

**TSG-RAN Meeting #17**  
**Biarritz, France, 3 - 6 September 2002**

**RP-020547**

**Title:** Agreed CRs (Release '99 and Rel-4/Rel-5 category A) to TS 25.331  
**Source:** TSG-RAN WG2  
**Agenda item:** 7.2.3

Doc-1st-	Status-	Spec	CR	Rev	Phase	Subject	Cat	Versio	Versio
R2-022301	agreed	25.331	1621		R99	RRC TVM Corrections	F	3.11.0	3.12.0
R2-022302	agreed	25.331	1622		Rel-4	RRC TVM Corrections	A	4.5.0	4.6.0
R2-022303	agreed	25.331	1623		Rel-5	RRC TVM Corrections	A	5.1.0	5.2.0
R2-022304	agreed	25.331	1624		R99	Correction of Transmission Gap Distance semantics description	F	3.11.0	3.12.0
R2-022305	agreed	25.331	1625		Rel-4	Correction of Transmission Gap Distance semantics description	A	4.5.0	4.6.0
R2-022306	agreed	25.331	1626		Rel-5	Correction of Transmission Gap Distance semantics description	A	5.1.0	5.2.0
R2-022307	agreed	25.331	1627		R99	Active Set Update and simultaneous reconfiguration	F	3.11.0	3.12.0
R2-022308	agreed	25.331	1628		Rel-4	Active Set Update and simultaneous reconfiguration	A	4.5.0	4.6.0
R2-022309	agreed	25.331	1629		Rel-5	Active Set Update and simultaneous reconfiguration	A	5.1.0	5.2.0
R2-022310	agreed	25.331	1630		R99	UE behaviour following RLC size change	F	3.11.0	3.12.0
R2-022311	agreed	25.331	1631		Rel-4	UE behaviour following RLC size change	A	4.5.0	4.6.0
R2-022312	agreed	25.331	1632		Rel-5	UE behaviour following RLC size change	A	5.1.0	5.2.0
R2-022313	agreed	25.331	1633		R99	RRC SN in uplink	F	3.11.0	3.12.0
R2-022314	agreed	25.331	1634		Rel-4	RRC SN in uplink	A	4.5.0	4.6.0
R2-022315	agreed	25.331	1635		Rel-5	RRC SN in uplink	A	5.1.0	5.2.0
R2-022316	agreed	25.331	1636		R99	Multiplexing of Tr mode RBs of different CN domains on the same transport channel	F	3.11.0	3.12.0
R2-022317	agreed	25.331	1637		Rel-4	Multiplexing of Tr mode RBs of different CN domains on the same transport channel	A	4.5.0	4.6.0
R2-022318	agreed	25.331	1638		Rel-5	Multiplexing of Tr mode RBs of different CN domains on the same transport channel	A	5.1.0	5.2.0

## CHANGE REQUEST

# **25.331 CR 1621** # rev **-** # Current version: **3.11.0** #

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	#	RRC TVM Corrections	
<b>Source:</b>	#	TSG-RAN WG2	
<b>Work item code:</b>	#	TEI	<b>Date:</b> # 13/08/2002
<b>Category:</b>	#	<b>F</b>	<b>Release:</b> # R99
		Use <u>one</u> of the following categories:	Use <u>one</u> of the following releases:
		<b>F</b> (correction)	2 (GSM Phase 2)
		<b>A</b> (corresponds to a correction in an earlier release)	R96 (Release 1996)
		<b>B</b> (addition of feature),	R97 (Release 1997)
		<b>C</b> (functional modification of feature)	R98 (Release 1998)
		<b>D</b> (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)
			Rel-6 (Release 6)

**Reason for change:** # The semantics description for the Time-to-trigger is erroneous. It is not clear how the Tx Interruption functionality works when multiple events are triggered before the Tx Interruption time elapses. This is allthemore complicated that different events could be configured with different "Tx Interruption after trigger" values.  
~~A clarification of the fact that the two reporting modes could be configured at the same time was carried over from the MAC specification, since it seemed to be more relevant here.~~

**Summary of change:** # Corrected the semantics description of the Time-to-trigger  
~~Introduced a Note to clarify that both reporting modes could be configured at the same time.~~  
 Clarified the Tx interruption functionality.

Impact Analysis:

This change clarifies the Traffic Volume Measurement procedure. It is a clarification that captures the common understanding in the industry. It would not affect implementations behaving like indicated in the CR, it would affect implementations supporting the corrected functionality otherwise

Impact on Test Specifications:

This CR has no impact on the test specifications.

**Consequences if not approved:** # Ambiguity in the specification.

<b>Clauses affected:</b>	⌘	10.3.7.19, 10.3.7.30, 10.3.7.39, 10.3.7.72, 14.4.2				
<b>Other specs affected:</b>	⌘	<table border="1"><tr><td>Y</td><td>N</td></tr></table>	Y	N	Other core specifications	⌘
		Y	N			
		<table border="1"><tr><td></td><td>N</td></tr></table>		N	Test specifications	
	N					
<table border="1"><tr><td></td><td>N</td></tr></table>		N	O&M Specifications			
	N					
<b>Other comments:</b>	⌘					

**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.

### 10.3.7.19 Inter-frequency measurement reporting criteria

The triggering of the event-triggered reporting for an inter-frequency measurements. All events concerning inter-frequency measurements are labelled 2x where x is a,b,c, ...

Event 2a: Change of best frequency.

Event 2b: The estimated quality of the currently used frequency is below a certain threshold **and** the estimated quality of a non-used frequency is above a certain threshold.

Event 2c: The estimated quality of a non-used frequency is above a certain threshold.

Event 2d: The estimated quality of the currently used frequency is below a certain threshold.

Event 2e: The estimated quality of a non-used frequency is below a certain threshold.

Event 2f: The estimated quality of the currently used frequency is above a certain threshold.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Parameters required for each event	OP	1 to <maxMeas Event>		
>Inter-frequency event identity	MP		Inter-frequency event identity 10.3.7.14	
>Threshold used frequency	CV-clause 0		Integer(-115..0)	Ranges used depend on measurement quantity. CPICH Ec/No -24..0dB CPICH/Primary CCPCH RSCP -115..-25dBm
>W used frequency	CV-clause 2		Real(0, 0.1..2.0 by step of 0.1)	
>Hysteresis	MP		Real(0, 0.5..14.5 by step of 0.5)	In event 2a, 2b, 2c, 2d, 2e, 2f
>Time to trigger	MP		Time to trigger 10.3.7.64	Indicates the period of time during which the event <u>condition has to be satisfied, before between the timing of event detection and the timing of sending a Measurement Report.</u> Time in ms.
>Reporting cell status	OP		Reporting cell status 10.3.7.61	
>Parameters required for each non-used frequency	OP	1 to <maxFreq >		In this release, the first listed threshold and W parameter shall apply to all non-used frequencies.
>>Threshold non used frequency	CV-clause 1		Integer(-115..0)	Ranges used depend on measurement quantity. CPICH Ec/No -24..0dB CPICH/Primary CCPCH RSCP -115..-25dBm. This IE is not needed if the IE "Inter-frequency event identity" is set to 2a. However, it is specified to be mandatory to align with the ASN.1.
>>W non-used frequency	CV-clause 1		Real(0, 0.1..2.0 by step of 0.1)	

Condition	Explanation
Clause 0	This IE is mandatory present if the IE "Inter frequency event identity" is set to 2b, 2d, or 2f, otherwise the IE is not needed.
Clause 1	This IE is mandatory present if the IE "Inter frequency event identity" is set to 2a, 2b, 2c or 2e, otherwise the IE is not needed
Clause 2	This IE is mandatory present if the IE "Inter-frequency event identity" is set to 2a, 2b, 2d or 2f, otherwise the IE is not needed.

