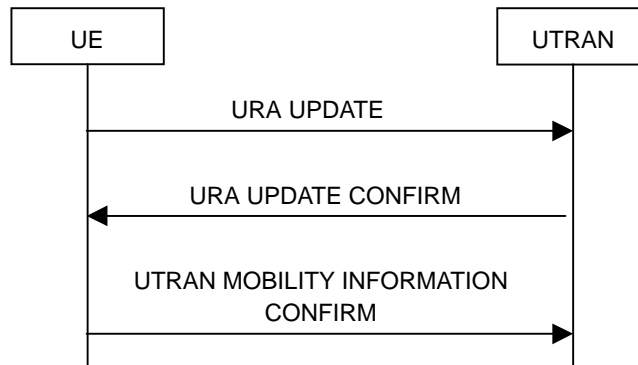


Figure 8.3.1-9: URA update procedure with update of UTRAN mobility information

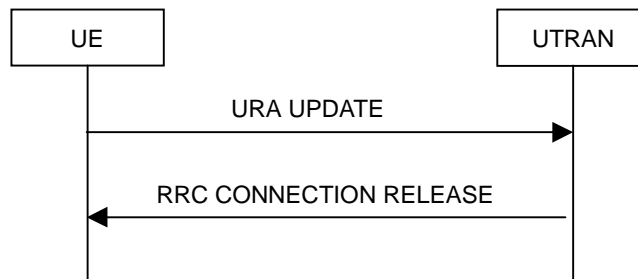


Figure 8.3.1-10: URA update procedure, failure case

8.3.1.1 General

The URA update and cell update procedures serve several main purposes:

- to notify UTRAN after re-entering service area in the URA_PCH or CELL_PCH state;
- to notify UTRAN of an RLC unrecoverable error [16] on an AM RLC entity;
- to be used as a supervision mechanism in the CELL_FACH, CELL_PCH, or URA_PCH state by means of periodical update.

In addition, the URA update procedure also serves the following purpose:

- to retrieve a new URA identity after cell re-selection to a cell not belonging to the current URA assigned to the UE in URA_PCH state.

In addition, the cell update procedure also serves the following purposes:

- to update UTRAN with the current cell the UE is camping on after cell reselection;
- to act on a radio link failure in the CELL_DCH state;
- when triggered in the URA_PCH or CELL_PCH state, to notify UTRAN of a transition to the CELL_FACH state due to the reception of UTRAN originated paging or due to a request to transmit uplink data.

The URA update and cell update procedures may:

- 1> include an update of mobility related information in the UE;
- 1> cause a state transition from the CELL_FACH state to the CELL_DCH, CELL_PCH or URA_PCH states or idle mode.

The cell update procedure may also include:

- a re-establish of AM RLC entities;

- a radio bearer release, radio bearer reconfiguration, transport channel reconfiguration or physical channel reconfiguration.

8.3.1.2 Initiation

A UE shall initiate the cell update procedure in the following cases:

1> Uplink data transmission:

- 2> if the UE is in URA_PCH or CELL_PCH state; and
- 2> if the UE has uplink RLC data PDU or uplink RLC control PDU on RB1 or upwards to transmit:
 - 3> perform cell update using the cause "uplink data transmission".

1> Paging response:

- 2> if the criteria for performing cell update with the cause specified above in the current subclause is not met; and
- 2> if the UE in URA_PCH or CELL_PCH state, receives a PAGING TYPE 1 message fulfilling the conditions for initiating a cell update procedure specified in subclause 8.1.2.3:
 - 3> perform cell update using the cause "paging response".

1> Radio link failure:

- 2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met; and
- 2> if the UE is in CELL_DCH state; and
- 2> if the criteria for radio link failure is met as specified in subclause 8.5.6:
 - 3> perform cell update using the cause "radio link failure".

1> Re-entering service area:

- 2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met; and
- 2> if the UE is in CELL_FACH or CELL_PCH state; and
- 2> if the UE has been out of service area and re-enters service area before T307 or T317 expires:
 - 3> perform cell update using the cause "re-entering service area".

1> RLC unrecoverable error:

- 2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met; and
- 2> if the UE detects RLC unrecoverable error [16] in an AM RLC entity:
 - 3> perform cell update using the cause "RLC unrecoverable error".

1> Cell reselection:

- 2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met:
 - 3> if the UE is in CELL_FACH or CELL_PCH state and the UE performs cell re-selection; or
 - 3> if the UE is in CELL_FACH state and the variable C_RNTI is empty:
 - 4> perform cell update using the cause "cell reselection".

1> Periodical cell update:

- 2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met; and
- 2> if the UE is in CELL_FACH or CELL_PCH state; and
- 2> if the timer T305 expires; and
- 2> if the criteria for "in service area" as specified in subclause 8.5.5.2 is fulfilled; and
- 2> if periodic updating has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity":
 - 3> perform cell update using the cause "periodical cell update".

A UE in URA_PCH state shall initiate the URA update procedure in the following cases:

1> URA reselection:

- 2> if the UE detects that the current URA assigned to the UE, stored in the variable URA_IDENTITY, is not present in the list of URA identities in system information block type 2; or
- 2> if the list of URA identities in system information block type 2 is empty; or
- 2> if the system information block type 2 can not be found:
 - 3> perform URA update using the cause "change of URA".

1> Periodic URA update:

- 2> if the criteria for performing URA update with the causes as specified above in the current subclause are not met; and
- 2> if the timer T305 expires while the UE is in the service area; and
- 2> if periodic updating has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity":
 - 3> perform URA update using the cause "periodic URA update".

When initiating the URA update or cell update procedure, the UE shall:

1> stop timer T305;

1> if the UE is in CELL_DCH state:

- 2> in the variable RB_TIMER_INDICATOR, set the IE "T314 expired" and the IE "T315 expired" to FALSE;
- 2> if the stored values of the timer T314 and timer T315 are both equal to zero:
 - 3> release all its radio resources;
 - 3> indicate release (abort) of the established signalling connections (as stored in the variable ESTABLISHED_SIGNALLING_CONNECTIONS) and established radio access bearers (as stored in the variable ESTABLISHED_RABS) to upper layers;
 - 3> clear the variable ESTABLISHED_SIGNALLING_CONNECTIONS;
 - 3> clear the variable ESTABLISHED_RABS;
 - 3> enter idle mode;
 - 3> perform other actions when entering idle mode from connected mode as specified in subclause 8.5.2;
 - 3> and the procedure ends.

- 2> if the stored value of the timer T314 is equal to zero:
 - 3> release all radio bearers, associated with any radio access bearers for which in the variable ESTABLISHED_RABS the value of the IE "Re-establishment timer" is set to "useT314";
 - 3> in the variable RB_TIMER_INDICATOR set the IE "T314 expired" to TRUE.
- 2> if the stored value of the timer T315 is equal to zero:
 - 3> release all radio bearers associated with any radio access bearers for which in the variable ESTABLISHED_RABS the value of the IE "Re-establishment timer" is set to "useT315";
 - 3> in the variable RB_TIMER_INDICATOR set the IE "T315 expired" to TRUE.
- 2> if the stored value of the timer T314 is greater than zero:
 - 3> if there are radio bearers associated with any radio access bearers for which in the variable ESTABLISHED_RABS the value of the IE "Re-establishment timer" is set to "useT314":
 - 4> start timer T314.
 - 3> if there are no radio bearers associated with any radio access bearers for which in the variable ESTABLISHED_RABS the value of the IE "Re-establishment timer" is set to "useT314" or "useT315":
 - 4> start timer T314.
- 2> if the stored value of the timer T315 is greater than zero:
 - 3> if there are radio bearers associated with any radio access bearers for which in the variable ESTABLISHED_RABS the value of the IE "Re-establishment timer" is set to "useT315":
 - 4> start timer T315.
- 2> for the released radio bearer(s):
 - 3> delete the information about the radio bearer from the variable ESTABLISHED_RABS;
 - 3> when all radio bearers belonging to the same radio access bearer have been released:
 - 4> indicate local end release of the radio access bearer to upper layers using the CN domain identity together with the RAB identity stored in the variable ESTABLISHED_RABS;
 - 4> delete all information about the radio access bearer from the variable ESTABLISHED_RABS.
- 2> select a suitable UTRA cell according to [4];
- 2> set the variable ORDERED_RECONFIGURATION to FALSE.
- 1> set the variables PROTOCOL_ERROR_INDICATOR, FAILURE_INDICATOR, UNSUPPORTED_CONFIGURATION and INVALID_CONFIGURATION to FALSE;
- 1> set the variable CELL_UPDATE_STARTED to TRUE;
- 1> if the UE is not already in CELL_FACH state
 - ~~2> move to CELL_FACH state, if not already in that state;~~
 - 2> select PRACH according to subclause 8.5.17;
 - 2> select Secondary CCPCH according to subclause 8.5.19;
 - 2> use the transport format set given in system information as specified in 8.6.5.1;
- 1> if the UE performs cell re-selection:
 - 2> clear the variable C_RNTI; and
 - 2> stop using that C_RNTI just cleared from the variable C_RNTI in MAC.

- 1> set CFN in relation to SFN of current cell according to subclause 8.5.15;
- 1> in case of a cell update procedure:
 - 2> set the contents of the CELL UPDATE message according to subclause 8.3.1.3;
 - 2> submit the CELL UPDATE message for transmission on the uplink CCCH.
- 1> in case of a URA update procedure:
 - 2> set the contents of the URA UPDATE message according to subclause 8.3.1.3;
 - 2> submit the URA UPDATE message for transmission on the uplink CCCH.
- 1> set counter V302 to 1;
- 1> start timer T302 when the MAC layer indicates success or failure in transmitting the message.

8.6.4.8 RB mapping info

If the IE "RB mapping info" is included, the UE shall:

- 1> for each multiplexing option of the RB:
 - 2> if a transport channel that would not exist as a result of the message (i.e. removed in the same message in IE "Deleted DL TrCH information" and IE "Deleted UL TrCH information") is referred to:
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> if a multiplexing option that maps a logical channel corresponding to a TM-RLC entity onto RACH, CPCH, FACH or DSCH is included:
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> if the multiplexing option realises the radio bearer on the uplink (resp. on the downlink) using two logical channels with different values of the IE "Uplink transport channel type" (resp. of the IE "Downlink transport channel type"):
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> if that RB is using TM and the IE "Segmentation indication" is set to TRUE and, based on the multiplexing configuration resulting from this message, the logical channel corresponding to it is mapped onto the same transport channel as another logical channel:
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> if the transport channel considered in that multiplexing option is different from RACH and if that RB is using AM and the set of RLC sizes applicable to the logical channel transferring data PDUs has more than one element:
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> if that RB is using UM or TM and the multiplexing option realises it using two logical channels:
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> for each logical channel in that multiplexing option:
 - 3> if the value of the IE "RLC size list" is set to "Explicit list":
 - 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is included in the same message, and the value (index) of any IE "RLC size index" in the IE "Explicit list" does not correspond to an "RLC size" in the IE transport format set of that transport channel given in the message; or
 - 4> if the transport channel this logical channel is mapped on in this multiplexing option is different from RACH, and if a "Transport format set" for that transport channel is not included in the same message, and the value (index) of any IE "RLC size index" in the IE "Explicit list" does not correspond to an "RLC size" in the stored transport format set of that transport channel; or
 - 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is included in the same message, and the value of any IE "Logical channel list" in the transport format set is not set to "Configured"; or
 - 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is not included in the same message, and the value of any IE "Logical channel list" in the stored transport format set of that transport channel is not set to "Configured":
 - 5> set the variable INVALID_CONFIGURATION to TRUE.

- 3> if the value of the IE "RLC size list" is set to "All":
 - 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is included in the same message, and the value of any IE "Logical channel list" in the transport format set is not set to "Configured"; or
 - 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is not included in the same message, and the value of any IE "Logical channel list" in the stored transport format set of that transport channel is not set to "Configured":
 - 5> set the variable INVALID_CONFIGURATION to TRUE.
- 3> if the value of the IE "RLC size list" is set to "Configured":
 - 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is included in the same message, and for none of the RLC sizes defined for that transport channel in the "Transport format set", the "Logical Channel List" is set to "All" or given as an "Explicit List" which contains this logical channel; or
 - 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is not included in the same message, and for none of the RLC sizes defined in the transport format set stored for that transport channel, the "Logical Channel List" is set to "All" or given as an "Explicit List" which contains this logical channel:
 - 5> set the variable INVALID_CONFIGURATION to TRUE.
- 1> if, as a result of the message this IE is included in, several radio bearers can be mapped onto the same transport channel, and the IE "Logical Channel Identity" was not included in the RB mapping info of any of those radio bearers for a multiplexing option on that transport channel or the same "Logical Channel Identity" was used more than once in the RB mapping info of those radio bearers for the multiplexing options on that transport channel:
 - 2> set the variable INVALID_CONFIGURATION to TRUE.
- 1> delete all previously stored multiplexing options for that radio bearer;
- 1> store each new multiplexing option for that radio bearer;
- ~~4> select and configure the multiplexing options applicable for the transport channels to be used;~~
- 1> if the IE "Uplink transport channel type" is set to the value "RACH":
 - 2> refer the IE "RLC size index" to the RACH Transport Format Set of the first PRACH received in the IE "PRACH system information list" received in SIB5 or SIB6.
- 1> determine the sets of RLC sizes that apply to the logical channels used by that RB, based on the IEs "RLC size list" and/or the IEs "Logical Channel List" included in the applicable "Transport format set" (either the ones received in the same message or the ones stored if none were received); and
- 1> in case the selected multiplexing option is a multiplexing option on RACH:
 - 2> ignore the RLC size indexes that do not correspond to any RLC size within the Transport Format Set stored for RACH.
- 1> if RACH is the transport channel to be used on the uplink, if that RB has a multiplexing option on RACH and if it is using AM:
 - 2> apply the largest size amongst the ones derived according to the previous bullet for the RLC size (or RLC sizes in case the RB is realised using two logical channels) for the corresponding RLC entity.
- 1> if that RB is using AM and the RLC size applicable to the logical channel transporting data PDUs is different from the one derived from the previously stored configuration:
 - 2> re-establish the corresponding RLC entity;
 - 2> configure the corresponding RLC entity with the new RLC size;

- 2> for each AM RLC radio bearer in the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS whose RLC size is changed; and
- 2> for each AM RLC signalling radio bearer in the CN domain as indicated in the IE "CN domain identity" in the variable LATEST_CONFIGURED_CN_DOMAIN whose RLC size is changed:
 - 3> if the IE "Status" in the variable CIPHERING_STATUS of this CN domain is set to "Started":
 - 4> if this IE was included in system information:
 - 5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" for this CN domain that will be included in the CELL UPDATE message that will be sent before the next transmission.
 - 4> if this IE was included in CELL UPDATE CONFIRM:
 - 5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" included in the latest transmitted CELL UPDATE message for this CN domain.
 - 4> if this IE was included in a reconfiguration message:
 - 5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" that will be included in the reconfiguration complete message for this CN domain.
- 1> if that RB is using UM:
 - 2> indicate the largest applicable RLC size to the corresponding RLC entity.
- 1> configure MAC multiplexing according to the selected multiplexing option (MAC multiplexing shall only be configured for a logical channel if the transport channel it is mapped on according to the selected multiplexing option is the same as the transport channel another logical channel is mapped on according to the multiplexing option selected for it);
- 1> configure the MAC with the logical channel priorities according to selected multiplexing option;
- 1> configure the MAC with the set of applicable RLC Sizes for each of the logical channels used for that RB;
- 1> if there is no multiplexing option applicable for the transport channels to be used in the RRC state indicated in the IE "RRC State Indicator" included in the received message:
 - 2> set the variable INVALID_CONFIGURATION to TRUE.
- 1> if there is more than one multiplexing option applicable for the transport channels to be used in the RRC state indicated in the IE "RRC State Indicator" included in the received message:
 - 2> set the variable INVALID_CONFIGURATION to TRUE.

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

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

CHANGE REQUEST

⌘ **25.331 CR 1464** ⌘ rev **-** ⌘ Current version: **4.4.0** ⌘

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

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

Title:	⌘ Correction to RB Mapping Info		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘ TEI	Date:	⌘ 13 th - May 2002
Category:	⌘ A	Release:	⌘ REL-4
	<i>Use one of the following categories:</i> F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		<i>Use one of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ The selection of the RB multiplexing option applicable in the target RRC state is ambiguously specified. The specification in section 8.6.4.8 of the "select and configure the multiplexing options applicable for the transport channels to be used" is not clear to which transport channel refers to.
Summary of change:	⌘ In section 7.2.2 it is clarified that the UE selects the multiplexing option to be used in the RRC state where the UE will be at the end of a procedure. In section 8.6.4.8 it is clarified that the transport channels to be used refers to the transport channels used in the target RRC state.
Consequences if not approved:	⌘ Ambiguous specification of which multiplexing option is to be used in the target RRC state

Clauses affected:	⌘ 7.2.2.2, 7.2.2.3, 8.3.1.2, 8.6.4.8		
Other specs affected:	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	25.331 v3.10.0, CR 1463 25.331 v5.0.0, CR 1465
Other comments:	⌘		

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

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

7.2.2 UTRA RRC Connected mode

In this specification unless otherwise mentioned "connected mode" shall refer to "UTRA RRC connected mode".

7.2.2.1 URA_PCH or CELL_PCH state

In the URA_PCH or CELL_PCH state the UE shall perform the following actions:

NOTE: Neither DCCH nor DTCH are available in these states.

1> if the UE is "in service area":

- 2> maintain up-to-date system information as broadcast by the serving cell as specified in the subclause 8.1.1;
- 2> perform cell reselection process as specified in [4];
- 2> perform a periodic search for higher priority PLMNs as specified in [25];

NOTE: If the DRX cycle length is 80ms, then a search for higher priority PLMNs may not identify all the available PLMNs due to the paging occasion on the current serving cell coinciding with the MIB of the cell of interest.

- 2> monitor the paging occasions and PICH monitoring occasions determined according to subclauses 8.6.3.1a and 8.6.3.2 and receive paging information on the PCH mapped on the S-CCPCH selected by the UE according to the procedure in subclause 8.5.19;
- 2> act on RRC messages received on PCCH and BCCH;
- 2> perform measurements process according to measurement control information as specified in subclause 8.4 and in subclause 14.4;
- 2> maintain up-to-date BMC data if it supports Cell Broadcast Service (CBS) as specified in [37];
- 2> run timer T305 for periodical URA update if the UE is in URA_PCH or for periodical cell update if the UE is in CELL_PCH.

1> if the UE is "out of service area":

- 2> perform cell reselection process as specified in [4];
- 2> run timer T316;
- 2> run timer T305.

7.2.2.2 CELL_FACH state

In the CELL_FACH state the UE shall perform the following actions:

NOTE: DCCH and, if configured, DTCH are available in this state.

1> if the UE is "in service area":

- 2> maintain up-to-date system information as broadcast by the serving cell as specified in subclause 8.1.1;
- 2> perform cell reselection process as specified in [4];
- 2> perform measurements process according to measurement control information as specified in subclause 8.4 and in subclause 14.4;
- 2> run timer T305 (periodical cell update);

2> select and configure the RB multiplexing options applicable for the transport channels to be used in this RRC state;

- 2> listen to all FACH transport channels mapped on the S-CCPCH selected by the UE according to the procedure in subclause 8.5.19;
 - 2> act on RRC messages received on BCCH, CCCH and DCCH;
 - 2> act on RRC messages received on, if available, SHCCH (TDD only).
- 1> if the UE is "out of service area":
- 2> perform cell reselection process as specified in [4];
 - 2> run timers T305 (periodical cell update), and T317 (cell update when re-entering "in service") or T307 (transition to Idle mode).

7.2.2.3 CELL_DCH state

In the CELL_DCH state the UE shall perform the following actions:

NOTE: DCCH and, if configured, DTCH are available in this state.

- 1> read system information broadcast on FACH as specified in subclause 8.1.1.3 (applicable only to UEs with certain capabilities and in FDD mode);
- 1> read the system information as specified in subclause 8.1.1 (for UEs in TDD mode);
- 1> perform measurements process according to measurement control information as specified in subclause 8.4 and in clause 14;
- 1> select and configure the RB multiplexing options applicable for the transport channels to be used in this RRC state;
- 1> act on RRC messages received on DCCH;
- 1> act on RRC messages received on BCCH (applicable only to UEs with certain capabilities and in FDD mode);
- 1> act on RRC messages received on BCCH (TDD only) and, if available, SHCCH (TDD only).

8.3.1 Cell and URA update procedures

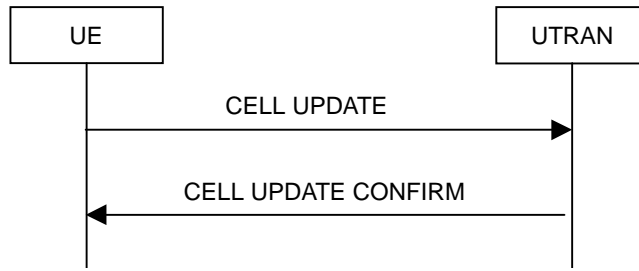


Figure 8.3.1-1: Cell update procedure, basic flow

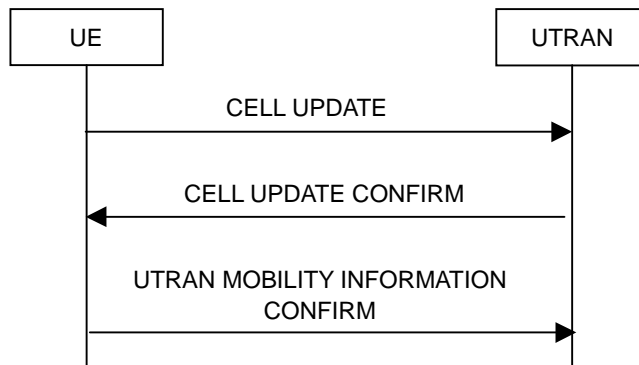


Figure 8.3.1-2: Cell update procedure with update of UTRAN mobility information

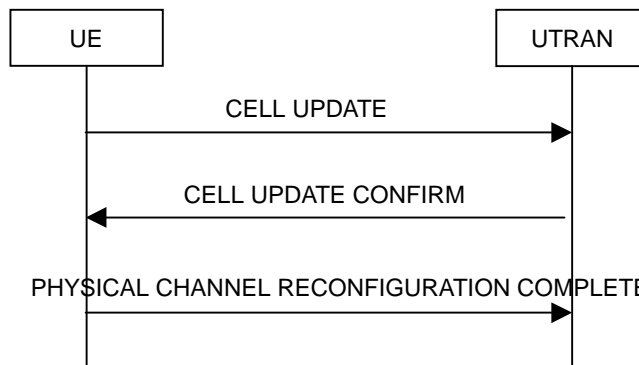


Figure 8.3.1-3: Cell update procedure with physical channel reconfiguration

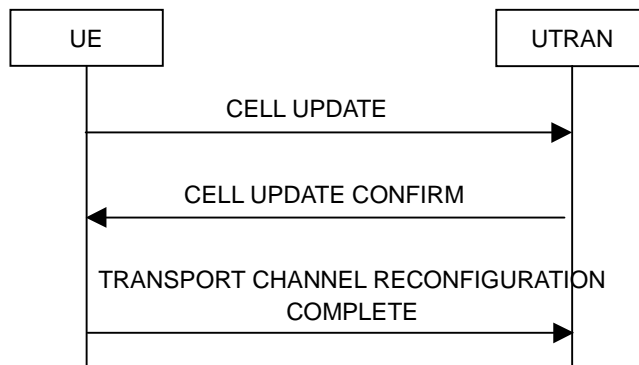


Figure 8.3.1-4: Cell update procedure with transport channel reconfiguration

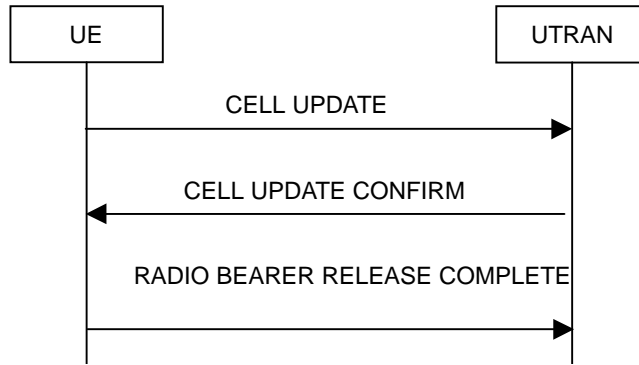


Figure 8.3.1-5: Cell update procedure with radio bearer release

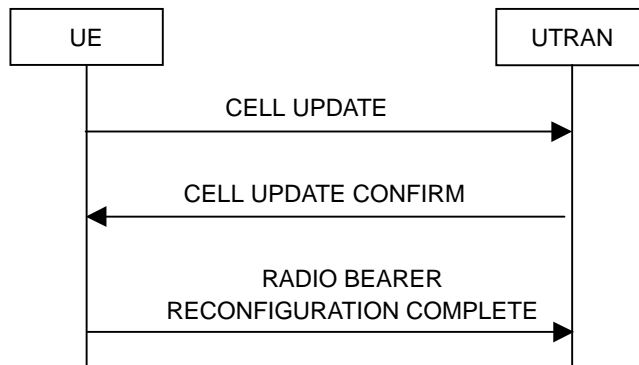


Figure 8.3.1-6: Cell update procedure with radio bearer reconfiguration

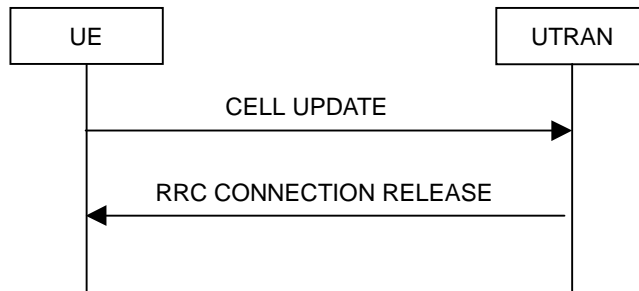


Figure 8.3.1-7: Cell update procedure, failure case

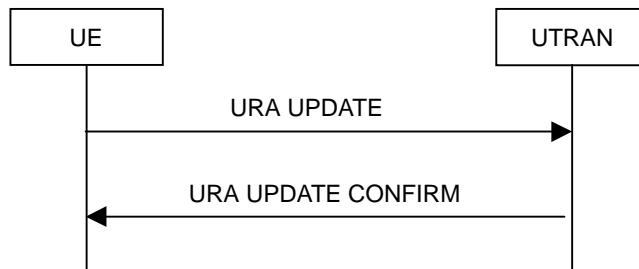


Figure 8.3.1-8: URA update procedure, basic flow

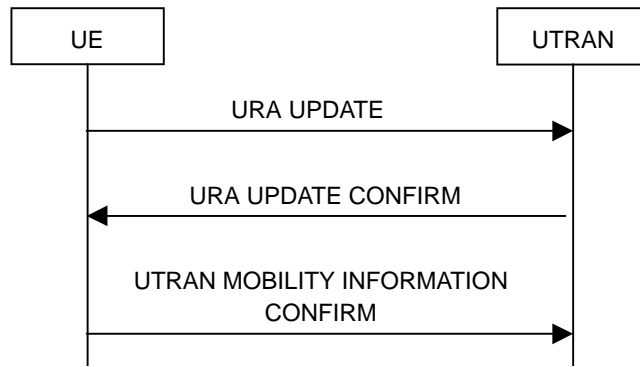


Figure 8.3.1-9: URA update procedure with update of UTRAN mobility information

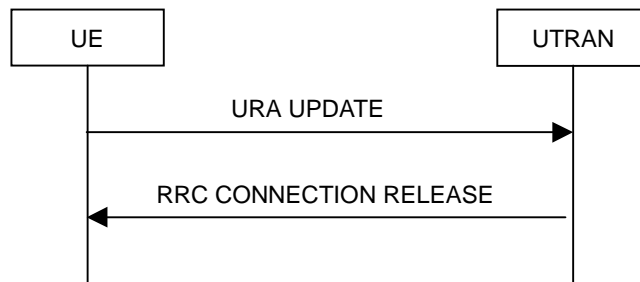


Figure 8.3.1-10: URA update procedure, failure case

8.3.1.1 General

The URA update and cell update procedures serve several main purposes:

- to notify UTRAN after re-entering service area in the URA_PCH or CELL_PCH state;
- to notify UTRAN of an RLC unrecoverable error [16] on an AM RLC entity;
- to be used as a supervision mechanism in the CELL_FACH, CELL_PCH, or URA_PCH state by means of periodical update.

In addition, the URA update procedure also serves the following purpose:

- to retrieve a new URA identity after cell re-selection to a cell not belonging to the current URA assigned to the UE in URA_PCH state.

In addition, the cell update procedure also serves the following purposes:

- to update UTRAN with the current cell the UE is camping on after cell reselection;
- to act on a radio link failure in the CELL_DCH state;
- when triggered in the URA_PCH or CELL_PCH state, to notify UTRAN of a transition to the CELL_FACH state due to the reception of UTRAN originated paging or due to a request to transmit uplink data.

The URA update and cell update procedures may:

- 1> include an update of mobility related information in the UE;
- 1> cause a state transition from the CELL_FACH state to the CELL_DCH, CELL_PCH or URA_PCH states or idle mode.

The cell update procedure may also include:

- a re-establish of AM RLC entities;

- a radio bearer release, radio bearer reconfiguration, transport channel reconfiguration or physical channel reconfiguration.

8.3.1.2 Initiation

A UE shall initiate the cell update procedure in the following cases:

1> Uplink data transmission:

- 2> if the UE is in URA_PCH or CELL_PCH state; and
- 2> if the UE has uplink RLC data PDU or uplink RLC control PDU on RB1 or upwards to transmit:
 - 3> perform cell update using the cause "uplink data transmission".

1> Paging response:

- 2> if the criteria for performing cell update with the cause specified above in the current subclause is not met; and
- 2> if the UE in URA_PCH or CELL_PCH state, receives a PAGING TYPE 1 message fulfilling the conditions for initiating a cell update procedure specified in subclause 8.1.2.3:
 - 3> perform cell update using the cause "paging response".

1> Radio link failure:

- 2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met; and
- 2> if the UE is in CELL_DCH state; and
- 2> if the criteria for radio link failure is met as specified in subclause 8.5.6:
 - 3> perform cell update using the cause "radio link failure".

1> Re-entering service area:

- 2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met; and
- 2> if the UE is in CELL_FACH or CELL_PCH state; and
- 2> if the UE has been out of service area and re-enters service area before T307 or T317 expires:
 - 3> perform cell update using the cause "re-entering service area".

1> RLC unrecoverable error:

- 2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met; and
- 2> if the UE detects RLC unrecoverable error [16] in an AM RLC entity:
 - 3> perform cell update using the cause "RLC unrecoverable error".

1> Cell reselection:

- 2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met:
 - 3> if the UE is in CELL_FACH or CELL_PCH state and the UE performs cell re-selection; or
 - 3> if the UE is in CELL_FACH state and the variable C_RNTI is empty:
 - 4> perform cell update using the cause "cell reselection".

1> Periodical cell update:

- 2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met; and
- 2> if the UE is in CELL_FACH or CELL_PCH state; and
- 2> if the timer T305 expires; and
- 2> if the criteria for "in service area" as specified in subclause 8.5.5.2 is fulfilled; and
- 2> if periodic updating has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity":
 - 3> perform cell update using the cause "periodical cell update".

A UE in URA_PCH state shall initiate the URA update procedure in the following cases:

1> URA reselection:

- 2> if the UE detects that the current URA assigned to the UE, stored in the variable URA_IDENTITY, is not present in the list of URA identities in system information block type 2; or
- 2> if the list of URA identities in system information block type 2 is empty; or
- 2> if the system information block type 2 can not be found:
 - 3> perform URA update using the cause "change of URA".

1> Periodic URA update:

- 2> if the criteria for performing URA update with the causes as specified above in the current subclause are not met; and
- 2> if the timer T305 expires while the UE is in the service area; and
- 2> if periodic updating has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity":
 - 3> perform URA update using the cause "periodic URA update".

When initiating the URA update or cell update procedure, the UE shall:

1> stop timer T305;

1> if the UE is in CELL_DCH state:

- 2> in the variable RB_TIMER_INDICATOR, set the IE "T314 expired" and the IE "T315 expired" to FALSE;
- 2> if the stored values of the timer T314 and timer T315 are both equal to zero:
 - 3> release all its radio resources;
 - 3> indicate release (abort) of the established signalling connections (as stored in the variable ESTABLISHED_SIGNALLING_CONNECTIONS) and established radio access bearers (as stored in the variable ESTABLISHED_RABS) to upper layers;
 - 3> clear the variable ESTABLISHED_SIGNALLING_CONNECTIONS;
 - 3> clear the variable ESTABLISHED_RABS;
 - 3> enter idle mode;
 - 3> perform other actions when entering idle mode from connected mode as specified in subclause 8.5.2;
 - 3> and the procedure ends.

- 2> if the stored value of the timer T314 is equal to zero:
 - 3> release all radio bearers, associated with any radio access bearers for which in the variable ESTABLISHED_RABS the value of the IE "Re-establishment timer" is set to "useT314";
 - 3> in the variable RB_TIMER_INDICATOR set the IE "T314 expired" to TRUE.
- 2> if the stored value of the timer T315 is equal to zero:
 - 3> release all radio bearers associated with any radio access bearers for which in the variable ESTABLISHED_RABS the value of the IE "Re-establishment timer" is set to "useT315";
 - 3> in the variable RB_TIMER_INDICATOR set the IE "T315 expired" to TRUE.
- 2> if the stored value of the timer T314 is greater than zero:
 - 3> if there are radio bearers associated with any radio access bearers for which in the variable ESTABLISHED_RABS the value of the IE "Re-establishment timer" is set to "useT314":
 - 4> start timer T314.
 - 3> if there are no radio bearers associated with any radio access bearers for which in the variable ESTABLISHED_RABS the value of the IE "Re-establishment timer" is set to "useT314" or "useT315":
 - 4> start timer T314.
- 2> if the stored value of the timer T315 is greater than zero:
 - 3> if there are radio bearers associated with any radio access bearers for which in the variable ESTABLISHED_RABS the value of the IE "Re-establishment timer" is set to "useT315":
 - 4> start timer T315.
- 2> for the released radio bearer(s):
 - 3> delete the information about the radio bearer from the variable ESTABLISHED_RABS;
 - 3> when all radio bearers belonging to the same radio access bearer have been released:
 - 4> indicate local end release of the radio access bearer to upper layers using the CN domain identity together with the RAB identity stored in the variable ESTABLISHED_RABS;
 - 4> delete all information about the radio access bearer from the variable ESTABLISHED_RABS.
- 2> select a suitable UTRA cell according to [4];
- 2> set the variable ORDERED_RECONFIGURATION to FALSE.
- 1> set the variables PROTOCOL_ERROR_INDICATOR, FAILURE_INDICATOR, UNSUPPORTED_CONFIGURATION and INVALID_CONFIGURATION to FALSE;
- 1> set the variable CELL_UPDATE_STARTED to TRUE;
- 1> if the UE is not already in CELL_FACH state:
 - 2> move to CELL_FACH state, if not already in that state;
 - 2> select PRACH according to subclause 8.5.17;
 - 2> select Secondary CCPCH according to subclause 8.5.19;
 - 2> use the transport format set given in system information as specified in 8.6.5.1;
- 1> if the UE performs cell re-selection:
 - 2> clear the variable C_RNTI; and
 - 2> stop using that C_RNTI just cleared from the variable C_RNTI in MAC.

- 1> set CFN in relation to SFN of current cell according to subclause 8.5.15;
- 1> in case of a cell update procedure:
 - 2> set the contents of the CELL UPDATE message according to subclause 8.3.1.3;
 - 2> submit the CELL UPDATE message for transmission on the uplink CCCH.
- 1> in case of a URA update procedure:
 - 2> set the contents of the URA UPDATE message according to subclause 8.3.1.3;
 - 2> submit the URA UPDATE message for transmission on the uplink CCCH.
- 1> set counter V302 to 1;
- 1> start timer T302 when the MAC layer indicates success or failure in transmitting the message.

8.3.1.3 CELL UPDATE / URA UPDATE message contents to set

In case of cell update procedure the UE shall transmit a CELL UPDATE message.

In case of URA update procedure the UE shall transmit a URA UPDATE message.

The UE shall set the IEs in the CELL UPDATE message as follows:

- 1> set the IE "Cell update cause" corresponding to the cause specified in subclause 8.3.1.2 that is valid when the CELL UPDATE message is submitted to lower layers for transmission;

NOTE: During the time period starting from when a cell update procedure is initiated by the UE until when the procedure ends, additional CELL UPDATE messages may be transmitted by the UE with different causes.

- 1> set the IE "U-RNTI" to the value of the variable U_RNTI;
- 1> if the value of the variable PROTOCOL_ERROR_INDICATOR is TRUE:
 - 2> include the IE "RRC transaction identifier"; and
 - 3> set it to the value of "RRC transaction identifier" in the entry for the CELL UPDATE CONFIRM message in the table "Rejected transactions" in the variable TRANSACTIONS.
 - 2> include and set the IE "failure cause" to the cause value "protocol error";
 - 2> set the IE "Protocol error information" set to the value of the variable PROTOCOL_ERROR_INFORMATION.
- 1> if the value of the variable FAILURE_INDICATOR is TRUE:
 - 2> include the IE "RRC transaction identifier"; and
 - 3> set it to the value of "RRC transaction identifier" in the entry for the CELL UPDATE CONFIRM message in the table "Accepted transactions" in the variable TRANSACTIONS.
 - 2> include and set the IE "failure cause" to the value of the variable FAILURE_CAUSE.
- 1> include the START values for each CN domain, calculated according to subclause 8.5.9;
- 1> if an unrecoverable error [16] in any of the AM RLC entities for the signalling radio bearers RB2, RB3 or RB4 is detected:
 - 2> set the IE "AM_RLC error indication (RB2, RB3 or RB4)" to TRUE.
- 1> otherwise:
 - 2> set the IE "AM_RLC error indication (RB2, RB3 or RB4)" to FALSE.

- 1> if an unrecoverable error [16] in any of the AM RLC entities for the RB5 or upward is detected:
 - 2> set the IE "AM_RLC error indication (RB>4)" to TRUE.
- 1> otherwise:
 - 2> set the IE "AM_RLC error indication (RB>4)" to FALSE.
- 1> set the IE "RB Timer indicator" to the value of the variable RB_TIMER_INDICATOR;
- 1> include an intra-frequency measurement report in the IE "Measured results on RACH", as specified in the IE "Intra-frequency reporting quantity for RACH reporting" and the IE "Maximum number of reported cells on RACH" in system information block type 12 (or System Information Block type 11, if System Information Block type 12 is not being broadcast); and
- 1> include in the IE "Measured results on RACH" all requested reporting quantities for all included measurement objects; and
- 1> take care that the maximum allowed message size is not exceeded when forming the IE "Measured results on RACH".

The UE shall set the IEs in the URA UPDATE message as follows:

- 1> set the IE "U-RNTI" to the value of the variable U_RNTI;
- 1> set the IE "URA update cause" corresponding to which cause as specified in subclause 8.3.1.2 that is valid when the URA UPDATE message is submitted to lower layers for transmission;

NOTE: During the time period starting from when a URA update procedure is initiated by the UE until when the procedure ends, additional URA UPDATE messages may be transmitted by the UE with different causes, depending on which causes are valid for the respective URA UPDATE message.

- 2> if the value of the variable PROTOCOL_ERROR_INDICATOR is TRUE:
 - 3> include the IE "RRC transaction identifier"; and
 - 4> set it to the value of "RRC transaction identifier" in the entry for the URA UPDATE CONFIRM message in the table "Rejected transactions" in the variable TRANSACTIONS;
 - 3> set the IE "Protocol error indicator" to TRUE;
 - 3> include the IE "Protocol error information" set to the value of the variable PROTOCOL_ERROR_INFORMATION.
- 2> if the value of the variable PROTOCOL_ERROR_INDICATOR is FALSE:
 - 3> if the value of the variable INVALID_CONFIGURATION is TRUE:
 - 4> include the IE "RRC transaction identifier"; and
 - 4> set it to the value of "RRC transaction identifier" in the entry for the URA UPDATE CONFIRM message in the table "Accepted transactions" in the variable TRANSACTIONS;
 - 4> set the IE "Protocol error indicator" to TRUE;
 - 4> include the IE "Protocol error information" set to "Information element value not comprehended";
 - 3> if the value of the variable INVALID_CONFIGURATION is FALSE:
 - 4> set the IE "Protocol error indicator" to FALSE.

8.6.4.8 RB mapping info

If the IE "RB mapping info" is included, the UE shall:

- 1> for each multiplexing option of the RB:
 - 2> if a transport channel that would not exist as a result of the message (i.e. removed in the same message in IE "Deleted DL TrCH information" and IE "Deleted UL TrCH information") is referred to:
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> if a multiplexing option that maps a logical channel corresponding to a TM-RLC entity onto RACH, CPCH, FACH or DSCH is included:
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> if the multiplexing option realises the radio bearer on the uplink (resp. on the downlink) using two logical channels with different values of the IE "Uplink transport channel type" (resp. of the IE "Downlink transport channel type"):
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> if that RB is using TM and the IE "Segmentation indication" is set to TRUE and, based on the multiplexing configuration resulting from this message, the logical channel corresponding to it is mapped onto the same transport channel as another logical channel:
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> if the transport channel considered in that multiplexing option is different from RACH and if that RB is using AM and the set of RLC sizes applicable to the logical channel transferring data PDUs has more than one element:
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> if that RB is using UM or TM and the multiplexing option realises it using two logical channels:
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> for each logical channel in that multiplexing option:
 - 3> if the value of the IE "RLC size list" is set to "Explicit list":
 - 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is included in the same message, and the value (index) of any IE "RLC size index" in the IE "Explicit list" does not correspond to an "RLC size" in the IE transport format set of that transport channel given in the message; or
 - 4> if the transport channel this logical channel is mapped on in this multiplexing option is different from RACH, and if a "Transport format set" for that transport channel is not included in the same message, and the value (index) of any IE "RLC size index" in the IE "Explicit list" does not correspond to an "RLC size" in the stored transport format set of that transport channel; or
 - 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is included in the same message, and the value of any IE "Logical channel list" in the transport format set is not set to "Configured"; or
 - 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is not included in the same message, and the value of any IE "Logical channel list" in the stored transport format set of that transport channel is not set to "Configured":
 - 5> set the variable INVALID_CONFIGURATION to TRUE.
 - 3> if the value of the IE "RLC size list" is set to "All":

- 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is included in the same message, and the value of any IE "Logical channel list" in the transport format set is not set to "Configured"; or
- 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is not included in the same message, and the value of any IE "Logical channel list" in the stored transport format set of that transport channel is not set to "Configured":
 - 5> set the variable INVALID_CONFIGURATION to TRUE.
- 3> if the value of the IE "RLC size list" is set to "Configured":
 - 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is included in the same message, and for none of the RLC sizes defined for that transport channel in the "Transport format set", the "Logical Channel List" is set to "All" or given as an "Explicit List" which contains this logical channel; or
 - 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is not included in the same message, and for none of the RLC sizes defined in the transport format set stored for that transport channel, the "Logical Channel List" is set to "All" or given as an "Explicit List" which contains this logical channel:
 - 5> set the variable INVALID_CONFIGURATION to TRUE.
- 1> if, as a result of the message this IE is included in, several radio bearers can be mapped onto the same transport channel, and the IE "Logical Channel Identity" was not included in the RB mapping info of any of those radio bearers for a multiplexing option on that transport channel or the same "Logical Channel Identity" was used more than once in the RB mapping info of those radio bearers for the multiplexing options on that transport channel:
 - 2> set the variable INVALID_CONFIGURATION to TRUE.
- 1> delete all previously stored multiplexing options for that radio bearer;
- 1> store each new multiplexing option for that radio bearer;
- ~~1> select and configure the multiplexing options applicable for the transport channels to be used;~~
- 1> if the IE "Uplink transport channel type" is set to the value "RACH":
 - 2> in FDD:
 - 3> refer the IE "RLC size index" to the RACH Transport Format Set of the first PRACH received in the IE "PRACH system information list" received in SIB5 or SIB6.
 - 2> in TDD:
 - 3> use the first Transport Format of the PRACH of the IE "PRACH system information list" at the position equal to the value in the IE "RLC size index".
- 1> determine the sets of RLC sizes that apply to the logical channels used by that RB, based on the IEs "RLC size list" and/or the IEs "Logical Channel List" included in the applicable "Transport format set" (either the ones received in the same message or the ones stored if none were received); and
- 1> in case the selected multiplexing option is a multiplexing option on RACH:
 - 2> ignore the RLC size indexes that do not correspond to any RLC size within the Transport Format Set stored for RACH.
- 1> if RACH is the transport channel to be used on the uplink, if that RB has a multiplexing option on RACH and if it is using AM:
 - 2> apply the largest size amongst the ones derived according to the previous bullet for the RLC size (or RLC sizes in case the RB is realised using two logical channels) for the corresponding RLC entity.

- 1> if that RB is using AM and the RLC size applicable to the logical channel transporting data PDUs is different from the one derived from the previously stored configuration:
 - 2> re-establish the corresponding RLC entity;
 - 2> configure the corresponding RLC entity with the new RLC size;
 - 2> for each AM RLC radio bearer in the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS whose RLC size is changed; and
 - 2> for each AM RLC signalling radio bearer in the CN domain as indicated in the IE "CN domain identity" in the variable LATEST_CONFIGURED_CN_DOMAIN whose RLC size is changed:
 - 3> if the IE "Status" in the variable CIPHERING_STATUS of this CN domain is set to "Started":
 - 4> if this IE was included in system information:
 - 5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" for this CN domain that will be included in the CELL UPDATE message that will be sent before the next transmission.
 - 4> if this IE was included in CELL UPDATE CONFIRM:
 - 5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" included in the latest transmitted CELL UPDATE message for this CN domain.
 - 4> if this IE was included in a reconfiguration message:
 - 5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" that will be included in the reconfiguration complete message for this CN domain.

- 1> if that RB is using UM:
 - 2> indicate the largest applicable RLC size to the corresponding RLC entity.
- 1> configure MAC multiplexing according to the selected multiplexing option (MAC multiplexing shall only be configured for a logical channel if the transport channel it is mapped on according to the selected multiplexing option is the same as the transport channel another logical channel is mapped on according to the multiplexing option selected for it);
- 1> configure the MAC with the logical channel priorities according to selected multiplexing option;
- 1> configure the MAC with the set of applicable RLC Sizes for each of the logical channels used for that RB;
- 1> if there is no multiplexing option applicable for the transport channels to be used in the RRC state indicated in the IE "RRC State Indicator" included in the received message:
 - 2> set the variable INVALID_CONFIGURATION to TRUE.
- 1> if there is more than one multiplexing option applicable for the transport channels to be used in the RRC state indicated in the IE "RRC State Indicator" included in the received message:
 - 2> set the variable INVALID_CONFIGURATION to TRUE.

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

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

CHANGE REQUEST

⌘ **25.331 CR 1465** ⌘ rev **-** ⌘ Current version: **5.0.0** ⌘

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

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

Title:	⌘ Correction to RB Mapping Info		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘ TEI	Date:	⌘ 13 th - May 2002
Category:	⌘ A	Release:	⌘ REL-5
	<i>Use one of the following categories:</i> F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		<i>Use one of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ The selection of the RB multiplexing option applicable in the target RRC state is ambiguously specified. The specification in section 8.6.4.8 of the "select and configure the multiplexing options applicable for the transport channels to be used" is not clear to which transport channel refers to.
Summary of change:	⌘ In section 7.2.2 it is clarified that the UE selects the multiplexing option to be used in the RRC state where the UE will be at the end of a procedure. In section 8.6.4.8 it is clarified that the transport channels to be used refers to the transport channels used in the target RRC state.
Consequences if not approved:	⌘ Ambiguous specification of which multiplexing option is to be used in the target RRC state

Clauses affected:	⌘ 7.2.2.2, 7.2.2.3, 8.3.1.2, 8.6.4.8		
Other specs affected:	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	25.331 v3.10.0, CR 1463 25.331 v4.4.0, CR 1464
Other comments:	⌘		

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

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

7.2.2 UTRA RRC Connected mode

In this specification unless otherwise mentioned "connected mode" shall refer to "UTRA RRC connected mode".

7.2.2.1 URA_PCH or CELL_PCH state

In the URA_PCH or CELL_PCH state the UE shall perform the following actions:

NOTE: Neither DCCH nor DTCH are available in these states.

1> if the UE is "in service area":

- 2> maintain up-to-date system information as broadcast by the serving cell as specified in the subclause 8.1.1;
- 2> perform cell reselection process as specified in [4];
- 2> perform a periodic search for higher priority PLMNs as specified in [25];

NOTE: If the DRX cycle length is 80ms, then a search for higher priority PLMNs may not identify all the available PLMNs due to the paging occasion on the current serving cell coinciding with the MIB of the cell of interest.

- 2> monitor the paging occasions and PICH monitoring occasions determined according to subclauses 8.6.3.1a and 8.6.3.2 and receive paging information on the PCH mapped on the S-CCPCH selected by the UE according to the procedure in subclause 8.5.19;
- 2> act on RRC messages received on PCCH and BCCH;
- 2> perform measurements process according to measurement control information as specified in subclause 8.4 and in subclause 14.4;
- 2> maintain up-to-date BMC data if it supports Cell Broadcast Service (CBS) as specified in [37];
- 2> run timer T305 for periodical URA update if the UE is in URA_PCH or for periodical cell update if the UE is in CELL_PCH.

1> if the UE is "out of service area":

- 2> perform cell reselection process as specified in [4];
- 2> run timer T316;
- 2> run timer T305.

7.2.2.2 CELL_FACH state

In the CELL_FACH state the UE shall perform the following actions:

NOTE: DCCH and, if configured, DTCH are available in this state.

1> if the UE is "in service area":

- 2> maintain up-to-date system information as broadcast by the serving cell as specified in subclause 8.1.1;
- 2> perform cell reselection process as specified in [4];
- 2> perform measurements process according to measurement control information as specified in subclause 8.4 and in subclause 14.4;
- 2> run timer T305 (periodical cell update);

2> select and configure the RB multiplexing options applicable for the transport channels to be used in this RRC state;

- 2> listen to all FACH transport channels mapped on the S-CCPCH selected by the UE according to the procedure in subclause 8.5.19;
 - 2> act on RRC messages received on BCCH, CCCH and DCCH;
 - 2> act on RRC messages received on, if available, SHCCH (TDD only).
- 1> if the UE is "out of service area":
- 2> perform cell reselection process as specified in [4];
 - 2> run timers T305 (periodical cell update), and T317 (cell update when re-entering "in service") or T307 (transition to Idle mode).

7.2.2.3 CELL_DCH state

In the CELL_DCH state the UE shall perform the following actions:

NOTE: DCCH and, if configured, DTCH are available in this state.

- 1> read system information broadcast on FACH as specified in subclause 8.1.1.3 (applicable only to UEs with certain capabilities and in FDD mode);
- 1> read the system information as specified in subclause 8.1.1 (for UEs in TDD mode);
- 1> perform measurements process according to measurement control information as specified in subclause 8.4 and in clause 14;
- 1> select and configure the RB multiplexing options applicable for the transport channels to be used in this RRC state;
- 1> act on RRC messages received on DCCH;
- 1> act on RRC messages received on BCCH (applicable only to UEs with certain capabilities and in FDD mode);
- 1> act on RRC messages received on BCCH (TDD only) and, if available, SHCCH (TDD only).

8.3.1 Cell and URA update procedures

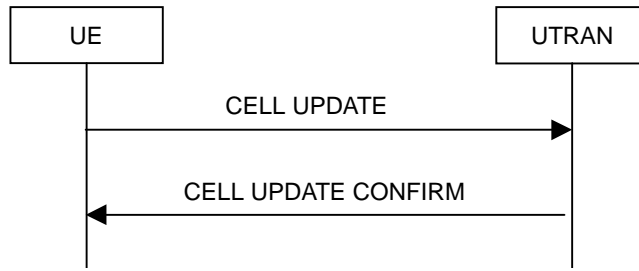


Figure 8.3.1-1: Cell update procedure, basic flow

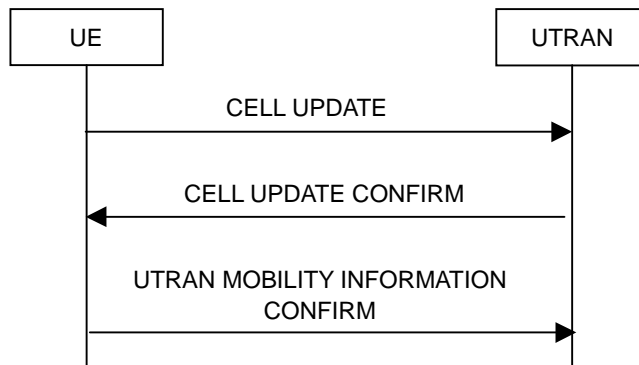


Figure 8.3.1-2: Cell update procedure with update of UTRAN mobility information

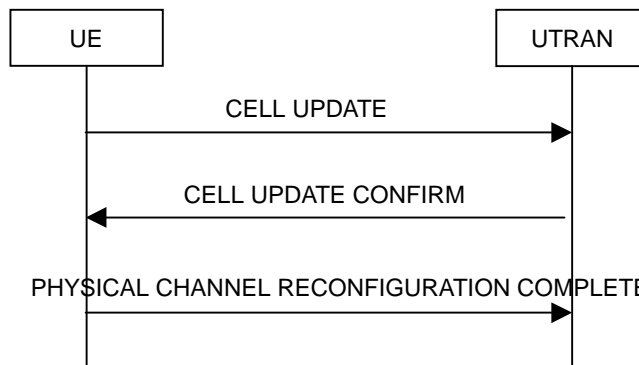


Figure 8.3.1-3: Cell update procedure with physical channel reconfiguration

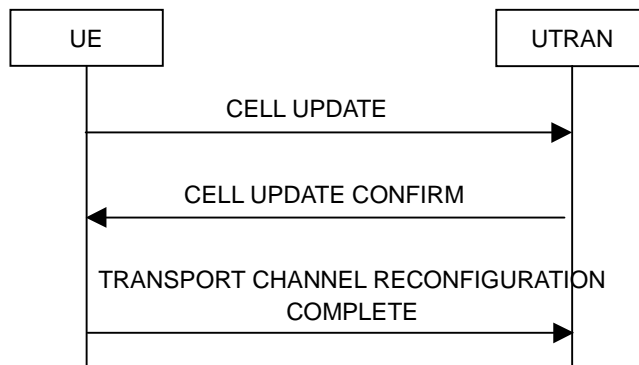


Figure 8.3.1-4: Cell update procedure with transport channel reconfiguration

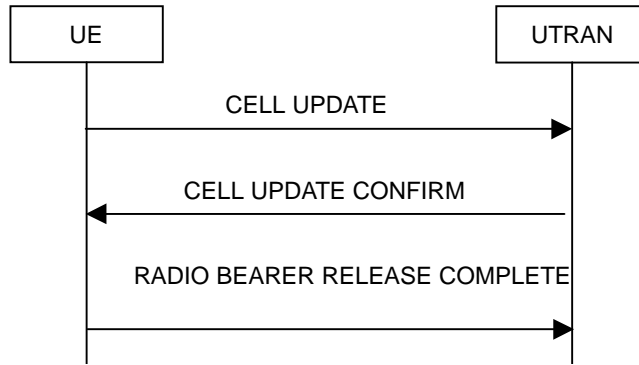


Figure 8.3.1-5: Cell update procedure with radio bearer release

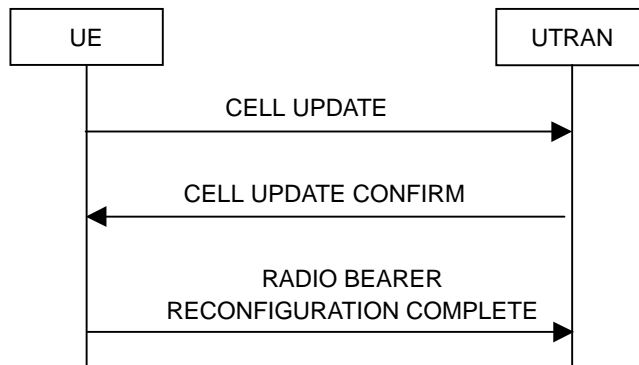


Figure 8.3.1-6: Cell update procedure with radio bearer reconfiguration

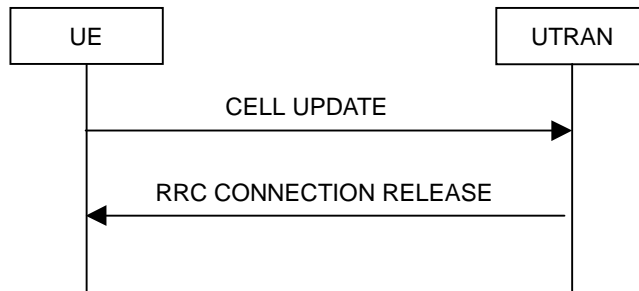


Figure 8.3.1-7: Cell update procedure, failure case

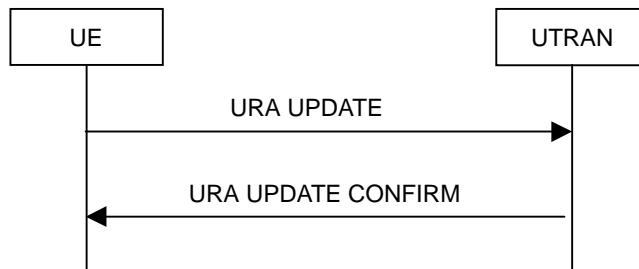


Figure 8.3.1-8: URA update procedure, basic flow

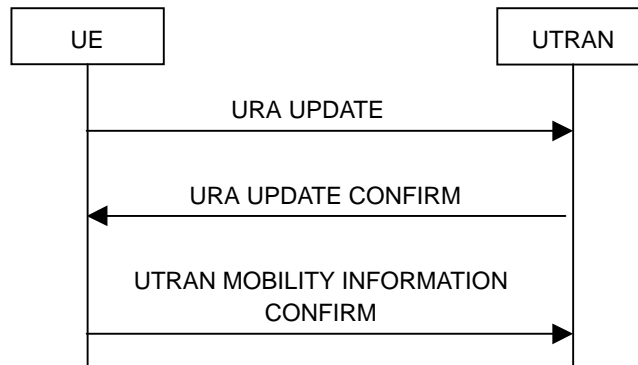


Figure 8.3.1-9: URA update procedure with update of UTRAN mobility information

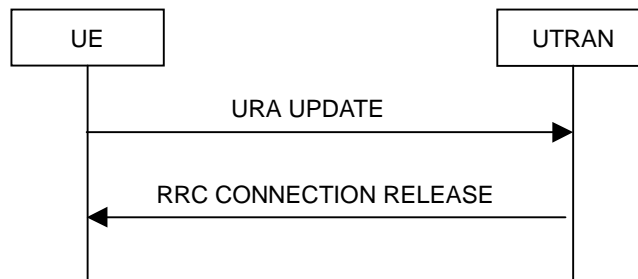


Figure 8.3.1-10: URA update procedure, failure case

8.3.1.1 General

The URA update and cell update procedures serve several main purposes:

- to notify UTRAN after re-entering service area in the URA_PCH or CELL_PCH state;
- to notify UTRAN of an RLC unrecoverable error [16] on an AM RLC entity;
- to be used as a supervision mechanism in the CELL_FACH, CELL_PCH, or URA_PCH state by means of periodical update.

In addition, the URA update procedure also serves the following purpose:

- to retrieve a new URA identity after cell re-selection to a cell not belonging to the current URA assigned to the UE in URA_PCH state.

In addition, the cell update procedure also serves the following purposes:

- to update UTRAN with the current cell the UE is camping on after cell reselection;
- to act on a radio link failure in the CELL_DCH state;
- when triggered in the URA_PCH or CELL_PCH state, to notify UTRAN of a transition to the CELL_FACH state due to the reception of UTRAN originated paging or due to a request to transmit uplink data.

The URA update and cell update procedures may:

- 1> include an update of mobility related information in the UE;
- 1> cause a state transition from the CELL_FACH state to the CELL_DCH, CELL_PCH or URA_PCH states or idle mode.

The cell update procedure may also include:

- a re-establish of AM RLC entities;

- a radio bearer release, radio bearer reconfiguration, transport channel reconfiguration or physical channel reconfiguration.

8.3.1.2 Initiation

A UE shall initiate the cell update procedure in the following cases:

1> Uplink data transmission:

- 2> if the UE is in URA_PCH or CELL_PCH state; and
- 2> if the UE has uplink RLC data PDU or uplink RLC control PDU on RB1 or upwards to transmit:
 - 3> perform cell update using the cause "uplink data transmission".

1> Paging response:

- 2> if the criteria for performing cell update with the cause specified above in the current subclause is not met; and
- 2> if the UE in URA_PCH or CELL_PCH state, receives a PAGING TYPE 1 message fulfilling the conditions for initiating a cell update procedure specified in subclause 8.1.2.3:
 - 3> perform cell update using the cause "paging response".

1> Radio link failure:

- 2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met; and
- 2> if the UE is in CELL_DCH state; and
- 2> if the criteria for radio link failure is met as specified in subclause 8.5.6:
 - 3> perform cell update using the cause "radio link failure".

1> Re-entering service area:

- 2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met; and
- 2> if the UE is in CELL_FACH or CELL_PCH state; and
- 2> if the UE has been out of service area and re-enters service area before T307 or T317 expires:
 - 3> perform cell update using the cause "re-entering service area".

1> RLC unrecoverable error:

- 2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met; and
- 2> if the UE detects RLC unrecoverable error [16] in an AM RLC entity:
 - 3> perform cell update using the cause "RLC unrecoverable error".

1> Cell reselection:

- 2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met:
 - 3> if the UE is in CELL_FACH or CELL_PCH state and the UE performs cell re-selection; or
 - 3> if the UE is in CELL_FACH state and the variable C_RNTI is empty:
 - 4> perform cell update using the cause "cell reselection".

1> Periodical cell update:

- 2> if none of the criteria for performing cell update with the causes specified above in the current subclause is met; and
- 2> if the UE is in CELL_FACH or CELL_PCH state; and
- 2> if the timer T305 expires; and
- 2> if the criteria for "in service area" as specified in subclause 8.5.5.2 is fulfilled; and
- 2> if periodic updating has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity":
 - 3> perform cell update using the cause "periodical cell update".

A UE in URA_PCH state shall initiate the URA update procedure in the following cases:

1> URA reselection:

- 2> if the UE detects that the current URA assigned to the UE, stored in the variable URA_IDENTITY, is not present in the list of URA identities in system information block type 2; or
- 2> if the list of URA identities in system information block type 2 is empty; or
- 2> if the system information block type 2 can not be found:
 - 3> perform URA update using the cause "change of URA".

1> Periodic URA update:

- 2> if the criteria for performing URA update with the causes as specified above in the current subclause are not met; and
- 2> if the timer T305 expires while the UE is in the service area; and
- 2> if periodic updating has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity":
 - 3> perform URA update using the cause "periodic URA update".

When initiating the URA update or cell update procedure, the UE shall:

1> stop timer T305;

1> if the UE is in CELL_DCH state:

- 2> in the variable RB_TIMER_INDICATOR, set the IE "T314 expired" and the IE "T315 expired" to FALSE;
- 2> if the stored values of the timer T314 and timer T315 are both equal to zero:
 - 3> release all its radio resources;
 - 3> indicate release (abort) of the established signalling connections (as stored in the variable ESTABLISHED_SIGNALLING_CONNECTIONS) and established radio access bearers (as stored in the variable ESTABLISHED_RABS) to upper layers;
 - 3> clear the variable ESTABLISHED_SIGNALLING_CONNECTIONS;
 - 3> clear the variable ESTABLISHED_RABS;
 - 3> enter idle mode;
 - 3> perform other actions when entering idle mode from connected mode as specified in subclause 8.5.2;
 - 3> and the procedure ends.

- 2> if the stored value of the timer T314 is equal to zero:
 - 3> release all radio bearers, associated with any radio access bearers for which in the variable ESTABLISHED_RABS the value of the IE "Re-establishment timer" is set to "useT314";
 - 3> in the variable RB_TIMER_INDICATOR set the IE "T314 expired" to TRUE.
- 2> if the stored value of the timer T315 is equal to zero:
 - 3> release all radio bearers associated with any radio access bearers for which in the variable ESTABLISHED_RABS the value of the IE "Re-establishment timer" is set to "useT315";
 - 3> in the variable RB_TIMER_INDICATOR set the IE "T315 expired" to TRUE.
- 2> if the stored value of the timer T314 is greater than zero:
 - 3> if there are radio bearers associated with any radio access bearers for which in the variable ESTABLISHED_RABS the value of the IE "Re-establishment timer" is set to "useT314":
 - 4> start timer T314.
 - 3> if there are no radio bearers associated with any radio access bearers for which in the variable ESTABLISHED_RABS the value of the IE "Re-establishment timer" is set to "useT314" or "useT315":
 - 4> start timer T314.
- 2> if the stored value of the timer T315 is greater than zero:
 - 3> if there are radio bearers associated with any radio access bearers for which in the variable ESTABLISHED_RABS the value of the IE "Re-establishment timer" is set to "useT315":
 - 4> start timer T315.
- 2> for the released radio bearer(s):
 - 3> delete the information about the radio bearer from the variable ESTABLISHED_RABS;
 - 3> when all radio bearers belonging to the same radio access bearer have been released:
 - 4> indicate local end release of the radio access bearer to upper layers using the CN domain identity together with the RAB identity stored in the variable ESTABLISHED_RABS;
 - 4> delete all information about the radio access bearer from the variable ESTABLISHED_RABS.
- 2> select a suitable UTRA cell according to [4];
- 2> set the variable ORDERED_RECONFIGURATION to FALSE.
- 1> set the variables PROTOCOL_ERROR_INDICATOR, FAILURE_INDICATOR, UNSUPPORTED_CONFIGURATION and INVALID_CONFIGURATION to FALSE;
- 1> set the variable CELL_UPDATE_STARTED to TRUE;
- 1> if the UE is not already in CELL_FACH state
 - ~~2> move to CELL_FACH state, if not already in that state;~~
 - 2> select PRACH according to subclause 8.5.17;
 - 2> select Secondary CCPCH according to subclause 8.5.19;
 - 2> use the transport format set given in system information as specified in 8.6.5.1;
- 1> if the UE performs cell re-selection:
 - 2> clear the variable C_RNTI; and
 - 2> stop using that C_RNTI just cleared from the variable C_RNTI in MAC.

- 1> set CFN in relation to SFN of current cell according to subclause 8.5.15;
- 1> in case of a cell update procedure:
 - 2> set the contents of the CELL UPDATE message according to subclause 8.3.1.3;
 - 2> submit the CELL UPDATE message for transmission on the uplink CCCH.
- 1> in case of a URA update procedure:
 - 2> set the contents of the URA UPDATE message according to subclause 8.3.1.3;
 - 2> submit the URA UPDATE message for transmission on the uplink CCCH.
- 1> set counter V302 to 1;
- 1> start timer T302 when the MAC layer indicates success or failure in transmitting the message.

8.6.4.8 RB mapping info

If the IE "RB mapping info" is included, the UE shall:

- 1> for each multiplexing option of the RB:
 - 2> if a transport channel that would not exist as a result of the message (i.e. removed in the same message in IE "Deleted DL TrCH information" and IE "Deleted UL TrCH information") is referred to:
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> if a multiplexing option that maps a logical channel corresponding to a TM-RLC entity onto RACH, CPCH, FACH or DSCH or HS-DSCH is included:
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> if the multiplexing option realises the radio bearer on the uplink (resp. on the downlink) using two logical channels with different values of the IE "Uplink transport channel type" (resp. of the IE "Downlink transport channel type"):
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> if that RB is using TM and the IE "Segmentation indication" is set to TRUE and, based on the multiplexing configuration resulting from this message, the logical channel corresponding to it is mapped onto the same transport channel as another logical channel:
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> if the transport channel considered in that multiplexing option is different from RACH and if that RB is using AM and the set of RLC sizes applicable to the logical channel transferring data PDUs has more than one element:
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> if that RB is using UM or TM and the multiplexing option realises it using two logical channels:
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> for each logical channel in that multiplexing option:
 - 3> if the value of the IE "RLC size list" is set to "Explicit list":
 - 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is included in the same message, and the value (index) of any IE "RLC size index" in the IE "Explicit list" does not correspond to an "RLC size" in the IE transport format set of that transport channel given in the message; or
 - 4> if the transport channel this logical channel is mapped on in this multiplexing option is different from RACH, and if a "Transport format set" for that transport channel is not included in the same message, and the value (index) of any IE "RLC size index" in the IE "Explicit list" does not correspond to an "RLC size" in the stored transport format set of that transport channel; or
 - 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is included in the same message, and the value of any IE "Logical channel list" in the transport format set is not set to "Configured"; or
 - 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is not included in the same message, and the value of any IE "Logical channel list" in the stored transport format set of that transport channel is not set to "Configured":
 - 5> set the variable INVALID_CONFIGURATION to TRUE.
 - 3> if the value of the IE "RLC size list" is set to "All":

- 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is included in the same message, and the value of any IE "Logical channel list" in the transport format set is not set to "Configured"; or
- 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is not included in the same message, and the value of any IE "Logical channel list" in the stored transport format set of that transport channel is not set to "Configured":
 - 5> set the variable INVALID_CONFIGURATION to TRUE.
- 3> if the value of the IE "RLC size list" is set to "Configured":
 - 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is included in the same message, and for none of the RLC sizes defined for that transport channel in the "Transport format set", the "Logical Channel List" is set to "All" or given as an "Explicit List" which contains this logical channel; or
 - 4> if a "Transport format set" for the transport channel this logical channel is mapped on in this multiplexing option is not included in the same message, and for none of the RLC sizes defined in the transport format set stored for that transport channel, the "Logical Channel List" is set to "All" or given as an "Explicit List" which contains this logical channel:
 - 5> set the variable INVALID_CONFIGURATION to TRUE.
- 1> if, as a result of the message this IE is included in, several radio bearers can be mapped onto the same transport channel, and the IE "Logical Channel Identity" was not included in the RB mapping info of any of those radio bearers for a multiplexing option on that transport channel or the same "Logical Channel Identity" was used more than once in the RB mapping info of those radio bearers for the multiplexing options on that transport channel:
 - 2> set the variable INVALID_CONFIGURATION to TRUE.
- 1> delete all previously stored multiplexing options for that radio bearer;
- 1> store each new multiplexing option for that radio bearer;
- ~~1> select and configure the multiplexing options applicable for the transport channels to be used;~~
- 1> if the IE "Uplink transport channel type" is set to the value "RACH":
 - 2> in FDD:
 - 3> refer the IE "RLC size index" to the RACH Transport Format Set of the first PRACH received in the IE "PRACH system information list" received in SIB5 or SIB6.
 - 2> in TDD:
 - 3> use the first Transport Format of the PRACH of the IE "PRACH system information list" at the position equal to the value in the IE "RLC size index".
- 1> determine the sets of RLC sizes that apply to the logical channels used by that RB, based on the IEs "RLC size list" and/or the IEs "Logical Channel List" included in the applicable "Transport format set" (either the ones received in the same message or the ones stored if none were received); and
- 1> in case the selected multiplexing option is a multiplexing option on RACH:
 - 2> ignore the RLC size indexes that do not correspond to any RLC size within the Transport Format Set stored for RACH.
- 1> if RACH is the transport channel to be used on the uplink, if that RB has a multiplexing option on RACH and if it is using AM:
 - 2> apply the largest size amongst the ones derived according to the previous bullet for the RLC size (or RLC sizes in case the RB is realised using two logical channels) for the corresponding RLC entity.

- 1> if that RB is using AM and the RLC size applicable to the logical channel transporting data PDUs is different from the one derived from the previously stored configuration:
 - 2> re-establish the corresponding RLC entity;
 - 2> configure the corresponding RLC entity with the new RLC size;
 - 2> for each AM RLC radio bearer in the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS whose RLC size is changed; and
 - 2> for each AM RLC signalling radio bearer in the CN domain as indicated in the IE "CN domain identity" in the variable LATEST_CONFIGURED_CN_DOMAIN whose RLC size is changed:
 - 3> if the IE "Status" in the variable CIPHERING_STATUS of this CN domain is set to "Started":
 - 4> if this IE was included in system information:
 - 5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" for this CN domain that will be included in the CELL UPDATE message that will be sent before the next transmission.
 - 4> if this IE was included in CELL UPDATE CONFIRM:
 - 5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" included in the latest transmitted CELL UPDATE message for this CN domain.
 - 4> if this IE was included in a reconfiguration message:
 - 5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" that will be included in the reconfiguration complete message for this CN domain.

- 1> if that RB is using UM:
 - 2> indicate the largest applicable RLC size to the corresponding RLC entity.
- 1> configure MAC multiplexing according to the selected multiplexing option (MAC multiplexing shall only be configured for a logical channel if the transport channel it is mapped on according to the selected multiplexing option is the same as the transport channel another logical channel is mapped on according to the multiplexing option selected for it);
- 1> configure the MAC with the logical channel priorities according to selected multiplexing option;
- 1> configure the MAC with the set of applicable RLC Sizes for each of the logical channels used for that RB;
- 1> if there is no multiplexing option applicable for the transport channels to be used in the RRC state indicated in the IE "RRC State Indicator" included in the received message:
 - 2> set the variable INVALID_CONFIGURATION to TRUE.
- 1> if there is more than one multiplexing option applicable for the transport channels to be used in the RRC state indicated in the IE "RRC State Indicator" included in the received message:
 - 2> set the variable INVALID_CONFIGURATION to TRUE.

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

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

3GPP TSG-RAN WG2 Meeting #29
Gyeongju, Korea, 13th-17th of May 2002

R2-021376

CR-Form-v5

CHANGE REQUEST

⌘ **25.331 CR 1466** ⌘ rev - ⌘ Current version: **3.10.0** ⌘

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

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

Title:	⌘ Cipherng Activation for TM Radio Bearers		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘ TEI	Date:	⌘ 2002-05-06
Category:	⌘ F	Release:	⌘ R99
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	R96 (Release 1996)	2 (GSM Phase 2)
	A (corresponds to a correction in an earlier release)	R97 (Release 1997)	
	B (addition of feature),	R98 (Release 1998)	
	C (functional modification of feature)	R99 (Release 1999)	
	D (editorial modification)	REL-4 (Release 4)	
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .	REL-5 (Release 5)	

Reason for change:	⌘ • The current specification contains ambiguous and incorrect text on cipherng, in particular at the setup of TM radio bearers (RB setup). See also summary of change below.
Summary of change:	⌘ • 8.6.4.3: When a TM RB is setup the behaviour is unspecified between the time of the RB setup message until the activation time of the cipherng (COUNT-C activation time set by UE or Downlink cipherng activation time set by UTRAN). It is specified that the last transmitted START value should be used to initiate HFN and the HFN shall be fixed in the time between the activation times.
	• In 8.2.2.3 the COUNT-C activation time in uplink is currently included when the first TM RB is setup. The COUNT-C activation time is however needed for the first TM RB for each CN domain.
	• In 8.2.2.3 the COUNT-C activation time is currently included in uplink when the last TM RB is released. Due to recent changes this is no longer needed and its proposed to delete this functionality.
	• In 8.6.3.4 the UE currently checks that activation times are included for all established RBS and SRBs if the IE "cipherng mode info" is included in downlink. These checks needs to be removed if it should be possible for UTRAN to give the Downlink activation time for cipherng when TM RBs are setup (as agreed at WG2 #28). In this document these checks are deleted.
	However, as some UE changes are required to allow this option, one possibility is to remove the option that UTRAN gives the activation time, i.e. only allow the option that the UE sets the COUNT-C activation time in uplink for RB setup. This seems to be the prefered way forward and if this is acceptable, an updated CR can be provided.
	<u>Updated CR:</u>
	<u>After discussion on R2-0221195, Security: Open Issues (Motorola), it was decided to</u>

have only one option for setting of the Ciphering Activation Time for TM RB setup, i.e. only allow the option that the UE sets the COUNT-C activation time in uplink.

In 8.6.6.28 the actions for transaction to CELL_DCH is not performed for RB SETUP since the corresponding actions are handled there. The reference to COUNT-C handling of TM RBs in CELL UPDATE CONFIRM is deleted since this is covered in 8.6.6.28.

The changes compared with R2-021271 are highlighted in blue.

Backwards compatibility analysis:

If the CR is not implemented in both UE and UTRAN:

- Speech will not be possible to decipher until the COUNT-C activation time set by the UE is reached (up to 2.5 seconds).
- ciphering may fail when a TM RB is setup on a CN domain and TM RBs are already established on the other CN domain (e.g. setup of PS TM RBs when CS speech is activated).

Impact on T1 test specifications: Security is in general not well covered in T1 and this CR is not foreseen to affect current T1 tests but the corrected functionality will affect future test cases produced by T1 on ciphering.

Consequences if not approved: ☞ Incorrect and ambiguous behaviour.

Clauses affected: ☞ 8.2.2.3, 8.2.2.5, 8.3.1.6, 8.6.3.4, 8.6.4.3, 8.6.6.28

Other specs affected: ☞

 Other core specifications ☞ 25.331 v4.4.0, CR 1467r1
 25.331 v5.0.0, CR 1468r1
 Test specifications
 O&M Specifications

Other comments: ☞

How to create CRs using this form:

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

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

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

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

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

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

If the UE receives:

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

it shall:

- 1> set the variable ORDERED_RECONFIGURATION to TRUE;
- 1> perform the physical layer synchronisation procedure as specified in [29];
- 1> act upon all received information elements as specified in subclause 8.6, unless specified in the following and perform the actions below.

The UE may first release the physical channel configuration used at reception of the reconfiguration message. The UE shall then:

- 1> 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:
 - 2> act upon the IE "PDSCH code mapping" as specified in subclause 8.6; and
 - 2> infer that the PDSCH will be transmitted from the cell from which the downlink DPCH is transmitted.
- 1> enter a state according to subclause 8.6.3.3.

In case the UE receives a RADIO BEARER RECONFIGURATION message including the IE "RB information to reconfigure" that only includes the IE "RB identity", the UE shall:

- 1> handle the message as if IE "RB information to reconfigure" was absent.

NOTE: The RADIO BEARER RECONFIGURATION message always includes the IE "RB information to reconfigure". UTRAN has to include it even if it does not require the reconfiguration of any RB.

If after state transition the UE enters CELL_DCH state, the UE shall, after the state transition:

- 1> remove any C-RNTI from MAC;
- 1> clear the variable C_RNTI.

In FDD, if after state transition the UE leaves CELL_DCH state, the UE shall, after the state transition:

- 1> remove any DSCH-RNTI from MAC;
- 1> clear the variable DSCH_RNTI.

If the UE was in CELL_DCH state upon reception of the reconfiguration message and remains in CELL_DCH state, the UE shall:

- 1> if the IE "Uplink DPCH Info" is absent, not change its current UL Physical channel configuration;
- 1> if the IE "Downlink information for each radio link" is absent, not change its current DL Physical channel configuration.

If after state transition the UE enters CELL_FACH state, the UE shall, after the state transition:

- 1> if the IE "Frequency info" is included in the received reconfiguration message:
 - 2> select a suitable UTRA cell according to [4] on that frequency.
- 1> if the IE "Frequency info" is not included in the received reconfiguration message:
 - 2> select a suitable UTRA cell according to [4].
- 1> if the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selects another cell than indicated by this IE or the received reconfiguration message did not include the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD):
 - 2> initiate a cell update procedure according to subclause 8.3.1 using the cause "Cell reselection";
 - 2> when the cell update procedure completed successfully:
 - 3> if the UE is in CELL_PCH or URA_PCH state:
 - 4> initiate a cell update procedure according to subclause 8.3.1 using the cause "Uplink data transmission";
 - 4> proceed as below.
- 1> start timer T305 using its initial value if timer T305 is not running and if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;
- 1> select PRACH according to subclause 8.5.17;
- 1> select Secondary CCPCH according to subclause 8.5.19;
- 1> use the transport format set given in system information;
- 1> if the IE "UTRAN DRX cycle length coefficient" is included in the same message:
 - 2> ignore that IE and stop using DRX.
- 1> if the contents of the variable C_RNTI is empty:
 - 2> perform a cell update procedure according to subclause 8.3.1 using the cause "Cell reselection";
 - 2> when the cell update procedure completed successfully:
 - 3> if the UE is in CELL_PCH or URA_PCH state:
 - 4> initiate a cell update procedure according to subclause 8.3.1 using the cause "Uplink data transmission";
 - 4> proceed as below.

If the UE was in CELL_FACH state upon reception of the reconfiguration message and remains in CELL_FACH state, the UE shall:

- 1> if the IE "Frequency info" is included in the received reconfiguration message:
 - 2> select a suitable UTRA cell according to [4] on that frequency;
 - 2> if the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE or the received reconfiguration message did not include the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD):
 - 3> initiate a cell update procedure according to subclause 8.3.1 using the cause "cell reselection";
 - 3> when the cell update procedure completed successfully:
 - 4> proceed as below.

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

- 1> if the received reconfiguration message included the IE "Downlink counter synchronisation info"; or
- 1> if the received reconfiguration message is a RADIO BEARER RECONFIGURATION and the IE "New U-RNTI" is included:
 - 2> re-establish RB2;
 - 2> set the new uplink and downlink HFN of RB2 to MAX(uplink HFN of RB2, downlink HFN of RB2);
 - 2> increment by one the downlink and uplink HFN values for RB2;
 - 2> calculate the START value according to subclause 8.5.9;
 - 2> include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info".
- 1> if the received reconfiguration message did not include the IE "Downlink counter synchronisation info":
 - 2> if the variable START_VALUE_TO_TRANSMIT is set:
 - 3> include and set the IE "START" to the value of that variable.
 - 2> if the variable START_VALUE_TO_TRANSMIT is not set and the IE "New U-RNTI" is included:
 - 3> calculate the START value according to subclause 8.5.9;
 - 3> include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info".
 - 2> if the received reconfiguration message caused a change in the RLC size for any RB using RLC-AM:
 - 3> calculate the START value according to subclause 8.5.9;
 - 3> include the calculated START values for the CN domain associated with the corresponding RB identity in the IE "START list" in the IE "Uplink counter synchronisation info".
- 1> if the received reconfiguration message contained the IE "Ciphering mode info" or contained the IE "Integrity protection mode info":
 - 2> set the IE "Status" in the variable SECURITY_MODIFICATION for all the CN domains in the variable SECURITY_MODIFICATION to "Affected".
- 1> if the received reconfiguration message contained the IE "Ciphering mode info":
 - 2> include and set the IE "Radio bearer uplink ciphering activation time info" to the value of the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO.
- 1> if the received reconfiguration message did not contain the IE "Ciphering activation time for DPCH" ~~in IE "Ciphering mode info"~~:

- 2> if prior to this procedure there exist no transparent mode RLC radio bearers for the CN domain indicated in the IE "CN domain identity" in the IE "RAB info":in the IE "CN domain information":
- 3> if, at the conclusion of this procedure, the UE will be in CELL_DCH state; and
- 3> if, at the conclusion of this procedure, at least one transparent mode RLC radio bearer exists for the CN domain indicated in the IE "CN domain identity" in the IE "RAB info":in the IE "CN domain information":
- 4> include the IE "COUNT-C activation time" and specify a CFN value for this IE.

Note: UTRAN should not include the IE "Ciphering mode info" in any reconfiguration messages unless it is also used to perform a SRNS relocation with change of ciphering algorithm.