### 10.3.7.30 Inter-RAT measurement reporting criteria

The triggering of the event-triggered reporting for an inter-RAT measurement. All events concerning inter-RAT measurements are labelled 3x where x is a,b,c, ...

Event 3a: The estimated quality of the currently used UTRAN frequency is below a certain threshold **and** the estimated quality of the other system is above a certain threshold.

Event 3b: The estimated quality of other system is below a certain threshold.

Event 3c: The estimated quality of other system is above a certain threshold.

Event 3d: Change of best cell in other system.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Parameters required for each event	OP	1 to <maxMeas Event>		
>Inter-RAT event identity	MP		Inter-RAT event identity 10.3.7.24	
>Threshold own system	CV-clause 0		Integer (-115..0)	
>W	CV-clause 0		Real(0, 0.1..2.0 by step of 0.1)	In event 3a
>Threshold other system	CV-clause 1		Integer (-115..0)	In event 3a, 3b, 3c
>Hysteresis	MP		Real(0..7.5 by step of 0.5)	
>Time to trigger	MP		Time to trigger 10.3.7.64	Indicates the period of time <u>during which the event condition has to be satisfied, before between the timing of event detection and the timing of sending a Measurement Report.</u>
>Reporting cell status	OP		Reporting cell status 10.3.7.61	

Condition	Explanation
Clause 0	The IE is mandatory present if the IE "Inter-RAT event identity" is set to "3a", otherwise the IE is not needed
Clause 1	The IE is mandatory present if the IE "Inter-RAT event identity" is set to 3a, 3b or 3c, otherwise the IE is not needed

### 10.3.7.39 Intra-frequency measurement reporting criteria

The triggering of the event-triggered reporting for an intra-frequency measurement. All events concerning intra-frequency measurements are labelled 1x where x is a, b, c....

Event 1a: A Primary CPICH enters the Reporting Range (FDD only).

Event 1b: A Primary CPICH leaves the Reporting Range (FDD only).

Event 1c: A Non-active Primary CPICH becomes better than an active Primary CPICH (FDD only).

Event 1d: Change of best cell (FDD only).

Event 1e: A Primary CPICH becomes better than an absolute threshold (FDD only).

Event 1f: A Primary CPICH becomes worse than an absolute threshold (FDD only).

Event 1g: Change of best cell in TDD.

Event 1h: Timeslot ISCP below a certain threshold (TDD only).

Event 1i: Timeslot ISCP above a certain threshold (TDD only).

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Parameters required for each event	OP	1 to <maxMeasEvent>		
>Intra-frequency event identity	MP		Intra-frequency event identity 10.3.7.34	
>Triggering condition 1	CV-clause 0		Enumerated(Active set cells, Monitored set cells, Active set cells and monitored set cells)	Indicates which cells can trigger the event
>Triggering condition 2	CV-clause 6		Enumerated(Active set cells, Monitored set cells, Active set cells and monitored set cells, Detected set cells, Detected set cells and monitored set cells)	Indicates which cells can trigger the event
>Reporting Range Constant	CV-clause 2		Real(0..14.5 by step of 0.5)	In dB. In event 1a,1b.
>Cells forbidden to affect Reporting range	CV-clause 1	1 to <maxCellMeas>		In event 1a,1b
>>CHOICE mode	MP			
>>>FDD				
>>>>Primary CPICH info	MP		Primary CPICH info 10.3.6.60	

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>>TDD				
>>>>Primary CCPCH info	MP		Primary CCPCH info 10.3.6.57	
>W	CV-clause 2		Real(0.0..2.0 by step of 0.1)	
>Hysteresis	MP		Real(0..7.5 by step of 0.5)	In dB.
>Threshold used frequency	CV-clause 3		Integer (-115..165)	Range used depend on measurement quantity. CPICH RSCP -115..-25 dBm CPICH Ec/No -24..0 dB Pathloss 30..165dB ISCP -115..-25 dBm
>Reporting deactivation threshold	CV-clause 4		Integer(0, 1, 2, 3, 4, 5, 6, 7)	In event 1a Indicates the maximum number of cells allowed in the active set in order for event 1a to occur. 0 means not applicable .
>Replacement activation threshold	CV-clause 5		Integer(0, 1, 2, 3, 4, 5, 6, 7)	In event 1c Indicates the minimum number of cells allowed in the active set in order for event 1c to occur. 0 means not applicable
>Time to trigger	MP		Time to trigger 10.3.7.64	Indicates the period of time <u>during which the event condition has to be satisfied, before between the timing of event detection and the timing of sending a Measurement Report.</u> Time in ms
>Amount of reporting	CV-clause 7		Integer(1, 2, 4, 8, 16, 32, 64, Infinity)	In case the IE "Intra-frequency reporting criteria" is included in the IE "Inter-frequency measurement", this IE is not needed.
>Reporting interval	CV-clause 7		Integer(0, 250, 500, 1000, 2000, 4000, 8000, 16000)	Indicates the interval of periodical reporting when such reporting is triggered by an event. Interval in milliseconds. 0 means no periodical reporting. In case the IE "Intra- frequency reporting criteria" is included in the IE "Inter- frequency measurement", this IE is not needed.
>Reporting cell status	OP		Reporting cell status 10.3.7.61	

Condition	Explanation
<i>Clause 0</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1b" or "1f", otherwise the IE is not needed.
<i>Clause 1</i>	The IE is optional if the IE "Intra-frequency event identity" is set to "1a" or "1b", otherwise the IE is not needed.
<i>Clause 2</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1a" or "1b", otherwise the IE is not needed.
<i>Clause 3</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to , "1e", "1f", "1h" or "1i", otherwise the IE is not needed.
<i>Clause 4</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1a", otherwise the IE is not needed.
<i>Clause 5</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1c", otherwise the IE is not needed.
<i>Clause 6</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1a" or "1e", otherwise the IE is not needed.
<i>Clause 7</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1a" or "1c", otherwise the IE is not needed.



## 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 <maxMeas parEvent>		This IE is always required. Need is OP to align with ASN.1.
>>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 <del>between the timing of event detection and the timing of event</del> <u>during which the event condition has to be verified</u> <del>satisfied, before</del> 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
<i>UL-DCH/USCH</i>	If IE "Uplink transport channel type" is equal to "DCH" or "USCH" (TDD only) this IE is optional. Otherwise the IE is not needed.

## 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.

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 triggered using two different mechanisms, periodical and event triggered. The reporting criteria are specified in the measurement control message.

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].

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":
  - 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;
    - 4> for each IE "Parameters required for each Event":
      - 5> for each uplink transport channel on which the UE is supposed to report (see below):
        - 6> 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":

6> 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:

2> 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

4> if the Pending-time-after-trigger timer for this event is not active:

5> if the IE "Pending time after trigger" is included:

6> 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> 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> if the IE "Traffic volume event identity" has value "4b":

4> if the IE "Time to trigger" is not present; and

4> if the Pending-time-after-trigger timer for this event is not active:

5> if the IE "Pending time after trigger" is included:

6> 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:

2> 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.

~~NOTE: The two reporting modes, periodical and event trigger are not exclusive. The UE may therefore be requested to report on both modes simultaneously.~~

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.

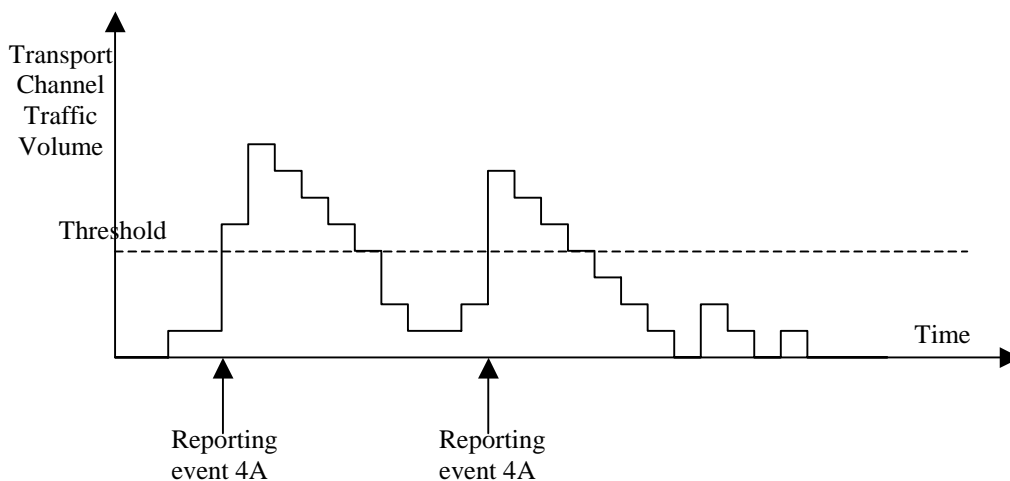
2> else:

3> 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> if the Tx interruption timer is not running; or
    - 4> if the Tx interruption timer is running and still has a value larger than the IE "Tx interruption after trigger" for the event, i.e. it was started earlier by another event with a larger value in IE "Tx interruption after trigger";
    - 5> start the Tx interruption timer with the value in the IE "Tx interruption after trigger" for this event;
  - 4> when it receives from the UTRAN a message causing the transition to CELL\_DCH state; or
  - 4> when the ~~time period indicated in the IE "Tx interruption timer after trigger"~~ elapses:
    - 5> stop the timer.
    - 5> resume these transmissions.
- 1> if the IE "Traffic volume measurement object" is not included:
  - 2> report on all the uplink transport channels as specified below.
- 1> if the IE "Traffic volume measurement object" is included:
  - 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:
  - 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 and set the IE "Average of RLC Buffer Payload" 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 and set the IE "Variance of RLC Buffer Payload" 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 and set the IE "RLC Buffers Payload" 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 and set the IE "Average of RLC Buffer Payload" 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 and set the IE "Variance of RLC Buffer Payload" 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> 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 and set the IE "RLC Buffers Payload" 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 and set the IE "Average of RLC Buffer Payload" 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 and set the IE "Variance of RLC Buffer Payload" 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.

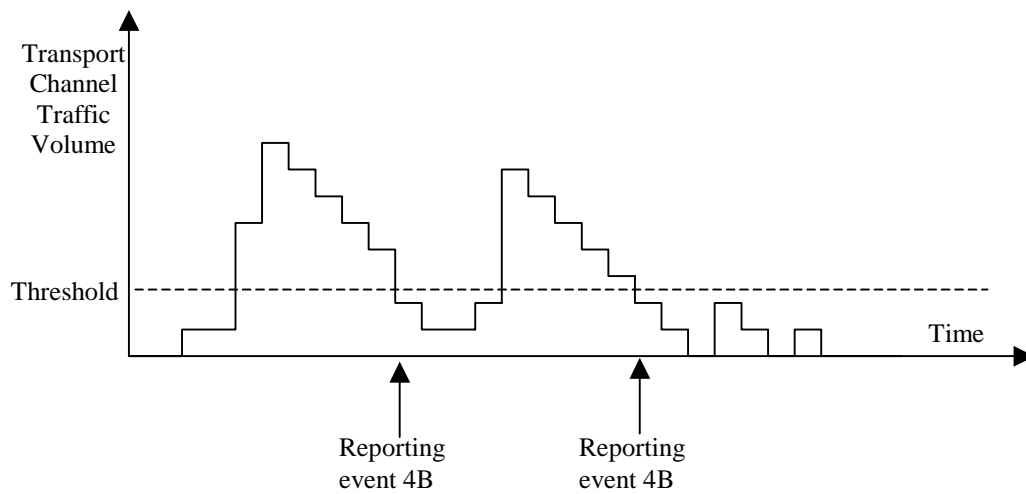
14.4.2.1 Reporting event 4 A: Transport Channel Traffic Volume becomes larger than an absolute threshold



**Figure 14.4.2.1-1: Event triggered report when Transport Channel Traffic Volume becomes larger than a certain threshold**

If the monitored Transport Channel Traffic Volume (TCTV) [15] becomes larger than an absolute threshold, i.e. if  $TCTV > \text{Reporting threshold}$ , this event could trigger a report. The event could be triggered again only if  $TCTV < \text{Reporting threshold}$  and later  $TCTV > \text{Reporting threshold}$  is verified again.

#### 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  $TCTV < \text{Reporting threshold}$ , this event could trigger a report. The event could be triggered again only if TCTV becomes bigger than the Reporting threshold and later  $TCTV < \text{Reporting threshold}$  is verified again.

CR-Form-v7

## CHANGE REQUEST

# **25.331 CR 1622** # rev **-** # Current version: **4.5.0** #

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	# RRC TVM Corrections		
<b>Source:</b>	# TSG-RAN WG2		
<b>Work item code:</b>	# TEI	<b>Date:</b>	# 13/08/2002
<b>Category:</b>	# <b>A</b>	<b>Release:</b>	# Rel-4
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (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)
			Rel-6 (Release 6)

<b>Reason for change:</b>	# The semantics description for the Time-to-trigger is erroneous. It is not clear how the Tx Interruption functionality works when multiple events are triggered before the Tx Interruption time elapses. This is allthemore complicated that different events could be configured with different "Tx Interruption after trigger" values. <del>A clarification of the fact that the two reporting modes could be configured at the same time was carried over from the MAC specification, since it seemed to be more relevant here.</del>
<b>Summary of change:</b>	# Corrected the semantics description of the Time-to-trigger Introduced a Note to clarify that both reporting modes could be configured at the same time. Clarified the Tx interruption functionality.
<b>Consequences if not approved:</b>	# Ambiguity in the specification.

<b>Clauses affected:</b>	# 10.3.7.19, 10.3.7.30, 10.3.7.39, 10.3.7.72, 14.4.2										
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">N</td> </tr> </table>	Y	N	#	N	#	N	#	N	Other core specifications	#
Y	N										
#	N										
#	N										
#	N										
		Test specifications									
		O&M Specifications									
<b>Other comments:</b>	#										



### **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.

### 10.3.7.19 Inter-frequency measurement reporting criteria

The triggering of the event-triggered reporting for an inter-frequency measurements. All events concerning inter-frequency measurements are labelled 2x where x is a,b,c, ...

Event 2a: Change of best frequency.

Event 2b: The estimated quality of the currently used frequency is below a certain threshold **and** the estimated quality of a non-used frequency is above a certain threshold.

Event 2c: The estimated quality of a non-used frequency is above a certain threshold.

Event 2d: The estimated quality of the currently used frequency is below a certain threshold.

Event 2e: The estimated quality of a non-used frequency is below a certain threshold.