- ~~2> if prior to this procedure there exists at least one transparent mode RLC radio bearer:~~
- ~~3> if, at the conclusion of this procedure, no transparent mode RLC radio bearers exist:~~
- ~~4> include the IE "COUNT-C activation time" and specify a CFN value for this IE:~~

- 1> set the IE "RRC transaction identifier" to the value of "RRC transaction identifier" in the entry for the received message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- 1> clear that entry;
- 1> if the variable PDCP_SN_INFO is not empty:
 - 2> include the IE "RB with PDCP information list" and set it to the value of the variable PDCP_SN_INFO.
- 1> in TDD, if the procedure is used to perform a handover to a cell where timing advance is enabled, and the UE can calculate the timing advance value in the new cell (i.e. in a synchronous TDD network):
 - 2> set the IE "Uplink Timing Advance" according to subclause 8.6.6.26.
- 1> if the IE "Integrity protection mode info" was present in the received reconfiguration message:
 - 2> start applying the new integrity protection configuration in the uplink for signalling radio bearer RB2 from and including the transmitted response message.

If after state transition the UE enters CELL_PCH or URA_PCH state, the UE shall, after the state transition and transmission of the response message:

- 1> if the IE "Frequency info" is included in the received reconfiguration message:
 - 2> select a suitable UTRA cell according to [4] on that frequency.
- 1> if the IE "Frequency info" is not included in the received reconfiguration message:
 - 2> select a suitable UTRA cell according to [4].
- 1> prohibit periodical status transmission in RLC;
- 1> remove any C-RNTI from MAC;
- 1> clear the variable C_RNTI;
- 1> start timer T305 using its initial value if timer T305 is not running and if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;
- 1> select Secondary CCPCH according to subclause 8.5.19;
- 1> if the IE "UTRAN DRX cycle length coefficient" is included in the same message:
 - 2> use the value in the IE "UTRAN DRX Cycle length coefficient" for calculating Paging occasion and PICH Monitoring Occasion as specified in subclause 8.6.3.2.

- 1> if the IE "UTRAN DRX cycle length coefficient" is not included in the same message:
 - 2> set the variable INVALID_CONFIGURATION to TRUE.
- 1> if the UE enters CELL_PCH state from CELL_DCH state, and the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE or the received reconfiguration message did not include the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD):
 - 2> initiate a cell update procedure according to subclause 8.3.1 using the cause "cell reselection";
 - 2> when the cell update procedure completed successfully:
 - 3> the procedure ends.
- 1> if the UE enters CELL_PCH state from CELL_FACH state, and the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE:
 - 2> initiate a cell update procedure according to subclause 8.3.1 using the cause "cell reselection";
 - 2> when the cell update procedure is successfully completed:
 - 3> the procedure ends.
- 1> if the UE enters URA_PCH state, and after cell selection the criteria for URA update caused by "URA reselection" according to subclause 8.3.1 is fulfilled:
 - 2> initiate a URA update procedure according to subclause 8.3.1 using the cause "URA reselection";
 - 2> when the URA update procedure is successfully completed:
 - 3> the procedure ends.

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

When UTRAN has received

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

UTRAN may:

- 1> delete the old configuration.

If the procedure caused the UE to leave the CELL_FACH state, UTRAN may:

- 1> delete the C-RNTI of the UE.

If the IE "UL Timing Advance" is included in TDD, UTRAN should:

- 1> evaluate the timing advance value that the UE has to use in the new cell after handover.

If the IE "START" or the IE "START list " is included, UTRAN should:

- 1> set the START value for each CN domain with the corresponding values as received in this response message;

- 1> consequently, then use the START values to initialise the hyper frame numbers, in the same way as specified for the UE in subclause 8.2.2.3, for any new radio bearers that are established.

If UTRAN has ordered a ciphering reconfiguration by including the IE "Ciphering mode info", UTRAN should:

- 1> for radio bearers using RLC-AM or RLC-UM:
- 2> use the old ciphering configuration for received RLC PDUs with RLC sequence number less than the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent by the UE;
 - 2> use the new ciphering configuration for received RLC PDUs with RLC sequence number greater than or equal to the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent by the UE;
 - 2> if an RLC reset or re-establishment occurs after this response message has been received by UTRAN before the activation time for the new ciphering configuration has been reached:
 - 3> ignore the activation time; and
 - 3> apply the new ciphering configuration immediately after the RLC reset or RLC re-establishment.
- 1> for radio bearers using RLC-TM:
- 2> ~~use the new ciphering configuration and~~ only begin incrementing the COUNT-C at the CFN as indicated in:
 - 3> the IE "Ciphering activation time for DPCH" in the IE "Ciphering mode info", if included in the message that triggered the radio bearer control procedure; or
 - 3> the IE "COUNT-C activation time", if included in the response message for this procedure.
- 1> and the procedure ends on the UTRAN side.

8.3.1.6 Reception of the CELL UPDATE CONFIRM/URA UPDATE CONFIRM message by the UE

When the UE receives a CELL UPDATE CONFIRM/URA UPDATE CONFIRM message; and

- if the message is received on the CCCH, and IE "U-RNTI" is present and has the same value as the variable U_RNTI; or
- if the message is received on DCCH:

the UE shall:

- 1> stop timer T302;
- 1> in case of a cell update procedure and the CELL UPDATE CONFIRM message:
 - 2> includes "RB information elements"; and/or
 - 2> includes "Transport channel information elements"; and/or
 - 2> includes "Physical channel information elements"; and
 - 2> if the variable ORDERED_RECONFIGURATION is set to FALSE:
 - 3> set the variable ORDERED_RECONFIGURATION to TRUE.
- 1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following:
 - 2> if the IE "Frequency info" is included in the message:
 - 3> if the IE "RRC State Indicator" is set to the value "CELL_FACH" or "CELL_PCH" or "URA_PCH":

- 4> select a suitable UTRA cell according to [4] on that frequency;
- 4> act as specified in subclause 8.3.1.12.
- 3> if the IE "RRC State Indicator" is set to the value "CELL_DCH":
 - 4> act on the IE "Frequency info" as specified in subclause 8.6.6.1.
- 2> use the transport channel(s) applicable for the physical channel types that is used; and
- 2> if the IE "TFS" is neither included nor previously stored in the UE for that transport channel(s):
 - 3> use the TFS given in system information.
- 2> if none of the TFS stored is compatible with the physical channel:
 - 3> delete the stored TFS;
 - 3> use the TFS given in system information.
- 2> perform the physical layer synchronisation procedure as specified in [29];
- 2> if the CELL UPDATE CONFIRM message includes the IE "RLC re-establish indicator (RB2, RB3 and RB4)":
 - 3> re-establish the RLC entities for signalling radio bearer RB2, signalling radio bearer RB3 and signalling radio bearer RB4 (if established);
 - 3> if the value of the IE "Status" in the variable CIPHERING_STATUS of the CN domain stored in the variable LATEST_CONFIGURED_CN_DOMAIN is set to "Started":
 - 4> set the HFN values for AM RLC entities with RB identity 2, RB identity 3 and RB identity 4 (if established) equal to the START value included in the latest transmitted CELL UPDATE message for the CN domain stored in the variable LATEST_CONFIGURED_CN_DOMAIN.
- 2> if the CELL UPDATE CONFIRM message includes the IE "RLC re-establish indicator (RB5 and upwards)":
 - 3> for radio bearers with RB identity 5 and upwards:
 - 4> re-establish the AM RLC entities;
 - 4> if the value of the IE "Status" in the variable CIPHERING_STATUS of the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS is set to "Started":
 - 5> set the HFN values for AM RLC entities equal to the START value included in this CELL UPDATE message for the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS.
- 1> if the CELL UPDATE CONFIRM / URA UPDATE CONFIRM message contained the IE "Ciphering mode info" or contained the IE "Integrity protection mode info":
 - 2> set the IE "Status" in the variable SECURITY_MODIFICATION for all the CN domains in the variable SECURITY_MODIFICATION to "Affected".
- 1> enter a state according to subclause 8.6.3.3 applied on the CELL UPDATE CONFIRM / URA UPDATE CONFIRM message.

If the UE after state transition enters CELL_DCH state, it shall:

- 1> not prohibit periodical status transmission in RLC;
- 1> for each CN domain for which a transparent mode radio bearer exists and for which the IE "Status" in the variable CIPHERING_STATUS is set to "Started" for that CN domain;
- 2> choose an activation time for the ciphering on transparent mode radio bearers and include it in the response message in the IE "COUNT_C activation time";

2> set the 20 MSB of the MAC-d HFN with the corresponding START value in the most recently sent IE "START list";

2> set the remaining LSB of the MAC-d HFN to zero;

2> apply ciphering on the transparent mode radio bearers;

2> start incrementing the COUNT-C value from the CFN that has been included in the IE "COUNT-C activation time";

If the UE after state transition remains in CELL_FACH state, it shall

1> start the timer T305 using its initial value if timer T305 is not running and periodical cell update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity";

1> select PRACH according to subclause 8.5.17;

1> select Secondary CCPCH according to subclause 8.5.19;

1> not prohibit periodical status transmission in RLC;

1> if the IE "UTRAN DRX cycle length coefficient" is included in the same message:

2> ignore that IE and stop using DRX.

If the UE after state transition enters URA_PCH or CELL_PCH state, it shall:

1> prohibit periodical status transmission in RLC;

1> clear the variable C_RNTI;

1> stop using that C_RNTI just cleared from the variable C_RNTI in MAC;

1> start the timer T305 using its initial value if timer T305 is not running and periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity";

1> select Secondary CCPCH according to subclause 8.5.19;

1> if the IE "UTRAN DRX cycle length coefficient" is included in the same message:

2> use the value in the IE "UTRAN DRX Cycle length coefficient" for calculating Paging Occasion and PICH Monitoring Occasion as specified in subclause 8.6.3.2 in CELL_PCH state.

1> if the IE "UTRAN DRX cycle length coefficient" is not included in the same message:

2> set the variable INVALID_CONFIGURATION to TRUE.

If the UE after the state transition remains in CELL_FACH state; and

1> the contents of the variable C_RNTI are empty;

it shall check the value of V302; and:

1> if V302 is equal to or smaller than N302:

2> if, caused by the received CELL UPDATE CONFIRM or URA UPDATE CONFIRM message:

3> the IE "Reconfiguration" in the variable CIPHERING_STATUS is set to TRUE; and/or

3> the IE "Reconfiguration" in the variable INTEGRITY_PROTECTION_INFO is set to TRUE;

4> abort the ongoing integrity and/or ciphering reconfiguration;

4> if the received CELL UPDATE CONFIRM or URA UPDATE CONFIRM message contained the IE "Ciphering mode info":

5> set the IE "Reconfiguration" in the variable CIPHERING_STATUS to FALSE; and

- 5> clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO.
- 4> if the received CELL UPDATE CONFIRM or URA UPDATE CONFIRM message contained the IE "Integrity protection mode info":
 - 5> set the IE "Reconfiguration" in the variable INTEGRITY_PROTECTION_INFO to FALSE; and
 - 5> clear the variable INTEGRITY_PROTECTION_ACTIVATION_INFO.
- 2> in case of a URA update procedure:
 - 3> stop the URA update procedure; and
 - 3> continue with a cell update procedure.
- 2> set the contents of the CELL UPDATE message according to subclause 8.3.1.3, except for the IE "Cell update cause" which shall be set to "cell reselection";
- 2> submit the CELL UPDATE message for transmission on the uplink CCCH;
- 2> increment counter V302;
- 2> restart timer T302 when the MAC layer indicates success or failure to transmit the message.
- 1> if V302 is greater than N302:
 - 2> clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO;
 - 2> clear the variable INTEGRITY_PROTECTION_ACTIVATION_INFO;
 - 2> in case of a cell update procedure:
 - 3> clear the entry for the CELL UPDATE CONFIRM message in the table "Rejected transactions" in the variable TRANSACTIONS.
 - 2> in case of a URA update procedure:
 - 3> clear the entry for the URA UPDATE CONFIRM message in the table "Rejected transactions" in the variable TRANSACTIONS.
 - 2> release all its radio resources;
 - 2> indicate release (abort) of the established signalling connections (as stored in the variable ESTABLISHED_SIGNALLING_CONNECTIONS) and established radio access bearers (as stored in the variable ESTABLISHED_RABS) to upper layers;
 - 2> clear the variable ESTABLISHED_SIGNALLING_CONNECTIONS;
 - 2> clear the variable ESTABLISHED_RABS;
 - 2> enter idle mode;
 - 2> other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2;
 - 2> and the procedure ends.

If the UE after the state transition remains in CELL_FACH state; and

- a C-RNTI is stored in the variable C_RNTI;

or

- the UE after the state transition moves to another state than the CELL_FACH state;

the UE shall:

- 1> if the CELL UPDATE CONFIRM / URA UPDATE CONFIRM message contained the IE "Ciphering mode info":
 - 2> include and set the IE "Radio bearer uplink ciphering activation time info" in any response message transmitted below to the value of the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO.
- 1> in case of a cell update procedure:
 - 2> set the IE "RRC transaction identifier" in any response message transmitted below to the value of "RRC transaction identifier" in the entry for the CELL UPDATE CONFIRM message in the table "Accepted transactions" in the variable TRANSACTIONS; and
 - 2> clear that entry.
- 1> in case of a URA update procedure:
 - 2> set the IE "RRC transaction identifier" in any response message transmitted below to the value of "RRC transaction identifier" in the entry for the URA UPDATE CONFIRM message in the table "Accepted transactions" in the variable TRANSACTIONS; and
 - 2> clear that entry;
- 1> if the variable PDCP_SN_INFO is non-empty:
 - 2> include the IE "RB with PDCP information list" in any response message transmitted below and set it to the value of the variable PDCP_SN_INFO.
- 1> if the received CELL UPDATE CONFIRM or URA UPDATE CONFIRM message included the IE "Downlink counter synchronisation info":
 - 2> re-establish RB2;
 - 2> set the new uplink and downlink HFN of RB2 to MAX(uplink HFN of RB2, downlink HFN of RB2);
 - 2> increment by one the downlink and uplink HFN values for RB2;
 - 2> calculate the START value according to subclause 8.5.9;
 - 2> include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info" in any response message transmitted below.
- 1> transmit a response message as specified in subclause 8.3.1.7;
- 1> if the IE "Integrity protection mode info" was present in the CELL UPDATE CONFIRM or URA UPDATE CONFIRM message:
 - 2> start applying the new integrity protection configuration in the uplink for signalling radio bearer RB2 from and including the transmitted response message.
- 1> if the variable ORDERED_RECONFIGURATION is set to TRUE caused by the received CELL UPDATE CONFIRM message in case of a cell update procedure:
 - 2> set the variable ORDERED_RECONFIGURATION to FALSE.
- 1> clear the variable PDCP_SN_INFO;
- 1> when the response message transmitted per subclause 8.3.1.7 to the UTRAN has been confirmed by RLC:
 - 2> if the CELL UPDATE CONFIRM / URA UPDATE CONFIRM message contained the IE "Ciphering mode info":
 - 3> resume data transmission on any suspended radio bearer and signalling radio bearer mapped on RLC-AM or RLC-UM;
 - 3> set the IE "Reconfiguration" in the variable CIPHERING_STATUS to FALSE; and
 - 3> clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO.

- 2> if the CELL UPDATE CONFIRM / URA UPDATE CONFIRM message contained the IE "Integrity protection mode info":
 - 3> set "Uplink RRC Message sequence number" for signalling radio bearer RB0 in the variable INTEGRITY_PROTECTION_INFO to a value such that next RRC message to be sent on uplink RB0 will use the new integrity protection configuration;
 - 3> allow the transmission of RRC messages on all signalling radio bearers with any RRC SN;
 - 3> set the IE "Reconfiguration" in the variable INTEGRITY_PROTECTION_INFO to FALSE.
- 2> clear the variable INTEGRITY_PROTECTION_ACTIVATION_INFO.
- 1> in case of a cell update procedure:
 - 2> clear the entry for the CELL UPDATE CONFIRM message in the table "Rejected transactions" in the variable TRANSACTIONS.
- 1> in case of a URA update procedure:
 - 2> clear the entry for the URA UPDATE CONFIRM message in the table "Rejected transactions" in the variable TRANSACTIONS.
- 1> set the variable CELL_UPDATE_STARTED to FALSE;
- 1> clear the variable SECURITY_MODIFICATION.

The procedure ends.

8.6.3.4 Cipherng mode info

The IE "Cipherng mode info" defines the new cipherng configuration. At any given time, the UE needs to store at most two different cipherng configurations (keyset and algorithm) per CN domain at any given time in total for all radio bearers and three configurations in total for all signalling radio bearers.

If the IE "Cipherng mode info" is present and if the IE "Reconfiguration" in the variable CIPHERING_STATUS is set to TRUE, the UE shall:

- 1> ignore this second attempt to change the cipherng configuration; and
- 1> set the variable INCOMPATIBLE_SECURITY_RECONFIGURATION to TRUE.

If the IE "Cipherng mode info" is present and if the IE "Reconfiguration" in the variable CIPHERING_STATUS is set to FALSE, the UE shall:

- 1> if the IE "Status" in the variable CIPHERING STATUS has the value "Not started", and this IE was included in a message that is not the message SECURITY MODE COMMAND; or
- 1> if **the IE "Cipherng Mode Info" was received in the message SECURITY MODE COMMAND and** there does not exist exactly one cipherng activation time in the IE "Radio bearer downlink cipherng activation time info" for each established RLC-AM and RLC-UM radio bearers included in the IE "RB information" in the IE "ESTABLISHED_RABS" for the CN domain as indicated in the variable LATEST_CONFIGURED_CN_DOMAIN; or
- 1> if the IE "**Cipherng Mode Info" was received in the message SECURITY MODE COMMAND and the IE "Cipherng activation time for DPCH" is not included in the message ~~ACTIVE SET UPDATE or SECURITY MODE COMMAND~~**, and there exist radio bearers using RLC-TM according to the IE "RB information" in the IE "ESTABLISHED_RABS" for the CN domain as indicated in the variable LATEST_CONFIGURED_CN_DOMAIN; or
- 1> if **the IE "Cipherng Mode Info" was received in the message SECURITY MODE COMMAND and** there does not exist exactly one cipherng activation time in the IE "Radio bearer downlink cipherng activation time info" for each established signalling radio bearer included in the IE "Signalling radio bearer information" in the IE "ESTABLISHED_RABS":

- 2> ignore this attempt to change the ciphering configuration;
 - 2> set the variable INVALID_CONFIGURATION to TRUE;
 - 2> perform the actions as specified in subclause 8.1.12.4c.
- 1> set the IE "Reconfiguration" in the variable CIPHERING_STATUS to TRUE;
- 1> set the IE "Status" in the variable CIPHERING_STATUS of the CN domains for which the IE "Status" of the variable SECURITY_MODIFICATION is set to "Affected" to "Started";
- 1> apply the new ciphering configuration in the lower layers for all RBs that belong to a CN domain for which the IE "Status" of the variable SECURITY_MODIFICATION is set to "Affected" and all signalling radio bearers:
- 2> using the ciphering algorithm (UEA [40]) indicated by the IE "Ciphering algorithm" as part of the new ciphering configuration;
 - 2> for each radio bearer that belongs to a CN domain for which the IE "Status" of the variable SECURITY_MODIFICATION is set to "Affected" and all signalling radio bearers:
 - 3> using the value of the IE "RB identity" in the variable ESTABLISHED_RABS minus one as the value of BEARER [40] in the ciphering algorithm.
- 1> apply the new ciphering configuration as follows:
- 2> consider an activation time in downlink to be pending:
 - 3> for UM-RLC until an UMD PDU with sequence number equal to or larger than activation time –1 has been received;
 - 3> for AM-RLC until all AMD PDUs with sequence numbers up to and including activation time –1 have been received;
 - 3> for TM-RLC until the CFN indicated in the activation time has been reached.
 - 2> if there are pending activation times in downlink set for ciphering by a previous procedure changing the ciphering configuration:
 - 3> apply the ciphering configuration included in the current message at this pending activation time.
 - 2> if the IE "Ciphering activation time for DPCH" is present in the IE "Ciphering mode info" and the UE was in CELL_DCH state prior to this procedure:
 - 3> for radio bearers using RLC-TM:
 - 4> apply the old ciphering configuration for CFN less than the number indicated in the IE "Ciphering activation time for DPCH";
 - 4> apply the new ciphering configuration for CFN greater than or equal to the number indicated in IE "Ciphering activation time for DPCH".
- ~~2> if the UE was in CELL_FACH state prior to this procedure and at completion of this procedure at least one transparent mode RLC radio bearer exists and the IE "Ciphering activation time for DPCH" is not present in the IE "Ciphering mode info" was not included in received message:~~
- ~~3> for radio bearers using RLC-TM:~~
- ~~4> apply the old ciphering configuration for CFN less than the number as indicated in the transmitted uplink response message for the ciphering activation time for this radio bearer;~~
 - ~~4> apply the new ciphering configuration for CFN greater than or equal to the number as indicated in the transmitted uplink response message for the ciphering activation time for this radio bearer.~~
- NOTE:—This is indicated by the IE "COUNT_C activation time" in the transmitted uplink response message.**
- 2> if the IE "Radio bearer downlink ciphering activation time info" is present:

- 3> apply the following procedure for each radio bearer and signalling radio bearers using RLC-AM or RLC-UM indicated by the IE "RB identity":
 - 4> suspend uplink transmission on the radio bearer or the signalling radio bearer (except for the SRB where the response message is transmitted) according to the following:
 - 5> do not transmit RLC PDUs with sequence number greater than or equal to the uplink activation time, where the uplink activation time is selected according to the rules below.
 - 4> select an "RLC send sequence number" at which (activation) time the new ciphering configuration shall be applied in uplink for that radio bearer according to the following:
 - 5> for each radio bearer and signalling radio bearer that has no pending ciphering activation time in uplink as set by a previous procedure changing the security configuration:
 - 6> set a suitable value that would ensure a minimised delay in the change to the latest security configuration.
 - 5> for each radio bearer and signalling radio bearer that has a pending ciphering activation time in uplink as set by a previous procedure changing the security configuration:
 - 6> set the same value as the pending ciphering activation time.
 - 5> consider this activation time in uplink to be elapsed when the selected activation time (as above) is equal to the "RLC send sequence number";
- 4> store the selected "RLC send sequence number" for that radio bearer in the entry for the radio bearer in the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO;
- 4> switch to the new ciphering configuration according to the following:
 - 5> use the old ciphering configuration for the transmitted and received RLC PDUs with RLC sequence numbers smaller than the corresponding RLC sequence numbers indicated in the IE "Radio bearer uplink ciphering activation time info" sent to UTRAN and in the received IE "Radio bearer downlink ciphering activation time info" received from UTRAN, respectively;
 - 5> use the new ciphering configuration for the transmitted and received RLC PDUs with RLC sequence numbers greater than or equal to the corresponding RLC sequence numbers indicated in the IE "Radio bearer uplink ciphering activation time info" sent to UTRAN and in the received IE "Radio bearer downlink ciphering activation time info" received from UTRAN, respectively;
 - 5> for a radio bearer using RLC-AM, when the RLC sequence number indicated in the IE "Radio bearer downlink ciphering activation time info" falls below the RLC receiving window and the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" falls below the RLC transmission window, the UE may release the old ciphering configuration for that radio bearer;
 - 5> if an RLC reset or re-establishment occurs before the activation time for the new ciphering configuration has been reached, ignore the activation time and apply the new ciphering configuration immediately after the RLC reset or RLC re-establishment.

If the IE "Ciphering mode info" is not present, the UE shall:

- 1> not change the ciphering configuration.

8.6.4.3 RB information to setup

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

- 1> use the same START value to initialise the hyper frame number components of COUNT-C variables for all the new radio bearers to setup;

- 1> perform the actions for the IE "PDCP info", if present, according to subclause 8.6.4.10, applied for the radio bearer;
- 1> perform the actions for the IE "RLC info", according to subclause 8.6.4.9, applied for the radio bearer;
- 1> perform the actions for the IE "RB mapping info", according to subclause 8.6.4.8, applied for the radio bearer;
- 1> if the IE "Downlink RLC mode" either in the IE "RLC info" or referenced by the RB identity in the IE "Same as RB" is set to "TM RLC":
 - 2> configure delivery of erroneous SDUs in lower layers according to indication from upper layer [5].
- 1> if the IE "Uplink RLC mode" or the IE "Downlink RLC mode" either in the IE "RLC info" or referenced by the RB identity in the IE "Same as RB" is set to "AM RLC" or "UM RLC":
 - 2> initialise the 20 MSB of the hyper frame number component of COUNT-C for this radio bearer with the START value in the variable START_VALUE_TO_TRANSMIT;
 - 2> set the remaining LSB of the hyper frame number component of COUNT-C for this radio bearer to zero;
 - 2> start incrementing the COUNT-C values.
- 1> if the IE "Uplink RLC mode" and the IE "Downlink RLC mode" either in the IE "RLC info" or referenced by the RB identity in the IE "Same as RB" is set to "TM RLC":
 - 2> if prior to this procedure there exists no transparent mode radio bearer for the CN domain included in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS and at least one transparent mode radio bearer is included in the IE "RB information to setup":
 - 3> if the IE "Status" in the variable CIPHERING_STATUS of the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS is set to "Not Started":
 - 43> at the activation time as specified in the IE "Ciphering activation time for DPCH" if included in the IE "Ciphering mode info" in the command message or, if this IE is not included, as specified in the IE "COUNT-C activation time" included in the response message:
 - 54> initialise the 20 most significant bits of the hyper frame number component of COUNT-C common for all transparent mode radio bearers of this CN domain with the START value in the variable START_VALUE_TO_TRANSMIT;
 - 54> set the remaining LSB of the hyper frame number component of COUNT-C to zero;
 - 5> do not increment the COUNT-C value common for all transparent mode radio bearers for this CN domain.:
 - 34> if the IE "Status" in the variable CIPHERING_STATUS of the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS is set to "~~Not~~Started":
 - ~~5> do not increment the COUNT-C value for this CN domain.~~
 - 4> else:
 - ~~5> if the IE "Status" in the variable CIPHERING_STATUS of the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS is set to "Started":~~
 - 4> at the activation time as specified in the IE "Activation Time" in the RADIO BEARER SETUP message:
 - 5> initialise the 20 most significant bits of the hyper frame number component of COUNT-C common for all transparent mode RLC radio bearer to the value of the latest transmitted START for this CN domain, while not incrementing the value of the HFN component of COUNT-C at each CFN cycle; and;
 - 5> set the remaining LSB of the hyper frame number component of COUNT-C to zero;
 - 5> start to perform ciphering on the radio bearer in lower layers while not incrementing the HFN;

4> at the activation time as specified in the IE "Ciphering activation time for DPCH" if included in the IE "Ciphering mode info" in the command message or, if this IE is not included, as specified in the IE "COUNT-C activation time" included in the response message:

5> initialise the 20 most significant bits of the hyper frame number component of COUNT-C common for all transparent mode radio bearers of this CN domain with the START value in the variable START_VALUE_TO_TRANSMIT;

5> set the remaining LSB of the hyper frame number component of COUNT-C to zero;

56> start incrementing the COUNT-C value common for all transparent mode radio bearers of this CN domain as normal, at each CFN value, i.e. the HFN component is no longer fixed in value but incremented at each CFN cycle

3> if prior to this procedure there exists at least one transparent mode radio bearer for the CN domain included in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS:

4> continue incrementing the COUNT-C value common for all transparent mode radio bearers of this CN domain.

1> if the IE "Status" in the variable CIPHERING_STATUS of the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS is set to "Started":

2> start to perform ciphering on the radio bearer in lower layers, using the value of the IE "RB identity" minus one as the value of BEARER in the ciphering algorithm.

NOTE: UTRAN should not use the IE "RB information to setup" to setup radio bearers with RB identity in the range 1-4.

8.6.6.28 Downlink DPCH info common for all radio links

If the IE "Downlink DPCH info common for all RL" is included the UE shall:

1> if the IE "Downlink DPCH info common for all RL" is included in a message used to perform a hard handover:

2> perform actions for the IE "Timing indication" as specified in subclause 8.5.15.2, and subclause 8.3.5.1 or 8.3.5.2.

1> ignore the value received in IE "CFN-targetSFN frame offset";

1> if the IE "Downlink DPCH power control information" is included:

2> perform actions for the IE "DPC Mode" according to [29].

1> if the IE choice "mode" is set to 'FDD':

2> if the IE "Downlink rate matching restriction information" is included:

3> set the variable INVALID_CONFIGURATION to TRUE.

2> perform actions for the IE "spreading factor";

2> perform actions for the IE "Fixed or Flexible position";

2> perform actions for the IE "TFCI existence";

2> if the IE choice "SF" is set to 256:

3> store the value of the IE "Number of bits for pilot bits".

2> if the IE choice "SF" set to 128:

3> store the value of the IE "Number of bits for pilot bits".

1> if the IE choice "mode" is set to 'TDD':

2> perform actions for the IE "Common timeslot info".

If the IE "Downlink DPCH info common for all RL" is included in a message used to perform a Timing re-initialised hard handover or the IE "Downlink DPCH info common for all RL" is included in a message **other than RB SETUP** used to transfer the UE from a state different from Cell_DCH to the Cell_DCH state, and ciphering is active for any radio bearer using RLC-TM, the UE shall, after having activated the dedicated physical channels indicated by that IE:

1> set the 20 MSB of the HFN component of COUNT-C for TM-RLC to the value of the latest transmitted IE "START" or "START List" for this CN domain, while not incrementing the value of the HFN component of COUNT-C at each CFN cycle; and

1> set the remaining LSBs of the HFN component of COUNT-C to zero;

1> start to perform ciphering on the radio bearer in lower layers while not incrementing the HFN;

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

1> calculate the START value according to subclause 8.5.9;

1> include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info" in the response message;

1> at the CFN value as indicated in the response message in the IE "COUNT-C activation time":

2> set the 20 MSB of the HFN component of the COUNT-C variable to the START value as indicated in the IE "START list" of the response message for the relevant CN domain; and

2> set the remaining LSBs of the HFN component of COUNT-C to zero;

2> increment the HFN component of the COUNT-C variable by one;

2> set the CFN component of the COUNT-C to the value of the IE "COUNT-C activation time" of the response message. The HFN component and the CFN component completely initialise the COUNT-C variable;

2> step the COUNT-C variable, as normal, at each CFN value, i.e. the HFN component is no longer fixed in value but incremented at each CFN cycle.

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CHANGE REQUEST

⌘ **25.331 CR 1467** ⌘ rev **r1** ⌘ Current version: **4.4.0** ⌘

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

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

Title:	⌘ Cipherng Activation for TM Radio Bearers		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘ TEI	Date:	⌘ 2002-05-06
Category:	⌘ A	Release:	⌘ REL-4
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)		2 (GSM Phase 2)
	A (corresponds to a correction in an earlier release)		R96 (Release 1996)
	B (addition of feature),		R97 (Release 1997)
	C (functional modification of feature)		R98 (Release 1998)
	D (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		REL-4 (Release 4)
			REL-5 (Release 5)

Reason for change:	⌘ • The current specification contains ambiguous and incorrect text on cipherng, in particular at the setup of TM radio bearers (RB setup). See also summary of change below.
Summary of change:	⌘ • 8.6.4.3: When a TM RB is setup the behaviour is unspecified between the time of the RB setup message until the activation time of the cipherng (COUNT-C activation time set by UE or Downlink cipherng activation time set by UTRAN). It is specified that the last transmitted START value should be used to initiate HFN and the HFN shall be fixed in the time between the activation times.
	• In 8.2.2.3 the COUNT-C activation time in uplink is currently included when the first TM RB is setup. The COUNT-C activation time is however needed for the first TM RB for each CN domain.
	• In 8.2.2.3 the COUNT-C activation time is currently included in uplink when the last TM RB is released. Due to recent changes this is no longer needed and its proposed to delete this functionality.
	• In 8.6.3.4 the UE currently checks that activation times are included for all established RBS and SRBs if the IE "cipherng mode info" is included in downlink. These checks needs to be removed if it should be possible for UTRAN to give the Downlink activation time for cipherng when TM RBs are setup (as agreed at WG2 #28). In this document these checks are deleted.
	However, as some UE changes are required to allow this option, one possibility is to remove the option that UTRAN gives the activation time, i.e. only allow the option that the UE sets the COUNT-C activation time in uplink for RB setup. This seems to be the prefered way forward and if this is acceptable, an updated CR can be provided.
	<u>Updated CR:</u>
	<u>After discussion on R2-0221195, Security: Open Issues (Motorola), it was decided to</u>

have only one option for setting of the Ciphering Activation Time for TM RB setup, i.e. only allow the option that the UE sets the COUNT-C activation time in uplink.

In 8.6.6.28 the actions for transaction to CELL_DCH is not performed for RB SETUP since the corresponding actions are handled there. The reference to COUNT-C handling of TM RBs in CELL UPDATE CONFIRM is deleted since this is covered in 8.6.6.28.

Rel4 Shadow CR.

Consequences if not approved: ⌘ Incorrect and ambiguous behaviour.

Clauses affected: ⌘ 8.2.2.3, 8.2.2.5, 8.3.1.6, 8.6.3.4, 8.6.4.3, 8.6.6.28

Other specs affected: ⌘

 Other core specifications ⌘ 25.331 v3.10.0, CR 1466
25.331 v5.0.0, CR 1468r1

 Test specifications
O&M Specifications

Other comments: ⌘

How to create CRs using this form:

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

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

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

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

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

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

If the UE receives:

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

it shall:

- 1> set the variable ORDERED_RECONFIGURATION to TRUE;
- 1> perform the physical layer synchronisation procedure as specified in [29];
- 1> act upon all received information elements as specified in subclause 8.6, unless specified in the following and perform the actions below.

The UE may:

- 1> maintain a list of the set of cells to which the UE has Radio Links if the IE "Cell ID" is present.

The UE may first release the physical channel configuration used at reception of the reconfiguration message. The UE shall then:

- 1> 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:
 - 2> act upon the IE "PDSCH code mapping" as specified in subclause 8.6; and
 - 2> infer that the PDSCH will be transmitted from the cell from which the downlink DPCH is transmitted.
- 1> enter a state according to subclause 8.6.3.3.

In case the UE receives a RADIO BEARER RECONFIGURATION message including the IE "RB information to reconfigure" that only includes the IE "RB identity", the UE shall:

- 1> handle the message as if IE "RB information to reconfigure" was absent.

NOTE: The RADIO BEARER RECONFIGURATION message always includes the IE "RB information to reconfigure". UTRAN has to include it even if it does not require the reconfiguration of any RB.

If after state transition the UE enters CELL_DCH state, the UE shall, after the state transition:

1> remove any C-RNTI from MAC;

1> clear the variable C_RNTI.

In FDD, if after state transition the UE leaves CELL_DCH state, the UE shall, after the state transition:

1> remove any DSCH-RNTI from MAC;

1> clear the variable DSCH_RNTI.

If the UE was in CELL_DCH state upon reception of the reconfiguration message and remains in CELL_DCH state, the UE shall:

1> if the IE "Uplink DPCH Info" is absent, not change its current UL Physical channel configuration;

1> if the IE "Downlink information for each radio link" is absent, not change its current DL Physical channel configuration.

If after state transition the UE enters CELL_FACH state, the UE shall, after the state transition:

1> if the IE "Frequency info" is included in the received reconfiguration message:

2> select a suitable UTRA cell according to [4] on that frequency.

1> if the IE "Frequency info" is not included in the received reconfiguration message:

2> select a suitable UTRA cell according to [4].

1> if the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selects another cell than indicated by this IE or the received reconfiguration message did not include the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD):

2> initiate a cell update procedure according to subclause 8.3.1 using the cause "Cell reselection";

2> when the cell update procedure completed successfully:

3> if the UE is in CELL_PCH or URA_PCH state:

4> initiate a cell update procedure according to subclause 8.3.1 using the cause "Uplink data transmission";

4> proceed as below.

1> start timer T305 using its initial value if timer T305 is not running and if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;

1> select PRACH according to subclause 8.5.17;

1> select Secondary CCPCH according to subclause 8.5.19;

1> use the transport format set given in system information;

1> if the IE "UTRAN DRX cycle length coefficient" is included in the same message:

2> ignore that IE and stop using DRX.

1> if the contents of the variable C_RNTI is empty:

2> perform a cell update procedure according to subclause 8.3.1 using the cause "Cell reselection";

2> when the cell update procedure completed successfully:

3> if the UE is in CELL_PCH or URA_PCH state:

4> initiate a cell update procedure according to subclause 8.3.1 using the cause "Uplink data transmission";

4> proceed as below.

If the UE was in CELL_FACH state upon reception of the reconfiguration message and remains in CELL_FACH state, the UE shall:

- 1> if the IE "Frequency info" is included in the received reconfiguration message:
 - 2> select a suitable UTRA cell according to [4] on that frequency;
 - 2> if the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE or the received reconfiguration message did not include the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD):
 - 3> initiate a cell update procedure according to subclause 8.3.1 using the cause "cell reselection";
 - 3> when the cell update procedure completed successfully:
 - 4> proceed as below.

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

- 1> if the received reconfiguration message included the IE "Downlink counter synchronisation info"; or
- 1> if the received reconfiguration message is a RADIO BEARER RECONFIGURATION and the IE "New U-RNTI" is included:
 - 2> re-establish RB2;
 - 2> set the new uplink and downlink HFN of RB2 to MAX(uplink HFN of RB2, downlink HFN of RB2);
 - 2> increment by one the downlink and uplink HFN values for RB2;
 - 2> calculate the START value according to subclause 8.5.9;
 - 2> include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info".
- 1> if the received reconfiguration message did not include the IE "Downlink counter synchronisation info":
 - 2> if the variable START_VALUE_TO_TRANSMIT is set:
 - 3> include and set the IE "START" to the value of that variable.
 - 2> if the variable START_VALUE_TO_TRANSMIT is not set and the IE "New U-RNTI" is included:
 - 3> calculate the START value according to subclause 8.5.9;
 - 3> include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info".
 - 2> if the received reconfiguration message caused a change in the RLC size for any RB using RLC-AM:
 - 3> calculate the START value according to subclause 8.5.9;
 - 3> include the calculated START values for the CN domain associated with the corresponding RB identity in the IE "START list" in the IE "Uplink counter synchronisation info".
- 1> if the received reconfiguration message contained the IE "Ciphering mode info" or contained the IE "Integrity protection mode info":
 - 2> set the IE "Status" in the variable SECURITY_MODIFICATION for all the CN domains in the variable SECURITY_MODIFICATION to "Affected".
- 1> if the received reconfiguration message contained the IE "Ciphering mode info":

2> include and set the IE "Radio bearer uplink ciphering activation time info" to the value of the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO.

1> if the received reconfiguration message did not contain the IE "Ciphering activation time for DPCH" ~~in IE "Ciphering mode info"~~:

2> if prior to this procedure there exist no transparent mode RLC radio bearers for the CN domain indicated in the IE "CN domain identity" in the IE "RAB info":

3> if, at the conclusion of this procedure, the UE will be in CELL_DCH state; and

3> if, at the conclusion of this procedure, at least one transparent mode RLC radio bearer exists for the CN domain indicated in the IE "CN domain identity" in the IE "RAB info":

4> include the IE "COUNT-C activation time" and specify a CFN value for this IE.

Note: UTRAN should not include the IE "Ciphering mode info" in any reconfiguration messages unless it is also used to perform a SRNS relocation with change of ciphering algorithm.

~~2> if prior to this procedure there exists at least one transparent mode RLC radio bearer:~~

~~3> if, at the conclusion of this procedure, no transparent mode RLC radio bearers exist:~~

~~4> include the IE "COUNT-C activation time" and specify a CFN value for this IE.~~

1> set the IE "RRC transaction identifier" to the value of "RRC transaction identifier" in the entry for the received message in the table "Accepted transactions" in the variable TRANSACTIONS; and

1> clear that entry;

1> if the variable PDCP_SN_INFO is not empty:

2> include the IE "RB with PDCP information list" and set it to the value of the variable PDCP_SN_INFO.

1> in TDD, if the procedure is used to perform a handover to a cell where timing advance is enabled, and the UE can calculate the timing advance value in the new cell (i.e. in a synchronous TDD network):

2> set the IE "Uplink Timing Advance" according to subclause 8.6.6.26.

1> if the IE "Integrity protection mode info" was present in the received reconfiguration message:

2> start applying the new integrity protection configuration in the uplink for signalling radio bearer RB2 from and including the transmitted response message.

If after state transition the UE enters CELL_PCH or URA_PCH state, the UE shall, after the state transition and transmission of the response message:

1> if the IE "Frequency info" is included in the received reconfiguration message:

2> select a suitable UTRA cell according to [4] on that frequency.

1> if the IE "Frequency info" is not included in the received reconfiguration message:

2> select a suitable UTRA cell according to [4].

1> prohibit periodical status transmission in RLC;

1> remove any C-RNTI from MAC;

1> clear the variable C_RNTI;

1> start timer T305 using its initial value if timer T305 is not running and if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;

1> select Secondary CCPCH according to subclause 8.5.19;

1> if the IE "UTRAN DRX cycle length coefficient" is included in the same message:

- 2> use the value in the IE "UTRAN DRX Cycle length coefficient" for calculating Paging occasion and PICH Monitoring Occasion as specified in subclause 8.6.3.2.
- 1> if the IE "UTRAN DRX cycle length coefficient" is not included in the same message:
 - 2> set the variable INVALID_CONFIGURATION to TRUE.
- 1> if the UE enters CELL_PCH state from CELL_DCH state, and the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE or the received reconfiguration message did not include the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD):
 - 2> initiate a cell update procedure according to subclause 8.3.1 using the cause "cell reselection";
 - 2> when the cell update procedure completed successfully:
 - 3> the procedure ends.
- 1> if the UE enters CELL_PCH state from CELL_FACH state, and the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE:
 - 2> initiate a cell update procedure according to subclause 8.3.1 using the cause "cell reselection";
 - 2> when the cell update procedure is successfully completed:
 - 3> the procedure ends.
- 1> if the UE enters URA_PCH state, and after cell selection the criteria for URA update caused by "URA reselection" according to subclause 8.3.1 is fulfilled:
 - 2> initiate a URA update procedure according to subclause 8.3.1 using the cause "URA reselection";
 - 2> when the URA update procedure is successfully completed:
 - 3> the procedure ends.

8.3.1.6 Reception of the CELL UPDATE CONFIRM/URA UPDATE CONFIRM message by the UE

When the UE receives a CELL UPDATE CONFIRM/URA UPDATE CONFIRM message; and

- if the message is received on the CCCH, and IE "U-RNTI" is present and has the same value as the variable U_RNTI; or
- if the message is received on DCCH:

the UE may:

- 1> maintain a list of the set of cells to which the UE has Radio Links if the IE "Cell ID" is present.

the UE shall:

- 1> stop timer T302;
- 1> in case of a cell update procedure and the CELL UPDATE CONFIRM message:
 - 2> includes "RB information elements"; and/or
 - 2> includes "Transport channel information elements"; and/or
 - 2> includes "Physical channel information elements"; and
 - 2> if the variable ORDERED_RECONFIGURATION is set to FALSE:

- 3> set the variable ORDERED_RECONFIGURATION to TRUE.
- 1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following:
 - 2> if the IE "Frequency info" is included in the message:
 - 3> if the IE "RRC State Indicator" is set to the value "CELL_FACH" or "CELL_PCH" or "URA_PCH":
 - 4> select a suitable UTRA cell according to [4] on that frequency;
 - 4> act as specified in subclause 8.3.1.12.
 - 3> if the IE "RRC State Indicator" is set to the value "CELL_DCH":
 - 4> act on the IE "Frequency info" as specified in subclause 8.6.6.1.
 - 2> use the transport channel(s) applicable for the physical channel types that is used; and
 - 2> if the IE "TFS" is neither included nor previously stored in the UE for that transport channel(s):
 - 3> use the TFS given in system information.
 - 2> if none of the TFS stored is compatible with the physical channel:
 - 3> delete the stored TFS;
 - 3> use the TFS given in system information.
 - 2> perform the physical layer synchronisation procedure as specified in [29];
 - 2> if the CELL UPDATE CONFIRM message includes the IE "RLC re-establish indicator (RB2, RB3 and RB4)":
 - 3> re-establish the RLC entities for signalling radio bearer RB2, signalling radio bearer RB3 and signalling radio bearer RB4 (if established);
 - 3> if the value of the IE "Status" in the variable CIPHERING_STATUS of the CN domain stored in the variable LATEST_CONFIGURED_CN_DOMAIN is set to "Started":
 - 4> set the HFN values for AM RLC entities with RB identity 2, RB identity 3 and RB identity 4 (if established) equal to the START value included in the latest transmitted CELL UPDATE message for the CN domain stored in the variable LATEST_CONFIGURED_CN_DOMAIN.
 - 2> if the CELL UPDATE CONFIRM message includes the IE "RLC re-establish indicator (RB5 and upwards)":
 - 3> for radio bearers with RB identity 5 and upwards:
 - 4> re-establish the AM RLC entities;
 - 4> if the value of the IE "Status" in the variable CIPHERING_STATUS of the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS is set to "Started":
 - 5> set the HFN values for AM RLC entities equal to the START value included in this CELL UPDATE message for the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS.
 - 1> if the CELL UPDATE CONFIRM / URA UPDATE CONFIRM message contained the IE "Ciphering mode info" or contained the IE "Integrity protection mode info":
 - 2> set the IE "Status" in the variable SECURITY_MODIFICATION for all the CN domains in the variable SECURITY_MODIFICATION to "Affected".
 - 1> enter a state according to subclause 8.6.3.3 applied on the CELL UPDATE CONFIRM / URA UPDATE CONFIRM message.

If the UE after state transition enters CELL_DCH state, it shall:

1> not prohibit periodical status transmission in RLC;

1> for each CN domain for which a transparent mode radio bearer exists and for which the IE "Status" in the variable CIPHERING_STATUS is set to "Started" for that CN domain;

2> choose an activation time for the ciphering on transparent mode radio bearers and include it in the response message in the IE "COUNT_C activation time";

2> set the 20 MSB of the MAC-d HFN with the corresponding START value in the most recently sent IE "START list";

2> set the remaining LSB of the MAC-d HFN to zero;

2> apply ciphering on the transparent mode radio bearers;

2> start incrementing the COUNT_C value from the CFN that has been included in the IE "COUNT_C activation time";

If the UE after state transition remains in CELL_FACH state, it shall

1> start the timer T305 using its initial value if timer T305 is not running and periodical cell update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity";

1> select PRACH according to subclause 8.5.17;

1> select Secondary CCPCH according to subclause 8.5.19;

1> not prohibit periodical status transmission in RLC;

1> if the IE "UTRAN DRX cycle length coefficient" is included in the same message:

2> ignore that IE and stop using DRX.

If the UE after state transition enters URA_PCH or CELL_PCH state, it shall:

1> prohibit periodical status transmission in RLC;

1> clear the variable C_RNTI;

1> stop using that C_RNTI just cleared from the variable C_RNTI in MAC;

1> start the timer T305 using its initial value if timer T305 is not running and periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity";

1> select Secondary CCPCH according to subclause 8.5.19;

1> if the IE "UTRAN DRX cycle length coefficient" is included in the same message:

2> use the value in the IE "UTRAN DRX Cycle length coefficient" for calculating Paging Occasion and PICH Monitoring Occasion as specified in subclause 8.6.3.2 in CELL_PCH state.

1> if the IE "UTRAN DRX cycle length coefficient" is not included in the same message:

2> set the variable INVALID_CONFIGURATION to TRUE.

If the UE after the state transition remains in CELL_FACH state; and

1> the contents of the variable C_RNTI are empty;

it shall check the value of V302; and:

1> if V302 is equal to or smaller than N302:

2> if, caused by the received CELL UPDATE CONFIRM or URA UPDATE CONFIRM message:

3> the IE "Reconfiguration" in the variable CIPHERING_STATUS is set to TRUE; and/or

- 3> the IE "Reconfiguration" in the variable INTEGRITY_PROTECTION_INFO is set to TRUE:
 - 4> abort the ongoing integrity and/or ciphering reconfiguration;
 - 4> if the received CELL UPDATE CONFIRM or URA UPDATE CONFIRM message contained the IE "Ciphering mode info":
 - 5> set the IE "Reconfiguration" in the variable CIPHERING_STATUS to FALSE; and
 - 5> clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO.
 - 4> if the received CELL UPDATE CONFIRM or URA UPDATE CONFIRM message contained the IE "Integrity protection mode info":
 - 5> set the IE "Reconfiguration" in the variable INTEGRITY_PROTECTION_INFO to FALSE; and
 - 5> clear the variable INTEGRITY_PROTECTION_ACTIVATION_INFO.
- 2> in case of a URA update procedure:
 - 3> stop the URA update procedure; and
 - 3> continue with a cell update procedure.
- 2> set the contents of the CELL UPDATE message according to subclause 8.3.1.3, except for the IE "Cell update cause" which shall be set to "cell reselection";
- 2> submit the CELL UPDATE message for transmission on the uplink CCCH;
- 2> increment counter V302;
- 2> restart timer T302 when the MAC layer indicates success or failure to transmit the message.
- 1> if V302 is greater than N302:
 - 2> clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO;
 - 2> clear the variable INTEGRITY_PROTECTION_ACTIVATION_INFO;
 - 2> in case of a cell update procedure:
 - 3> clear the entry for the CELL UPDATE CONFIRM message in the table "Rejected transactions" in the variable TRANSACTIONS.
 - 2> in case of a URA update procedure:
 - 3> clear the entry for the URA UPDATE CONFIRM message in the table "Rejected transactions" in the variable TRANSACTIONS.
 - 2> release all its radio resources;
 - 2> indicate release (abort) of the established signalling connections (as stored in the variable ESTABLISHED_SIGNALLING_CONNECTIONS) and established radio access bearers (as stored in the variable ESTABLISHED_RABS) to upper layers;
 - 2> clear the variable ESTABLISHED_SIGNALLING_CONNECTIONS;
 - 2> clear the variable ESTABLISHED_RABS;
 - 2> enter idle mode;
 - 2> other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2;
 - 2> and the procedure ends.

If the UE after the state transition remains in CELL_FACH state; and

- a C-RNTI is stored in the variable C_RNTI;

or

- the UE after the state transition moves to another state than the CELL_FACH state:

the UE shall:

- 1> if the CELL UPDATE CONFIRM / URA UPDATE CONFIRM message contained the IE "Ciphering mode info":

- 2> include and set the IE "Radio bearer uplink ciphering activation time info" in any response message transmitted below to the value of the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO.

- 1> in case of a cell update procedure:

- 2> set the IE "RRC transaction identifier" in any response message transmitted below to the value of "RRC transaction identifier" in the entry for the CELL UPDATE CONFIRM message in the table "Accepted transactions" in the variable TRANSACTIONS; and

- 2> clear that entry.

- 1> in case of a URA update procedure:

- 2> set the IE "RRC transaction identifier" in any response message transmitted below to the value of "RRC transaction identifier" in the entry for the URA UPDATE CONFIRM message in the table "Accepted transactions" in the variable TRANSACTIONS; and

- 2> clear that entry;

- 1> if the variable PDCP_SN_INFO is non-empty:

- 2> include the IE "RB with PDCP information list" in any response message transmitted below and set it to the value of the variable PDCP_SN_INFO.

- 1> if the received CELL UPDATE CONFIRM or URA UPDATE CONFIRM message included the IE "Downlink counter synchronisation info":

- 2> re-establish RB2;

- 2> set the new uplink and downlink HFN of RB2 to $\text{MAX}(\text{uplink HFN of RB2, downlink HFN of RB2})$;

- 2> increment by one the downlink and uplink HFN values for RB2;

- 2> calculate the START value according to subclause 8.5.9;

- 2> include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info" in any response message transmitted below.

- 1> transmit a response message as specified in subclause 8.3.1.7;

- 1> if the IE "Integrity protection mode info" was present in the CELL UPDATE CONFIRM or URA UPDATE CONFIRM message:

- 2> start applying the new integrity protection configuration in the uplink for signalling radio bearer RB2 from and including the transmitted response message.

- 1> if the variable ORDERED_RECONFIGURATION is set to TRUE caused by the received CELL UPDATE CONFIRM message in case of a cell update procedure:

- 2> set the variable ORDERED_RECONFIGURATION to FALSE.

- 1> clear the variable PDCP_SN_INFO;

- 1> when the response message transmitted per subclause 8.3.1.7 to the UTRAN has been confirmed by RLC:

- 2> if the CELL UPDATE CONFIRM / URA UPDATE CONFIRM message contained the IE "Ciphering mode info":

- 3> resume data transmission on any suspended radio bearer and signalling radio bearer mapped on RLC-AM or RLC-UM;
 - 3> set the IE "Reconfiguration" in the variable CIPHERING_STATUS to FALSE; and
 - 3> clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO.
- 2> if the CELL UPDATE CONFIRM / URA UPDATE CONFIRM message contained the IE "Integrity protection mode info":
 - 3> set "Uplink RRC Message sequence number" for signalling radio bearer RB0 in the variable INTEGRITY_PROTECTION_INFO to a value such that next RRC message to be sent on uplink RB0 will use the new integrity protection configuration;
 - 3> allow the transmission of RRC messages on all signalling radio bearers with any RRC SN;
 - 3> set the IE "Reconfiguration" in the variable INTEGRITY_PROTECTION_INFO to FALSE.
 - 2> clear the variable INTEGRITY_PROTECTION_ACTIVATION_INFO.
- 1> in case of a cell update procedure:
 - 2> clear the entry for the CELL UPDATE CONFIRM message in the table "Rejected transactions" in the variable TRANSACTIONS.
 - 1> in case of a URA update procedure:
 - 2> clear the entry for the URA UPDATE CONFIRM message in the table "Rejected transactions" in the variable TRANSACTIONS.
- 1> set the variable CELL_UPDATE_STARTED to FALSE;
 - 1> clear the variable SECURITY_MODIFICATION.

The procedure ends.

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

When UTRAN has received

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

UTRAN may:

- 1> delete the old configuration.

If the procedure caused the UE to leave the CELL_FACH state, UTRAN may:

- 1> delete the C-RNTI of the UE.

If the IE "UL Timing Advance" is included in TDD, UTRAN should:

- 1> evaluate the timing advance value that the UE has to use in the new cell after handover.

If the IE "START" or the IE "START list" is included, UTRAN should:

- 1> set the START value for each CN domain with the corresponding values as received in this response message;

- 1> consequently, then use the START values to initialise the hyper frame numbers, in the same way as specified for the UE in subclause 8.2.2.3, for any new radio bearers that are established.

If UTRAN has ordered a ciphering reconfiguration by including the IE "Ciphering mode info", UTRAN should:

- 1> for radio bearers using RLC-AM or RLC-UM:
 - 2> use the old ciphering configuration for received RLC PDUs with RLC sequence number less than the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent by the UE;
 - 2> use the new ciphering configuration for received RLC PDUs with RLC sequence number greater than or equal to the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent by the UE;
 - 2> if an RLC reset or re-establishment occurs after this response message has been received by UTRAN before the activation time for the new ciphering configuration has been reached:
 - 3> ignore the activation time; and
 - 3> apply the new ciphering configuration immediately after the RLC reset or RLC re-establishment.
- 1> for radio bearers using RLC-TM:
 - 2> ~~use the new ciphering configuration and~~ only begin incrementing the COUNT-C at the CFN as indicated in:
 - 3> the IE "Ciphering activation time for DPCH" in the IE "Ciphering mode info", if included in the message that triggered the radio bearer control procedure; or
 - 3> the IE "COUNT-C activation time", if included in the response message for this procedure.
- 1> and the procedure ends on the UTRAN side.

8.6.3.4 Ciphering mode info

The IE "Ciphering mode info" defines the new ciphering configuration. At any given time, the UE needs to store at most two different ciphering configurations (keyset and algorithm) per CN domain at any given time in total for all radio bearers and three configurations in total for all signalling radio bearers.

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

- 1> ignore this second attempt to change the ciphering configuration; and
- 1> set the variable INCOMPATIBLE_SECURITY_RECONFIGURATION to TRUE.

If the IE "Ciphering mode info" is present and if the IE "Reconfiguration" in the variable CIPHERING_STATUS is set to FALSE, the UE shall:

- 1> if the IE "Status" in the variable CIPHERING STATUS has the value "Not started", and this IE was included in a message that is not the message SECURITY MODE COMMAND; or
- 1> if [the IE "Ciphering Mode Info" was received in the message SECURITY MODE COMMAND and](#) there does not exist exactly one ciphering activation time in the IE "Radio bearer downlink ciphering activation time info" for each established RLC-AM and RLC-UM radio bearers included in the IE "RB information" in the IE "ESTABLISHED_RABS" for the CN domain as indicated in the variable LATEST_CONFIGURED_CN_DOMAIN; or
- 1> if [the IE "Ciphering Mode Info" was received in the message SECURITY MODE COMMAND and](#) the IE "Ciphering activation time for DPCH" is not included in ~~the message ACTIVE SET UPDATE or SECURITY MODE COMMAND~~, and there exist radio bearers using RLC-TM according to the IE "RB information" in the IE "ESTABLISHED_RABS" for the CN domain as indicated in the variable LATEST_CONFIGURED_CN_DOMAIN; or
- 1> if [the IE "Ciphering Mode Info" was received in the message SECURITY MODE COMMAND and](#) there does not exist exactly one ciphering activation time in the IE "Radio bearer downlink ciphering activation time info"

for each established signalling radio bearer included in the IE "Signalling radio bearer information" in the IE "ESTABLISHED_RABS":

- 2> ignore this attempt to change the ciphering configuration;
 - 2> set the variable INVALID_CONFIGURATION to TRUE;
 - 2> perform the actions as specified in subclause 8.1.12.4c.
- 1> set the IE "Reconfiguration" in the variable CIPHERING_STATUS to TRUE;
- 1> set the IE "Status" in the variable CIPHERING_STATUS of the CN domains for which the IE "Status" of the variable SECURITY_MODIFICATION is set to "Affected" to "Started";
- 1> apply the new ciphering configuration in the lower layers for all RBs that belong to a CN domain for which the IE "Status" of the variable SECURITY_MODIFICATION is set to "Affected" and all signalling radio bearers:
- 2> using the ciphering algorithm (UEA [40]) indicated by the IE "Ciphering algorithm" as part of the new ciphering configuration;
 - 2> for each radio bearer that belongs to a CN domain for which the IE "Status" of the variable SECURITY_MODIFICATION is set to "Affected" and all signalling radio bearers:
 - 3> using the value of the IE "RB identity" in the variable ESTABLISHED_RABS minus one as the value of BEARER [40] in the ciphering algorithm.
- 1> apply the new ciphering configuration as follows:
- 2> consider an activation time in downlink to be pending:
 - 3> for UM-RLC until an UMD PDU with sequence number equal to or larger than activation time –1 has been received;
 - 3> for AM-RLC until all AMD PDUs with sequence numbers up to and including activation time –1 have been received;
 - 3> for TM-RLC until the CFN indicated in the activation time has been reached.
 - 2> if there are pending activation times in downlink set for ciphering by a previous procedure changing the ciphering configuration:
 - 3> apply the ciphering configuration included in the current message at this pending activation time.
 - 2> if the IE "Ciphering activation time for DPCH" is present in the IE "Ciphering mode info" and the UE was in CELL_DCH state prior to this procedure:
 - 3> for radio bearers using RLC-TM:
 - 4> apply the old ciphering configuration for CFN less than the number indicated in the IE "Ciphering activation time for DPCH";
 - 4> apply the new ciphering configuration for CFN greater than or equal to the number indicated in IE "Ciphering activation time for DPCH".

~~2> if the UE was in CELL_FACH state prior to this procedure and at completion of this procedure a transparent mode radio bearer exists and the IE "Ciphering activation time for DPCH" is not present in the IE "Ciphering mode info":~~

~~3> for radio bearers using RLC-TM:~~

~~4> apply the old ciphering configuration for CFN less than the number as indicated in the transmitted uplink response message for the ciphering activation time for this radio bearer;~~

~~4> apply the new ciphering configuration for CFN greater than or equal to the number as indicated in the transmitted uplink response message for the ciphering activation time for this radio bearer.~~

~~NOTE: This is indicated by the IE "COUNT_C activation time" in the transmitted uplink response message.~~

- 2> if the IE "Radio bearer downlink ciphering activation time info" is present:
 - 3> apply the following procedure for each radio bearer and signalling radio bearers using RLC-AM or RLC-UM indicated by the IE "RB identity":
 - 4> suspend uplink transmission on the radio bearer or the signalling radio bearer (except for the SRB where the response message is transmitted) according to the following:
 - 5> do not transmit RLC PDUs with sequence number greater than or equal to the uplink activation time, where the uplink activation time is selected according to the rules below.
 - 4> select an "RLC send sequence number" at which (activation) time the new ciphering configuration shall be applied in uplink for that radio bearer according to the following:
 - 5> for each radio bearer and signalling radio bearer that has no pending ciphering activation time in uplink as set by a previous procedure changing the security configuration:
 - 6> set a suitable value that would ensure a minimised delay in the change to the latest security configuration.
 - 5> for each radio bearer and signalling radio bearer that has a pending ciphering activation time in uplink as set by a previous procedure changing the security configuration:
 - 6> set the same value as the pending ciphering activation time.
 - 5> consider this activation time in uplink to be elapsed when the selected activation time (as above) is equal to the "RLC send sequence number";
 - 4> store the selected "RLC send sequence number" for that radio bearer in the entry for the radio bearer in the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO;
 - 4> switch to the new ciphering configuration according to the following:
 - 5> use the old ciphering configuration for the transmitted and received RLC PDUs with RLC sequence numbers smaller than the corresponding RLC sequence numbers indicated in the IE "Radio bearer uplink ciphering activation time info" sent to UTRAN and in the received IE "Radio bearer downlink ciphering activation time info" received from UTRAN, respectively;
 - 5> use the new ciphering configuration for the transmitted and received RLC PDUs with RLC sequence numbers greater than or equal to the corresponding RLC sequence numbers indicated in the IE "Radio bearer uplink ciphering activation time info" sent to UTRAN and in the received IE "Radio bearer downlink ciphering activation time info" received from UTRAN, respectively;
 - 5> for a radio bearer using RLC-AM, when the RLC sequence number indicated in the IE "Radio bearer downlink ciphering activation time info" falls below the RLC receiving window and the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" falls below the RLC transmission window, the UE may release the old ciphering configuration for that radio bearer;
 - 5> if an RLC reset or re-establishment occurs before the activation time for the new ciphering configuration has been reached, ignore the activation time and apply the new ciphering configuration immediately after the RLC reset or RLC re-establishment.

If the IE "Ciphering mode info" is not present, the UE shall:

- 1> not change the ciphering configuration.

8.6.4.3 RB information to setup

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

- 1> use the same START value to initialise the hyper frame number components of COUNT-C variables for all the new radio bearers to setup;

- 1> perform the actions for the IE "PDCP info", if present, according to subclause 8.6.4.10, applied for the radio bearer;
- 1> perform the actions for the IE "RLC info", according to subclause 8.6.4.9, applied for the radio bearer;
- 1> perform the actions for the IE "RB mapping info", according to subclause 8.6.4.8, applied for the radio bearer;
- 1> if the IE "Downlink RLC mode" either in the IE "RLC info" or referenced by the RB identity in the IE "Same as RB" is set to "TM RLC":
 - 2> configure delivery of erroneous SDUs in lower layers according to indication from upper layer [5].
- 1> if the IE "Uplink RLC mode" or the IE "Downlink RLC mode" either in the IE "RLC info" or referenced by the RB identity in the IE "Same as RB" is set to "AM RLC" or "UM RLC":
 - 2> initialise the 20 MSB of the hyper frame number component of COUNT-C for this radio bearer with the START value in the variable START_VALUE_TO_TRANSMIT;
 - 2> set the remaining LSB of the hyper frame number component of COUNT-C for this radio bearer to zero;
 - 2> start incrementing the COUNT-C values.
- 1> if the IE "Uplink RLC mode" and the IE "Downlink RLC mode" either in the IE "RLC info" or referenced by the RB identity in the IE "Same as RB" is set to "TM RLC":
 - 2> if prior to this procedure there exists no transparent mode radio bearer for the CN domain included in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS and at least one transparent mode radio bearer is included in the IE "RB information to setup":
 - 3> if the IE "Status" in the variable CIPHERING_STATUS of the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS is set to "Not Started":
 - 43> at the activation time as specified in the IE "Ciphering activation time for DPCH" if included in the IE "Ciphering mode info" in the command message or, if this IE is not included, as specified in the IE "COUNT-C activation time" included in the response message:
 - 54> initialise the 20 most significant bits of the hyper frame number component of COUNT-C common for all transparent mode radio bearers of this CN domain with the START value in the variable START_VALUE_TO_TRANSMIT;
 - 54> set the remaining LSB of the hyper frame number component of COUNT-C to zero;
 - 5> do not increment the COUNT-C value common for all transparent mode radio bearers for this CN domain;
 - 34> if the IE "Status" in the variable CIPHERING_STATUS of the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS is set to "Not Started":
 - ~~5> do not increment the COUNT-C value for this CN domain.~~
 - 4> else:
 - ~~5> if the IE "Status" in the variable CIPHERING_STATUS of the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS is set to "Started":~~
- 4> at the activation time as specified in the IE "Activation Time" in the RADIO BEARER SETUP message:
 - 5> initialise the 20 most significant bits of the hyper frame number component of COUNT-C common for all transparent mode RLC radio bearer to the value of the latest transmitted START for this CN domain, while not incrementing the value of the HFN component of COUNT-C at each CFN cycle; and;
 - 5> set the remaining LSB of the hyper frame number component of COUNT-C to zero;
 - 5> start to perform ciphering on the radio bearer in lower layers while not incrementing the HFN;

4> at the activation time as specified in the IE "Ciphering activation time for DPCH" if included in the IE "Ciphering mode info" in the command message or, if this IE is not included, as specified in the IE "COUNT-C activation time" included in the response message:

5> initialise the 20 most significant bits of the hyper frame number component of COUNT-C common for all transparent mode radio bearers of this CN domain with the START value in the variable START_VALUE_TO_TRANSMIT;

5> set the remaining LSB of the hyper frame number component of COUNT-C to zero;

56> start incrementing the COUNT-C value common for all transparent mode radio bearers of this CN domain as normal, at each CFN value, i.e. the HFN component is no longer fixed in value but incremented at each CFN cycle.

3> if prior to this procedure there exists at least one transparent mode radio bearer for the CN domain included in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS:

4> continue incrementing the COUNT-C value common for all transparent mode radio bearers of this CN domain.

1> if the IE "Status" in the variable CIPHERING_STATUS of the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS is set to "Started":

2> start to perform ciphering on the radio bearer in lower layers, using the value of the IE "RB identity" minus one as the value of BEARER in the ciphering algorithm.

NOTE: UTRAN should not use the IE "RB information to setup" to setup radio bearers with RB identity in the range 1-4.

8.6.6.28 Downlink DPCH info common for all radio links

If the IE "Downlink DPCH info common for all RL" is included the UE shall:

1> if the IE "Downlink DPCH info common for all RL" is included in a message used to perform a hard handover:

2> perform actions for the IE "Timing indication" as specified in subclause 8.5.15.2, and subclause 8.3.5.1 or 8.3.5.2.

1> ignore the value received in IE "CFN-targetSFN frame offset";

1> if the IE "Downlink DPCH power control information" is included:

2> perform actions for the IE "DPC Mode" according to [29].

1> if the IE choice "mode" is set to 'FDD':

2> if the IE "Downlink rate matching restriction information" is included:

3> set the variable INVALID_CONFIGURATION to TRUE.

2> perform actions for the IE "spreading factor";

2> perform actions for the IE "Fixed or Flexible position";

2> perform actions for the IE "TFCI existence";

2> if the IE choice "SF" is set to 256:

3> store the value of the IE "Number of bits for pilot bits".

2> if the IE choice "SF" set to 128:

3> store the value of the IE "Number of bits for pilot bits".

1> if the IE choice "mode" is set to 'TDD':

2> perform actions for the IE "Common timeslot info".

If the IE "Downlink DPCH info common for all RL" is included in a message used to perform a Timing re-initialised hard handover or the IE "Downlink DPCH info common for all RL" is included in a message **other than RB SETUP** used to transfer the UE from a state different from Cell_DCH to the Cell_DCH state, and ciphering is active for any radio bearer using RLC-TM, the UE shall, after having activated the dedicated physical channels indicated by that IE:

1> set the 20 MSB of the HFN component of COUNT-C for TM-RLC to the value of the latest transmitted IE "START" or "START List" for this CN domain, while not incrementing the value of the HFN component of COUNT-C at each CFN cycle; and

1> set the remaining LSBs of the HFN component of COUNT-C to zero;

1> start to perform ciphering on the radio bearer in lower layers while not incrementing the HFN;

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

1> calculate the START value according to subclause 8.5.9;

1> include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info" in the response message;

1> at the CFN value as indicated in the response message in the IE "COUNT-C activation time":

2> set the 20 MSB of the HFN component of the COUNT-C variable to the START value as indicated in the IE "START list" of the response message for the relevant CN domain; and

2> set the remaining LSBs of the HFN component of COUNT-C to zero;

2> increment the HFN component of the COUNT-C variable by one;

2> set the CFN component of the COUNT-C to the value of the IE "COUNT-C activation time" of the response message. The HFN component and the CFN component completely initialise the COUNT-C variable;

2> step the COUNT-C variable, as normal, at each CFN value, i.e. the HFN component is no longer fixed in value but incremented at each CFN cycle.

3GPP TSG-RAN WG2 Meeting #29
Gyeongju, Korea, 13th-17th of May 2002

R2-021483

CR-Form-v5

CHANGE REQUEST

⌘ **25.331 CR 1468** ⌘ rev **r1** ⌘ Current version: **5.0.0** ⌘

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

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

Title:	⌘ Cipherng Activation for TM Radio Bearers		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘ TEI	Date:	⌘ 2002-05-06
Category:	⌘ A	Release:	⌘ REL-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)		2 (GSM Phase 2)
	A (corresponds to a correction in an earlier release)		R96 (Release 1996)
	B (addition of feature),		R97 (Release 1997)
	C (functional modification of feature)		R98 (Release 1998)
	D (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		REL-4 (Release 4)
			REL-5 (Release 5)

Reason for change:	⌘ • The current specification contains ambiguous and incorrect text on cipherng, in particular at the setup of TM radio bearers (RB setup). See also summary of change below.
Summary of change:	⌘ • 8.6.4.3: When a TM RB is setup the behaviour is unspecified between the time of the RB setup message until the activation time of the cipherng (COUNT-C activation time set by UE or Downlink cipherng activation time set by UTRAN). It is specified that the last transmitted START value should be used to initiate HFN and the HFN shall be fixed in the time between the activation times.
	• In 8.2.2.3 the COUNT-C activation time in uplink is currently included when the first TM RB is setup. The COUNT-C activation time is however needed for the first TM RB for each CN domain.
	• In 8.2.2.3 the COUNT-C activation time is currently included in uplink when the last TM RB is released. Due to recent changes this is no longer needed and its proposed to delete this functionality.
	• In 8.6.3.4 the UE currently checks that activation times are included for all established RBS and SRBs if the IE "cipherng mode info" is included in downlink. These checks needs to be removed if it should be possible for UTRAN to give the Downlink activation time for cipherng when TM RBs are setup (as agreed at WG2 #28). In this document these checks are deleted.
	However, as some UE changes are required to allow this option, one possibility is to remove the option that UTRAN gives the activation time, i.e. only allow the option that the UE sets the COUNT-C activation time in uplink for RB setup. This seems to be the prefered way forward and if this is acceptable, an updated CR can be provided.
	<u>Updated CR:</u>
	<u>After discussion on R2-0221195, Security: Open Issues (Motorola), it was decided to</u>

have only one option for setting of the Ciphering Activation Time for TM RB setup, i.e. only allow the option that the UE sets the COUNT-C activation time in uplink.

In 8.6.6.28 the actions for transaction to CELL_DCH is not performed for RB SETUP since the corresponding actions are handled there. The reference to COUNT-C handling of TM RBs in CELL UPDATE CONFIRM is deleted since this is covered in 8.6.6.28.

Rel5 Shadow CR.

Consequences if not approved: ☹ Incorrect and ambiguous behaviour.

Clauses affected: ☹ 8.2.2.3, 8.2.2.5, 8.3.1.6, 8.6.3.4, 8.6.4.3, 8.6.6.28

Other specs affected: ☹

 Other core specifications ☹ 25.331 v3.10.0, CR 1466
25.331 v4.4.0, CR 1467r1

 Test specifications
O&M Specifications

Other comments: ☹

How to create CRs using this form:

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

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

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

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

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

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

If the UE receives:

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

it shall:

- 1> set the variable ORDERED_RECONFIGURATION to TRUE;
- 1> perform the physical layer synchronisation procedure as specified in [29];
- 1> act upon all received information elements as specified in subclause 8.6, unless specified in the following and perform the actions below.

The UE may:

- 1> maintain a list of the set of cells to which the UE has Radio Links if the IE "Cell ID" is present.

The UE may first release the physical channel configuration used at reception of the reconfiguration message. The UE shall then:

- 1> 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:
 - 2> act upon the IE "PDSCH code mapping" as specified in subclause 8.6; and
 - 2> infer that the PDSCH will be transmitted from the cell from which the downlink DPCH is transmitted.
- 1> enter a state according to subclause 8.6.3.3.

In case the UE receives a RADIO BEARER RECONFIGURATION message including the IE "RB information to reconfigure" that only includes the IE "RB identity", the UE shall:

- 1> handle the message as if IE "RB information to reconfigure" was absent.

NOTE: The RADIO BEARER RECONFIGURATION message always includes the IE "RB information to reconfigure". UTRAN has to include it even if it does not require the reconfiguration of any RB.

If after state transition the UE enters CELL_DCH state, the UE shall, after the state transition:

1> remove any C-RNTI from MAC;

1> clear the variable C_RNTI.

In FDD, if after state transition the UE leaves CELL_DCH state, the UE shall, after the state transition:

1> remove any DSCH-RNTI from MAC;

1> clear the variable DSCH_RNTI.

If the UE was in CELL_DCH state upon reception of the reconfiguration message and remains in CELL_DCH state, the UE shall:

1> if the IE "Uplink DPCH Info" is absent, not change its current UL Physical channel configuration;

1> if the IE "Downlink information for each radio link" is absent, not change its current DL Physical channel configuration;

1> if "DPCH frame offset" is included for one or more RLS in the active set:

2> use its value to determine the beginning of the DPCH frame in accordance with the following:

3> if the received IE "DPCH frame offset" is across the value range border compared to the DPCH frame offset currently used by the UE:

4> consider it to be a request to adjust the timing with 256 chips across the frame border (e.g. if the UE receives value 0 while the value currently used is 38144 consider this as a request to adjust the timing with +256 chips).

3> if after taking into account value range borders, the received IE "DPCH frame offset" corresponds with a request to adjust the timing with a step exceeding 256 chips:

4> set the variable INVALID_CONFIGURATION to FALSE;

4> and the procedure ends.

2> adjust the radio link timing accordingly.

If after state transition the UE enters CELL_FACH state, the UE shall, after the state transition:

1> if the IE "Frequency info" is included in the received reconfiguration message:

2> select a suitable UTRA cell according to [4] on that frequency.

1> if the IE "Frequency info" is not included in the received reconfiguration message:

2> select a suitable UTRA cell according to [4].

1> if the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selects another cell than indicated by this IE or the received reconfiguration message did not include the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD):

2> initiate a cell update procedure according to subclause 8.3.1 using the cause "Cell reselection";

2> when the cell update procedure completed successfully:

3> if the UE is in CELL_PCH or URA_PCH state:

4> initiate a cell update procedure according to subclause 8.3.1 using the cause "Uplink data transmission";

4> proceed as below.

1> start timer T305 using its initial value if timer T305 is not running and if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;

1> select PRACH according to subclause 8.5.17;

- 1> select Secondary CCPCH according to subclause 8.5.19;
- 1> use the transport format set given in system information;
- 1> if the IE "UTRAN DRX cycle length coefficient" is included in the same message:
 - 2> ignore that IE and stop using DRX.
- 1> remove any H-RNTI stored;
- 1> clear the variable H_RNTI;
- 1> if the contents of the variable C_RNTI is empty:
 - 2> perform a cell update procedure according to subclause 8.3.1 using the cause "Cell reselection";
 - 2> when the cell update procedure completed successfully:
 - 3> if the UE is in CELL_PCH or URA_PCH state:
 - 4> initiate a cell update procedure according to subclause 8.3.1 using the cause "Uplink data transmission";
 - 4> proceed as below.

If the UE was in CELL_FACH state upon reception of the reconfiguration message and remains in CELL_FACH state, the UE shall:

- 1> if the IE "Frequency info" is included in the received reconfiguration message:
 - 2> select a suitable UTRA cell according to [4] on that frequency;
 - 2> if the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE or the received reconfiguration message did not include the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD):
 - 3> initiate a cell update procedure according to subclause 8.3.1 using the cause "cell reselection";
 - 3> when the cell update procedure completed successfully:
 - 4> proceed as below.

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

- 1> if the received reconfiguration message included the IE "Downlink counter synchronisation info"; or
- 1> if the received reconfiguration message is a RADIO BEARER RECONFIGURATION and the IE "New U-RNTI" is included:
 - 2> re-establish RB2;
 - 2> set the new uplink and downlink HFN of RB2 to $\text{MAX}(\text{uplink HFN of RB2, downlink HFN of RB2})$;
 - 2> increment by one the downlink and uplink HFN values for RB2;
 - 2> calculate the START value according to subclause 8.5.9;
 - 2> include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info".
- 1> if the received reconfiguration message did not include the IE "Downlink counter synchronisation info":
 - 2> if the variable START_VALUE_TO_TRANSMIT is set:
 - 3> include and set the IE "START" to the value of that variable.

- 2> if the variable START_VALUE_TO_TRANSMIT is not set and the IE "New U-RNTI" is included:
 - 3> calculate the START value according to subclause 8.5.9;
 - 3> include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info".
- 2> if the received reconfiguration message caused a change in the RLC size for any RB using RLC-AM:
 - 3> calculate the START value according to subclause 8.5.9;
 - 3> include the calculated START values for the CN domain associated with the corresponding RB identity in the IE "START list" in the IE "Uplink counter synchronisation info".
- 1> if the received reconfiguration message contained the IE "Ciphering mode info" or contained the IE "Integrity protection mode info":
 - 2> set the IE "Status" in the variable SECURITY_MODIFICATION for all the CN domains in the variable SECURITY_MODIFICATION to "Affected".
- 1> if the received reconfiguration message contained the IE "Ciphering mode info":
 - 2> include and set the IE "Radio bearer uplink ciphering activation time info" to the value of the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO.
- 1> if the received reconfiguration message did not contain the IE "Ciphering activation time for DPCH" ~~in IE "Ciphering mode info":~~
 - 2> if prior to this procedure there exist no transparent mode RLC radio bearers for the CN domain indicated in the IE "CN domain identity" in the IE "RAB info":
 - 3> if, at the conclusion of this procedure, the UE will be in CELL_DCH state; and
 - 3> if, at the conclusion of this procedure, at least one transparent mode RLC radio bearer exists for the CN domain indicated in the IE "CN domain identity" in the IE "RAB info":
 - 4> include the IE "COUNT-C activation time" and specify a CFN value for this IE.
 - Note: UTRAN should not include the IE "Ciphering mode info" in any reconfiguration messages unless it is also used to perform a SRNS relocation with change of ciphering algorithm.
 - ~~2> if prior to this procedure there exists at least one transparent mode RLC radio bearer:~~
 - ~~3> if, at the conclusion of this procedure, no transparent mode RLC radio bearers exist:~~
 - ~~4> include the IE "COUNT-C activation time" and specify a CFN value for this IE.~~
- 1> set the IE "RRC transaction identifier" to the value of "RRC transaction identifier" in the entry for the received message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- 1> clear that entry;
- 1> if the variable PDCP_SN_INFO is not empty:
 - 2> include the IE "RB with PDCP information list" and set it to the value of the variable PDCP_SN_INFO.
- 1> in TDD, if the procedure is used to perform a handover to a cell where timing advance is enabled, and the UE can calculate the timing advance value in the new cell (i.e. in a synchronous TDD network):
 - 2> set the IE "Uplink Timing Advance" according to subclause 8.6.6.26.
- 1> if the IE "Integrity protection mode info" was present in the received reconfiguration message:
 - 2> start applying the new integrity protection configuration in the uplink for signalling radio bearer RB2 from and including the transmitted response message.

If after state transition the UE enters CELL_PCH or URA_PCH state, the UE shall, after the state transition and transmission of the response message:

- 1> if the IE "Frequency info" is included in the received reconfiguration message:
 - 2> select a suitable UTRA cell according to [4] on that frequency.
- 1> if the IE "Frequency info" is not included in the received reconfiguration message:
 - 2> select a suitable UTRA cell according to [4].
- 1> prohibit periodical status transmission in RLC;
- 1> remove any C-RNTI from MAC;
- 1> clear the variable C_RNTI;
- 1> remove any H-RNTI stored;
- 1> clear the variable H_RNTI;
- 1> start timer T305 using its initial value if timer T305 is not running and if periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity" in system information block type 1;
- 1> select Secondary CCPCH according to subclause 8.5.19;
- 1> if the IE "UTRAN DRX cycle length coefficient" is included in the same message:
 - 2> use the value in the IE "UTRAN DRX Cycle length coefficient" for calculating Paging occasion and PICH Monitoring Occasion as specified in subclause 8.6.3.2.
- 1> if the IE "UTRAN DRX cycle length coefficient" is not included in the same message:
 - 2> set the variable INVALID_CONFIGURATION to TRUE.
- 1> if the UE enters CELL_PCH state from CELL_DCH state, and the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE or the received reconfiguration message did not include the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD):
 - 2> initiate a cell update procedure according to subclause 8.3.1 using the cause "cell reselection";
 - 2> when the cell update procedure completed successfully:
 - 3> the procedure ends.
- 1> if the UE enters CELL_PCH state from CELL_FACH state, and the received reconfiguration message included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selected another cell than indicated by this IE:
 - 2> initiate a cell update procedure according to subclause 8.3.1 using the cause "cell reselection";
 - 2> when the cell update procedure is successfully completed:
 - 3> the procedure ends.
- 1> if the UE enters URA_PCH state, and after cell selection the criteria for URA update caused by "URA reselection" according to subclause 8.3.1 is fulfilled:
 - 2> initiate a URA update procedure according to subclause 8.3.1 using the cause "URA reselection";
 - 2> when the URA update procedure is successfully completed:
 - 3> the procedure ends.

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

When UTRAN has received

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

UTRAN may:

- 1> delete the old configuration.

If the procedure caused the UE to leave the CELL_FACH state, UTRAN may:

- 1> delete the C-RNTI of the UE.

If the IE "UL Timing Advance" is included in TDD, UTRAN should:

- 1> evaluate the timing advance value that the UE has to use in the new cell after handover.

If the IE "START" or the IE "START list " is included, UTRAN should:

- 1> set the START value for each CN domain with the corresponding values as received in this response message;
- 1> consequently, then use the START values to initialise the hyper frame numbers, in the same way as specified for the UE in subclause 8.2.2.3, for any new radio bearers that are established.