Event 2f: The estimated quality of the currently used frequency is above a certain threshold.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Parameters required for each event	OP	1 to <maxMeas Event>		
>Inter-frequency event identity	MP		Inter-frequency event identity 10.3.7.14	
>Threshold used frequency	CV-clause 0		Integer(-115..0)	Ranges used depend on measurement quantity. CPICH Ec/No -24..0dB CPICH/Primary CCPCH RSCP -115..-25dBm
>W used frequency	CV-clause 2		Real(0, 0.1..2.0 by step of 0.1)	
>Hysteresis	MP		Real(0, 0.5..14.5 by step of 0.5)	In event 2a, 2b, 2c, 2d, 2e, 2f
>Time to trigger	MP		Time to trigger 10.3.7.64	Indicates the period of time during which the event <u>condition has to be satisfied, before between the timing of event detection and the timing of sending a Measurement Report.</u> Time in ms.
>Reporting cell status	OP		Reporting cell status 10.3.7.61	
>Parameters required for each non-used frequency	OP	1 to <maxFreq >		In this release, the first listed threshold and W parameter shall apply to all non-used frequencies.
>>Threshold non used frequency	CV-clause 1		Integer(-115..0)	Ranges used depend on measurement quantity. CPICH Ec/No -24..0dB CPICH/Primary CCPCH RSCP -115..-25dBm. This IE is not needed if the IE "Inter-frequency event identity" is set to 2a. However, it is specified to be mandatory to align with the ASN.1.
>>W non-used frequency	CV-clause 1		Real(0, 0.1..2.0 by step of 0.1)	

Condition	Explanation
Clause 0	This IE is mandatory present if the IE "Inter frequency event identity" is set to 2b, 2d, or 2f, otherwise the IE is not needed.
Clause 1	This IE is mandatory present if the IE "Inter frequency event identity" is set to 2a, 2b, 2c or 2e, otherwise the IE is not needed
Clause 2	This IE is mandatory present if the IE "Inter-frequency event identity" is set to 2a, 2b, 2d or 2f, otherwise the IE is not needed.

### 10.3.7.30 Inter-RAT measurement reporting criteria

The triggering of the event-triggered reporting for an inter-RAT measurement. All events concerning inter-RAT measurements are labelled 3x where x is a,b,c, ...

Event 3a: The estimated quality of the currently used UTRAN frequency is below a certain threshold **and** the estimated quality of the other system is above a certain threshold.

Event 3b: The estimated quality of other system is below a certain threshold.

Event 3c: The estimated quality of other system is above a certain threshold.

Event 3d: Change of best cell in other system.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Parameters required for each event	OP	1 to <maxMeas Event>		
>Inter-RAT event identity	MP		Inter-RAT event identity 10.3.7.24	
>Threshold own system	CV-clause 0		Integer (-115..0)	
>W	CV-clause 0		Real(0, 0.1..2.0 by step of 0.1)	In event 3a
>Threshold other system	CV-clause 1		Integer (-115..0)	In event 3a, 3b, 3c
>Hysteresis	MP		Real(0..7.5 by step of 0.5)	
>Time to trigger	MP		Time to trigger 10.3.7.64	Indicates the period of time <u>during which the event condition has to be satisfied, before between the timing of event detection and the timing of sending a Measurement Report.</u>
>Reporting cell status	OP		Reporting cell status 10.3.7.61	

Condition	Explanation
Clause 0	The IE is mandatory present if the IE "Inter-RAT event identity" is set to "3a", otherwise the IE is not needed
Clause 1	The IE is mandatory present if the IE "Inter-RAT event identity" is set to 3a, 3b or 3c, otherwise the IE is not needed

### 10.3.7.39 Intra-frequency measurement reporting criteria

The triggering of the event-triggered reporting for an intra-frequency measurement. All events concerning intra-frequency measurements are labelled 1x where x is a, b, c....

Event 1a: A Primary CPICH enters the Reporting Range (FDD only).

Event 1b: A Primary CPICH leaves the Reporting Range (FDD only).

Event 1c: A Non-active Primary CPICH becomes better than an active Primary CPICH (FDD only).

Event 1d: Change of best cell (FDD only).

Event 1e: A Primary CPICH becomes better than an absolute threshold (FDD only).

Event 1f: A Primary CPICH becomes worse than an absolute threshold (FDD only).

Event 1g: Change of best cell in TDD.

Event 1h: Timeslot ISCP below a certain threshold (TDD only).

Event 1i: Timeslot ISCP above a certain threshold (TDD only).

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Parameters required for each event	OP	1 to <maxMeasEvent>		
>Intra-frequency event identity	MP		Intra-frequency event identity 10.3.7.34	
>Triggering condition 1	CV-clause 0		Enumerated(Active set cells, Monitored set cells, Active set cells and monitored set cells)	Indicates which cells can trigger the event
>Triggering condition 2	CV-clause 6		Enumerated(Active set cells, Monitored set cells, Active set cells and monitored set cells, Detected set cells, Detected set cells and monitored set cells)	Indicates which cells can trigger the event
>Reporting Range Constant	CV-clause 2		Real(0..14.5 by step of 0.5)	In dB. In event 1a,1b.
>Cells forbidden to affect Reporting range	CV-clause 1	1 to <maxCellMeas>		In event 1a,1b
>>CHOICE mode	MP			
>>>FDD				
>>>>Primary CPICH info	MP		Primary CPICH info 10.3.6.60	

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>>TDD				
>>>>Primary CCPCH info	MP		Primary CCPCH info 10.3.6.57	
>W	CV-clause 2		Real(0.0..2.0 by step of 0.1)	
>Hysteresis	MP		Real(0..7.5 by step of 0.5)	In dB.
>Threshold used frequency	CV-clause 3		Integer (-115..165)	Range used depend on measurement quantity. CPICH RSCP -115..-25 dBm CPICH Ec/No -24..0 dB Pathloss 30..165dB ISCP -115..-25 dBm
>Reporting deactivation threshold	CV-clause 4		Integer(0, 1, 2, 3, 4, 5, 6, 7)	In event 1a Indicates the maximum number of cells allowed in the active set in order for event 1a to occur. 0 means not applicable .
>Replacement activation threshold	CV-clause 5		Integer(0, 1, 2, 3, 4, 5, 6, 7)	In event 1c Indicates the minimum number of cells allowed in the active set in order for event 1c to occur. 0 means not applicable
>Time to trigger	MP		Time to trigger 10.3.7.64	Indicates the period of time <u>during which the event</u> <u>condition has to be satisfied,</u> <u>before between the timing of</u> <u>event detection and the timing</u> <u>of sending a Measurement</u> <u>Report.</u> Time in ms
>Amount of reporting	CV-clause 7		Integer(1, 2, 4, 8, 16, 32, 64, Infinity)	In case the IE "Intra-frequency reporting criteria" is included in the IE "Inter-frequency measurement", this IE is not needed.
>Reporting interval	CV-clause 7		Integer(0, 250, 500, 1000, 2000, 4000, 8000, 16000)	Indicates the interval of periodical reporting when such reporting is triggered by an event. Interval in milliseconds. 0 means no periodical reporting. In case the IE "Intra- frequency reporting criteria" is included in the IE "Inter- frequency measurement", this IE is not needed.
>Reporting cell status	OP		Reporting cell status 10.3.7.61	

Condition	Explanation
<i>Clause 0</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1b" or "1f", otherwise the IE is not needed.
<i>Clause 1</i>	The IE is optional if the IE "Intra-frequency event identity" is set to "1a" or "1b", otherwise the IE is not needed.
<i>Clause 2</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1a" or "1b", otherwise the IE is not needed.
<i>Clause 3</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to , "1e", "1f", "1h" or "1i", otherwise the IE is not needed.
<i>Clause 4</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1a", otherwise the IE is not needed.
<i>Clause 5</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1c", otherwise the IE is not needed.
<i>Clause 6</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1a" or "1e", otherwise the IE is not needed.
<i>Clause 7</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1a" or "1c", otherwise the IE is not needed.