If UTRAN has ordered a ciphering reconfiguration by including the IE "Ciphering mode info", UTRAN should:

- 1> for radio bearers using RLC-AM or RLC-UM:
 - 2> use the old ciphering configuration for received RLC PDUs with RLC sequence number less than the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent by the UE;
 - 2> use the new ciphering configuration for received RLC PDUs with RLC sequence number greater than or equal to the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" sent by the UE;
 - 2> if an RLC reset or re-establishment occurs after this response message has been received by UTRAN before the activation time for the new ciphering configuration has been reached:
 - 3> ignore the activation time; and
 - 3> apply the new ciphering configuration immediately after the RLC reset or RLC re-establishment.
- 1> for radio bearers using RLC-TM:
 - 2> ~~use the new ciphering configuration and~~ only begin incrementing the COUNT-C at the CFN as indicated in:
 - 3> the IE "Ciphering activation time for DPCH" in the IE "Ciphering mode info", if included in the message that triggered the radio bearer control procedure; or
 - 3> the IE "COUNT-C activation time", if included in the response message for this procedure.

- 1> and the procedure ends on the UTRAN side.

8.3.1.6 Reception of the CELL UPDATE CONFIRM/URA UPDATE CONFIRM message by the UE

When the UE receives a CELL UPDATE CONFIRM/URA UPDATE CONFIRM message; and

- if the message is received on the CCCH, and IE "U-RNTI" is present and has the same value as the variable U_RNTI; or
- if the message is received on DCCH:

the UE may:

- 1> maintain a list of the set of cells to which the UE has Radio Links if the IE "Cell ID" is present.

the UE shall:

- 1> stop timer T302;

- 1> in case of a cell update procedure and the CELL UPDATE CONFIRM message:

- 2> includes "RB information elements"; and/or
- 2> includes "Transport channel information elements"; and/or
- 2> includes "Physical channel information elements"; and

- 2> if the variable ORDERED_RECONFIGURATION is set to FALSE:

- 3> set the variable ORDERED_RECONFIGURATION to TRUE.

- 1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following:

- 2> if the IE "Frequency info" is included in the message:

- 3> if the IE "RRC State Indicator" is set to the value "CELL_FACH" or "CELL_PCH" or "URA_PCH":

- 4> select a suitable UTRA cell according to [4] on that frequency;
- 4> act as specified in subclause 8.3.1.12.

- 3> if the IE "RRC State Indicator" is set to the value "CELL_DCH":

- 4> act on the IE "Frequency info" as specified in subclause 8.6.6.1.

- 2> use the transport channel(s) applicable for the physical channel types that is used; and

- 2> if the IE "TFS" is neither included nor previously stored in the UE for that transport channel(s):

- 3> use the TFS given in system information.

- 2> if none of the TFS stored is compatible with the physical channel:

- 3> delete the stored TFS;
- 3> use the TFS given in system information.

- 2> perform the physical layer synchronisation procedure as specified in [29];

- 2> if the CELL UPDATE CONFIRM message includes the IE "RLC re-establish indicator (RB2, RB3 and RB4)":

- 3> re-establish the RLC entities for signalling radio bearer RB2, signalling radio bearer RB3 and signalling radio bearer RB4 (if established);

- 3> if the value of the IE "Status" in the variable CIPHERING_STATUS of the CN domain stored in the variable LATEST_CONFIGURED_CN_DOMAIN is set to "Started":
 - 4> set the HFN values for AM RLC entities with RB identity 2, RB identity 3 and RB identity 4 (if established) equal to the START value included in the latest transmitted CELL UPDATE message for the CN domain stored in the variable LATEST_CONFIGURED_CN_DOMAIN.
- 2> if the CELL UPDATE CONFIRM message includes the IE "RLC re-establish indicator (RB5 and upwards)":
 - 3> for radio bearers with RB identity 5 and upwards:
 - 4> re-establish the AM RLC entities;
 - 4> if the value of the IE "Status" in the variable CIPHERING_STATUS of the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS is set to "Started":
 - 5> set the HFN values for AM RLC entities equal to the START value included in this CELL UPDATE message for the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS.
- 1> if the CELL UPDATE CONFIRM / URA UPDATE CONFIRM message contained the IE "Ciphering mode info" or contained the IE "Integrity protection mode info":
 - 2> set the IE "Status" in the variable SECURITY_MODIFICATION for all the CN domains in the variable SECURITY_MODIFICATION to "Affected".
- 1> enter a state according to subclause 8.6.3.3 applied on the CELL UPDATE CONFIRM / URA UPDATE CONFIRM message.

If the UE after state transition enters CELL_DCH state, it shall:

- 1> not prohibit periodical status transmission in RLC;

- 1> for each CN domain for which a transparent mode radio bearer exists and for which the IE "Status" in the variable CIPHERING_STATUS is set to "Started" for that CN domain:
 - 2> choose an activation time for the ciphering on transparent mode radio bearers and include it in the response message in the IE "COUNT_C activation time";
 - 2> set the 20 MSB of the MAC-d HFN with the corresponding START value in the most recently sent IE "START list";
 - 2> set the remaining LSB of the MAC-d HFN to zero;
 - 2> apply ciphering on the transparent mode radio bearers;
 - 2> start incrementing the COUNT_C value from the CFN that has been included in the IE "COUNT_C activation time";

If the UE after state transition remains in CELL_FACH state, it shall

- 1> start the timer T305 using its initial value if timer T305 is not running and periodical cell update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity";
- 1> select PRACH according to subclause 8.5.17;
- 1> select Secondary CCPCH according to subclause 8.5.19;
- 1> not prohibit periodical status transmission in RLC;
- 1> if the IE "UTRAN DRX cycle length coefficient" is included in the same message:
 - 2> ignore that IE and stop using DRX.

If the UE after state transition enters URA_PCH or CELL_PCH state, it shall:

- 1> prohibit periodical status transmission in RLC;
- 1> clear the variable C_RNTI;
- 1> stop using that C_RNTI just cleared from the variable C_RNTI in MAC;
- 1> start the timer T305 using its initial value if timer T305 is not running and periodical update has been configured by T305 in the IE "UE Timers and constants in connected mode" set to any other value than "infinity";
- 1> select Secondary CCPCH according to subclause 8.5.19;
- 1> if the IE "UTRAN DRX cycle length coefficient" is included in the same message:
 - 2> use the value in the IE "UTRAN DRX Cycle length coefficient" for calculating Paging Occasion and PICH Monitoring Occasion as specified in subclause 8.6.3.2 in CELL_PCH state.
- 1> if the IE "UTRAN DRX cycle length coefficient" is not included in the same message:
 - 2> set the variable INVALID_CONFIGURATION to TRUE.

If the UE after the state transition remains in CELL_FACH state; and

- 1> the contents of the variable C_RNTI are empty;

it shall check the value of V302; and:

- 1> if V302 is equal to or smaller than N302:
 - 2> if, caused by the received CELL UPDATE CONFIRM or URA UPDATE CONFIRM message:
 - 3> the IE "Reconfiguration" in the variable CIPHERING_STATUS is set to TRUE; and/or
 - 3> the IE "Reconfiguration" in the variable INTEGRITY_PROTECTION_INFO is set to TRUE:
 - 4> abort the ongoing integrity and/or ciphering reconfiguration;
 - 4> if the received CELL UPDATE CONFIRM or URA UPDATE CONFIRM message contained the IE "Ciphering mode info":
 - 5> set the IE "Reconfiguration" in the variable CIPHERING_STATUS to FALSE; and
 - 5> clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO.
 - 4> if the received CELL UPDATE CONFIRM or URA UPDATE CONFIRM message contained the IE "Integrity protection mode info":
 - 5> set the IE "Reconfiguration" in the variable INTEGRITY_PROTECTION_INFO to FALSE; and
 - 5> clear the variable INTEGRITY_PROTECTION_ACTIVATION_INFO.
 - 2> in case of a URA update procedure:
 - 3> stop the URA update procedure; and
 - 3> continue with a cell update procedure.
 - 2> set the contents of the CELL UPDATE message according to subclause 8.3.1.3, except for the IE "Cell update cause" which shall be set to "cell reselection";
 - 2> submit the CELL UPDATE message for transmission on the uplink CCCH;
 - 2> increment counter V302;
 - 2> restart timer T302 when the MAC layer indicates success or failure to transmit the message.
 - 1> if V302 is greater than N302:
 - 2> clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO;

- 2> clear the variable INTEGRITY_PROTECTION_ACTIVATION_INFO;
- 2> in case of a cell update procedure:
 - 3> clear the entry for the CELL UPDATE CONFIRM message in the table "Rejected transactions" in the variable TRANSACTIONS.
- 2> in case of a URA update procedure:
 - 3> clear the entry for the URA UPDATE CONFIRM message in the table "Rejected transactions" in the variable TRANSACTIONS.
- 2> release all its radio resources;
- 2> indicate release (abort) of the established signalling connections (as stored in the variable ESTABLISHED_SIGNALLING_CONNECTIONS) and established radio access bearers (as stored in the variable ESTABLISHED_RABS) to upper layers;
- 2> clear the variable ESTABLISHED_SIGNALLING_CONNECTIONS;
- 2> clear the variable ESTABLISHED_RABS;
- 2> enter idle mode;
- 2> other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2;
- 2> and the procedure ends.

If the UE after the state transition remains in CELL_FACH state; and

- a C-RNTI is stored in the variable C_RNTI;

or

- the UE after the state transition moves to another state than the CELL_FACH state:

the UE shall:

- 1> if the CELL UPDATE CONFIRM / URA UPDATE CONFIRM message contained the IE "Ciphering mode info":
 - 2> include and set the IE "Radio bearer uplink ciphering activation time info" in any response message transmitted below to the value of the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO.
- 1> in case of a cell update procedure:
 - 2> set the IE "RRC transaction identifier" in any response message transmitted below to the value of "RRC transaction identifier" in the entry for the CELL UPDATE CONFIRM message in the table "Accepted transactions" in the variable TRANSACTIONS; and
 - 2> clear that entry.
- 1> in case of a URA update procedure:
 - 2> set the IE "RRC transaction identifier" in any response message transmitted below to the value of "RRC transaction identifier" in the entry for the URA UPDATE CONFIRM message in the table "Accepted transactions" in the variable TRANSACTIONS; and
 - 2> clear that entry;
- 1> if the variable PDCP_SN_INFO is non-empty:
 - 2> include the IE "RB with PDCP information list" in any response message transmitted below and set it to the value of the variable PDCP_SN_INFO.
- 1> if the received CELL UPDATE CONFIRM or URA UPDATE CONFIRM message included the IE "Downlink counter synchronisation info":

- 2> re-establish RB2;
 - 2> set the new uplink and downlink HFN of RB2 to MAX(uplink HFN of RB2, downlink HFN of RB2);
 - 2> increment by one the downlink and uplink HFN values for RB2;
 - 2> calculate the START value according to subclause 8.5.9;
 - 2> include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info" in any response message transmitted below.
- 1> transmit a response message as specified in subclause 8.3.1.7;
- 1> if the IE "Integrity protection mode info" was present in the CELL UPDATE CONFIRM or URA UPDATE CONFIRM message:
- 2> start applying the new integrity protection configuration in the uplink for signalling radio bearer RB2 from and including the transmitted response message.
- 1> if the variable ORDERED_RECONFIGURATION is set to TRUE caused by the received CELL UPDATE CONFIRM message in case of a cell update procedure:
- 2> set the variable ORDERED_RECONFIGURATION to FALSE.
- 1> clear the variable PDCP_SN_INFO;
- 1> when the response message transmitted per subclause 8.3.1.7 to the UTRAN has been confirmed by RLC:
- 2> if the CELL UPDATE CONFIRM / URA UPDATE CONFIRM message contained the IE "Ciphering mode info":
 - 3> resume data transmission on any suspended radio bearer and signalling radio bearer mapped on RLC-AM or RLC-UM;
 - 3> set the IE "Reconfiguration" in the variable CIPHERING_STATUS to FALSE; and
 - 3> clear the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO.
 - 2> if the CELL UPDATE CONFIRM / URA UPDATE CONFIRM message contained the IE "Integrity protection mode info":
 - 3> set "Uplink RRC Message sequence number" for signalling radio bearer RB0 in the variable INTEGRITY_PROTECTION_INFO to a value such that next RRC message to be sent on uplink RB0 will use the new integrity protection configuration;
 - 3> allow the transmission of RRC messages on all signalling radio bearers with any RRC SN;
 - 3> set the IE "Reconfiguration" in the variable INTEGRITY_PROTECTION_INFO to FALSE.
 - 2> clear the variable INTEGRITY_PROTECTION_ACTIVATION_INFO.
- 1> in case of a cell update procedure:
- 2> clear the entry for the CELL UPDATE CONFIRM message in the table "Rejected transactions" in the variable TRANSACTIONS.
- 1> in case of a URA update procedure:
- 2> clear the entry for the URA UPDATE CONFIRM message in the table "Rejected transactions" in the variable TRANSACTIONS.
- 1> set the variable CELL_UPDATE_STARTED to FALSE;
- 1> clear the variable SECURITY_MODIFICATION.

The procedure ends.

8.6.3.4 Cipherring mode info

The IE "Cipherring mode info" defines the new cipherring configuration. At any given time, the UE needs to store at most two different cipherring configurations (keyset and algorithm) per CN domain at any given time in total for all radio bearers and three configurations in total for all signalling radio bearers.

If the IE "Cipherring mode info" is present and if the IE "Reconfiguration" in the variable CIPHERING_STATUS is set to TRUE, the UE shall:

- 1> ignore this second attempt to change the cipherring configuration; and
- 1> set the variable INCOMPATIBLE_SECURITY_RECONFIGURATION to TRUE.

If the IE "Cipherring mode info" is present and if the IE "Reconfiguration" in the variable CIPHERING_STATUS is set to FALSE, the UE shall:

- 1> if the IE "Status" in the variable CIPHERING STATUS has the value "Not started", and this IE was included in a message that is not the message SECURITY MODE COMMAND; or

- 1> if [the IE "Cipherring Mode Info" was received in the message SECURITY MODE COMMAND and](#) there does not exist exactly one cipherring activation time in the IE "Radio bearer downlink cipherring activation time info" for each established RLC-AM and RLC-UM radio bearers included in the IE "RB information" in the IE "ESTABLISHED_RABS" for the CN domain as indicated in the variable LATEST_CONFIGURED_CN_DOMAIN; or

- 1> if [the IE "Cipherring Mode Info" was received in the message SECURITY MODE COMMAND and](#) the IE "Cipherring activation time for DPCH" is not included in [the message ACTIVE SET UPDATE or SECURITY MODE COMMAND](#), and there exist radio bearers using RLC-TM according to the IE "RB information" in the IE "ESTABLISHED_RABS" for the CN domain as indicated in the variable LATEST_CONFIGURED_CN_DOMAIN; or

- 1> if [the IE "Cipherring Mode Info" was received in the message SECURITY MODE COMMAND and](#) there does not exist exactly one cipherring activation time in the IE "Radio bearer downlink cipherring activation time info" for each established signalling radio bearer included in the IE "Signalling radio bearer information" in the IE "ESTABLISHED_RABS":

- 2> ignore this attempt to change the cipherring configuration;
- 2> set the variable INVALID_CONFIGURATION to TRUE;
- 2> perform the actions as specified in subclause 8.1.12.4c.

- 1> set the IE "Reconfiguration" in the variable CIPHERING_STATUS to TRUE;

- 1> set the IE "Status" in the variable CIPHERING_STATUS of the CN domains for which the IE "Status" of the variable SECURITY_MODIFICATION is set to "Affected" to "Started";

- 1> apply the new cipherring configuration in the lower layers for all RBs that belong to a CN domain for which the IE "Status" of the variable SECURITY_MODIFICATION is set to "Affected" and all signalling radio bearers:

- 2> using the cipherring algorithm (UEA [40]) indicated by the IE "Cipherring algorithm" as part of the new cipherring configuration;
- 2> for each radio bearer that belongs to a CN domain for which the IE "Status" of the variable SECURITY_MODIFICATION is set to "Affected" and all signalling radio bearers:

- 3> using the value of the IE "RB identity" in the variable ESTABLISHED_RABS minus one as the value of BEARER [40] in the cipherring algorithm.

- 1> apply the new cipherring configuration as follows:

- 2> consider an activation time in downlink to be pending:
 - 3> for UM-RLC until an UMD PDU with sequence number equal to or larger than activation time -1 has been received;

- 3> for AM-RLC until all AMD PDUs with sequence numbers up to and including activation time –1 have been received;
- 3> for TM-RLC until the CFN indicated in the activation time has been reached.
- 2> if there are pending activation times in downlink set for ciphering by a previous procedure changing the ciphering configuration:
 - 3> apply the ciphering configuration included in the current message at this pending activation time.
- 2> if the IE "Ciphering activation time for DPCH" is present in the IE "Ciphering mode info" and the UE was in CELL_DCH state prior to this procedure:
 - 3> for radio bearers using RLC-TM:
 - 4> apply the old ciphering configuration for CFN less than the number indicated in the IE "Ciphering activation time for DPCH";
 - 4> apply the new ciphering configuration for CFN greater than or equal to the number indicated in IE "Ciphering activation time for DPCH".

~~2> if the UE was in CELL_FACH state prior to this procedure and at completion of this procedure a transparent mode radio bearer exists and the IE "Ciphering activation time for DPCH" is not present in the IE "Ciphering mode info":~~

~~3> for radio bearers using RLC-TM:~~

~~4> apply the old ciphering configuration for CFN less than the number as indicated in the transmitted uplink response message for the ciphering activation time for this radio bearer;~~

~~4> apply the new ciphering configuration for CFN greater than or equal to the number as indicated in the transmitted uplink response message for the ciphering activation time for this radio bearer.~~

~~NOTE:—This is indicated by the IE "COUNT C activation time" in the transmitted uplink response message.~~

- 2> if the IE "Radio bearer downlink ciphering activation time info" is present:
 - 3> apply the following procedure for each radio bearer and signalling radio bearers using RLC-AM or RLC-UM indicated by the IE "RB identity":
 - 4> suspend uplink transmission on the radio bearer or the signalling radio bearer (except for the SRB where the response message is transmitted) according to the following:
 - 5> do not transmit RLC PDUs with sequence number greater than or equal to the uplink activation time, where the uplink activation time is selected according to the rules below.
 - 4> select an "RLC send sequence number" at which (activation) time the new ciphering configuration shall be applied in uplink for that radio bearer according to the following:
 - 5> for each radio bearer and signalling radio bearer that has no pending ciphering activation time in uplink as set by a previous procedure changing the security configuration:
 - 6> set a suitable value that would ensure a minimised delay in the change to the latest security configuration.
 - 5> for each radio bearer and signalling radio bearer that has a pending ciphering activation time in uplink as set by a previous procedure changing the security configuration:
 - 6> set the same value as the pending ciphering activation time.
 - 5> consider this activation time in uplink to be elapsed when the selected activation time (as above) is equal to the "RLC send sequence number";
 - 4> store the selected "RLC send sequence number" for that radio bearer in the entry for the radio bearer in the variable RB_UPLINK_CIPHERING_ACTIVATION_TIME_INFO;
 - 4> switch to the new ciphering configuration according to the following:

- 5> use the old ciphering configuration for the transmitted and received RLC PDUs with RLC sequence numbers smaller than the corresponding RLC sequence numbers indicated in the IE "Radio bearer uplink ciphering activation time info" sent to UTRAN and in the received IE "Radio bearer downlink ciphering activation time info" received from UTRAN, respectively;
- 5> use the new ciphering configuration for the transmitted and received RLC PDUs with RLC sequence numbers greater than or equal to the corresponding RLC sequence numbers indicated in the IE "Radio bearer uplink ciphering activation time info" sent to UTRAN and in the received IE "Radio bearer downlink ciphering activation time info" received from UTRAN, respectively;
- 5> for a radio bearer using RLC-AM, when the RLC sequence number indicated in the IE "Radio bearer downlink ciphering activation time info" falls below the RLC receiving window and the RLC sequence number indicated in the IE "Radio bearer uplink ciphering activation time info" falls below the RLC transmission window, the UE may release the old ciphering configuration for that radio bearer;
- 5> if an RLC reset or re-establishment occurs before the activation time for the new ciphering configuration has been reached, ignore the activation time and apply the new ciphering configuration immediately after the RLC reset or RLC re-establishment.

If the IE "Ciphering mode info" is not present, the UE shall:

- 1> not change the ciphering configuration.

8.6.4.3 RB information to setup

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

- 1> use the same START value to initialise the hyper frame number components of COUNT-C variables for all the new radio bearers to setup;
- 1> perform the actions for the IE "PDCP info", if present, according to subclause 8.6.4.10, applied for the radio bearer;
- 1> perform the actions for the IE "RLC info", according to subclause 8.6.4.9, applied for the radio bearer;
- 1> perform the actions for the IE "RB mapping info", according to subclause 8.6.4.8, applied for the radio bearer;
- 1> if the IE "Downlink RLC mode" either in the IE "RLC info" or referenced by the RB identity in the IE "Same as RB" is set to "TM RLC":
 - 2> configure delivery of erroneous SDUs in lower layers according to indication from upper layer [5].
- 1> if the IE "Uplink RLC mode" or the IE "Downlink RLC mode" either in the IE "RLC info" or referenced by the RB identity in the IE "Same as RB" is set to "AM RLC" or "UM RLC":
 - 2> initialise the 20 MSB of the hyper frame number component of COUNT-C for this radio bearer with the START value in the variable START_VALUE_TO_TRANSMIT;
 - 2> set the remaining LSB of the hyper frame number component of COUNT-C for this radio bearer to zero;
 - 2> start incrementing the COUNT-C values.
- 1> if the IE "Uplink RLC mode" and the IE "Downlink RLC mode" either in the IE "RLC info" or referenced by the RB identity in the IE "Same as RB" is set to "TM RLC":
 - 2> if prior to this procedure there exists no transparent mode radio bearer for the CN domain included in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS and at least one transparent mode radio bearer is included in the IE "RB information to setup":
 - 3> if the IE "Status" in the variable CIPHERING_STATUS of the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS is set to "Not Started":

- ~~43~~> at the activation time as specified in the IE "Ciphering activation time for DPCH" if included in the IE "Ciphering mode info" in the command message or, if this IE is not included, as specified in the IE "COUNT-C activation time" included in the response message:
- ~~54~~> initialise the 20 most significant bits of the hyper frame number component of COUNT-C common for all transparent mode radio bearers of this CN domain with the START value in the variable START_VALUE_TO_TRANSMIT;
- ~~54~~> set the remaining LSB of the hyper frame number component of COUNT-C to zero;
- ~~5~~> do not increment the COUNT-C value common for all transparent mode radio bearers for this CN domain;
- ~~34~~> if the IE "Status" in the variable CIPHERING_STATUS of the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS is set to "Not Started":
- ~~5~~> ~~do not increment the COUNT-C value for this CN domain.~~
- ~~4~~> ~~else:~~
- ~~5~~> ~~if the IE "Status" in the variable CIPHERING_STATUS of the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS is set to "Started":~~
- ~~4~~> at the activation time as specified in the IE "Activation Time" in the RADIO BEARER SETUP message:
- ~~5~~> initialise the 20 most significant bits of the hyper frame number component of COUNT-C common for all transparent mode RLC radio bearer to the value of the latest transmitted START for this CN domain, while not incrementing the value of the HFN component of COUNT-C at each CFN cycle; and;
- ~~5~~> set the remaining LSB of the hyper frame number component of COUNT-C to zero;
- ~~5~~> start to perform ciphering on the radio bearer in lower layers while not incrementing the HFN;
- ~~4~~> at the activation time as specified in the IE "Ciphering activation time for DPCH" if included in the IE "Ciphering mode info" in the command message or, if this IE is not included, as specified in the IE "COUNT-C activation time" included in the response message:
- ~~5~~> initialise the 20 most significant bits of the hyper frame number component of COUNT-C common for all transparent mode radio bearers of this CN domain with the START value in the variable START_VALUE_TO_TRANSMIT;
- ~~5~~> set the remaining LSB of the hyper frame number component of COUNT-C to zero;
- ~~56~~> start incrementing the COUNT-C value common for all transparent mode radio bearers of for this CN domain as normal, at each CFN value, i.e. the HFN component is no longer fixed in value but incremented at each CFN cycle.
- 3> if prior to this procedure there exists at least one transparent mode radio bearer for the CN domain included in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS:
- 4> continue incrementing the COUNT-C value common for all transparent mode radio bearers of this CN domain.
- 1> if the IE "Status" in the variable CIPHERING_STATUS of the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS is set to "Started":
- 2> start to perform ciphering on the radio bearer in lower layers, using the value of the IE "RB identity" minus one as the value of BEARER in the ciphering algorithm.

NOTE: UTRAN should not use the IE "RB information to setup" to setup radio bearers with RB identity in the range 1-4.

8.6.6.28 Downlink DPCH info common for all radio links

If the IE "Downlink DPCH info common for all RL" is included the UE shall:

- 1> if the IE "Downlink DPCH info common for all RL" is included in a message used to perform a hard handover:
 - 2> perform actions for the IE "Timing indication" as specified in subclause 8.5.15.2, and subclause 8.3.5.1 or 8.3.5.2.
- 1> ignore the value received in IE "CFN-targetSFN frame offset";
- 1> if the IE "Downlink DPCH power control information" is included:
 - 2> perform actions for the IE "DPC Mode" according to [29].
- 1> if the IE choice "mode" is set to 'FDD':
 - 2> if the IE "Downlink rate matching restriction information" is included:
 - 3> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> perform actions for the IE "spreading factor";
 - 2> perform actions for the IE "Fixed or Flexible position";
 - 2> perform actions for the IE "TFCI existence";
 - 2> if the IE choice "SF" is set to 256:
 - 3> store the value of the IE "Number of bits for pilot bits".
 - 2> if the IE choice "SF" set to 128:
 - 3> store the value of the IE "Number of bits for pilot bits".
- 1> if the IE choice "mode" is set to 'TDD':
 - 2> perform actions for the IE "Common timeslot info".

If the IE "Downlink DPCH info common for all RL" is included in a message used to perform a Timing re-initialised hard handover or the IE "Downlink DPCH info common for all RL" is included in a message **other than RB SETUP** used to transfer the UE from a state different from Cell_DCH to the Cell_DCH state, and ciphering is active for any radio bearer using RLC-TM, the UE shall, after having activated the dedicated physical channels indicated by that IE:

- 1> set the 20 MSB of the HFN component of COUNT-C for TM-RLC to the value of the latest transmitted IE "START" or "START List" for this CN domain, while not incrementing the value of the HFN component of COUNT-C at each CFN cycle; and
- 1> set the remaining LSBs of the HFN component of COUNT-C to zero;
- 1> **start to perform ciphering on the radio bearer in lower layers while not incrementing the HFN;**
- 1> include the IE "COUNT-C activation time" in the response message and specify a CFN value other than the default, "Now" for this IE;
- 1> calculate the START value according to subclause 8.5.9;
- 1> include the calculated START values for each CN domain in the IE "START list" in the IE "Uplink counter synchronisation info" in the response message;
- 1> at the CFN value as indicated in the response message in the IE "COUNT-C activation time":
 - 2> set the 20 MSB of the HFN component of the COUNT-C variable to the START value as indicated in the IE "START list" of the response message for the relevant CN domain; and
 - 2> set the remaining LSBs of the HFN component of COUNT-C to zero;
 - 2> increment the HFN component of the COUNT-C variable by one;

- 2> set the CFN component of the COUNT-C to the value of the IE "COUNT-C activation time" of the response message. The HFN component and the CFN component completely initialise the COUNT-C variable;
- 2> step the COUNT-C variable, as normal, at each CFN value, i.e. the HFN component is no longer fixed in value but incremented at each CFN cycle.

CHANGE REQUEST

⌘ **25.331 CR 1469** ⌘ rev **-** ⌘ Current version: **3.10.0** ⌘

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

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

Title:	⌘ TFCS selection guideline correction		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘ TEI	Date:	⌘ 17.05.2002
Category:	⌘ F	Release:	⌘ R99
	<i>Use <u>one</u> of the following categories:</i> F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		<i>Use <u>one</u> of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ The current description of the minimum set of TFCs used for TFC selection is unclear. In particular the definition of minimum set TFC is ambiguous in case of AMR speech.
Summary of change:	⌘ The minimum set of TFCs is clarified in section 8.6.5.2. For AMR speech the minimum set of TFCS is clarified to include all AMR rates. The rate control of the AMR codec is done when MAC informs the codec of the available bitrate.
Consequences if not approved:	⌘ The TFC selection algorithm in 25.321 will be ambiguous since the outcome of the TFC selection algorithm is dependent on the definition of the minimum set of TFCs in 25.331. <p>If the CR is implemented in the UE but not in UTRAN:</p> <ul style="list-style-type: none"> - As the clarified rules are assumed to be included in a good UTRAN configuration the corrections will work as intended. <p>If the CR is implemented in UTRAN but not in the UE:</p> <ul style="list-style-type: none"> - This will give the same result as if the CR is not implemented at all. The TFC selection may not give the desired result at the cell border. The UE behaviour when selecting TFCs for AMR speech is ambiguous which may impact speech quality. <p>Impact on T1 test specs:</p> <ul style="list-style-type: none"> - No impact foreseen

Clauses affected: ⌘ 8.6.5.2

Other specs	⌘	<input type="checkbox"/>	Other core specifications	⌘	25.331 v4.4.0, CR 1470
affected:		<input type="checkbox"/>	Test specifications		25.331 v5.0.0, CR 1471
		<input type="checkbox"/>	O&M Specifications		
Other comments:	⌘	<input type="text"/>			

How to create CRs using this form:

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

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

8.6.5.2 Transport format combination set

If the IE "Transport format combination set" is included, the UE shall for that direction (uplink or downlink):

- 1> store the new transport format combination set, or (if this exists) modify a previously stored transport format combination set according to IEs included in IE "Transport format combination set";
- 1> start to respect those transport format combinations;
- 1> if IE "Transport format combination subset" is received in this message:
 - 2> perform the actions as specified in subclause 8.6.5.3.
- 1> if IE "Transport format combination subset" is not received in this message:
 - 2> clear the IE "Duration" in the variable TFC_SUBSET;
 - 2> set both the IE "Current TFC subset" and the IE "Default TFC subset" in the variable TFC_SUBSET to the value indicating "full transport format combination set".

If the IE "Transport format combination set" is not included and if there is no addition, removal or reconfiguration of transport channels, the UE shall for that direction (uplink or downlink):

- 1> use a previously stored transport format combination set if this exists.

If the IE "Transport format combination set" is not included; and

- 1> if no transport format combination set is stored in the UE; or
- 1> if transport channels are added or removed in the message; or
- 1> if any transport channel is reconfigured in the message such that the size of the transport format set is changed:

the UE shall:

- 1> set the variable INVALID_CONFIGURATION to TRUE.

In the uplink TFCS the minimum set of TFCs is the set of TFCs that is needed for the TFC selection algorithm defined in [15] to give a predictable result. The minimum set of TFCs consists of~~includes~~ the following:

~~UTRAN should include the following minimum set of TFCs:~~

- 1> for each UM logical channel for which traffic is generated:
 - 2> a TFC with one transport block for this transport channel and empty TFs (see [34]) for all the others. If more than one TFC fulfils this criteria, only the TFC with the lowest number of bits should be included in the minimum set of TFCs.
- 1> for each AM logical channel for which traffic is generated:
 - 2> a TFC with a ~~minimum size compatible~~ non-empty TF ~~(see the definition below)~~ for the corresponding transport channel and empty TFs for all other transport channels, where:
 - 3> the non-empty TF includes one transport block with "Configured RLC Size" equal to the RLC PDU size.
- 1> for each set of "synchronous" TM logical channels (see the definition below) for which traffic is generated and for each set of SDU sizes associated with it:
 - 2> a TFC with TFs corresponding to any combination of SDU sizes that can be received in a TTI from higher layers on the corresponding transport channels and empty TFs for all other transport channels.~~2> a TFC with non-empty minimum size compatible TFs for the corresponding transport channels and SDU sizes, and empty TFs for all other transport channels, where:~~

- ~~3> For non-segmented mode TM-RLC logical channels the non-empty TFs include, for each combination of SDU sizes that can be received in a single TTI from higher layer:~~
 - ~~4> a TF with non-zero number of transport blocks with "Configured RLC Size" equal to the corresponding SDU size;~~
- ~~3> For segmented mode TM-RLC, the non-empty TFs include any TF such that the number of transport blocks multiplied by the "Configured RLC Size" is equal to the RLC SDU size considered.~~
- 1> for each ~~set of~~ TM logical channels that ~~are~~ is not part of a set of "synchronous" TM logical channels (see the definition below) for which traffic is generated ~~and for each set of SDU sizes associated with it:~~
 - 2> a TFC with non-empty TFs for the corresponding transport channel, and empty TFs for all other transport channels, where:
 - 3> For non-segmented mode TM-RLC logical channels the non-empty TFs include, for the smallest SDU size that can be received in a single TTI from higher layer:
 - 4> a TF with non-zero number of transport blocks with "Configured RLC Size" equal to the corresponding SDU size. If more than one TFC fulfils this criteria, only the TFC with the lowest number of bits in the TFC is included in the minimum set of TFCs.
 - 3> For segmented mode TM-RLC, the non-empty TFs include any TF such that the number of transport blocks multiplied by the "Configured RLC Size" is equal to the smallest SDU size that can be received in a single TTI from higher layer.
 - ~~2> a TFC with at least one transport blocks for this transport channel and empty TFs (see [34]) for all the others. If more than one TFC fulfils this criteria, only the TFC with the lowest number of bits in the TFCs is part of should be included in the minimum set of TFCs.~~

1> an "empty" TFC (see [34]).

Furthermore, the UTRAN should ensure that the uplink TFCS satisfies the following rules:

- 1> for each TTI length with which at least one transport channel is configured:
- 2> for each combination of TFs for the transport channels configured with this TTI length included in the TFCS:
- 3> a TFC with these TFs for the transport channels configured with this TTI length and empty TFs on all transport channels configured with shorter TTI lengths is also included in the TFCS ~~is also included in the TFCS.~~

For TDD, the TFCS of a CCTrCH should include those of the above combinations, which include a TF with one transport block for a transport channel used in that CCTrCH, and the "empty" TFC should be included in the TFCS of every CCTrCH.

~~For AM-RLC logical channels, the minimum size compatible TF includes one transport block with "Configured RLC Size" equal to the RLC PDU size. For non-segmented mode TM-RLC logical channels, the minimum size compatible TF includes the minimum (non-zero) number of transport blocks of "Configured RLC Size" equal to the RLC SDU size that can be received in a single TTI from the upper layers. For segmented mode TM-RLC, the minimum size compatible TF is any TF such that the number of transport blocks multiplied by the "Configured RLC Size" is equal to the RLC SDU size considered.~~

Synchronous TM logical channels are logical channels on which higher layer traffic is generated in a perfectly correlated fashion (e.g. AMR RAB). ~~Independent TM logical channels can be regarded as sets of synchronous TM logical channels of size 1.~~

NOTE: The "Configured RLC Size" is defined as the transport block size minus the MAC header size.

CHANGE REQUEST

⌘ **25.331 CR 1470** ⌘ rev **-** ⌘ Current version: **4.4.0** ⌘

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

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

Title:	⌘ TFCS selection guideline correction		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘ TEI	Date:	⌘ 17.05.2002
Category:	⌘ A	Release:	⌘ REL-4
	<i>Use <u>one</u> of the following categories:</i> F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		<i>Use <u>one</u> of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ The current description of the minimum set of TFCs used for TFC selection is unclear. In particular the definition of minimum set TFC is ambiguous in case of AMR speech.
Summary of change:	⌘ The minimum set of TFCs is clarified in section 8.6.5.2. For AMR speech the minimum set of TFCS is clarified to include all AMR rates. The rate control of the AMR codec is done when MAC informs the codec of the available bitrate.
Consequences if not approved:	⌘ The TFC selection algorithm in 25.321 will be ambiguous since the outcome of the TFC selection algorithm is dependent on the definition of the minimum set of TFCs in 25.331. <p>If the CR is implemented in the UE but not in UTRAN:</p> <ul style="list-style-type: none"> - As the clarified rules are assumed to be included in a good UTRAN configuration the corrections will work as intended. <p>If the CR is implemented in UTRAN but not in the UE:</p> <ul style="list-style-type: none"> - This will give the same result as if the CR is not implemented at all. The TFC selection may not give the desired result at the cell border. The UE behaviour when selecting TFCs for AMR speech is ambiguous which may impact speech quality. <p>Impact on T1 test specs:</p> <ul style="list-style-type: none"> - No impact foreseen

Clauses affected: ⌘ 8.6.5.2

Other specs	⌘	<input type="checkbox"/>	Other core specifications	⌘	25.331 v3.10.0, CR 1469
affected:		<input type="checkbox"/>	Test specifications		25.331 v5.0.0, CR 1471
		<input type="checkbox"/>	O&M Specifications		
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8.6.5.2 Transport format combination set

If the IE "Transport format combination set" is included, the UE shall for that direction (uplink or downlink):

- 1> store the new transport format combination set, or (if this exists) modify a previously stored transport format combination set according to IEs included in IE "Transport format combination set";
- 1> start to respect those transport format combinations;
- 1> if IE "Transport format combination subset" is received in this message:
 - 2> perform the actions as specified in subclause 8.6.5.3.
- 1> if IE "Transport format combination subset" is not received in this message:
 - 2> clear the IE "Duration" in the variable TFC_SUBSET;
 - 2> set both the IE "Current TFC subset" and the IE "Default TFC subset" in the variable TFC_SUBSET to the value indicating "full transport format combination set".

If the IE "Transport format combination set" is not included and if there is no addition, removal or reconfiguration of transport channels, the UE shall for that direction (uplink or downlink):

- 1> use a previously stored transport format combination set if this exists.

If the IE "Transport format combination set" is not included; and

- 1> if no transport format combination set is stored in the UE; or
- 1> if transport channels are added or removed in the message; or
- 1> if any transport channel is reconfigured in the message such that the size of the transport format set is changed:

the UE shall:

- 1> set the variable INVALID_CONFIGURATION to TRUE.

In the uplink TFCS the minimum set of TFCs is the set of TFCs that is needed for the TFC selection algorithm defined in [15] to give a predictable result. The minimum set of TFCs consists of~~includes~~ the following:

~~UTRAN should include the following minimum set of TFCs:~~

- 1> for each UM logical channel for which traffic is generated:
 - 2> a TFC with one transport block for this transport channel and empty TFs (see [34]) for all the others. If more than one TFC fulfils this criteria, only the TFC with the lowest number of bits should be included in the minimum set of TFCs.
- 1> for each AM logical channel for which traffic is generated:
 - 2> a TFC with a ~~minimum size compatible~~ non-empty TF ~~(see the definition below)~~ for the corresponding transport channel and empty TFs for all other transport channels, where:
 - 3> the non-empty TF includes one transport block with "Configured RLC Size" equal to the RLC PDU size.
- 1> for each set of "synchronous" TM logical channels (see the definition below) for which traffic is generated and for each set of SDU sizes associated with it:
 - 2> a TFC with TFs corresponding to any combination of SDU sizes that can be received in a TTI from higher layers on the corresponding transport channels and empty TFs for all other transport channels.~~2> a TFC with non-empty minimum size compatible TFs for the corresponding transport channels and SDU sizes, and empty TFs for all other transport channels, where:~~

~~3> For non-segmented mode TM-RLC logical channels the non-empty TFs include, for each combination of SDU sizes that can be received in a single TTI from higher layer:~~

~~4> a TF with non-zero number of transport blocks with "Configured RLC Size" equal to the corresponding SDU size;~~

~~3> For segmented mode TM-RLC, the non-empty TFs include any TF such that the number of transport blocks multiplied by the "Configured RLC Size" is equal to the RLC SDU size considered.~~

1> for each ~~set of~~ TM logical channels that ~~are~~ is not part of a set of "synchronous" TM logical channels (see the definition below) for which traffic is generated ~~and for each set of SDU sizes associated with it:~~

2> a TFC with non-empty TFs for the corresponding transport channel, and empty TFs for all other transport channels, where:

3> For non-segmented mode TM-RLC logical channels the non-empty TFs include, for the smallest SDU size that can be received in a single TTI from higher layer:

4> a TF with non-zero number of transport blocks with "Configured RLC Size" equal to the corresponding SDU size. ~~If more than one TFC fulfils this criteria, only the TFC with the lowest number of bits in the TFC is included in the minimum set of TFCs.~~

3> For segmented mode TM-RLC, the non-empty TFs include any TF such that the number of transport blocks multiplied by the "Configured RLC Size" is equal to the smallest SDU size that can be received in a single TTI from higher layer.

~~2> a TFC with at least one transport blocks for this transport channel and empty TFs (see [34]) for all the others. If more than one TFC fulfils this criteria, only the TFC with the lowest number of bits in the TFCs is part of should be included in the minimum set of TFCs:~~

1> an "empty" TFC (see [34]).

Furthermore, the UTRAN should ensure that the uplink TFCS satisfies the following rules:

1> for each TTI length with which at least one transport channel is configured:

2> for each combination of TFs for the transport channels configured with this TTI length included in the TFCS:

3> a TFC with these TFs for the transport channels configured with this TTI length and empty TFs on all transport channels configured with shorter TTI lengths is also included in the TFCS ~~is also included in the TFCS.~~

For TDD, the TFCS of a CCTrCH should include those of the above combinations, which include a TF with one transport block for a transport channel used in that CCTrCH, and the "empty" TFC should be included in the TFCS of every CCTrCH.

~~For AM-RLC logical channels, the minimum size compatible TF includes one transport block with "Configured RLC Size" equal to the RLC PDU size. For non-segmented mode TM-RLC logical channels, the minimum size compatible TF includes the minimum (non-zero) number of transport blocks of "Configured RLC Size" equal to the RLC SDU size that can be received in a single TTI from the upper layers. For segmented mode TM-RLC, the minimum size compatible TF is any TF such that the number of transport blocks multiplied by the "Configured RLC Size" is equal to the RLC SDU size considered.~~

Synchronous TM logical channels are logical channels on which higher layer traffic is generated in a perfectly correlated fashion (e.g. AMR RAB). ~~Independent TM logical channels can be regarded as sets of synchronous TM logical channels of size 1.~~

NOTE: The "Configured RLC Size" is defined as the transport block size minus the MAC header size.

CHANGE REQUEST

⌘ **25.331 CR 1471** ⌘ rev **-** ⌘ Current version: **5.0.0** ⌘

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

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

Title:	⌘ TFCS selection guideline correction		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘ TEI	Date:	⌘ 17.05.2002
Category:	⌘ A	Release:	⌘ REL-5
	<i>Use <u>one</u> of the following categories:</i> F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		<i>Use <u>one</u> of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ The current description of the minimum set of TFCs used for TFC selection is unclear. In particular the definition of minimum set TFC is ambiguous in case of AMR speech.
Summary of change:	⌘ The minimum set of TFCs is clarified in section 8.6.5.2. For AMR speech the minimum set of TFCS is clarified to include all AMR rates. The rate control of the AMR codec is done when MAC informs the codec of the available bitrate.
Consequences if not approved:	⌘ The TFC selection algorithm in 25.321 will be ambiguous since the outcome of the TFC selection algorithm is dependent on the definition of the minimum set of TFCs in 25.331. <p>If the CR is implemented in the UE but not in UTRAN:</p> <ul style="list-style-type: none"> - As the clarified rules are assumed to be included in a good UTRAN configuration the corrections will work as intended. <p>If the CR is implemented in UTRAN but not in the UE:</p> <ul style="list-style-type: none"> - This will give the same result as if the CR is not implemented at all. The TFC selection may not give the desired result at the cell border. The UE behaviour when selecting TFCs for AMR speech is ambiguous which may impact speech quality. <p>Impact on T1 test specs:</p> <ul style="list-style-type: none"> - No impact foreseen

Clauses affected: ⌘ 8.6.5.2

Other specs	⌘	<input type="checkbox"/>	Other core specifications	⌘	25.331 v3.10.0, CR 1469
affected:		<input type="checkbox"/>	Test specifications		25.331 v4.4.0, CR 1470
		<input type="checkbox"/>	O&M Specifications		
Other comments:	⌘	<input type="text"/>			

How to create CRs using this form:

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

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

8.6.5.2 Transport format combination set

If the IE "Transport format combination set" is included, the UE shall for that direction (uplink or downlink):

- 1> store the new transport format combination set, or (if this exists) modify a previously stored transport format combination set according to IEs included in IE "Transport format combination set";
- 1> start to respect those transport format combinations;
- 1> if IE "Transport format combination subset" is received in this message:
 - 2> perform the actions as specified in subclause 8.6.5.3.
- 1> if IE "Transport format combination subset" is not received in this message:
 - 2> clear the IE "Duration" in the variable TFC_SUBSET;
 - 2> set both the IE "Current TFC subset" and the IE "Default TFC subset" in the variable TFC_SUBSET to the value indicating "full transport format combination set".

If the IE "Transport format combination set" is not included and if there is no addition, removal or reconfiguration of transport channels, the UE shall for that direction (uplink or downlink):

- 1> use a previously stored transport format combination set if this exists.

If the IE "Transport format combination set" is not included; and

- 1> if no transport format combination set is stored in the UE; or
- 1> if transport channels are added or removed in the message; or
- 1> if any transport channel is reconfigured in the message such that the size of the transport format set is changed:

the UE shall:

- 1> set the variable INVALID_CONFIGURATION to TRUE.

In the uplink TFCS the minimum set of TFCs is the set of TFCs that is needed for the TFC selection algorithm defined in [15] to give a predictable result. The minimum set of TFCs consists of~~includes~~ the following:

~~UTRAN should include the following minimum set of TFCs:~~

- 1> for each UM logical channel for which traffic is generated:
 - 2> a TFC with one transport block for this transport channel and empty TFs (see [34]) for all the others. If more than one TFC fulfils this criteria, only the TFC with the lowest number of bits should be included in the minimum set of TFCs.
- 1> for each AM logical channel for which traffic is generated:
 - 2> a TFC with a ~~minimum size compatible~~ non-empty TF ~~(see the definition below)~~ for the corresponding transport channel and empty TFs for all other transport channels, where:
 - 3> the non-empty TF includes one transport block with "Configured RLC Size" equal to the RLC PDU size.
- 1> for each set of "synchronous" TM logical channels (see the definition below) for which traffic is generated and for each set of SDU sizes associated with it:
 - 2> a TFC with TFs corresponding to any combination of SDU sizes that can be received in a TTI from higher layers on the corresponding transport channels and empty TFs for all other transport channels.~~2> a TFC with non-empty minimum size compatible TFs for the corresponding transport channels and SDU sizes, and empty TFs for all other transport channels, where:~~

~~3> For non-segmented mode TM-RLC logical channels the non-empty TFs include, for each combination of SDU sizes that can be received in a single TTI from higher layer:~~

~~4> a TF with non-zero number of transport blocks with "Configured RLC Size" equal to the corresponding SDU size;~~

~~3> For segmented mode TM-RLC, the non-empty TFs include any TF such that the number of transport blocks multiplied by the "Configured RLC Size" is equal to the RLC SDU size considered.~~

1> for each ~~set of~~ TM logical channels that ~~are~~ is not part of a set of "synchronous" TM logical channels (see the definition below) for which traffic is generated ~~and for each set of SDU sizes associated with it:~~

2> a TFC with non-empty TFs for the corresponding transport channel, and empty TFs for all other transport channels, where:

3> For non-segmented mode TM-RLC logical channels the non-empty TFs include, for the smallest SDU size that can be received in a single TTI from higher layer:

4> a TF with non-zero number of transport blocks with "Configured RLC Size" equal to the corresponding SDU size. ~~If more than one TFC fulfils this criteria, only the TFC with the lowest number of bits in the TFC is included in the minimum set of TFCs.~~

3> For segmented mode TM-RLC, the non-empty TFs include any TF such that the number of transport blocks multiplied by the "Configured RLC Size" is equal to the smallest SDU size that can be received in a single TTI from higher layer.

~~2> a TFC with at least one transport blocks for this transport channel and empty TFs (see [34]) for all the others. If more than one TFC fulfils this criteria, only the TFC with the lowest number of bits in the TFCs is part of should be included in the minimum set of TFCs:~~

1> an "empty" TFC (see [34]).

Furthermore, the UTRAN should ensure that the uplink TFCS satisfies the following rules:

1> for each TTI length with which at least one transport channel is configured:

2> for each combination of TFs for the transport channels configured with this TTI length included in the TFCS:

3> a TFC with these TFs for the transport channels configured with this TTI length and empty TFs on all transport channels configured with shorter TTI lengths is also included in the TFCS ~~is also included in the TFCS.~~

For TDD, the TFCS of a CCTrCH should include those of the above combinations, which include a TF with one transport block for a transport channel used in that CCTrCH, and the "empty" TFC should be included in the TFCS of every CCTrCH.

~~For AM-RLC logical channels, the minimum size compatible TF includes one transport block with "Configured RLC Size" equal to the RLC PDU size. For non-segmented mode TM-RLC logical channels, the minimum size compatible TF includes the minimum (non-zero) number of transport blocks of "Configured RLC Size" equal to the RLC SDU size that can be received in a single TTI from the upper layers. For segmented mode TM-RLC, the minimum size compatible TF is any TF such that the number of transport blocks multiplied by the "Configured RLC Size" is equal to the RLC SDU size considered.~~

Synchronous TM logical channels are logical channels on which higher layer traffic is generated in a perfectly correlated fashion (e.g. AMR RAB). ~~Independent TM logical channels can be regarded as sets of synchronous TM logical channels of size 1.~~

NOTE: The "Configured RLC Size" is defined as the transport block size minus the MAC header size.

CHANGE REQUEST

⌘ **25.331 CR 1484** ⌘ rev **-** ⌘ Current version: **3.10.0** ⌘

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

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

Title:	⌘ Traffic Volume Measurement correction		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘ TEI	Date:	⌘ 22.01.2002
Category:	⌘ F	Release:	⌘ R99
	<i>Use <u>one</u> of the following categories:</i> F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		<i>Use <u>one</u> of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change: ⌘ The current description is unclear and does not match the group's understanding of how it should work.

- Summary of change:** ⌘
- Clarified the distinction between the set of transport channels the UE is supposed to report on and the set of transport channels it is supposed to trigger on. The two sets can be completely disjoint.
 - Clarified the cases in which the configuration should be rejected.
 - Aligned the name of one Multiplicity value with what is in the Tabular.
 - Moved the text dealing with the generation of reports to section 14 (to align with other measurements).
 - Clarified that the Pending-time-after trigger applied per event rather than per measurement ID (to align with the signalling).
 - Corrected the Interruption of user data transmission to align it with the understanding of the group.
 - Clarified what the UE should report on when an RB is mapped onto two logical channels (as per the agreement in the previous meeting).
 - Specified that when the set of TrCHs on which an event trigger is defined is not provided explicitly, the UE shall apply it on the TrCHs specified by the measurement object.
 - Specified when the Pending-time-after-trigger timer needed to be started.
 - Corrected some of the interactions between the time-to-trigger and Pending-time-after-trigger mechanisms.
 - Clarified that at most one Time-to-trigger and Pending-time-after-trigger was needed for each configured event.

- Aligned the name of the event 4a with its behavior.
- Corrected a number of editorial errors.

Impact Analysis:

This CR has limited impact to traffic volume measurement functionality and is consistent with RAN2 understanding. However, since the specification is currently unclear, if a UE has implemented something different it may:

- If this CR is not implemented in the UE:
 - o It will not reject some configurations, which are ambiguous.
 - o It will not re-start its transmission on RACH after the time "Tx Interruption after trigger" elapses and it is not in CELL_DCH.
 - o It will provide traffic volume measurements for a set of transport channels which is not exactly what the UTRAN intended.
- If not implemented in the network:
 - o It will receive traffic volume measurement reports which do not match exactly what it expects.
 - o The UE may re-start uplink transmission on RACH before what the UTRAN expects.

Consequences if not approved: ⌘ Unclear and inconsistent specifications.

Clauses affected: ⌘ 8.6.7.10, 8.6.7.11, 10.3.7.71, 10.3.7.72, 14.4.1, 14.4.2, 14.4.2.1, 14.4.2.2, 14.4.3.1, 14.4.3.x (new), 14.4.4

Other specs affected: ⌘

 Other core specifications ⌘ 25.331 v4.4.0, CR 1485
 25.331 v5.0.0, CR 1486

Other comments: ⌘

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8.6.7.10 Traffic Volume Measurement

If the IE "Traffic Volume Measurement" is received by the UE, the UE shall:

- 1> store the content of the IE to the variable MEASUREMENT_IDENTITY.

~~If the IE "Traffic volume measurement Object" is not included, the UE shall:~~

- ~~1> apply the measurement reporting criteria to all uplink transport channels.~~

If IE "Traffic volume measurement" is received by the UE in a MEASUREMENT CONTROL message, where IE "measurement command" has the value "setup", and if the IE "traffic volume reporting quantity" is included, the UE shall:

- ~~1> report the measured quantities specified in the IE "traffic volume reporting quantity";~~

- 1> if the parameter "Average of RLC Buffer Payload for each RB" or the parameter "Variance of RLC Buffer payload for each RB" is set to "TRUE":

- 2> if the IE "Traffic volume measurement quantity" is not included:

- 3> set the variable CONFIGURATION_INCOMPLETE to TRUE.

- 2> if the IE "Traffic volume measurement quantity" is included;

- ~~3> if the parameter "time interval to take an average or a variance" is included:~~

- ~~4> use the time specified in the parameter "time interval to take an average or a variance" to calculate the average and/or variance of RLC Buffer Payload according to the IE "traffic volume reporting quantity".~~

- 3> if the parameter "time interval to take an average or a variance" is not included:

- 4> set the variable CONFIGURATION_INCOMPLETE to TRUE.

If IE "Traffic volume measurement" is received by the UE in a MEASUREMENT CONTROL message, where IE "measurement command" has the value "setup", but IE "Traffic volume measurement quantity" ~~or IE "Traffic volume reporting quantity"~~ is not received, the UE shall:

- ~~1> clear all stored measurement control information related associated to this measurement identity in variable MEASUREMENT_IDENTITY;~~

- 1> set the variable CONFIGURATION_INCOMPLETE to TRUE.

8.6.7.11 Traffic Volume Measurement Reporting Criteria

If the IE "Traffic Volume Measurement Reporting Criteria" is received by the UE, the UE shall:

- 1> if the IE "Parameters sent for each transport channel" is absent:

- 2> set the variable PROTOCOL_ERROR_REJECT to TRUE;

- 2> set the IE "Protocol error cause" in the variable PROTOCOL_ERROR_INFORMATION to "Information element missing".

- 1> for each IE "Parameters sent for each transport channel":

- 2> if the IE "Parameters required for each Event" is absent:

- 3> set the variable CONFIGURATION_INCOMPLETE to TRUE;

- ~~1> store the content of the IE "Traffic Volume Measurement Reporting Criteria" to the variable MEASUREMENT_IDENTITY.~~

~~If the IE "UL transport channel id" is not included, the UE shall:~~

- 1> ~~apply the measurement reporting criteria to all uplink transport channels indicated in the IE "Traffic volume measurement object";~~
- 1> ~~if the UTRAN has not specified a traffic volume measurement object for a given measurement identity:~~
- 2> ~~apply the measurement reporting criteria to all uplink transport channels that are configured for the current UE state.~~

If the IE "Tx interruption after trigger" is included, the UE shall:

- 1> ~~block DTCH transmissions on the RACH during the time specified in the IE after a measurement report is transmitted.~~

10.3.7.71 Traffic volume measurement quantity

Contains the measurement quantity information for a traffic volume measurement.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Measurement quantity	MP		Enumerated(RLC buffer payload, Average RLC buffer payload, Variance of RLC buffer payload)	The use of this parameter is described in subclause 8.6.7.10. This parameter should be ignored.
Time Interval to take an average or a variance	CV-A/V		Integer(20, 40, ..260, by steps of 20)	In ms

Condition	Explanation
A/V	This IE is mandatory present when "Average RLC buffer" or "Variance of RLC buffer payload" is chosen and not needed otherwise.

10.3.7.72 Traffic volume measurement reporting criteria

Contains the measurement reporting criteria information for a traffic volume measurement.

Event 4a: Transport Channel Traffic Volume [15] exceeds an absolute threshold.

Event 4b: Transport Channel Traffic Volume [15] becomes smaller than an absolute threshold.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Parameters sent for each transport channel	OP	1 to <maxTrCH >		This IE is always required, need is OP to align with ASN.1
>Uplink transport channel type	OP		Enumerated(DCH,RACHorCPCH,USCH)	USCH is TDD only. CPCH is FDD only. RACHorCPCH is the currently configured default in the uplink.
>UL Transport Channel ID	CV-UL-DCH/USCH		Transport channel identity 10.3.5.18	
>Parameters required for each Event	OP	1 to <maxMeaspaerEvent >		
>>Traffic volume event identity	MP		Traffic volume event identity 10.3.7.66	
>>Reporting Threshold	MP		Enumerated(8,16,32,64,128,256,512,1024,2K,3K,4K,6K,8K,12K,16K,24K,32K,48K,64K,96K,128K,192K,256K,384K,512K,768K)	Threshold in bytes And N Kbytes = N*1024 bytes
>>Time to trigger	OP		Time to trigger 10.3.7.64	Indicates the period of time between the timing of event detection and the timing of sending Measurement Report. Time in ms
>>Pending time after trigger	OP		Integer(250, 500, 1000, 2000, 4000, 8000, 16000)	Indicates the period of time during which it is forbidden to send any new measurement reports with the same Traffic volume event identity even if the triggering condition is fulfilled. Time in milliseconds
>>Tx interruption after trigger	OP		Integer (250, 500, 1000, 2000, 4000, 8000, 16000)	Time in milliseconds. Indicates how long the UE shall block DTCH transmissions on the RACH after a measurement report is triggered.

Condition	Explanation
UL-DCH/USCH	If IE "Uplink transport channel type" is equal to "DCH" or "USCH" (TDD only) this IE is optional. Otherwise the IE is not needed.

10.3.10 Multiplicity values and type constraint values

The following table includes constants that are either used as multi bounds (name starting with "max") or as high or low value in a type specification (name starting with "lo" or "hi"). Constants are specified only for values appearing more than once in the RRC specification. In case a constant is related to one or more other constants, an expression is included in the "value" column instead of the actual value.

Constant	Explanation	Value
CN information		
maxCNdomains	Maximum number of CN domains	4
UTRAN mobility information		
maxRAT	Maximum number of Radio Access Technologies	maxOtherRAT + 1
maxOtherRAT	Maximum number of other Radio Access Technologies	15
maxURA	Maximum number of URAs in a cell	8
maxInterSysMessages	Maximum number of Inter System Messages	4
maxRABsetup	Maximum number of RABs to be established	16
UE information		
maxtransactions	Maximum number of parallel RRC transactions in downlink	25
maxPDCPalgoType	Maximum number of PDCP algorithm types	8
maxDRACclasses	Maximum number of UE classes which would require different DRAC parameters	8
MaxFreqBandsFDD	Maximum number of frequency bands supported by the UE as defined in [21]	8
MaxFreqBandsTDD	Maximum number of frequency bands supported by the UE as defined in [22]	4
MaxFreqBandsGSM	Maximum number of frequency bands supported by the UE as defined in [45]	16
maxPage1	Number of UEs paged in the Paging Type 1 message	8
MaxSystemCapability	Maximum number of system specific capabilities that can be requested in one message.	16
RB information		
MaxPredefConfig	Maximum number of predefined configurations	16
MaxRB	Maximum number of RBs	32
MaxSRBsetup	Maximum number of signalling RBs to be established	8
MaxRBperRAB	Maximum number of RBs per RAB	8
MaxRBallRABs	Maximum number of non signalling RBs	27
MaxRBMuxOptions	Maximum number of RB multiplexing options	8
MaxLoCHperRLC	Maximum number of logical channels per RLC entity	2
TrCH information		
MaxTrCH	Maximum number of transport channels used in one direction (UL or DL)	32
MaxTrCHpreconf	Maximum number of preconfigured Transport channels, per direction	16
MaxCCTrCH	Maximum number of CCTrCHs	8
MaxTF	Maximum number of different transport formats that can be included in the Transport format set for one transport channel	32
maxTF-CPCH	Maximum number of TFs in a CPCH set	16
MaxTFC	Maximum number of Transport Format Combinations	1024
maxTFCI-1-Combs	Maximum number of TFCI (field 1) combinations	512
maxTFCI-2-Combs	Maximum number of TFCI (field 2) combinations	512
maxCPCHsets	Maximum number of CPCH sets per cell	16
maxSIBperMsg	Maximum number of complete system information blocks per SYSTEM INFORMATION message	16
maxSIB	Maximum number of references to other system information blocks.	32
maxSIB-FACH	Maximum number of references to system information blocks on the FACH	8
PhyCH information		
maxPCPCH-APsubCH	Maximum number of available sub-channels for AP signature on PCPCH	12
maxPCPCH-CDsubCH	Maximum number of available sub-channels for CD signature on PCPCH	12
maxPCPCH-APsig	Maximum number of available signatures for AP on PCPCH	16

Constant	Explanation	Value
maxPCPCH-CDsig	Maximum number of available signatures for CD on PCPCH	16
maxAC	Maximum number of access classes	16
maxASC	Maximum number of access service classes	8
maxASCmap	Maximum number of access class to access service classes mappings	7
maxASCpersist	Maximum number of access service classes for which persistence scaling factors are specified	6
maxPRACH	Maximum number of PRACHs in a cell	16
maxFACHPCH	Maximum number of FACHs and PCHs mapped onto one secondary CCPCHs	8
maxRL	Maximum number of radio links	8
maxSCCPCH	Maximum number of secondary CCPCHs per cell	16
maxDPDCH-UL	Maximum number of DPDCHs per cell	6
maxDPCH-DLchan	Maximum number of channelisation codes used for DL DPCH	8
maxPUSCH	Maximum number of PUSCHs	(8)
maxPDSCH	Maximum number of PDSCHs	8
maxPDSCHcodes	Maximum number of codes for PDSCH	16
maxPDSCH-TFCIgroups	Maximum number of TFCI groups for PDSCH	256
maxPDSCHcodeGroups	Maximum number of code groups for PDSCH	256
maxPCPCHs	Maximum number of PCPCH channels in a CPCH Set	64
maxPCPCH-SF	Maximum number of available SFs on PCPCH	7
maxTS	Maximum number of timeslots used in one direction (UL or DL)	14
hiPUSCHidentities	Maximum number of PUSCH Identities	64
hiPDSCHidentities	Maximum number of PDSCH Identities	64
Measurement information		
maxTGPS	Maximum number of transmission gap pattern sequences	6
maxAdditionalMeas	Maximum number of additional measurements for a given measurement identity	4
maxMeasEvent	Maximum number of events that can be listed in measurement reporting criteria	8
MaxMeasParEvent	Maximum number of measurement parameters (e.g. thresholds) per event	2
maxMeasIntervals	Maximum number of intervals that define the mapping function between the measurements for the cell quality Q of a cell and the representing quality value	1
maxCellMeas	Maximum number of cells to measure	32
maxReportedGSMCells	Maximum number of GSM cells to be reported	6
maxFreq	Maximum number of frequencies to measure	8
maxSat	Maximum number of satellites to measure	16
HiRM	Maximum number that could be set as rate matching attribute for a transport channel	256
Frequency information		
maxFDDFreqList	Maximum number of FDD carrier frequencies to be stored in USIM	4
maxTDDFreqList	Maximum number of TDD carrier frequencies to be stored in USIM	4
maxFDDFreqCellList	Maximum number of neighbouring FDD cells to be stored in USIM	32
maxTDDFreqCellList	Maximum number of neighbouring TDD cells to be stored in USIM	32
maxGSMCellList	Maximum number of GSM cells to be stored in USIM	32
Other information		
maxNumGSMFreqRanges	Maximum number of GSM Frequency Ranges to store	32
maxNumFDDFreqs	Maximum number of FDD centre frequencies to store	8
maxNumTDDFreqs	Maximum number of TDD centre frequencies to store	8
maxNumCDMA200Freqs	Maximum number of CDMA2000 centre frequencies to store	8

14.4 Traffic Volume Measurements

14.4.1 Traffic Volume Measurement Quantity

Traffic volume measurements may be configured by RRC to assist with dynamic radio bearer control. The reported quantities that can be configured are:

- 1 Buffer Occupancy.
- 2 Average of Buffer Occupancy.
- 3 Variance of Buffer Occupancy.

A description of these values can be found in [15].

When a report is triggered, the UE shall provide the requested quantities for the acknowledged and unacknowledged mode RBs mapped onto the transport channels identified.

~~In order to support a large variation of bit rates and RLC buffer size capabilities, a non-linear scale is used. Since, for each RB, the expected traffic includes both new and retransmitted RLC PDUs and potentially existing Control PDUs, all these should be included in the Buffer Occupancy measure. It should also be noted that traffic volume measurements are only applicable for acknowledged and unacknowledged mode.~~

~~According to what is stated in the Measurement Control message, the UE should support reporting of RLC Buffer Payload, Average of RLC Buffer Payload, and Variance of RLC Buffer Payload for RBs multiplexed onto the same Transport channel. The Reporting Quantities (i.e. RLC Buffer Payload, Average of RLC Buffer Payload, and Variance of RLC Buffer Payload of each RB) are indicated in the measurement control message. If Average of RLC Buffer Payload or Variance of RLC Buffer Payload is included as Reporting Quantity, the time interval to take an average or a variance shall be used. When the RLC buffer payload, Average of RLC buffer payload or Variance of RLC buffer payload is reported, the measured quantity shall be rounded upwards to the closest higher value possible to report.~~

14.4.2 Traffic Volume reporting triggers

~~Traffic volume measurement reports can be reported-triggered using~~ in two different ways/mechanisms, periodical and event triggered. The reporting criteria are specified in the measurement control message.

~~For periodical reporting the UE simply determines the Reporting Quantities in number of bytes for each RB mapped onto the indicated transport channels and reports the results at the time interval and for the number of times specified.~~

All the specified events are evaluated with respect to the Transport Channel Traffic Volume (TCTV). This quantity is equal to the sum of the Buffer Occupancy for all logical channels mapped onto a transport channel. The events on a given transport channel shall be evaluated at least at every TTI (may be more often) as described in [15].

~~For traffic volume measurements in the UE only one quantity is compared with the thresholds. This quantity is Transport Channel Traffic Volume [15] (which equals the sum of Buffer Occupancies of RBs multiplexed onto a transport channel) in number of bytes. Event triggered reporting is performed when the Transport Channel Traffic Volume exceeds an upper threshold or becomes smaller than a lower threshold. Every TTI, UE measures the Transport Channel Traffic Volume for each transport channel and compares it with the configured thresholds. If the value is out of range, the UE determines the Reporting Quantities for the RBs mapped onto that transport channel and reports the results.~~

When a traffic volume measurement is set up, the UE shall:

- 1> if the IE "report criteria" is set to "Traffic volume measurement reporting criteria", the UE shall:
 - 2> for each IE "Parameters sent for each transport channel":
 - 3> if the IE "Uplink transport channel type" is not included; or
 - 3> if the IE "Uplink Transport Channel Type" has the value "DCH" or "USCH" and the IE "UL transport channel id" is not included, the UE shall:
 - 4> for each IE "Parameters required for each Event":

5> for each ~~configured~~ uplink transport channel on which the UE is supposed to report (see below), configure an event trigger defined by the values in the IEs “Measurement Identity”, “Traffic volume event identity”, “Reporting threshold”, “Time to trigger”, “Pending time after trigger” and “Tx Interruption after trigger”;

3> else:

4> for each IE “Parameters required for each Event”:

5> for the uplink transport channel defined by the IEs “Uplink transport channel type” and “UL transport channel id”, configure an event trigger defined by the values in the IEs “Measurement Identity”, “Traffic volume event identity”, “Reporting threshold”, “Time to trigger”, “Pending time after trigger” and “Tx Interruption after trigger”;

1> else if the IE “report criteria” is set to “Periodical reporting criteria”:

2> configure periodical triggers with period equal to the value in the IE “Reporting Interval” and with number of transmissions equal to the value in the IE “Amount of reporting” for the measurement identified by the IE “Measurement Identity”;

For each transport channel for which an event trigger has been configured, the UE shall:

1> for each event configured for this transport channel:

2> if the transport channel TCTV becomes larger than the threshold in IE “Reporting threshold”:

3> if the IE “Traffic volume event identity” has value “4a”:

4> if the IE “Time to trigger” is not present; and:

54> if there is no active Pending-time-after-trigger timer for this event is not active;:

5> if the IE “Pending time after trigger” is included, start the Pending-time-after-trigger timer for this event with the value in this IE;

5> trigger a report for the measurement identified by the IE “Measurement Identity”.

4> else:

5> start the Time-to-trigger timer for this event with the value in the IE “Time to trigger”;

3> else (if the IE “Traffic volume event identity” has value “4b”):

4> if the Time-to-trigger timer for this event is active:

5> stop this timer.

2> if the transport channel TCTV becomes smaller than the threshold in IE “Reporting threshold”:

3> if the IE “Traffic volume event identity” has value “4a”:

4> if the Time-to-trigger timer for this event is active:

5> stop this timer.

3> else (if the IE “Traffic volume event identity” has value “4b”):

4> if the IE “Time to trigger” is not present; and:

54> if there is no active Pending-time-after-trigger timer for this event is not active;:

5> if the IE “Pending time after trigger” is included, start the Pending-time-after-trigger timer for this event with the value in this IE;

5> trigger a report for the measurement identified by the IE “Measurement Identity”.

4> else:

5> start the Time-to-trigger timer for this event with the value in the IE “Time to trigger”;

When the Time-to-trigger timer for an event elapses:

1> if the Pending-time-after-trigger timer for this event is not active:

42> trigger a report for the measurement identified by the IE “Measurement Identity” corresponding to this event;-

2> if the IE “Pending time after trigger” is included:

3> start the Pending-time-after-trigger timer for this event with the value in this IE;

When the Pending-time-after-trigger for an event elapses:

1> if the IE “Traffic volume event identity” has value “4a”:

2> if the transport channel TCTV is larger than the threshold in IE “Reporting threshold”:

3> if the IE “Time to trigger” is not present:

4> trigger a report for the measurement identified by the IE “Measurement Identity” corresponding to this event;-

4> start the Pending-time-after-trigger timer for this event with the value in the IE “Pending time after trigger”.

3> else:

4> start the Time-to-trigger timer for this event with the value in the IE “Time to trigger”;

1> if the IE “Traffic volume event identity” has value “4b”:

2> if the transport channel TCTV is smaller than the threshold in IE “Reporting threshold”:

3> if the IE “Time to trigger” is not present:

4> trigger a report for the measurement identified by the IE “Measurement Identity” corresponding to this event;-

4> start the Pending-time-after-trigger timer for this event with the value in the IE “Pending time after trigger”.

3> else:

4> start the Time-to-trigger timer for this event with the value in the IE “Time to trigger”;

When a periodical trigger elapses, the UE shall:

1> trigger a report for the measurement identified by the IE “Measurement Identity”;

1> if the number of reports triggered by this periodical trigger reaches the value in the IE “Amount of reporting”:

2> disable this periodical trigger.

When a report is triggered for a given IE “Measurement Identity”, the UE shall:

1> consider the variable MEASUREMENT_IDENTITY corresponding to this measurement identity;

1> if the report is triggered by an event trigger:

2> include the IE “Event results”;

2> set the IE “Uplink transport channel type causing the event” to the type of the transport channel which triggered the report;

2> if the transport channel type is “DCH” or “USCH”:

- 3> include the IE “UL Transport Channel identity” and set it to the identity of the transport channel which triggered the report;
- 2> else:
 - 3> do not include the IE “UL Transport Channel identity”;
 - 2> set the IE “Traffic volume event identity” to the identity of the event that triggered the report;
 - 2> if the IE “Tx interruption after trigger” for the event that triggered the report is included:
 - 3> if the UE is in CELL_FACH state:
 - 4> prohibit DTCH transmissions on the RACH;
 - 4> resume these transmissions when:
 - 5> it receives from the UTRAN a message causing the transition to CELL_DCH state; or
 - 5> the time period indicated in the IE “Tx interruption after trigger” elapses;
- 1> if the IE “Traffic volume measurement object” is not included, the UE shall:
 - 2> report on all the uplink transport channels as specified below;
- 1> if the IE “Traffic volume measurement object” is included, the UE shall:
 - 2> report on the uplink transport channels identified in this IE as specified below;
- 1> for each UM or AM RB mapped onto a transport channel on which the UE is expected to report, the UE shall:
 - 2> add an element in the IE “Traffic volume measurement results”;
 - 2> set the value of the IE “RB Identity” to the identity of the considered radio bearer;
 - 2> if the RB is mapped onto one logical channel:
 - 3> if the IE “RLC Buffer Payload for each RB” is set to TRUE:
 - 4> include the IE “RLC Buffers Payload” and set it to the Buffer Occupancy value for this logical channel, rounded up to the next allowed value;
 - 3> if the IE “Average of RLC Buffer Payload for each RB” is set to TRUE:
 - 4> include the IE “Average of RLC Buffer Payload” and set it to the Buffer Occupancy for this logical channel averaged over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]), rounded up to the next allowed value;
 - 3> if the IE “Variance of RLC Buffer Payload for each RB” is set to TRUE:
 - 4> include the IE “Variance of RLC Buffer Payload” and set it to the variance of the Buffer Occupancy for this logical channel computed over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]), rounded up to the next allowed value;
 - 2> if the RB is mapped onto two logical channels:
 - 3> if one logical channel is mapped onto transport channels on which the UE is supposed to report:
 - 4> if the IE “RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “RLC Buffers Payload” and set it to the Buffer Occupancy value for this logical channel, rounded up to the next allowed value;
 - 4> if the IE “Average of RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “Average of RLC Buffer Payload” and set it to the Buffer Occupancy for this logical channel averaged over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]), rounded up to the next allowed value;

- 4> if the IE “Variance of RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “Variance of RLC Buffer Payload” and set it to the variance of the Buffer Occupancy for this logical channel computed over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]), rounded up to the next allowed value;
- 3> else (if both logical channels are mapped onto transport channels on which the UE is supposed to report):
 - 4> if the IE “RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “RLC Buffers Payload” and set it to the sum of the Buffer Occupancy values for the two logical channels, rounded up to the next allowed value;
 - 4> if the IE “Average of RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “Average of RLC Buffer Payload” and set it to the sum of the Buffer Occupancy for the two logical channels averaged over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]) and rounded up to the next allowed value;
 - 4> if the IE “Variance of RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “Variance of RLC Buffer Payload” and set it to the variance of the sum of the Buffer Occupancy for the two logical channels, computed over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]) and rounded up to the next allowed value;

14.4.2.1 Reporting event 4 A: Transport Channel Traffic Volume ~~exceeds~~becomes larger than an absolute threshold

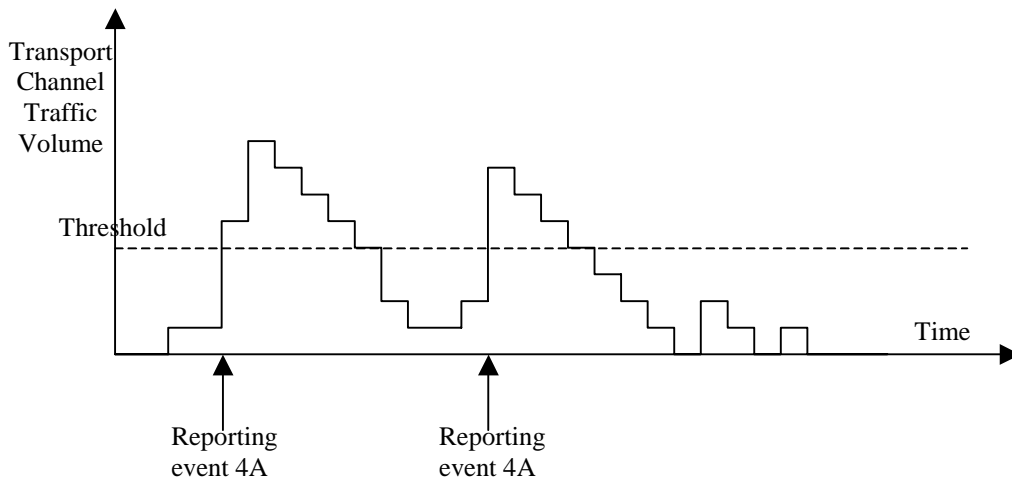


Figure 14.4.2.1-1: Event triggered report when Transport Channel Traffic Volume ~~exceeds~~becomes larger than a certain threshold

If the monitored Transport Channel Traffic Volume [15] ~~exceeds~~becomes larger than an absolute threshold, i.e. if $TCTVF > \text{Reporting threshold}$, this is an event that could trigger a report. ~~The corresponding report specifies at least which measurement ID the event that triggered the report belongs to.~~

14.4.2.2 Reporting event 4 B: Transport Channel Traffic Volume becomes smaller than an absolute threshold

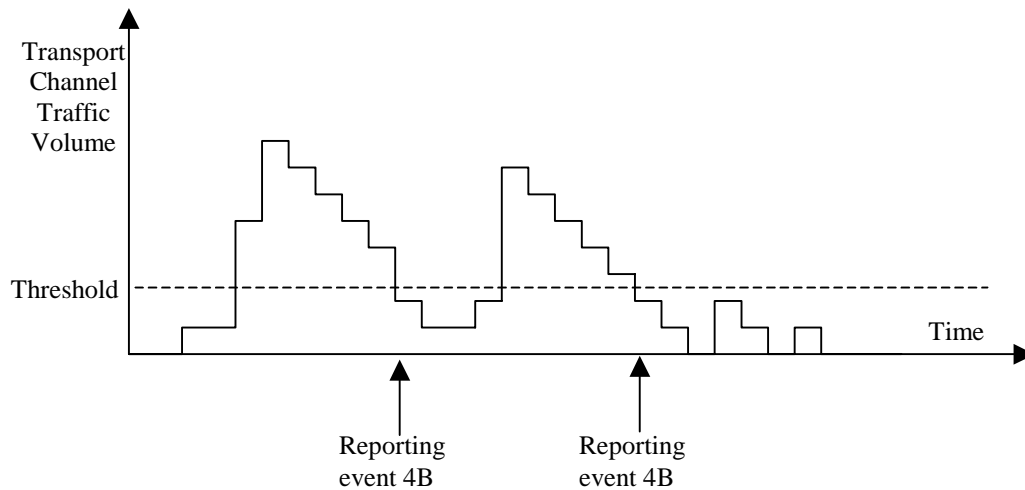


Figure 14.4.2-1-2: Event triggered report when Transport Channel Traffic Volume becomes smaller than certain threshold

If the monitored Transport Channel Traffic Volume [15] becomes smaller than an absolute threshold, i.e. if $TCTVF < \text{Reporting threshold}$, this is an event that could trigger a report. The corresponding report specifies at least which measurement ID the event that triggered the report belongs to.

14.4.3 Traffic volume reporting mechanisms

Traffic volume measurement triggering could be associated with both a *time-to-trigger* and a *pending time after trigger*. The time-to-trigger is used to get time domain hysteresis, i.e. the condition must be fulfilled during the time-to-trigger time before a report is sent. Pending time after trigger is used to limit consecutive reports when one traffic volume measurement report already has been sent. This is described in detail below.

14.4.3.1 Pending time after trigger

This timer is started in the UE when a measurement report has been triggered by a given event. The UE is then forbidden to send any new measurement reports with the same measurement ID triggered by the same event during this time period even when the triggering condition is fulfilled again. Instead the UE waits until the timer has suspended/expired. If the Transport Channel Traffic Volume [15] is still above the threshold when the timer has expired the UE sends a new measurement report, and the timer is restarted. Otherwise it waits for a new triggering.

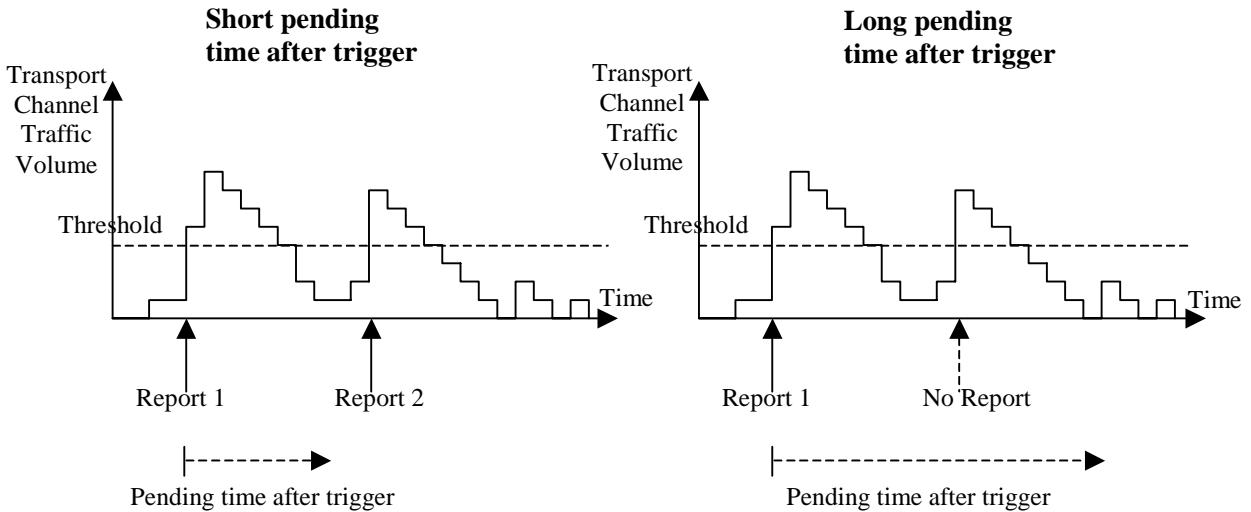


Figure 14.4.3.1-1: Pending time after trigger limits the amount of consecutive measurement reports

Figure 14.4.3.1-1 shows that by increasing the pending time after trigger a triggered second event does not result in a measurement report.

14.4.3.x Time-to-trigger

The timer is started in the UE when the Transport Channel Traffic Volume triggers the event. If the TCTV does not cross the threshold before the timer expires, a report is triggered.

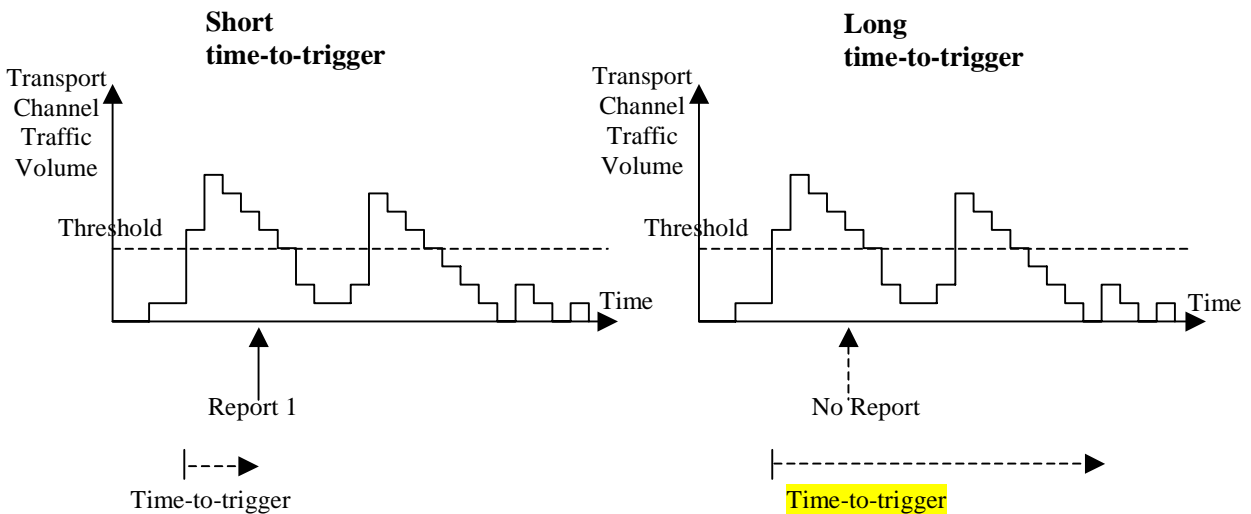


Figure 14.4.3.1-2: Time-to-trigger is used to achieve time hysteresis

Figure 14.4.3.1-2 shows that by increasing the time-to-trigger the report is not triggered.