### 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 <maxMeas parEvent>		This IE is always required. Need is OP to align with ASN.1.
>>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 <del>between the timing of event detection and the timing of event</del> <u>during which the event condition has to be verified</u> <del>satisfied, before</del> 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
<i>UL-DCH/USCH</i>	If IE "Uplink transport channel type" is equal to "DCH" or "USCH" (TDD only) this IE is optional. Otherwise the IE is not needed.

## 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.

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 triggered using two different mechanisms, periodical and event triggered. The reporting criteria are specified in the measurement control message.

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].

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":
  - 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;
    - 4> for each IE "Parameters required for each Event":
      - 5> for each uplink transport channel on which the UE is supposed to report (see below):
        - 6> 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":



6> 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:

2> 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

4> if the Pending-time-after-trigger timer for this event is not active:

5> if the IE "Pending time after trigger" is included:

6> 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> 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> if the IE "Traffic volume event identity" has value "4b":

4> if the IE "Time to trigger" is not present; and

4> if the Pending-time-after-trigger timer for this event is not active:

5> if the IE "Pending time after trigger" is included:

6> 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:

2> 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.

~~NOTE: The two reporting modes, periodical and event trigger are not exclusive. The UE may therefore be requested to report on both modes simultaneously.~~

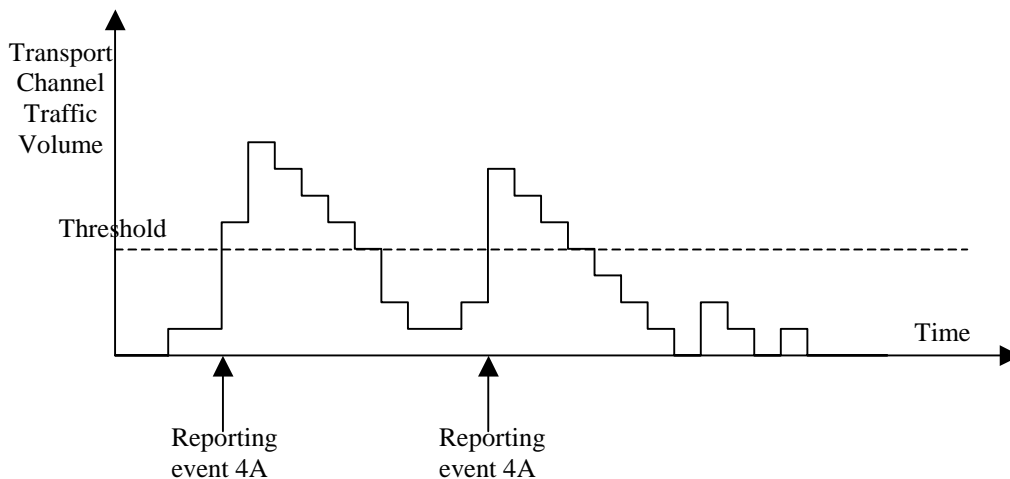
When a report is triggered for a given IE "Measurement Identity", the UE shall:

- 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> 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> if the Tx interruption timer is not running; or
    - 4> if the Tx interruption timer is running and still has a value larger than the IE "Tx interruption after trigger" for the event, i.e. it was started earlier by another event with a larger value in IE "Tx interruption after trigger:
      - 5> start the Tx interruption timer with the value in the IE "Tx interruption after trigger" for this event;
    - 4> when it receives from the UTRAN a message causing the transition to CELL\_DCH state; or
    - 4> when the ~~time period indicated in the IE "Tx interruption timer after trigger"~~ timer after trigger elapses:
      - 5> stop the timer.
      - 5> resume these transmissions.
- 1> if the IE "Traffic volume measurement object" is not included:
  - 2> report on all the uplink transport channels as specified below.
- 1> if the IE "Traffic volume measurement object" is included:
  - 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:
  - 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 and set the IE "Average of RLC Buffer Payload" 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 and set the IE "Variance of RLC Buffer Payload" 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 and set the IE "RLC Buffers Payload" 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 and set the IE "Average of RLC Buffer Payload" 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 and set the IE "Variance of RLC Buffer Payload" 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> 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 and set the IE "RLC Buffers Payload" 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 and set the IE "Average of RLC Buffer Payload" 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 and set the IE "Variance of RLC Buffer Payload" 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.

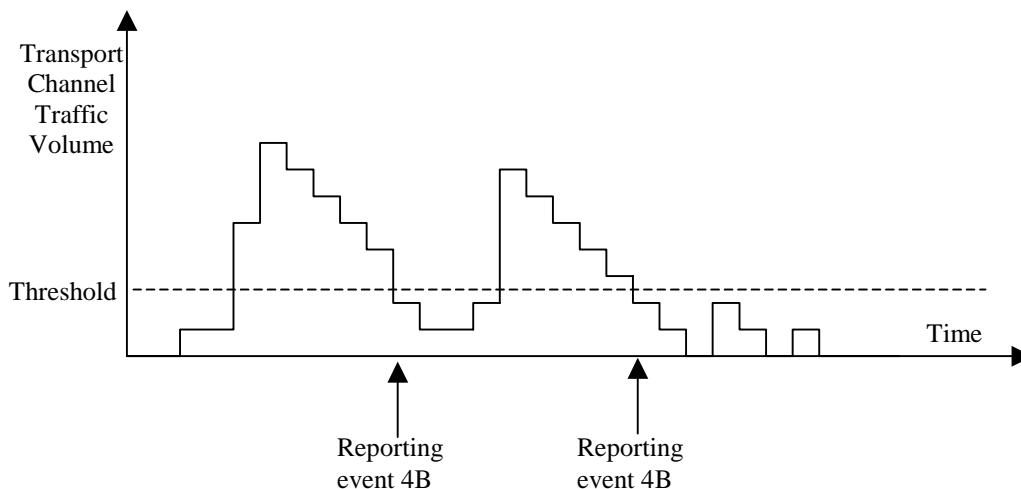
#### 14.4.2.1 Reporting event 4 A: Transport Channel Traffic Volume becomes larger than an absolute threshold



**Figure 14.4.2.1-1: Event triggered report when Transport Channel Traffic Volume becomes larger than a certain threshold**

If the monitored Transport Channel Traffic Volume (TCTV) [15] becomes larger than an absolute threshold, i.e. if  $TCTV > \text{Reporting threshold}$ , this event could trigger a report. The event could be triggered again only if  $TCTV < \text{Reporting threshold}$  and later  $TCTV > \text{Reporting threshold}$  is verified again.

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  $TCTV < \text{Reporting threshold}$ , this event could trigger a report. The event could be triggered again only if TCTV becomes bigger than the Reporting threshold and later  $TCTV < \text{Reporting threshold}$  is verified again.

## CHANGE REQUEST

# **25.331 CR 1623** # rev **-** # Current version: **5.1.0** #

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	# RRC TVM Corrections		
<b>Source:</b>	# TSG-RAN WG2		
<b>Work item code:</b>	# TEI	<b>Date:</b>	# 13/08/2002
<b>Category:</b>	# <b>A</b>	<b>Release:</b>	# Rel-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (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)
			Rel-6 (Release 6)

<b>Reason for change:</b>	# The semantics description for the Time-to-trigger is erroneous. It is not clear how the Tx Interruption functionality works when multiple events are triggered before the Tx Interruption time elapses. This is allthemore complicated that different events could be configured with different "Tx Interruption after trigger" values. <del>A clarification of the fact that the two reporting modes could be configured at the same time was carried over from the MAC specification, since it seemed to be more relevant here.</del>
<b>Summary of change:</b>	# Corrected the semantics description of the Time-to-trigger Introduced a Note to clarify that both reporting modes could be configured at the same time. Clarified the Tx interruption functionality.
<b>Consequences if not approved:</b>	# Ambiguity in the specification.