14.4.4 Interruption of user data transmission

By including the IE “Tx Interruption after trigger”, a UE in CELL_FACH substate may be instructed by the UTRAN to ~~ease temporarily prohibit~~ temporarily prohibit transmission of user data on the RACH after a measurement report has been triggered. ~~Before~~ The UE shall only resume the transmission of user data, when:

- 1> ~~the UE shall~~ it receives from the UTRAN either a message allocating a dedicated physical channel, and ~~make~~ leading to the transition to CELL_DCH state; or
- 1> ~~the UE shall~~ the time period indicated by the IE “Tx Interruption after trigger” elapses, ~~receive an individually assigned measurement control message indicating that interruption of user data transmission is not be applied.~~

The transmission of signalling messages on the signalling radio bearers shall not be interrupted.

CHANGE REQUEST

⌘ **25.331 CR 1485** ⌘ rev **-** ⌘ Current version: **4.4.0** ⌘

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

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

Title:	⌘ Traffic Volume Measurement correction		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘ TEI	Date:	⌘ 22.01.2002
Category:	⌘ A	Release:	⌘ REL-4
	<i>Use <u>one</u> of the following categories:</i> F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		<i>Use <u>one</u> of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change: ⌘ The current description is unclear and does not match the group's understanding of how it should work.

- Summary of change:** ⌘
- Clarified the distinction between the set of transport channels the UE is supposed to report on and the set of transport channels it is supposed to trigger on. The two sets can be completely disjoint.
 - Clarified the cases in which the configuration should be rejected.
 - Aligned the name of one Multiplicity value with what is in the Tabular.
 - Moved the text dealing with the generation of reports to section 14 (to align with other measurements).
 - Clarified that the Pending-time-after trigger applied per event rather than per measurement ID (to align with the signalling).
 - Corrected the Interruption of user data transmission to align it with the understanding of the group.
 - Clarified what the UE should report on when an RB is mapped onto two logical channels (as per the agreement in the previous meeting).
 - Specified that when the set of TrCHs on which an event trigger is defined is not provided explicitly, the UE shall apply it on the TrCHs specified by the measurement object.
 - Specified when the Pending-time-after-trigger timer needed to be started.
 - Corrected some of the interactions between the time-to-trigger and Pending-time-after-trigger mechanisms.
 - Clarified that at most one Time-to-trigger and Pending-time-after-trigger was needed for each configured event.

- Aligned the name of the event 4a with its behavior.
- Corrected a number of editorial errors.

Impact Analysis:

This CR has limited impact to traffic volume measurement functionality and is consistent with RAN2 understanding. However, since the specification is currently unclear, if a UE has implemented something different it may:

- If this CR is not implemented in the UE:
 - o It will not reject some configurations, which are ambiguous.
 - o It will not re-start its transmission on RACH after the time "Tx Interruption after trigger" elapses and it is not in CELL_DCH.
 - o It will provide traffic volume measurements for a set of transport channels which is not exactly what the UTRAN intended.
- If not implemented in the network:
 - o It will receive traffic volume measurement reports which do not match exactly what it expects.
 - o The UE may re-start uplink transmission on RACH before what the UTRAN expects.

Consequences if not approved: ☼ Unclear and inconsistent specifications.

Clauses affected: ☼ 8.6.7.10, 8.6.7.11, 10.3.7.71, 10.3.7.72, 14.4.1, 14.4.2, 14.4.2.1, 14.4.2.2, 14.4.3.1, 14.4.3.x (new), 14.4.4

Other specs affected:

☼ <input type="checkbox"/> Other core specifications	☼ 25.331 v3.10.0, CR 1484
☼ <input type="checkbox"/> Test specifications	☼ 25.331 v5.0.0, CR 1486
☼ <input type="checkbox"/> O&M Specifications	

Other comments: ☼

How to create CRs using this form:

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

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

8.6.7.10 Traffic Volume Measurement

If the IE "Traffic Volume Measurement" is received by the UE, the UE shall:

- 1> store the content of the IE to the variable MEASUREMENT_IDENTITY.

~~If the IE "Traffic volume measurement Object" is not included, the UE shall:~~

- ~~1> apply the measurement reporting criteria to all uplink transport channels.~~

If IE "Traffic volume measurement" is received by the UE in a MEASUREMENT CONTROL message, where IE "measurement command" has the value "setup", and if the IE "traffic volume reporting quantity" is included, the UE shall:

- ~~1> report the measured quantities specified in the IE "traffic volume reporting quantity";~~

- 1> if the parameter "Average of RLC Buffer Payload for each RB" or the parameter "Variance of RLC Buffer payload for each RB" is set to "TRUE":

- 2> if the IE "Traffic volume measurement quantity" is not included:

- 3> set the variable CONFIGURATION_INCOMPLETE to TRUE.

- 2> if the IE "Traffic volume measurement quantity" is included;

- ~~3> if the parameter "time interval to take an average or a variance" is included:~~

- ~~4> use the time specified in the parameter "time interval to take an average or a variance" to calculate the average and/or variance of RLC Buffer Payload according to the IE "traffic volume reporting quantity".~~

- 3> if the parameter "time interval to take an average or a variance" is not included:

- 4> set the variable CONFIGURATION_INCOMPLETE to TRUE.

If IE "Traffic volume measurement" is received by the UE in a MEASUREMENT CONTROL message, where IE "measurement command" has the value "setup", but IE "Traffic volume measurement quantity" ~~or IE "Traffic volume reporting quantity"~~ is not received, the UE shall:

- ~~1> clear all stored measurement control information related associated to this measurement identity in variable MEASUREMENT_IDENTITY;~~

- 1> set the variable CONFIGURATION_INCOMPLETE to TRUE.

8.6.7.11 Traffic Volume Measurement Reporting Criteria

If the IE "Traffic Volume Measurement Reporting Criteria" is received by the UE, the UE shall:

- 1> if the IE "Parameters sent for each transport channel" is absent:

- 2> set the variable PROTOCOL_ERROR_REJECT to TRUE;

- 2> set the IE "Protocol error cause" in the variable PROTOCOL_ERROR_INFORMATION to "Information element missing".

- 1> for each IE "Parameters sent for each transport channel":

- 2> if the IE "Parameters required for each Event" is absent:

- 3> set the variable CONFIGURATION_INCOMPLETE to TRUE;

- ~~1> store the content of the IE "Traffic Volume Measurement Reporting Criteria" to the variable MEASUREMENT_IDENTITY.~~

~~If the IE "UL transport channel id" is not included, the UE shall:~~

- 1> ~~apply the measurement reporting criteria to all uplink transport channels indicated in the IE "Traffic volume measurement object";~~
- 1> ~~if the UTRAN has not specified a traffic volume measurement object for a given measurement identity:~~
- 2> ~~apply the measurement reporting criteria to all uplink transport channels that are configured for the current UE state.~~

If the IE "Tx interruption after trigger" is included, the UE shall:

- 1> ~~block DTCH transmissions on the RACH during the time specified in the IE after a measurement report is transmitted.~~

10.3.7.71 Traffic volume measurement quantity

Contains the measurement quantity information for a traffic volume measurement.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Measurement quantity	MP		Enumerated(RLC buffer payload, Average RLC buffer payload, Variance of RLC buffer payload)	The use of this parameter is described in subclause 8.6.7.10. This parameter should be ignored.
Time Interval to take an average or a variance	CV-A/V		Integer(20, 40, ..260, by steps of 20)	In ms

Condition	Explanation
A/V	This IE is mandatory present when "Average RLC buffer" or "Variance of RLC buffer payload" is chosen and not needed otherwise.

10.3.7.72 Traffic volume measurement reporting criteria

Contains the measurement reporting criteria information for a traffic volume measurement.

Event 4a: Transport Channel Traffic Volume [15] exceeds an absolute threshold.

Event 4b: Transport Channel Traffic Volume [15] becomes smaller than an absolute threshold.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Parameters sent for each transport channel	OP	1 to <maxTrCH >		This IE is always required, need is OP to align with ASN.1
>Uplink transport channel type	OP		Enumerated(DCH,RACHorCPCH,USCH)	USCH is TDD only. CPCH is FDD only. RACHorCPCH is the currently configured default in the uplink.
>UL Transport Channel ID	CV-UL-DCH/USCH		Transport channel identity 10.3.5.18	
>Parameters required for each Event	OP	1 to <maxMeaspaerEvent >		
>>Traffic volume event identity	MP		Traffic volume event identity 10.3.7.66	
>>Reporting Threshold	MP		Enumerated(8,16,32,64,128,256,512,1024,2K,3K,4K,6K,8K,12K,16K,24K,32K,48K,64K,96K,128K,192K,256K,384K,512K,768K)	Threshold in bytes And N Kbytes = N*1024 bytes
>>Time to trigger	OP		Time to trigger 10.3.7.64	Indicates the period of time between the timing of event detection and the timing of sending Measurement Report. Time in ms
>>Pending time after trigger	OP		Integer(250, 500, 1000, 2000, 4000, 8000, 16000)	Indicates the period of time during which it is forbidden to send any new measurement reports with the same Traffic volume event identity even if the triggering condition is fulfilled. Time in milliseconds
>>Tx interruption after trigger	OP		Integer (250, 500, 1000, 2000, 4000, 8000, 16000)	Time in milliseconds. Indicates how long the UE shall block DTCH transmissions on the RACH after a measurement report is triggered.

Condition	Explanation
UL-DCH/USCH	If IE "Uplink transport channel type" is equal to "DCH" or "USCH" (TDD only) this IE is optional. Otherwise the IE is not needed.

10.3.10 Multiplicity values and type constraint values

The following table includes constants that are either used as multi bounds (name starting with "max") or as high or low value in a type specification (name starting with "lo" or "hi"). Constants are specified only for values appearing more than once in the RRC specification. In case a constant is related to one or more other constants, an expression is included in the "value" column instead of the actual value.

Constant	Explanation	Value
CN information		
maxCNdomains	Maximum number of CN domains	4
UTRAN mobility information		
maxRAT	Maximum number of Radio Access Technologies	maxOtherRAT + 1
maxOtherRAT	Maximum number of other Radio Access Technologies	15
maxURA	Maximum number of URAs in a cell	8
maxInterSysMessages	Maximum number of Inter System Messages	4
maxRABsetup	Maximum number of RABs to be established	16
UE information		
maxtransactions	Maximum number of parallel RRC transactions in downlink	25
maxPDCPalgoType	Maximum number of PDCP algorithm types	8
maxDRACclasses	Maximum number of UE classes which would require different DRAC parameters	8
MaxFreqBandsFDD	Maximum number of frequency bands supported by the UE as defined in [21]	8
MaxFreqBandsTDD	Maximum number of frequency bands supported by the UE as defined in [22]	4
MaxFreqBandsGSM	Maximum number of frequency bands supported by the UE as defined in [45]	16
maxPage1	Number of UEs paged in the Paging Type 1 message	8
MaxSystemCapability	Maximum number of system specific capabilities that can be requested in one message.	16
RB information		
MaxPredefConfig	Maximum number of predefined configurations	16
MaxRB	Maximum number of RBs	32
MaxSRBsetup	Maximum number of signalling RBs to be established	8
MaxRBperRAB	Maximum number of RBs per RAB	8
MaxRBallRABs	Maximum number of non signalling RBs	27
MaxRBMuxOptions	Maximum number of RB multiplexing options	8
MaxLoCHperRLC	Maximum number of logical channels per RLC entity	2
TrCH information		
MaxTrCH	Maximum number of transport channels used in one direction (UL or DL)	32
MaxTrCHpreconf	Maximum number of preconfigured Transport channels, per direction	16
MaxCCTrCH	Maximum number of CCTrCHs	8
MaxTF	Maximum number of different transport formats that can be included in the Transport format set for one transport channel	32
maxTF-CPCH	Maximum number of TFs in a CPCH set	16
MaxTFC	Maximum number of Transport Format Combinations	1024
maxTFCI-1-Combs	Maximum number of TFCI (field 1) combinations	512
maxTFCI-2-Combs	Maximum number of TFCI (field 2) combinations	512
maxCPCHsets	Maximum number of CPCH sets per cell	16
maxSIBperMsg	Maximum number of complete system information blocks per SYSTEM INFORMATION message	16
maxSIB	Maximum number of references to other system information blocks.	32
maxSIB-FACH	Maximum number of references to system information blocks on the FACH	8
PhyCH information		
maxPCPCH-APsubCH	Maximum number of available sub-channels for AP signature on PCPCH	12
maxPCPCH-CDsubCH	Maximum number of available sub-channels for CD signature on PCPCH	12
maxPCPCH-APsig	Maximum number of available signatures for AP on PCPCH	16

Constant	Explanation	Value
maxPCPCH-CDsig	Maximum number of available signatures for CD on PCPCH	16
maxAC	Maximum number of access classes	16
maxASC	Maximum number of access service classes	8
maxASCmap	Maximum number of access class to access service classes mappings	7
maxASCpersist	Maximum number of access service classes for which persistence scaling factors are specified	6
maxPRACH	Maximum number of PRACHs in a cell	16
maxFACHPCH	Maximum number of FACHs and PCHs mapped onto one secondary CCPCHs	8
maxRL	Maximum number of radio links	8
maxSCCPCH	Maximum number of secondary CCPCHs per cell	16
maxDPDCH-UL	Maximum number of DPDCHs per cell	6
maxDPCH-DLchan	Maximum number of channelisation codes used for DL DPCH	8
maxPUSCH	Maximum number of PUSCHs	(8)
maxPDSCH	Maximum number of PDSCHs	8
maxPDSCHcodes	Maximum number of codes for PDSCH	16
maxPDSCH-TFCIgroups	Maximum number of TFCI groups for PDSCH	256
maxPDSCHcodeGroups	Maximum number of code groups for PDSCH	256
maxPCPCHs	Maximum number of PCPCH channels in a CPCH Set	64
maxPCPCH-SF	Maximum number of available SFs on PCPCH	7
maxTS	Maximum number of timeslots used in one direction (UL or DL)	14
hiPUSCHidentities	Maximum number of PUSCH Identities	64
hiPDSCHidentities	Maximum number of PDSCH Identities	64
Measurement information		
maxTGPS	Maximum number of transmission gap pattern sequences	6
maxAdditionalMeas	Maximum number of additional measurements for a given measurement identity	4
maxMeasEvent	Maximum number of events that can be listed in measurement reporting criteria	8
MaxMeasParEvent	Maximum number of measurement parameters (e.g. thresholds) per event	2
maxMeasIntervals	Maximum number of intervals that define the mapping function between the measurements for the cell quality Q of a cell and the representing quality value	1
maxCellMeas	Maximum number of cells to measure	32
maxReportedGSMCells	Maximum number of GSM cells to be reported	6
maxFreq	Maximum number of frequencies to measure	8
maxSat	Maximum number of satellites to measure	16
HiRM	Maximum number that could be set as rate matching attribute for a transport channel	256
Frequency information		
maxFDDFreqList	Maximum number of FDD carrier frequencies to be stored in USIM	4
maxTDDFreqList	Maximum number of TDD carrier frequencies to be stored in USIM	4
maxFDDFreqCellList	Maximum number of neighbouring FDD cells to be stored in USIM	32
maxTDDFreqCellList	Maximum number of neighbouring TDD cells to be stored in USIM	32
maxGSMCellList	Maximum number of GSM cells to be stored in USIM	32
Other information		
maxNumGSMFreqRanges	Maximum number of GSM Frequency Ranges to store	32
maxNumFDDFreqs	Maximum number of FDD centre frequencies to store	8
maxNumTDDFreqs	Maximum number of TDD centre frequencies to store	8
maxNumCDMA200Freqs	Maximum number of CDMA2000 centre frequencies to store	8

14.4 Traffic Volume Measurements

14.4.1 Traffic Volume Measurement Quantity

Traffic volume measurements may be configured by RRC to assist with dynamic radio bearer control. The reported quantities that can be configured are:

- 1 Buffer Occupancy.
- 2 Average of Buffer Occupancy.
- 3 Variance of Buffer Occupancy.

A description of these values can be found in [15].

When a report is triggered, the UE shall provide the requested quantities for the acknowledged and unacknowledged mode RBs mapped onto the transport channels identified.

~~In order to support a large variation of bit rates and RLC buffer size capabilities, a non-linear scale is used. Since, for each RB, the expected traffic includes both new and retransmitted RLC PDUs and potentially existing Control PDUs, all these should be included in the Buffer Occupancy measure. It should also be noted that traffic volume measurements are only applicable for acknowledged and unacknowledged mode.~~

~~According to what is stated in the Measurement Control message, the UE should support reporting of RLC Buffer Payload, Average of RLC Buffer Payload, and Variance of RLC Buffer Payload for RBs multiplexed onto the same Transport channel. The Reporting Quantities (i.e. RLC Buffer Payload, Average of RLC Buffer Payload, and Variance of RLC Buffer Payload of each RB) are indicated in the measurement control message. If Average of RLC Buffer Payload or Variance of RLC Buffer Payload is included as Reporting Quantity, the time interval to take an average or a variance shall be used. When the RLC buffer payload, Average of RLC buffer payload or Variance of RLC buffer payload is reported, the measured quantity shall be rounded upwards to the closest higher value possible to report.~~

14.4.2 Traffic Volume reporting triggers

~~Traffic volume measurement reports can be reported-triggered using~~ in two different ways/mechanisms, periodical and event triggered. The reporting criteria are specified in the measurement control message.

~~For periodical reporting the UE simply determines the Reporting Quantities in number of bytes for each RB mapped onto the indicated transport channels and reports the results at the time interval and for the number of times specified.~~

All the specified events are evaluated with respect to the Transport Channel Traffic Volume (TCTV). This quantity is equal to the sum of the Buffer Occupancy for all logical channels mapped onto a transport channel. The events on a given transport channel shall be evaluated at least at every TTI (may be more often) as described in [15].

~~For traffic volume measurements in the UE only one quantity is compared with the thresholds. This quantity is Transport Channel Traffic Volume [15] (which equals the sum of Buffer Occupancies of RBs multiplexed onto a transport channel) in number of bytes. Event triggered reporting is performed when the Transport Channel Traffic Volume exceeds an upper threshold or becomes smaller than a lower threshold. Every TTI, UE measures the Transport Channel Traffic Volume for each transport channel and compares it with the configured thresholds. If the value is out of range, the UE determines the Reporting Quantities for the RBs mapped onto that transport channel and reports the results.~~

When a traffic volume measurement is set up, the UE shall:

- 1> if the IE "report criteria" is set to "Traffic volume measurement reporting criteria", the UE shall:
 - 2> for each IE "Parameters sent for each transport channel":
 - 3> if the IE "Uplink transport channel type" is not included; or
 - 3> if the IE "Uplink Transport Channel Type" has the value "DCH" or "USCH" and the IE "UL transport channel id" is not included, the UE shall:
 - 4> for each IE "Parameters required for each Event":

5> for each ~~configured~~ uplink transport channel on which the UE is supposed to report (see below), configure an event trigger defined by the values in the IEs “Measurement Identity”, “Traffic volume event identity”, “Reporting threshold”, “Time to trigger”, “Pending time after trigger” and “Tx Interruption after trigger”;

3> else:

4> for each IE “Parameters required for each Event”:

5> for the uplink transport channel defined by the IEs “Uplink transport channel type” and “UL transport channel id”, configure an event trigger defined by the values in the IEs “Measurement Identity”, “Traffic volume event identity”, “Reporting threshold”, “Time to trigger”, “Pending time after trigger” and “Tx Interruption after trigger”;

1> else if the IE “report criteria” is set to “Periodical reporting criteria”:

2> configure periodical triggers with period equal to the value in the IE “Reporting Interval” and with number of transmissions equal to the value in the IE “Amount of reporting” for the measurement identified by the IE “Measurement Identity”;

For each transport channel for which an event trigger has been configured, the UE shall:

1> for each event configured for this transport channel:

2> if the transport channel TCTV becomes larger than the threshold in IE “Reporting threshold”:

3> if the IE “Traffic volume event identity” has value “4a”:

4> if the IE “Time to trigger” is not present; and:

54> if there is no active Pending-time-after-trigger timer for this event is not active;:

5> if the IE “Pending time after trigger” is included, start the Pending-time-after-trigger timer for this event with the value in this IE;

5> trigger a report for the measurement identified by the IE “Measurement Identity”.

4> else:

5> start the Time-to-trigger timer for this event with the value in the IE “Time to trigger”;

3> else (if the IE “Traffic volume event identity” has value “4b”):

4> if the Time-to-trigger timer for this event is active:

5> stop this timer.

2> if the transport channel TCTV becomes smaller than the threshold in IE “Reporting threshold”:

3> if the IE “Traffic volume event identity” has value “4a”:

4> if the Time-to-trigger timer for this event is active:

5> stop this timer.

3> else (if the IE “Traffic volume event identity” has value “4b”):

4> if the IE “Time to trigger” is not present; and:

54> if there is no active Pending-time-after-trigger timer for this event is not active;:

5> if the IE “Pending time after trigger” is included, start the Pending-time-after-trigger timer for this event with the value in this IE;

5> trigger a report for the measurement identified by the IE “Measurement Identity”.

4> else:

5> start the Time-to-trigger timer for this event with the value in the IE “Time to trigger”;

When the Time-to-trigger timer for an event elapses:

1> if the Pending-time-after-trigger timer for this event is not active:

42> trigger a report for the measurement identified by the IE “Measurement Identity” corresponding to this event;-

2> if the IE “Pending time after trigger” is included:

3> start the Pending-time-after-trigger timer for this event with the value in this IE;

When the Pending-time-after-trigger for an event elapses:

1> if the IE “Traffic volume event identity” has value “4a”:

2> if the transport channel TCTV is larger than the threshold in IE “Reporting threshold”:

3> if the IE “Time to trigger” is not present:

4> trigger a report for the measurement identified by the IE “Measurement Identity” corresponding to this event;-

4> start the Pending-time-after-trigger timer for this event with the value in the IE “Pending time after trigger”.

3> else:

4> start the Time-to-trigger timer for this event with the value in the IE “Time to trigger”;

1> if the IE “Traffic volume event identity” has value “4b”:

2> if the transport channel TCTV is smaller than the threshold in IE “Reporting threshold”:

3> if the IE “Time to trigger” is not present:

4> trigger a report for the measurement identified by the IE “Measurement Identity” corresponding to this event;-

4> start the Pending-time-after-trigger timer for this event with the value in the IE “Pending time after trigger”.

3> else:

4> start the Time-to-trigger timer for this event with the value in the IE “Time to trigger”;

When a periodical trigger elapses, the UE shall:

1> trigger a report for the measurement identified by the IE “Measurement Identity”;

1> if the number of reports triggered by this periodical trigger reaches the value in the IE “Amount of reporting”:

2> disable this periodical trigger.

When a report is triggered for a given IE “Measurement Identity”, the UE shall:

1> consider the variable MEASUREMENT_IDENTITY corresponding to this measurement identity;

1> if the report is triggered by an event trigger:

2> include the IE “Event results”;

2> set the IE “Uplink transport channel type causing the event” to the type of the transport channel which triggered the report;

2> if the transport channel type is “DCH” or “USCH”:

- 3> include the IE “UL Transport Channel identity” and set it to the identity of the transport channel which triggered the report;
- 2> else:
 - 3> do not include the IE “UL Transport Channel identity”;
 - 2> set the IE “Traffic volume event identity” to the identity of the event that triggered the report;
 - 2> if the IE “Tx interruption after trigger” for the event that triggered the report is included:
 - 3> if the UE is in CELL_FACH state:
 - 4> prohibit DTCH transmissions on the RACH;
 - 4> resume these transmissions when:
 - 5> it receives from the UTRAN a message causing the transition to CELL_DCH state; or
 - 5> the time period indicated in the IE “Tx interruption after trigger” elapses;
- 1> if the IE “Traffic volume measurement object” is not included, the UE shall:
 - 2> report on all the uplink transport channels as specified below;
- 1> if the IE “Traffic volume measurement object” is included, the UE shall:
 - 2> report on the uplink transport channels identified in this IE as specified below;
- 1> for each UM or AM RB mapped onto a transport channel on which the UE is expected to report, the UE shall:
 - 2> add an element in the IE “Traffic volume measurement results”;
 - 2> set the value of the IE “RB Identity” to the identity of the considered radio bearer;
 - 2> if the RB is mapped onto one logical channel:
 - 3> if the IE “RLC Buffer Payload for each RB” is set to TRUE:
 - 4> include the IE “RLC Buffers Payload” and set it to the Buffer Occupancy value for this logical channel, rounded up to the next allowed value;
 - 3> if the IE “Average of RLC Buffer Payload for each RB” is set to TRUE:
 - 4> include the IE “Average of RLC Buffer Payload” and set it to the Buffer Occupancy for this logical channel averaged over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]), rounded up to the next allowed value;
 - 3> if the IE “Variance of RLC Buffer Payload for each RB” is set to TRUE:
 - 4> include the IE “Variance of RLC Buffer Payload” and set it to the variance of the Buffer Occupancy for this logical channel computed over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]), rounded up to the next allowed value;
 - 2> if the RB is mapped onto two logical channels:
 - 3> if one logical channel is mapped onto transport channels on which the UE is supposed to report:
 - 4> if the IE “RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “RLC Buffers Payload” and set it to the Buffer Occupancy value for this logical channel, rounded up to the next allowed value;
 - 4> if the IE “Average of RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “Average of RLC Buffer Payload” and set it to the Buffer Occupancy for this logical channel averaged over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]), rounded up to the next allowed value;

- 4> if the IE “Variance of RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “Variance of RLC Buffer Payload” and set it to the variance of the Buffer Occupancy for this logical channel computed over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]), rounded up to the next allowed value;
- 3> else (if both logical channels are mapped onto transport channels on which the UE is supposed to report):
 - 4> if the IE “RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “RLC Buffers Payload” and set it to the sum of the Buffer Occupancy values for the two logical channels, rounded up to the next allowed value;
 - 4> if the IE “Average of RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “Average of RLC Buffer Payload” and set it to the sum of the Buffer Occupancy for the two logical channels averaged over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]) and rounded up to the next allowed value;
 - 4> if the IE “Variance of RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “Variance of RLC Buffer Payload” and set it to the variance of the sum of the Buffer Occupancy for the two logical channels, computed over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]) and rounded up to the next allowed value;

14.4.2.1 Reporting event 4 A: Transport Channel Traffic Volume ~~exceeds~~ becomes larger than an absolute threshold

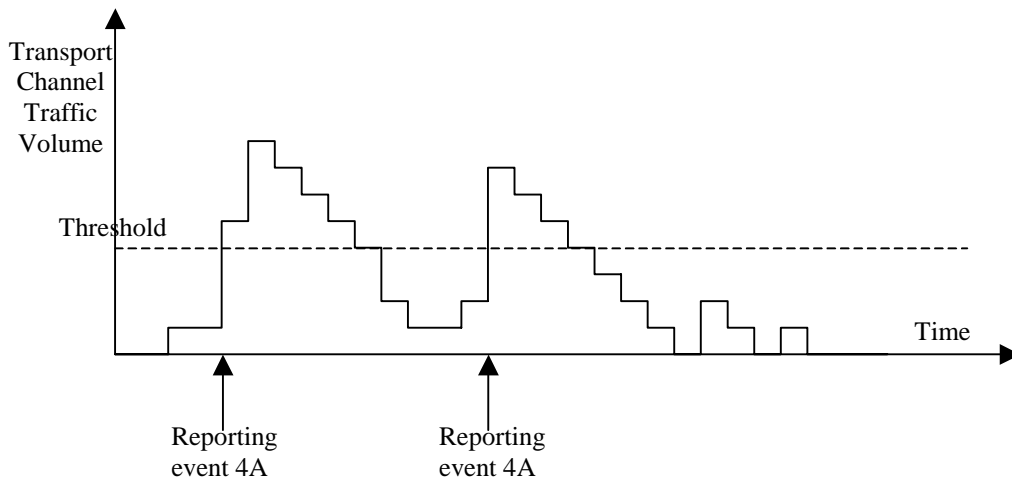


Figure 14.4.2.1-1: Event triggered report when Transport Channel Traffic Volume ~~exceeds~~ becomes larger than a certain threshold

If the monitored Transport Channel Traffic Volume [15] ~~exceeds~~ becomes larger than an absolute threshold, i.e. if $TCTVF > \text{Reporting threshold}$, this is an event that could trigger a report. The corresponding report specifies at least which measurement ID the event that triggered the report belongs to.

14.4.2.2 Reporting event 4 B: Transport Channel Traffic Volume becomes smaller than an absolute threshold

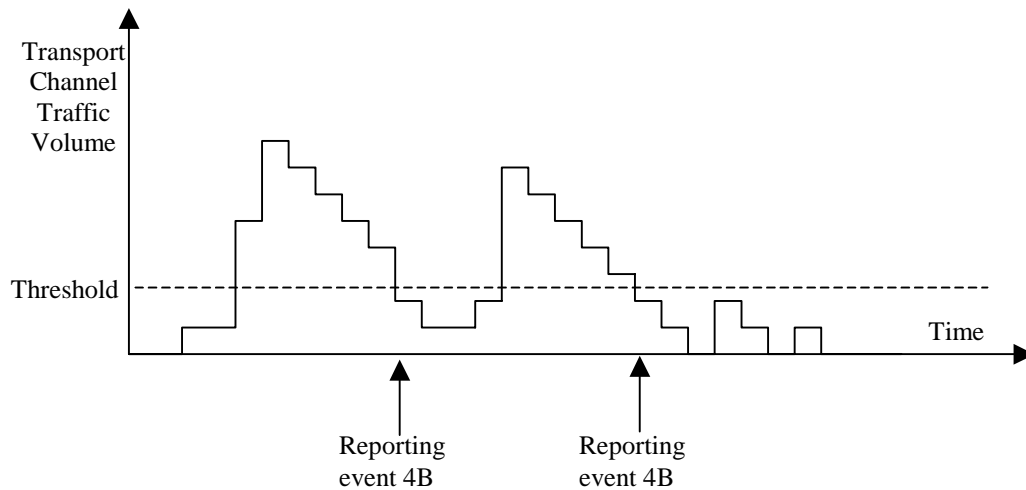


Figure 14.4.2-1-2: Event triggered report when Transport Channel Traffic Volume becomes smaller than certain threshold

If the monitored Transport Channel Traffic Volume [15] becomes smaller than an absolute threshold, i.e. if $TCTVF < \text{Reporting threshold}$, this is an event that could trigger a report. The corresponding report specifies at least which measurement ID the event that triggered the report belongs to.

14.4.3 Traffic volume reporting mechanisms

Traffic volume measurement triggering could be associated with both a *time-to-trigger* and a *pending time after trigger*. The time-to-trigger is used to get time domain hysteresis, i.e. the condition must be fulfilled during the time-to-trigger time before a report is sent. Pending time after trigger is used to limit consecutive reports when one traffic volume measurement report already has been sent. This is described in detail below.

14.4.3.1 Pending time after trigger

This timer is started in the UE when a measurement report has been triggered by a given event. The UE is then forbidden to send any new measurement reports with the same measurement ID triggered by the same event during this time period even when the triggering condition is fulfilled again. Instead the UE waits until the timer has suspended/expired. If the Transport Channel Traffic Volume [15] is still above the threshold when the timer has expired the UE sends a new measurement report, and the timer is restarted. Otherwise it waits for a new triggering.

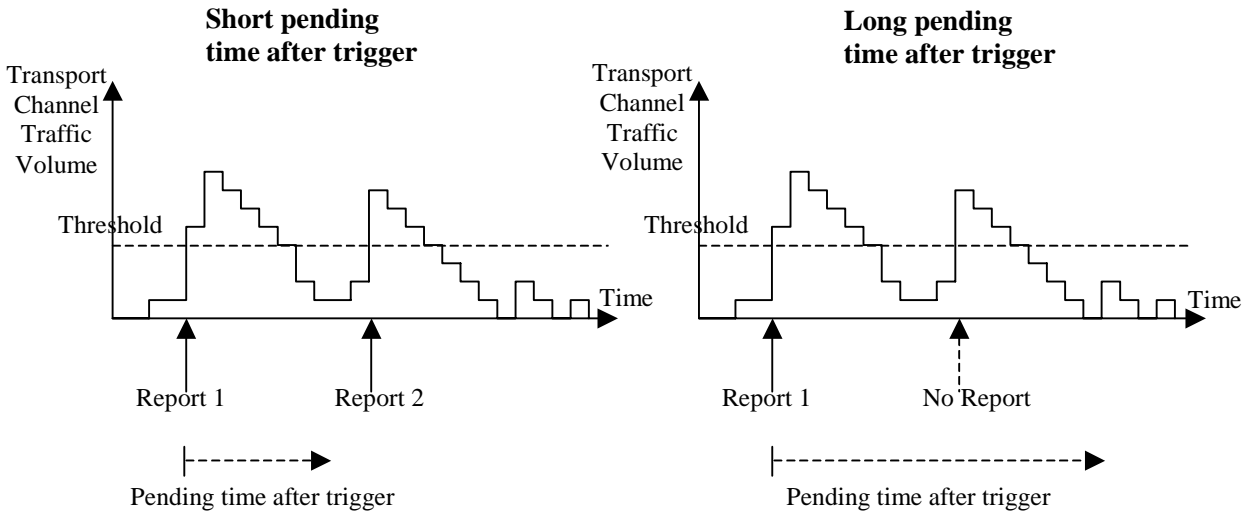


Figure 14.4.3.1-1: Pending time after trigger limits the amount of consecutive measurement reports

Figure 14.4.3.1-1 shows that by increasing the pending time after trigger a triggered second event does not result in a measurement report.

14.4.3.x Time-to-trigger

The timer is started in the UE when the Transport Channel Traffic Volume triggers the event. If the TCTV does not cross the threshold before the timer expires, a report is triggered.

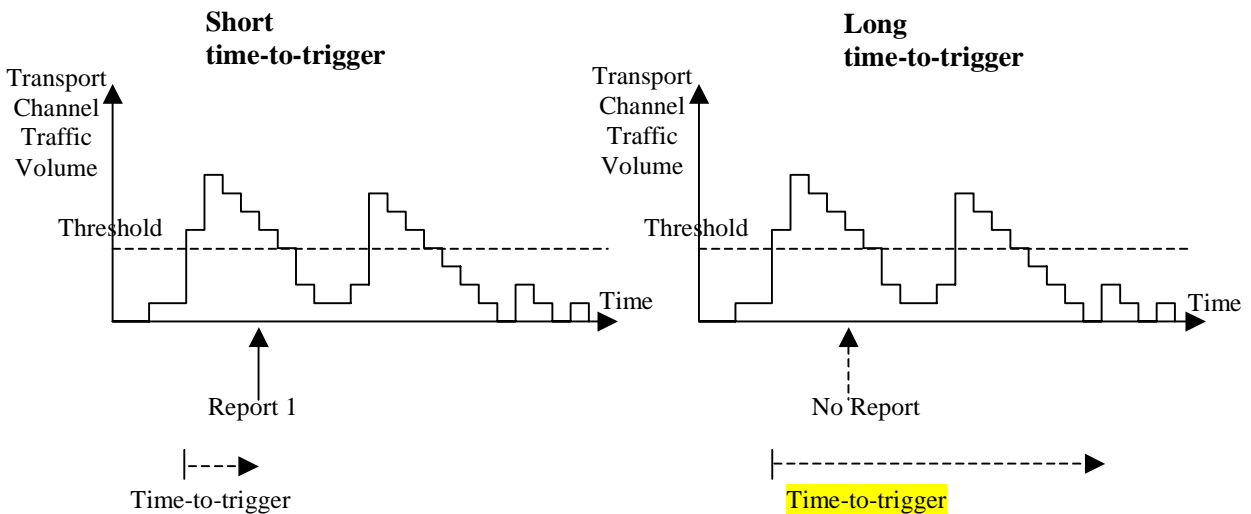


Figure 14.4.3.1-2: Time-to-trigger is used to achieve time hysteresis

Figure 14.4.3.1-2 shows that by increasing the time-to-trigger the report is not triggered.

14.4.4 Interruption of user data transmission

By including the IE “Tx Interruption after trigger”, a UE in CELL_FACH substate may be instructed by the UTRAN to ~~ease temporarily prohibit~~ temporarily prohibit transmission of user data on the RACH after a measurement report has been triggered. ~~Before~~ The UE shall only resume the transmission of user data, when:

- 1> ~~the UE shall~~ it receives from the UTRAN either a message allocating a dedicated physical channel, and ~~make~~ leading to the transition to CELL_DCH state; or
- 1> ~~the UE shall~~ the time period indicated by the IE “Tx Interruption after trigger” elapses, ~~receive an individually assigned measurement control message indicating that interruption of user data transmission is not be applied.~~

The transmission of signalling messages on the signalling radio bearers shall not be interrupted.

CHANGE REQUEST

⌘ **25.331 CR 1486** ⌘ rev **-** ⌘ Current version: **5.0.0** ⌘

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

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

Title:	⌘ Traffic Volume Measurement correction		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘ TEI	Date:	⌘ 22.01.2002
Category:	⌘ A	Release:	⌘ REL-5
	<i>Use <u>one</u> of the following categories:</i> F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		<i>Use <u>one</u> of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change: ⌘ The current description is unclear and does not match the group's understanding of how it should work.

- Summary of change:** ⌘
- Clarified the distinction between the set of transport channels the UE is supposed to report on and the set of transport channels it is supposed to trigger on. The two sets can be completely disjoint.
 - Clarified the cases in which the configuration should be rejected.
 - Aligned the name of one Multiplicity value with what is in the Tabular.
 - Moved the text dealing with the generation of reports to section 14 (to align with other measurements).
 - Clarified that the Pending-time-after trigger applied per event rather than per measurement ID (to align with the signalling).
 - Corrected the Interruption of user data transmission to align it with the understanding of the group.
 - Clarified what the UE should report on when an RB is mapped onto two logical channels (as per the agreement in the previous meeting).
 - Specified that when the set of TrCHs on which an event trigger is defined is not provided explicitly, the UE shall apply it on the TrCHs specified by the measurement object.
 - Specified when the Pending-time-after-trigger timer needed to be started.
 - Corrected some of the interactions between the time-to-trigger and Pending-time-after-trigger mechanisms.
 - Clarified that at most one Time-to-trigger and Pending-time-after-trigger was needed for each configured event.

- Aligned the name of the event 4a with its behavior.
- Corrected a number of editorial errors.

Impact Analysis:

This CR has limited impact to traffic volume measurement functionality and is consistent with RAN2 understanding. However, since the specification is currently unclear, if a UE has implemented something different it may:

- If this CR is not implemented in the UE:
 - o It will not reject some configurations, which are ambiguous.
 - o It will not re-start its transmission on RACH after the time "Tx Interruption after trigger" elapses and it is not in CELL_DCH.
 - o It will provide traffic volume measurements for a set of transport channels which is not exactly what the UTRAN intended.
- If not implemented in the network:
 - o It will receive traffic volume measurement reports which do not match exactly what it expects.
 - o The UE may re-start uplink transmission on RACH before what the UTRAN expects.

Consequences if not approved: ⌘ Unclear and inconsistent specifications.

Clauses affected: ⌘ 8.6.7.10, 8.6.7.11, 10.3.7.71, 10.3.7.72, 14.4.1, 14.4.2, 14.4.2.1, 14.4.2.2, 14.4.3.1, 14.4.3.x (new), 14.4.4

Other specs affected: ⌘

 Other core specifications ⌘ 25.331 v3.10.0, CR 1484
 25.331 v4.4.0, CR 1485

Other comments: ⌘

How to create CRs using this form:

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

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

8.6.7.10 Traffic Volume Measurement

If the IE "Traffic Volume Measurement" is received by the UE, the UE shall:

- 1> store the content of the IE to the variable MEASUREMENT_IDENTITY.

~~If the IE "Traffic volume measurement Object" is not included, the UE shall:~~

- ~~1> apply the measurement reporting criteria to all uplink transport channels.~~

If IE "Traffic volume measurement" is received by the UE in a MEASUREMENT CONTROL message, where IE "measurement command" has the value "setup", and if the IE "traffic volume reporting quantity" is included, the UE shall:

- ~~1> report the measured quantities specified in the IE "traffic volume reporting quantity";~~

- 1> if the parameter "Average of RLC Buffer Payload for each RB" or the parameter "Variance of RLC Buffer payload for each RB" is set to "TRUE":

- 2> if the IE "Traffic volume measurement quantity" is not included:

- 3> set the variable CONFIGURATION_INCOMPLETE to TRUE.

- 2> if the IE "Traffic volume measurement quantity" is included;

- ~~3> if the parameter "time interval to take an average or a variance" is included:~~

- ~~4> use the time specified in the parameter "time interval to take an average or a variance" to calculate the average and/or variance of RLC Buffer Payload according to the IE "traffic volume reporting quantity".~~

- 3> if the parameter "time interval to take an average or a variance" is not included:

- 4> set the variable CONFIGURATION_INCOMPLETE to TRUE.

If IE "Traffic volume measurement" is received by the UE in a MEASUREMENT CONTROL message, where IE "measurement command" has the value "setup", but IE "Traffic volume measurement quantity" ~~or IE "Traffic volume reporting quantity"~~ is not received, the UE shall:

- ~~1> clear all stored measurement control information related associated to this measurement identity in variable MEASUREMENT_IDENTITY;~~

- 1> set the variable CONFIGURATION_INCOMPLETE to TRUE.