<b>Clauses affected:</b>	# 10.3.7.19, 10.3.7.30, 10.3.7.39, 10.3.7.72, 14.4.2		
<b>Other specs affected:</b>	#	Y N	#
	#	N	
	#	N	
<b>Other comments:</b>	#		

### **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.

### 10.3.7.19 Inter-frequency measurement reporting criteria

The triggering of the event-triggered reporting for an inter-frequency measurements. All events concerning inter-frequency measurements are labelled 2x where x is a,b,c, ...

Event 2a: Change of best frequency.

Event 2b: The estimated quality of the currently used frequency is below a certain threshold **and** the estimated quality of a non-used frequency is above a certain threshold.

Event 2c: The estimated quality of a non-used frequency is above a certain threshold.

Event 2d: The estimated quality of the currently used frequency is below a certain threshold.

Event 2e: The estimated quality of a non-used frequency is below a certain threshold.

Event 2f: The estimated quality of the currently used frequency is above a certain threshold.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Parameters required for each event	OP	1 to <maxMeas Event>		
>Inter-frequency event identity	MP		Inter-frequency event identity 10.3.7.14	
>Threshold used frequency	CV-clause 0		Integer(-115..0)	Ranges used depend on measurement quantity. CPICH Ec/No -24..0dB CPICH/Primary CCPCH RSCP -115..-25dBm
>W used frequency	CV-clause 2		Real(0, 0.1..2.0 by step of 0.1)	
>Hysteresis	MP		Real(0, 0.5..14.5 by step of 0.5)	In event 2a, 2b, 2c, 2d, 2e, 2f
>Time to trigger	MP		Time to trigger 10.3.7.64	Indicates the period of time during which the event <u>condition has to be satisfied, before between the timing of event detection and the timing of sending a Measurement Report.</u> Time in ms.
>Reporting cell status	OP		Reporting cell status 10.3.7.61	
>Parameters required for each non-used frequency	OP	1 to <maxFreq >		In this release, the first listed threshold and W parameter shall apply to all non-used frequencies.
>>Threshold non used frequency	CV-clause 1		Integer(-115..0)	Ranges used depend on measurement quantity. CPICH Ec/No -24..0dB CPICH/Primary CCPCH RSCP -115..-25dBm. This IE is not needed if the IE "Inter-frequency event identity" is set to 2a. However, it is specified to be mandatory to align with the ASN.1.
>>W non-used frequency	CV-clause 1		Real(0, 0.1..2.0 by step of 0.1)	



Condition	Explanation
Clause 0	This IE is mandatory present if the IE "Inter frequency event identity" is set to 2b, 2d, or 2f, otherwise the IE is not needed.
Clause 1	This IE is mandatory present if the IE "Inter frequency event identity" is set to 2a, 2b, 2c or 2e, otherwise the IE is not needed
Clause 2	This IE is mandatory present if the IE "Inter-frequency event identity" is set to 2a, 2b, 2d or 2f, otherwise the IE is not needed.

### 10.3.7.30 Inter-RAT measurement reporting criteria

The triggering of the event-triggered reporting for an inter-RAT measurement. All events concerning inter-RAT measurements are labelled 3x where x is a,b,c, ...

Event 3a: The estimated quality of the currently used UTRAN frequency is below a certain threshold **and** the estimated quality of the other system is above a certain threshold.

Event 3b: The estimated quality of other system is below a certain threshold.

Event 3c: The estimated quality of other system is above a certain threshold.

Event 3d: Change of best cell in other system.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Parameters required for each event	OP	1 to <maxMeas Event>		
>Inter-RAT event identity	MP		Inter-RAT event identity 10.3.7.24	
>Threshold own system	CV-clause 0		Integer (-115..0)	
>W	CV-clause 0		Real(0, 0.1..2.0 by step of 0.1)	In event 3a
>Threshold other system	CV-clause 1		Integer (-115..0)	In event 3a, 3b, 3c
>Hysteresis	MP		Real(0..7.5 by step of 0.5)	
>Time to trigger	MP		Time to trigger 10.3.7.64	Indicates the period of time <u>during which the event condition has to be satisfied, before between the timing of event detection and the timing of sending a Measurement Report.</u>
>Reporting cell status	OP		Reporting cell status 10.3.7.61	

Condition	Explanation
Clause 0	The IE is mandatory present if the IE "Inter-RAT event identity" is set to "3a", otherwise the IE is not needed
Clause 1	The IE is mandatory present if the IE "Inter-RAT event identity" is set to 3a, 3b or 3c, otherwise the IE is not needed

### 10.3.7.39 Intra-frequency measurement reporting criteria

The triggering of the event-triggered reporting for an intra-frequency measurement. All events concerning intra-frequency measurements are labelled 1x where x is a, b, c....

Event 1a: A Primary CPICH enters the Reporting Range (FDD only).

Event 1b: A Primary CPICH leaves the Reporting Range (FDD only).

Event 1c: A Non-active Primary CPICH becomes better than an active Primary CPICH (FDD only).

Event 1d: Change of best cell (FDD only).

Event 1e: A Primary CPICH becomes better than an absolute threshold (FDD only).

Event 1f: A Primary CPICH becomes worse than an absolute threshold (FDD only).

Event 1g: Change of best cell in TDD.

Event 1h: Timeslot ISCP below a certain threshold (TDD only).

Event 1i: Timeslot ISCP above a certain threshold (TDD only).

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Parameters required for each event	OP	1 to <maxMeasEvent>		
>Intra-frequency event identity	MP		Intra-frequency event identity 10.3.7.34	
>Triggering condition 1	CV-clause 0		Enumerated(Active set cells, Monitored set cells, Active set cells and monitored set cells)	Indicates which cells can trigger the event
>Triggering condition 2	CV-clause 6		Enumerated(Active set cells, Monitored set cells, Active set cells and monitored set cells, Detected set cells, Detected set cells and monitored set cells)	Indicates which cells can trigger the event
>Reporting Range Constant	CV-clause 2		Real(0..14.5 by step of 0.5)	In dB. In event 1a,1b.
>Cells forbidden to affect Reporting range	CV-clause 1	1 to <maxCellMeas>		In event 1a,1b
>>CHOICE mode	MP			
>>>FDD				
>>>>Primary CPICH info	MP		Primary CPICH info 10.3.6.60	

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>>TDD				
>>>>Primary CCPCH info	MP		Primary CCPCH info 10.3.6.57	
>W	CV-clause 2		Real(0.0..2.0 by step of 0.1)	
>Hysteresis	MP		Real(0..7.5 by step of 0.5)	In dB.
>Threshold used frequency	CV-clause 3		Integer (-115..165)	Range used depend on measurement quantity. CPICH RSCP -115..-25 dBm CPICH Ec/No -24..0 dB Pathloss 30..165dB ISCP -115..-25 dBm
>Reporting deactivation threshold	CV-clause 4		Integer(0, 1, 2, 3, 4, 5, 6, 7)	In event 1a Indicates the maximum number of cells allowed in the active set in order for event 1a to occur. 0 means not applicable .
>Replacement activation threshold	CV-clause 5		Integer(0, 1, 2, 3, 4, 5, 6, 7)	In event 1c Indicates the minimum number of cells allowed in the active set in order for event 1c to occur. 0 means not applicable
>Time to trigger	MP		Time to trigger 10.3.7.64	Indicates the period of time <u>during which the event condition has to be satisfied, before between the timing of event detection and the timing of sending a Measurement Report.</u> Time in ms
>Amount of reporting	CV-clause 7		Integer(1, 2, 4, 8, 16, 32, 64, Infinity)	In case the IE "Intra-frequency reporting criteria" is included in the IE "Inter-frequency measurement", this IE is not needed.
>Reporting interval	CV-clause 7		Integer(0, 250, 500, 1000, 2000, 4000, 8000, 16000)	Indicates the interval of periodical reporting when such reporting is triggered by an event. Interval in milliseconds. 0 means no periodical reporting. In case the IE "Intra- frequency reporting criteria" is included in the IE "Inter- frequency measurement", this IE is not needed.
>Reporting cell status	OP		Reporting cell status 10.3.7.61	