8.6.7.11 Traffic Volume Measurement Reporting Criteria

If the IE "Traffic Volume Measurement Reporting Criteria" is received by the UE, the UE shall:

- 1> if the IE "Parameters sent for each transport channel" is absent:

- 2> set the variable PROTOCOL_ERROR_REJECT to TRUE;

- 2> set the IE "Protocol error cause" in the variable PROTOCOL_ERROR_INFORMATION to "Information element missing".

- 1> for each IE "Parameters sent for each transport channel":

- 2> if the IE "Parameters required for each Event" is absent:

- 3> set the variable CONFIGURATION_INCOMPLETE to TRUE;

- ~~1> store the content of the IE "Traffic Volume Measurement Reporting Criteria" to the variable MEASUREMENT_IDENTITY.~~

~~If the IE "UL transport channel id" is not included, the UE shall:~~

- 1> ~~apply the measurement reporting criteria to all uplink transport channels indicated in the IE "Traffic volume measurement object";~~
- 1> ~~if the UTRAN has not specified a traffic volume measurement object for a given measurement identity:~~
- 2> ~~apply the measurement reporting criteria to all uplink transport channels that are configured for the current UE state.~~

If the IE "Tx interruption after trigger" is included, the UE shall:

- 1> ~~block DTCH transmissions on the RACH during the time specified in the IE after a measurement report is transmitted.~~

10.3.7.71 Traffic volume measurement quantity

Contains the measurement quantity information for a traffic volume measurement.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Measurement quantity	MP		Enumerated(RLC buffer payload, Average RLC buffer payload, Variance of RLC buffer payload)	The use of this parameter is described in subclause 8.6.7.10. This parameter should be ignored.
Time Interval to take an average or a variance	CV-A/V		Integer(20, 40, ..260, by steps of 20)	In ms

Condition	Explanation
A/V	This IE is mandatory present when "Average RLC buffer" or "Variance of RLC buffer payload" is chosen and not needed otherwise.

10.3.7.72 Traffic volume measurement reporting criteria

Contains the measurement reporting criteria information for a traffic volume measurement.

Event 4a: Transport Channel Traffic Volume [15] exceeds an absolute threshold.

Event 4b: Transport Channel Traffic Volume [15] becomes smaller than an absolute threshold.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Parameters sent for each transport channel	OP	1 to <maxTrCH >		This IE is always required, need is OP to align with ASN.1
>Uplink transport channel type	OP		Enumerated(DCH,RACHorCPCH,USCH)	USCH is TDD only. CPCH is FDD only. RACHorCPCH is the currently configured default in the uplink.
>UL Transport Channel ID	CV-UL-DCH/USCH		Transport channel identity 10.3.5.18	
>Parameters required for each Event	OP	1 to <maxMeaspaerEvent >		
>>Traffic volume event identity	MP		Traffic volume event identity 10.3.7.66	
>>Reporting Threshold	MP		Enumerated(8,16,32,64,128,256,512,1024,2K,3K,4K,6K,8K,12K,16K,24K,32K,48K,64K,96K,128K,192K,256K,384K,512K,768K)	Threshold in bytes And N Kbytes = N*1024 bytes
>>Time to trigger	OP		Time to trigger 10.3.7.64	Indicates the period of time between the timing of event detection and the timing of sending Measurement Report. Time in ms
>>Pending time after trigger	OP		Integer(250, 500, 1000, 2000, 4000, 8000, 16000)	Indicates the period of time during which it is forbidden to send any new measurement reports with the same Traffic volume event identity even if the triggering condition is fulfilled. Time in milliseconds
>>Tx interruption after trigger	OP		Integer (250, 500, 1000, 2000, 4000, 8000, 16000)	Time in milliseconds. Indicates how long the UE shall block DTCH transmissions on the RACH after a measurement report is triggered.

Condition	Explanation
UL-DCH/USCH	If IE "Uplink transport channel type" is equal to "DCH" or "USCH" (TDD only) this IE is optional. Otherwise the IE is not needed.

10.3.10 Multiplicity values and type constraint values

The following table includes constants that are either used as multi bounds (name starting with "max") or as high or low value in a type specification (name starting with "lo" or "hi"). Constants are specified only for values appearing more than once in the RRC specification. In case a constant is related to one or more other constants, an expression is included in the "value" column instead of the actual value.

Constant	Explanation	Value
CN information		
maxCNdomains	Maximum number of CN domains	4
UTRAN mobility information		
maxRAT	Maximum number of Radio Access Technologies	maxOtherRAT + 1
maxOtherRAT	Maximum number of other Radio Access Technologies	15
maxURA	Maximum number of URAs in a cell	8
maxInterSysMessages	Maximum number of Inter System Messages	4
maxRABsetup	Maximum number of RABs to be established	16
UE information		
maxtransactions	Maximum number of parallel RRC transactions in downlink	25
maxPDCPalgoType	Maximum number of PDCP algorithm types	8
maxDRACclasses	Maximum number of UE classes which would require different DRAC parameters	8
MaxFreqBandsFDD	Maximum number of frequency bands supported by the UE as defined in [21]	8
MaxFreqBandsTDD	Maximum number of frequency bands supported by the UE as defined in [22]	4
MaxFreqBandsGSM	Maximum number of frequency bands supported by the UE as defined in [45]	16
maxPage1	Number of UEs paged in the Paging Type 1 message	8
MaxSystemCapability	Maximum number of system specific capabilities that can be requested in one message.	16
RB information		
MaxPredefConfig	Maximum number of predefined configurations	16
MaxRB	Maximum number of RBs	32
MaxSRBsetup	Maximum number of signalling RBs to be established	8
MaxRBperRAB	Maximum number of RBs per RAB	8
MaxRBallRABs	Maximum number of non signalling RBs	27
MaxRBMuxOptions	Maximum number of RB multiplexing options	8
MaxLoCHperRLC	Maximum number of logical channels per RLC entity	2
TrCH information		
MaxTrCH	Maximum number of transport channels used in one direction (UL or DL)	32
MaxTrCHpreconf	Maximum number of preconfigured Transport channels, per direction	16
MaxCCTrCH	Maximum number of CCTrCHs	8
MaxTF	Maximum number of different transport formats that can be included in the Transport format set for one transport channel	32
maxTF-CPCH	Maximum number of TFs in a CPCH set	16
MaxTFC	Maximum number of Transport Format Combinations	1024
maxTFCI-1-Combs	Maximum number of TFCI (field 1) combinations	512
maxTFCI-2-Combs	Maximum number of TFCI (field 2) combinations	512
maxCPCHsets	Maximum number of CPCH sets per cell	16
maxSIBperMsg	Maximum number of complete system information blocks per SYSTEM INFORMATION message	16
maxSIB	Maximum number of references to other system information blocks.	32
maxSIB-FACH	Maximum number of references to system information blocks on the FACH	8
PhyCH information		
maxPCPCH-APsubCH	Maximum number of available sub-channels for AP signature on PCPCH	12
maxPCPCH-CDsubCH	Maximum number of available sub-channels for CD signature on PCPCH	12
maxPCPCH-APsig	Maximum number of available signatures for AP on PCPCH	16

Constant	Explanation	Value
maxPCPCH-CDsig	Maximum number of available signatures for CD on PCPCH	16
maxAC	Maximum number of access classes	16
maxASC	Maximum number of access service classes	8
maxASCmap	Maximum number of access class to access service classes mappings	7
maxASCpersist	Maximum number of access service classes for which persistence scaling factors are specified	6
maxPRACH	Maximum number of PRACHs in a cell	16
maxFACHPCH	Maximum number of FACHs and PCHs mapped onto one secondary CCPCHs	8
maxRL	Maximum number of radio links	8
maxSCCPCH	Maximum number of secondary CCPCHs per cell	16
maxDPDCH-UL	Maximum number of DPDCHs per cell	6
maxDPCH-DLchan	Maximum number of channelisation codes used for DL DPCH	8
maxPUSCH	Maximum number of PUSCHs	(8)
maxPDSCH	Maximum number of PDSCHs	8
maxPDSCHcodes	Maximum number of codes for PDSCH	16
maxPDSCH-TFCIgroups	Maximum number of TFCI groups for PDSCH	256
maxPDSCHcodeGroups	Maximum number of code groups for PDSCH	256
maxPCPCHs	Maximum number of PCPCH channels in a CPCH Set	64
maxPCPCH-SF	Maximum number of available SFs on PCPCH	7
maxTS	Maximum number of timeslots used in one direction (UL or DL)	14
hiPUSCHidentities	Maximum number of PUSCH Identities	64
hiPDSCHidentities	Maximum number of PDSCH Identities	64
Measurement information		
maxTGPS	Maximum number of transmission gap pattern sequences	6
maxAdditionalMeas	Maximum number of additional measurements for a given measurement identity	4
maxMeasEvent	Maximum number of events that can be listed in measurement reporting criteria	8
MaxMeasParEvent	Maximum number of measurement parameters (e.g. thresholds) per event	2
maxMeasIntervals	Maximum number of intervals that define the mapping function between the measurements for the cell quality Q of a cell and the representing quality value	1
maxCellMeas	Maximum number of cells to measure	32
maxReportedGSMCells	Maximum number of GSM cells to be reported	6
maxFreq	Maximum number of frequencies to measure	8
maxSat	Maximum number of satellites to measure	16
HiRM	Maximum number that could be set as rate matching attribute for a transport channel	256
Frequency information		
maxFDDFreqList	Maximum number of FDD carrier frequencies to be stored in USIM	4
maxTDDFreqList	Maximum number of TDD carrier frequencies to be stored in USIM	4
maxFDDFreqCellList	Maximum number of neighbouring FDD cells to be stored in USIM	32
maxTDDFreqCellList	Maximum number of neighbouring TDD cells to be stored in USIM	32
maxGSMCellList	Maximum number of GSM cells to be stored in USIM	32
Other information		
maxNumGSMFreqRanges	Maximum number of GSM Frequency Ranges to store	32
maxNumFDDFreqs	Maximum number of FDD centre frequencies to store	8
maxNumTDDFreqs	Maximum number of TDD centre frequencies to store	8
maxNumCDMA200Freqs	Maximum number of CDMA2000 centre frequencies to store	8

14.4 Traffic Volume Measurements

14.4.1 Traffic Volume Measurement Quantity

Traffic volume measurements may be configured by RRC to assist with dynamic radio bearer control. The reported quantities that can be configured are:

- 1 Buffer Occupancy.
- 2 Average of Buffer Occupancy.
- 3 Variance of Buffer Occupancy.

A description of these values can be found in [15].

When a report is triggered, the UE shall provide the requested quantities for the acknowledged and unacknowledged mode RBs mapped onto the transport channels identified.

~~In order to support a large variation of bit rates and RLC buffer size capabilities, a non-linear scale is used. Since, for each RB, the expected traffic includes both new and retransmitted RLC PDUs and potentially existing Control PDUs, all these should be included in the Buffer Occupancy measure. It should also be noted that traffic volume measurements are only applicable for acknowledged and unacknowledged mode.~~

~~According to what is stated in the Measurement Control message, the UE should support reporting of RLC Buffer Payload, Average of RLC Buffer Payload, and Variance of RLC Buffer Payload for RBs multiplexed onto the same Transport channel. The Reporting Quantities (i.e. RLC Buffer Payload, Average of RLC Buffer Payload, and Variance of RLC Buffer Payload of each RB) are indicated in the measurement control message. If Average of RLC Buffer Payload or Variance of RLC Buffer Payload is included as Reporting Quantity, the time interval to take an average or a variance shall be used. When the RLC buffer payload, Average of RLC buffer payload or Variance of RLC buffer payload is reported, the measured quantity shall be rounded upwards to the closest higher value possible to report.~~

14.4.2 Traffic Volume reporting triggers

~~Traffic volume measurement reports can be reported-triggered using~~ in two different ways/mechanisms, periodical and event triggered. The reporting criteria are specified in the measurement control message.

~~For periodical reporting the UE simply determines the Reporting Quantities in number of bytes for each RB mapped onto the indicated transport channels and reports the results at the time interval and for the number of times specified.~~

All the specified events are evaluated with respect to the Transport Channel Traffic Volume (TCTV). This quantity is equal to the sum of the Buffer Occupancy for all logical channels mapped onto a transport channel. The events on a given transport channel shall be evaluated at least at every TTI (may be more often) as described in [15].

~~For traffic volume measurements in the UE only one quantity is compared with the thresholds. This quantity is Transport Channel Traffic Volume [15] (which equals the sum of Buffer Occupancies of RBs multiplexed onto a transport channel) in number of bytes. Event triggered reporting is performed when the Transport Channel Traffic Volume exceeds an upper threshold or becomes smaller than a lower threshold. Every TTI, UE measures the Transport Channel Traffic Volume for each transport channel and compares it with the configured thresholds. If the value is out of range, the UE determines the Reporting Quantities for the RBs mapped onto that transport channel and reports the results.~~

When a traffic volume measurement is set up, the UE shall:

- 1> if the IE "report criteria" is set to "Traffic volume measurement reporting criteria", the UE shall:
 - 2> for each IE "Parameters sent for each transport channel":
 - 3> if the IE "Uplink transport channel type" is not included; or
 - 3> if the IE "Uplink Transport Channel Type" has the value "DCH" or "USCH" and the IE "UL transport channel id" is not included, the UE shall:
 - 4> for each IE "Parameters required for each Event":

5> for each ~~configured~~ uplink transport channel on which the UE is supposed to report (see below), configure an event trigger defined by the values in the IEs “Measurement Identity”, “Traffic volume event identity”, “Reporting threshold”, “Time to trigger”, “Pending time after trigger” and “Tx Interruption after trigger”;

3> else:

4> for each IE “Parameters required for each Event”:

5> for the uplink transport channel defined by the IEs “Uplink transport channel type” and “UL transport channel id”, configure an event trigger defined by the values in the IEs “Measurement Identity”, “Traffic volume event identity”, “Reporting threshold”, “Time to trigger”, “Pending time after trigger” and “Tx Interruption after trigger”;

1> else if the IE “report criteria” is set to “Periodical reporting criteria”:

2> configure periodical triggers with period equal to the value in the IE “Reporting Interval” and with number of transmissions equal to the value in the IE “Amount of reporting” for the measurement identified by the IE “Measurement Identity”;

For each transport channel for which an event trigger has been configured, the UE shall:

1> for each event configured for this transport channel:

2> if the transport channel TCTV becomes larger than the threshold in IE “Reporting threshold”:

3> if the IE “Traffic volume event identity” has value “4a”:

4> if the IE “Time to trigger” is not present; and:

54> if there is no active Pending-time-after-trigger timer for this event is not active;:

5> if the IE “Pending time after trigger” is included, start the Pending-time-after-trigger timer for this event with the value in this IE;

5> trigger a report for the measurement identified by the IE “Measurement Identity”.

4> else:

5> start the Time-to-trigger timer for this event with the value in the IE “Time to trigger”;

3> else (if the IE “Traffic volume event identity” has value “4b”):

4> if the Time-to-trigger timer for this event is active:

5> stop this timer.

2> if the transport channel TCTV becomes smaller than the threshold in IE “Reporting threshold”:

3> if the IE “Traffic volume event identity” has value “4a”:

4> if the Time-to-trigger timer for this event is active:

5> stop this timer.

3> else (if the IE “Traffic volume event identity” has value “4b”):

4> if the IE “Time to trigger” is not present; and:

54> if there is no active Pending-time-after-trigger timer for this event is not active;:

5> if the IE “Pending time after trigger” is included, start the Pending-time-after-trigger timer for this event with the value in this IE;

5> trigger a report for the measurement identified by the IE “Measurement Identity”.

4> else:

5> start the Time-to-trigger timer for this event with the value in the IE “Time to trigger”;

When the Time-to-trigger timer for an event elapses:

1> if the Pending-time-after-trigger timer for this event is not active:

42> trigger a report for the measurement identified by the IE “Measurement Identity” corresponding to this event;-

2> if the IE “Pending time after trigger” is included:

3> start the Pending-time-after-trigger timer for this event with the value in this IE;

When the Pending-time-after-trigger for an event elapses:

1> if the IE “Traffic volume event identity” has value “4a”:

2> if the transport channel TCTV is larger than the threshold in IE “Reporting threshold”:

3> if the IE “Time to trigger” is not present:

4> trigger a report for the measurement identified by the IE “Measurement Identity” corresponding to this event;-

4> start the Pending-time-after-trigger timer for this event with the value in the IE “Pending time after trigger”.

3> else:

4> start the Time-to-trigger timer for this event with the value in the IE “Time to trigger”;

1> if the IE “Traffic volume event identity” has value “4b”:

2> if the transport channel TCTV is smaller than the threshold in IE “Reporting threshold”:

3> if the IE “Time to trigger” is not present:

4> trigger a report for the measurement identified by the IE “Measurement Identity” corresponding to this event;-

4> start the Pending-time-after-trigger timer for this event with the value in the IE “Pending time after trigger”.

3> else:

4> start the Time-to-trigger timer for this event with the value in the IE “Time to trigger”;

When a periodical trigger elapses, the UE shall:

1> trigger a report for the measurement identified by the IE “Measurement Identity”;

1> if the number of reports triggered by this periodical trigger reaches the value in the IE “Amount of reporting”:

2> disable this periodical trigger.

When a report is triggered for a given IE “Measurement Identity”, the UE shall:

1> consider the variable MEASUREMENT_IDENTITY corresponding to this measurement identity;

1> if the report is triggered by an event trigger:

2> include the IE “Event results”;

2> set the IE “Uplink transport channel type causing the event” to the type of the transport channel which triggered the report;

2> if the transport channel type is “DCH” or “USCH”:

- 3> include the IE “UL Transport Channel identity” and set it to the identity of the transport channel which triggered the report;
- 2> else:
 - 3> do not include the IE “UL Transport Channel identity”;
 - 2> set the IE “Traffic volume event identity” to the identity of the event that triggered the report;
 - 2> if the IE “Tx interruption after trigger” for the event that triggered the report is included:
 - 3> if the UE is in CELL_FACH state:
 - 4> prohibit DTCH transmissions on the RACH;
 - 4> resume these transmissions when:
 - 5> it receives from the UTRAN a message causing the transition to CELL_DCH state; or
 - 5> the time period indicated in the IE “Tx interruption after trigger” elapses;
- 1> if the IE “Traffic volume measurement object” is not included, the UE shall:
 - 2> report on all the uplink transport channels as specified below;
- 1> if the IE “Traffic volume measurement object” is included, the UE shall:
 - 2> report on the uplink transport channels identified in this IE as specified below;
- 1> for each UM or AM RB mapped onto a transport channel on which the UE is expected to report, the UE shall:
 - 2> add an element in the IE “Traffic volume measurement results”;
 - 2> set the value of the IE “RB Identity” to the identity of the considered radio bearer;
 - 2> if the RB is mapped onto one logical channel:
 - 3> if the IE “RLC Buffer Payload for each RB” is set to TRUE:
 - 4> include the IE “RLC Buffers Payload” and set it to the Buffer Occupancy value for this logical channel, rounded up to the next allowed value;
 - 3> if the IE “Average of RLC Buffer Payload for each RB” is set to TRUE:
 - 4> include the IE “Average of RLC Buffer Payload” and set it to the Buffer Occupancy for this logical channel averaged over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]), rounded up to the next allowed value;
 - 3> if the IE “Variance of RLC Buffer Payload for each RB” is set to TRUE:
 - 4> include the IE “Variance of RLC Buffer Payload” and set it to the variance of the Buffer Occupancy for this logical channel computed over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]), rounded up to the next allowed value;
 - 2> if the RB is mapped onto two logical channels:
 - 3> if one logical channel is mapped onto transport channels on which the UE is supposed to report:
 - 4> if the IE “RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “RLC Buffers Payload” and set it to the Buffer Occupancy value for this logical channel, rounded up to the next allowed value;
 - 4> if the IE “Average of RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “Average of RLC Buffer Payload” and set it to the Buffer Occupancy for this logical channel averaged over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]), rounded up to the next allowed value;

- 4> if the IE “Variance of RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “Variance of RLC Buffer Payload” and set it to the variance of the Buffer Occupancy for this logical channel computed over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]), rounded up to the next allowed value;
- 3> else (if both logical channels are mapped onto transport channels on which the UE is supposed to report):
 - 4> if the IE “RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “RLC Buffers Payload” and set it to the sum of the Buffer Occupancy values for the two logical channels, rounded up to the next allowed value;
 - 4> if the IE “Average of RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “Average of RLC Buffer Payload” and set it to the sum of the Buffer Occupancy for the two logical channels averaged over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]) and rounded up to the next allowed value;
 - 4> if the IE “Variance of RLC Buffer Payload for each RB” is set to TRUE:
 - 5> include the IE “Variance of RLC Buffer Payload” and set it to the variance of the sum of the Buffer Occupancy for the two logical channels, computed over the interval specified in the IE “Time Interval to take an average or a variance” (see [15]) and rounded up to the next allowed value;

14.4.2.1 Reporting event 4 A: Transport Channel Traffic Volume ~~exceeds~~ becomes larger than an absolute threshold

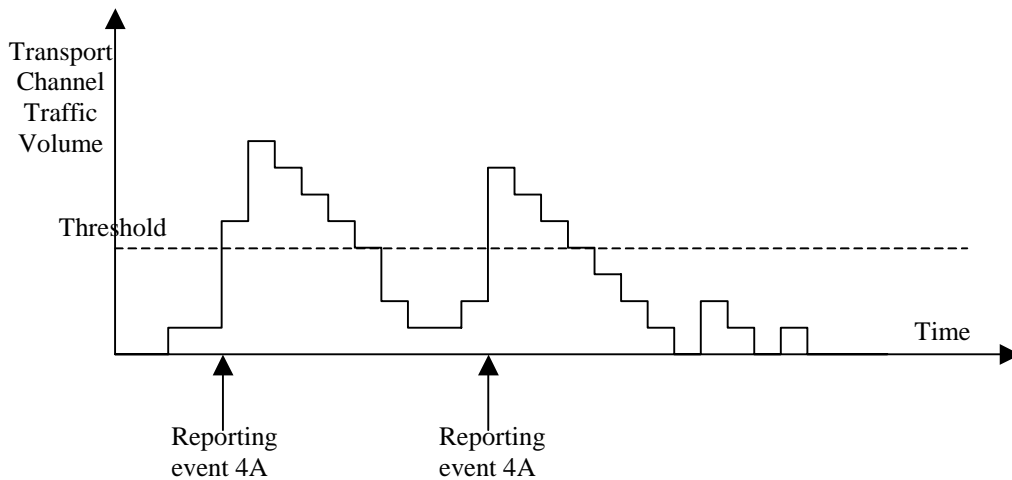


Figure 14.4.2.1-1: Event triggered report when Transport Channel Traffic Volume ~~exceeds~~ becomes larger than a certain threshold

If the monitored Transport Channel Traffic Volume [15] ~~exceeds~~ becomes larger than an absolute threshold, i.e. if $TCTVF > \text{Reporting threshold}$, this is an event that could trigger a report. The corresponding report specifies at least which measurement ID the event that triggered the report belongs to.

14.4.2.2 Reporting event 4 B: Transport Channel Traffic Volume becomes smaller than an absolute threshold

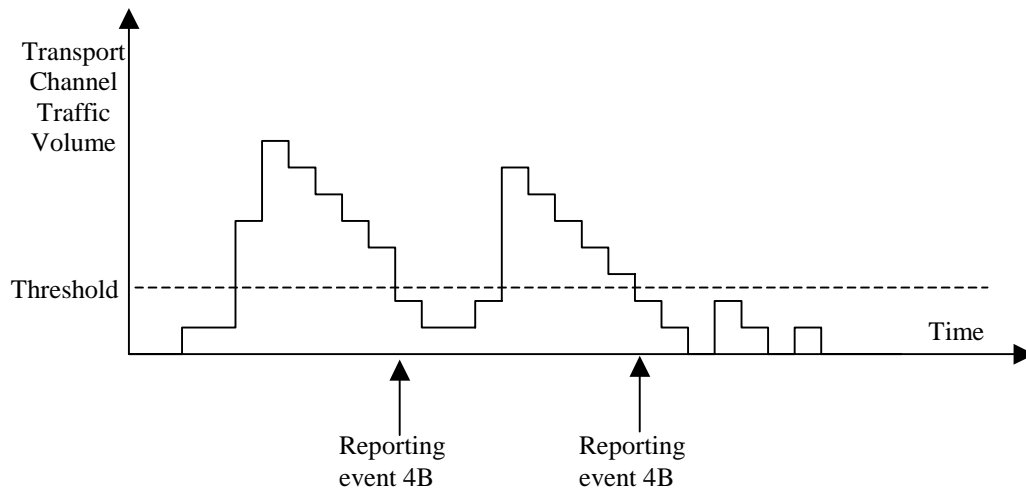


Figure 14.4.2-1-2: Event triggered report when Transport Channel Traffic Volume becomes smaller than certain threshold

If the monitored Transport Channel Traffic Volume [15] becomes smaller than an absolute threshold, i.e. if $TCTVF < \text{Reporting threshold}$, this is an event that could trigger a report. The corresponding report specifies at least which measurement ID the event that triggered the report belongs to.

14.4.3 Traffic volume reporting mechanisms

Traffic volume measurement triggering could be associated with both a *time-to-trigger* and a *pending time after trigger*. The time-to-trigger is used to get time domain hysteresis, i.e. the condition must be fulfilled during the time-to-trigger time before a report is sent. Pending time after trigger is used to limit consecutive reports when one traffic volume measurement report already has been sent. This is described in detail below.

14.4.3.1 Pending time after trigger

This timer is started in the UE when a measurement report has been triggered by a given event. The UE is then forbidden to send any new measurement reports with the same measurement ID triggered by the same event during this time period even when the triggering condition is fulfilled again. Instead the UE waits until the timer has suspended expired. If the Transport Channel Traffic Volume [15] is still above the threshold when the timer has expired the UE sends a new measurement report, and the timer is restarted. Otherwise it waits for a new triggering.

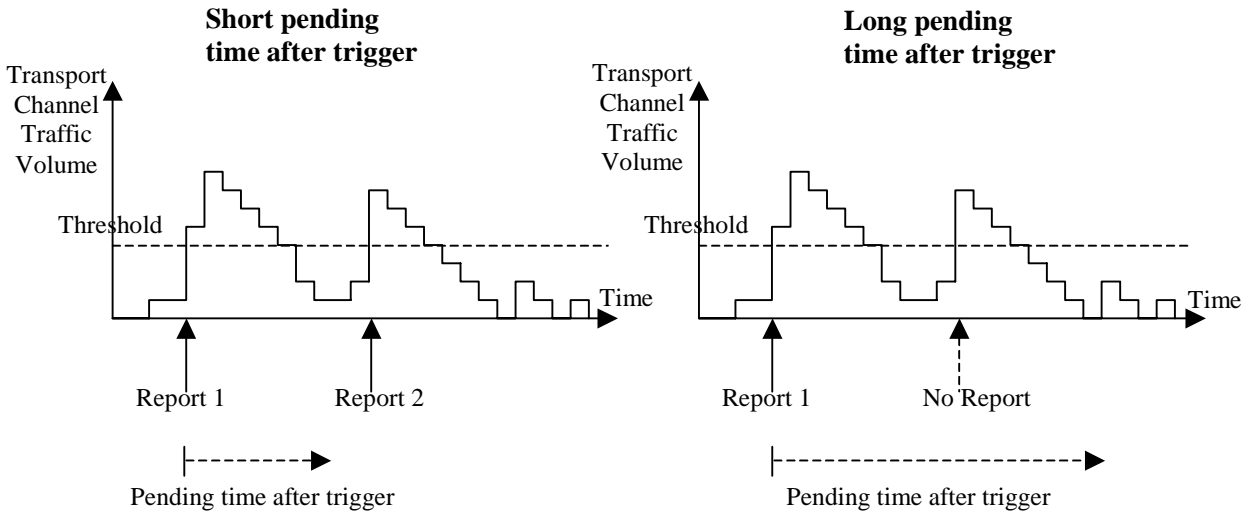


Figure 14.4.3.1-1: Pending time after trigger limits the amount of consecutive measurement reports

Figure 14.4.3.1-1 shows that by increasing the pending time after trigger a triggered second event does not result in a measurement report.

14.4.3.x Time-to-trigger

The timer is started in the UE when the Transport Channel Traffic Volume triggers the event. If the TCTV does not cross the threshold before the timer expires, a report is triggered.

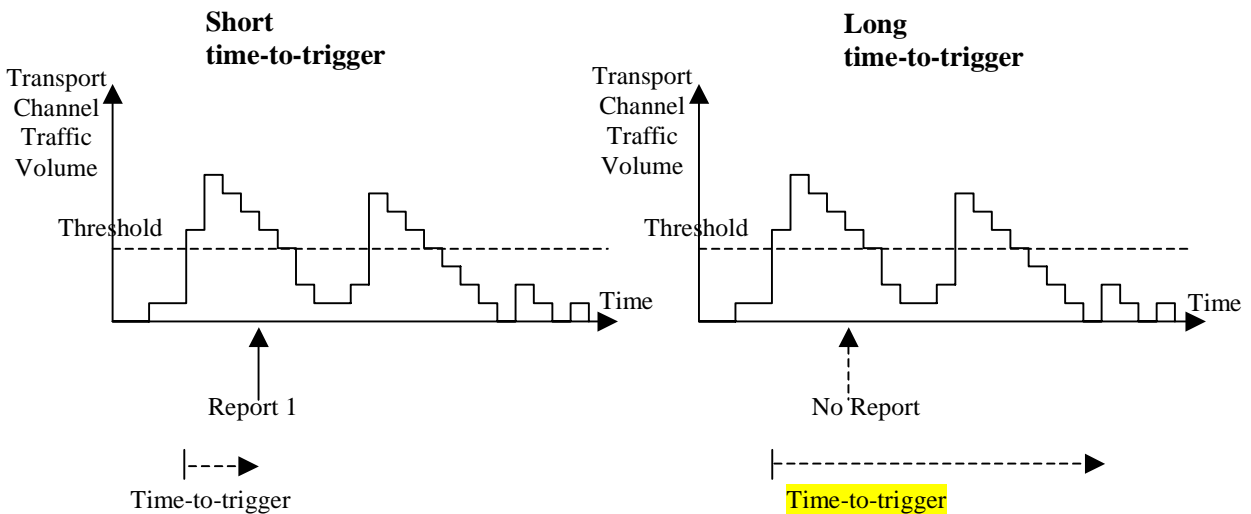


Figure 14.4.3.1-2: Time-to-trigger is used to achieve time hysteresis

Figure 14.4.3.1-2 shows that by increasing the time-to-trigger the report is not triggered.

14.4.4 Interruption of user data transmission

By including the IE “Tx Interruption after trigger”, a UE in CELL_FACH substate may be instructed by the UTRAN to ~~ease temporarily prohibit~~ temporarily prohibit transmission of user data on the RACH after a measurement report has been triggered. ~~Before~~ The UE shall only resume the transmission of user data, when:

- 1> ~~the UE shall~~ it receives from the UTRAN either a message allocating a dedicated physical channel, and ~~make~~ leading to the transition to CELL_DCH state; or
- 1> ~~the UE shall~~ the time period indicated by the IE “Tx Interruption after trigger” elapses, ~~receive an individually assigned measurement control message indicating that interruption of user data transmission is not be applied.~~

The transmission of signalling messages on the signalling radio bearers shall not be interrupted.

CR-Form-v5

CHANGE REQUEST

⌘ **25.331 CR 1487** ⌘ rev **-** ⌘ Current version: **3.10.0** ⌘

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

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

Title:	⌘ Correction to handling of IE 'Downlink information for each RL'		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘ TEI	Date:	⌘ 17/05/2002
Category:	⌘ F	Release:	⌘ R99
	Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ Section 8.6.6.4 describing the handling of the IE 'Downlink information for each RL' has incorrect indentation. Some TDD related bullets are at an indentation that relates to FDD only. Some bullets relating to FDD UE's capable of simultaneous SCCPCH and DPCH reception are at an indentation that relates to UEs without such capability
Summary of change:	⌘ The indentation of the bullets is corrected Isolated Impact Analysis Functionality corrected: Handling of IE 'Downlink information for each RL'. Functionality impacts TDD UEs, and FDD UEs capable of SCCPCH and DPCH reception. Isolated impact statement: Correction to a function where specification is ambiguous. Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.
Consequences if not approved:	⌘ The specification will have incorrect indentation. Some small potential for mis-interpretation of the spec

Clauses affected:	⌘ 8.6.6.4		
Other specs affected:	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	25.331 v4.4.0, CR 1488 25.331 v5.0.0, CR 1489
Other comments:	⌘		

How to create CRs using this form:

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

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

8.6.6.4 Downlink information for each radio link

If the IE "Downlink information for each radio link" is included in a received message, the UE shall:

- 1> if the UE would enter CELL_DCH state according to subclause 8.6.3.3 applied on the received message:
 - 2> if the IE "SCCPCH Information for FACH" is included; and
 - 2> if the UE is in FDD mode and is not capable of simultaneous reception of DPCH and Secondary CCPCH:
 - 3> set the variable UNSUPPORTED_CONFIGURATION to TRUE;
 - ~~2~~3> if the UE is in FDD mode and is capable of simultaneous reception of DPCH and SCCPCH:
 - ~~3~~4> start to receive the indicated Secondary CCPCH.
 - ~~2~~3> if the UE is in TDD mode and shared transport channels are assigned to the UE:
 - ~~3~~4> start to receive the indicated Secondary CCPCH.
 - ~~2~~3> if the UE is in TDD mode and no shared transport channels are assigned to the UE:
 - ~~3~~4> set the variable UNSUPPORTED_CONFIGURATION to TRUE.
 - 2> act on the other IEs contained in the IE "Downlink information for each radio link" as specified in subclause 8.6 applied on this radio link.
- 1> if the UE would enter either the CELL_FACH, CELL_PCH or URA_PCH state according to subclause 8.6.3.3 applied on the received message:
 - 2> if the received message is CELL UPDATE CONFIRM:
 - 3> ignore the IE "Downlink information for each radio link".
 - 2> if the received message is any other message than CELL UPDATE CONFIRM; and
 - 2> if IEs other than the IE "Primary CPICH info" (for FDD) or the IE "Primary CCPCH info" (for TDD) are included in the IE "Downlink information for each radio link":
 - 3> ignore these IEs.
 - 2> act on the other IEs contained in the IE "Downlink information for each radio link" as specified in subclause 8.6 applied on this radio link.

CHANGE REQUEST

⌘ **25.331 CR 1488** ⌘ rev **-** ⌘ Current version: **4.4.0** ⌘

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

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

Title:	⌘ Correction to handling of IE 'Downlink information for each RL'		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘ TEI	Date:	⌘ 17/05/2002
Category:	⌘ A	Release:	⌘ REL-4
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)		2 (GSM Phase 2)
	A (corresponds to a correction in an earlier release)		R96 (Release 1996)
	B (addition of feature),		R97 (Release 1997)
	C (functional modification of feature)		R98 (Release 1998)
	D (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		REL-4 (Release 4)
			REL-5 (Release 5)

Reason for change:	⌘ Section 8.6.6.4 describing the handling of the IE 'Downlink information for each RL' has incorrect indentation. Some TDD related bullets are at an indentation that relates to FDD only. Some bullets relating to FDD UE's capable of simultaneous SCCPCH and DPCH reception are at an indentation that relates to UEs without such capability
Summary of change:	⌘ The indentation of the bullets is corrected Isolated Impact Analysis Functionality corrected: Handling of IE 'Downlink information for each RL'. Functionality impacts TDD UEs, and FDD UEs capable of SCCPCH and DPCH reception. Isolated impact statement: Correction to a function where specification is ambiguous. Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.
Consequences if not approved:	⌘ The specification will have incorrect indentation. Some small potential for mis-interpretation of the spec

Clauses affected:	⌘ 8.6.6.4		
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications	⌘ 25.331 v3.10.0, CR 1487	
	<input type="checkbox"/> Test specifications	25.331 v5.0.0, CR 1489	
	<input type="checkbox"/> O&M Specifications		
Other comments:	⌘		

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8.6.6.4 Downlink information for each radio link

If the IE "Downlink information for each radio link" is included in a received message, the UE shall:

- 1> if the UE would enter CELL_DCH state according to subclause 8.6.3.3 applied on the received message:
 - 2> if the IE "SCCPCH Information for FACH" is included; and
 - 2> if the UE is in FDD mode and is not capable of simultaneous reception of DPCH and Secondary CCPCH:
 - 3> set the variable UNSUPPORTED_CONFIGURATION to TRUE;
 - ~~2~~3> if the UE is in FDD mode and is capable of simultaneous reception of DPCH and SCCPCH:
 - ~~3~~4> start to receive the indicated Secondary CCPCH.
 - ~~2~~3> if the UE is in TDD mode and shared transport channels are assigned to the UE:
 - ~~3~~4> start to receive the indicated Secondary CCPCH.
 - ~~2~~3> if the UE is in TDD mode and no shared transport channels are assigned to the UE:
 - ~~3~~4> set the variable UNSUPPORTED_CONFIGURATION to TRUE.
 - 2> act on the other IEs contained in the IE "Downlink information for each radio link" as specified in subclause 8.6 applied on this radio link.
- 1> if the UE would enter either the CELL_FACH, CELL_PCH or URA_PCH state according to subclause 8.6.3.3 applied on the received message:
 - 2> if the received message is CELL UPDATE CONFIRM:
 - 3> ignore the IE "Downlink information for each radio link".
 - 2> if the received message is any other message than CELL UPDATE CONFIRM; and
 - 2> if IEs other than the IE "Primary CPICH info" (for FDD) or the IE "Primary CCPCH info" (for TDD) are included in the IE "Downlink information for each radio link":
 - 3> ignore these IEs.
 - 2> act on the other IEs contained in the IE "Downlink information for each radio link" as specified in subclause 8.6 applied on this radio link.

3GPP TSG-RAN WG2 Meeting #29
Gyeongju, Korea, 13th - 17th May 2002

Tdoc r2-021436

CR-Form-v5
<h2 style="margin: 0;">CHANGE REQUEST</h2>
⌘ 25.331 CR 1489 ⌘ rev - ⌘ Current version: 5.0.0 ⌘

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

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

Title:	⌘ Correction to handling of IE 'Downlink information for each RL'		
Source:	⌘ TSG-RAN WG2		
Work item code:	⌘ TEI Date: ⌘ 17/05/2002		
Category:	⌘ A Release: ⌘ REL-5 Use <u>one</u> of the following categories: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) </td> <td style="width: 50%; vertical-align: top;"> Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5) </td> </tr> </table> Detailed explanations of the above categories can be found in 3GPP TR 21.900 .	F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification)	Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)
F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification)	Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)		

Reason for change:	⌘ Section 8.6.6.4 describing the handling of the IE 'Downlink information for each RL' has incorrect indentation. Some TDD related bullets are at an indentation that relates to FDD only. Some bullets relating to FDD UE's capable of simultaneous SCCPCH and DPCH reception are at an indentation that relates to UEs without such capability
Summary of change:	⌘ The indentation of the bullets is corrected Isolated Impact Analysis Functionality corrected: Handling of IE 'Downlink information for each RL'. Functionality impacts TDD UEs, and FDD UEs capable of SCCPCH and DPCH reception. Isolated impact statement: Correction to a function where specification is ambiguous. Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.
Consequences if not approved:	⌘ The specification will have incorrect indentation. Some small potential for mis-interpretation of the spec

Clauses affected:	⌘ 8.6.6.4
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications ⌘ 25.331 v3.10.0, CR 1487 ⌘ <input type="checkbox"/> Test specifications ⌘ 25.331 v4.4.0, CR 1488 ⌘ <input type="checkbox"/> O&M Specifications
Other comments:	⌘

How to create CRs using this form:

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

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

8.6.6.4 Downlink information for each radio link

If the IE "Downlink information for each radio link" is included in a received message, the UE shall:

- 1> if the UE would enter CELL_DCH state according to subclause 8.6.3.3 applied on the received message:
 - 2> if the IE "SCCPCH Information for FACH" is included; and
 - 2> if the UE is in FDD mode and is not capable of simultaneous reception of DPCH and Secondary CCPCH:
 - 3> set the variable UNSUPPORTED_CONFIGURATION to TRUE;
 - ~~2~~3> if the UE is in FDD mode and is capable of simultaneous reception of DPCH and SCCPCH:
 - ~~3~~4> start to receive the indicated Secondary CCPCH.
 - ~~2~~3> if the UE is in TDD mode and shared transport channels are assigned to the UE:
 - ~~3~~4> start to receive the indicated Secondary CCPCH.
 - ~~2~~3> if the UE is in TDD mode and no shared transport channels are assigned to the UE:
 - ~~3~~4> set the variable UNSUPPORTED_CONFIGURATION to TRUE.
 - 2> if the IE "Serving HS-DSCH radio link indicator" is set to "TRUE":
 - 3> consider this radio link as the serving HS-DSCH radio link;
 - 3> if the serving HS-DSCH radio link was another radio link than this radio link prior to reception of the message and the IE "H-RNTI" is not included:
 - 4> set the variable INVALID_CONFIGURATION to TRUE.
 - 2> act on the other IEs contained in the IE "Downlink information for each radio link" as specified in subclause 8.6 applied on this radio link.
- 1> if the UE would enter either the CELL_FACH, CELL_PCH or URA_PCH state according to subclause 8.6.3.3 applied on the received message:
 - 2> if the received message is CELL UPDATE CONFIRM:
 - 3> ignore the IE "Downlink information for each radio link".
 - 2> if the received message is any other message than CELL UPDATE CONFIRM; and
 - 2> if IEs other than the IE "Primary CPICH info" (for FDD) or the IE "Primary CCPCH info" (for TDD) are included in the IE "Downlink information for each radio link":
 - 3> ignore these IEs.
 - 2> act on the other IEs contained in the IE "Downlink information for each radio link" as specified in subclause 8.6 applied on this radio link.