Condition	Explanation
<i>Clause 0</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1b" or "1f", otherwise the IE is not needed.
<i>Clause 1</i>	The IE is optional if the IE "Intra-frequency event identity" is set to "1a" or "1b", otherwise the IE is not needed.
<i>Clause 2</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1a" or "1b", otherwise the IE is not needed.
<i>Clause 3</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to , "1e", "1f", "1h" or "1i", otherwise the IE is not needed.
<i>Clause 4</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1a", otherwise the IE is not needed.
<i>Clause 5</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1c", otherwise the IE is not needed.
<i>Clause 6</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1a" or "1e", otherwise the IE is not needed.
<i>Clause 7</i>	The IE is mandatory present if the IE "Intra-frequency event identity" is set to "1a" or "1c", otherwise the IE is not needed.

## 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 <maxMeas parEvent>		This IE is always required. Need is OP to align with ASN.1.
>>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 <del>between the timing of event detection and the timing of event</del> <u>during which the event condition has to be verified</u> <del>satisfied, before</del> 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
<i>UL-DCH/USCH</i>	If IE "Uplink transport channel type" is equal to "DCH" or "USCH" (TDD only) this IE is optional. Otherwise the IE is not needed.

## 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.

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 triggered using two different mechanisms, periodical and event triggered. The reporting criteria are specified in the measurement control message.

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].

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":
  - 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;
    - 4> for each IE "Parameters required for each Event":
      - 5> for each uplink transport channel on which the UE is supposed to report (see below):
        - 6> 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":

6> 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:

2> 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

4> if the Pending-time-after-trigger timer for this event is not active:

5> if the IE "Pending time after trigger" is included:

6> 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> 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> if the IE "Traffic volume event identity" has value "4b":

4> if the IE "Time to trigger" is not present; and

4> if the Pending-time-after-trigger timer for this event is not active:

5> if the IE "Pending time after trigger" is included:

6> 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:

2> 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.

~~NOTE: The two reporting modes, periodical and event trigger are not exclusive. The UE may therefore be requested to report on both modes simultaneously.~~

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:

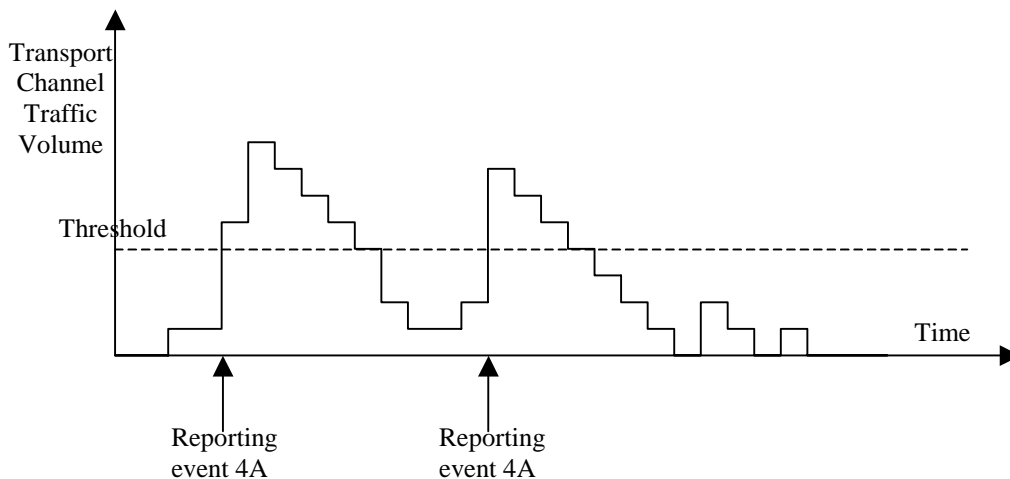
3> not include the IE "UL Transport Channel identity".



- 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> if the Tx interruption timer is not running; or
    - 4> if the Tx interruption timer is running and still has a value larger than the IE "Tx interruption after trigger" for the event, i.e. it was started earlier by another event with a larger value in IE "Tx interruption after trigger;
    - 5> start the Tx interruption timer with the value in the IE "Tx interruption after trigger" for this event;
  - 4> when it receives from the UTRAN a message causing the transition to CELL\_DCH state; or
  - 4> when the ~~time period indicated in the IE "Tx interruption timer after trigger"~~ elapses:
    - 5> stop the timer.
    - 5> resume these transmissions.
- 1> if the IE "Traffic volume measurement object" is not included:
  - 2> report on all the uplink transport channels as specified below.
- 1> if the IE "Traffic volume measurement object" is included:
  - 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:
  - 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 and set the IE "Average of RLC Buffer Payload" 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 and set the IE "Variance of RLC Buffer Payload" 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 and set the IE "RLC Buffers Payload" 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 and set the IE "Average of RLC Buffer Payload" 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 and set the IE "Variance of RLC Buffer Payload" 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> 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 and set the IE "RLC Buffers Payload" 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 and set the IE "Average of RLC Buffer Payload" 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 and set the IE "Variance of RLC Buffer Payload" 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.

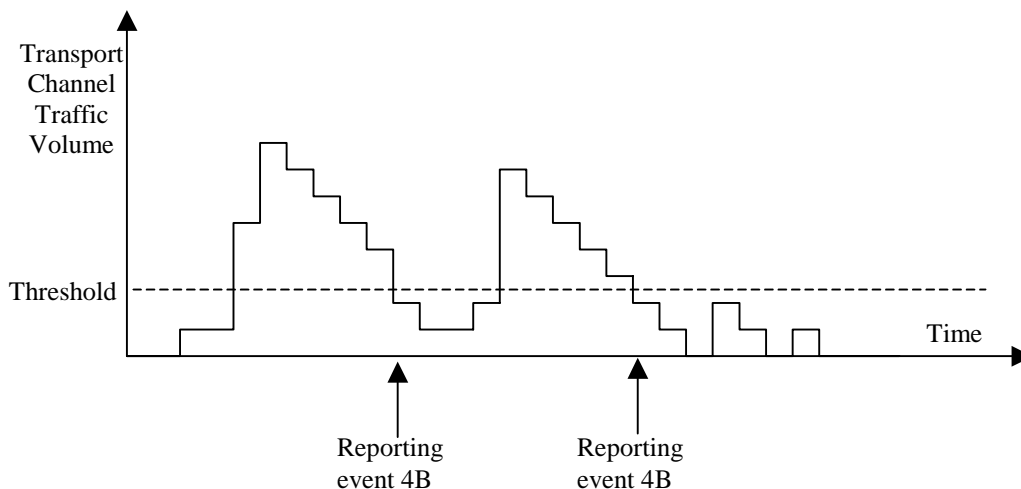
#### 14.4.2.1 Reporting event 4 A: Transport Channel Traffic Volume becomes larger than an absolute threshold



**Figure 14.4.2.1-1: Event triggered report when Transport Channel Traffic Volume becomes larger than a certain threshold**

If the monitored Transport Channel Traffic Volume (TCTV) [15] becomes larger than an absolute threshold, i.e. if  $TCTV > \text{Reporting threshold}$ , this event could trigger a report. The event could be triggered again only if  $TCTV < \text{Reporting threshold}$  and later  $TCTV > \text{Reporting threshold}$  is verified again.

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  $TCTV < \text{Reporting threshold}$ , this event could trigger a report. The event could be triggered again only if TCTV becomes bigger than the Reporting threshold and later  $TCTV < \text{Reporting threshold}$  is verified again.

CR-Form-v7

## CHANGE REQUEST

# **25.331 CR 1624** # rev **-** # Current version: **3.11.0** #

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	# Correction of Transmission Gap Distance semantics description		
<b>Source:</b>	# TSG-RAN WG2		
<b>Work item code:</b>	# TEI	<b>Date:</b>	# 13/08/2002
<b>Category:</b>	# <b>F</b>	<b>Release:</b>	# R99
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (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)
			Rel-6 (Release 6)

<b>Reason for change:</b>	# The current semantics description states that under certain conditions TGD should be set to zero, but this is not a possible value for this parameter. The link between presence of TGD and TGL2 has also been omitted.
<b>Summary of change:</b>	# Semantics description updated to say that TGD should be set to "undefined", and link to TGL2 in this case clarified.
	<b>Impact Analysis:</b> This is an isolated impact correction to the configuration of compressed mode, where the specification is currently incomplete. Specifically, in the case of: TGD - No backwards compatibility problems are envisaged as it is not possible to signal "zero" anyway TGL2 - No backwards compatibility problems are envisaged as it is not clear how a UE could make use of the parameter under these conditions.
<b>Consequences if not approved:</b>	# Possible confusion over what value should be set, leading to misinterpretation of the parameters.

<b>Clauses affected:</b>	# 10.3.6.33								
<b>Other specs affected:</b>	<table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px;">Y</td> <td style="border: 1px solid black; padding: 2px;">N</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;"></td> <td style="border: 1px solid black; padding: 2px;">X</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;"></td> <td style="border: 1px solid black; padding: 2px;">X</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;"></td> <td style="border: 1px solid black; padding: 2px;">X</td> </tr> </table> Other core specifications # Test specifications # O&M Specifications #	Y	N		X		X		X
Y	N								
	X								
	X								
	X								
<b>Other comments:</b>	#								

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.

## 10.3.6.33 DPCH compressed mode info

NOTE: Only for FDD.

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

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Transmission gap pattern sequence	MP	1 to <maxTGPS>		
>TGPSI	MP		TGPSI 10.3.6.82	
>TGPS Status Flag	MP		Enumerated(activate, deactivate)	This flag indicates whether the Transmission Gap Pattern Sequence shall be activated or deactivated.
>TGCFN	CV-Active		Integer (0..255)	Connection Frame Number of the first frame of the first pattern within the Transmission Gap Pattern Sequence.
>Transmission gap pattern sequence configuration parameters	OP			
>>TGMP	MP		Enumerated(TDD measurement, FDD measurement, GSM carrier RSSI measurement, GSM Initial BSIC identification, GSM BSIC re-confirmation, Multi-carrier measurement)	Transmission Gap pattern sequence Measurement Purpose.
>>TGPRC	MP		Integer (1..511, Infinity)	The number of transmission gap patterns within the Transmission Gap Pattern Sequence.
>>TGSN	MP		Integer (0..14)	Transmission Gap Starting Slot Number The slot number of the first transmission gap slot within the TGCFN.
>>TGL1	MP		Integer(1..14)	The length of the first Transmission Gap within the transmission gap pattern expressed in number of slots
>>TGL2	MD		Integer (1..14)	The length of the second Transmission Gap within the transmission gap pattern. If omitted, then TGL2=TGL1. <u>The value of TGL2 shall be ignored if TGD is set to "undefined"</u>

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>TGD	MP		Integer(15..269, undefined)	Transmission gap distance indicates the number of slots between starting slots of two consecutive transmission gaps within a transmission gap pattern. If there is only one transmission gap in the transmission gap pattern, this parameter shall be set to zeroundefined.
>>TGPL1	MP		Integer (1..144)	The duration of transmission gap pattern 1.
>>TGPL2	MD		Integer (1..144)	The duration of transmission gap pattern 2. If omitted, then TGPL2=TGPL1.
>>RPP	MP		Enumerated (mode 0, mode 1).	Recovery Period Power control mode during the frame after the transmission gap within the compressed frame. Indicates whether normal PC mode or compressed PC mode is applied
>>ITP	MP		Enumerated (mode 0, mode 1).	Initial Transmit Power is the uplink power control method to be used to compute the initial transmit power after the compressed mode gap.
>>CHOICE <i>UL/DL mode</i>	MP			
>>>DL only				Compressed mode used in DL only
>>>>Downlink compressed mode method	MP		Enumerated (puncturing, SF/2, higher layer scheduling)	Method for generating downlink compressed mode gap
>>>UL only				Compressed mode used in UL only
>>>>Uplink compressed mode method	MP		Enumerated (SF/2, higher layer scheduling)	Method for generating uplink compressed mode gap
>>>UL and DL				Compressed mode used in UL and DL
>>>>Downlink compressed mode method	MP		Enumerated (puncturing, SF/2, higher layer scheduling)	Method for generating downlink compressed mode gap
>>>>Uplink compressed mode method	MP		Enumerated (SF/2, higher layer scheduling)	Method for generating uplink compressed mode gap
>>Downlink frame type	MP		Enumerated (A, B)	
>>DeltaSIR1	MP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE during the frame containing the start of the first transmission gap in the transmission gap pattern (without including the effect of the bit-rate increase)
>>DeltaSIRafter1	MP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE one frame after the frame containing the start of the first transmission

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>DeltaSIR2	OP		Real(0..3 by step of 0.1)	gap in the transmission gap pattern. Delta in DL SIR target value to be set in the UE during the frame containing the start of the second transmission gap in the transmission gap pattern (without including the effect of the bit-rate increase) When omitted, DeltaSIR2 = DeltaSIR1.
>>DeltaSIRafter2	OP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE one frame after the frame containing the start of the second transmission gap in the transmission gap pattern. When omitted, DeltaSIRafter2 = DeltaSIRafter1.
>>N Identify abort	CV-Initial BSIC		Integer(1..12 8)	Indicates the maximum number of repeats of patterns that the UE shall use to attempt to decode the unknown BSIC of the GSM cell in the initial BSIC identification procedure
>>T Reconfirm abort	CV-Re-confirm BSIC		Real(0.5..10.0 by step of 0.5)	Indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure. The time is given in steps of 0.5 seconds.

Condition	Explanation
Active	This IE is mandatory present when the value of the IE "TGPS Status Flag" is "Activate" and not needed otherwise.
Initial BSIC	This IE is mandatory present when the value of the IE "TGMP" is set to "GSM Initial BSIC identification" and not needed otherwise.
Re-confirm BSIC	This IE is mandatory present when the value of the IE "TGMP" is set to "GSM BSIC re-confirmation" and not needed otherwise.



CR-Form-v7

## CHANGE REQUEST

# 25.331 CR 1625 # rev - # Current version: 4.5.0 #

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	# Correction of Transmission Gap Distance semantics description		
<b>Source:</b>	# TSG-RAN WG2		
<b>Work item code:</b>	# TEI	<b>Date:</b>	# 13/08/2002
<b>Category:</b>	# <b>A</b>	<b>Release:</b>	# 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)
		Rel-6	(Release 6)

<b>Reason for change:</b>	# The current semantics description states that under certain conditions TGD should be set to zero, but this is not a possible value for this parameter. The link between presence of TGD and TGL2 has also been omitted.
<b>Summary of change:</b>	# Semantics description updated to say that TGD should be set to "undefined", and link to TGL2 in this case clarified.
<b>Consequences if not approved:</b>	# Possible confusion over what value should be set, leading to misinterpretation of the parameters.

<b>Clauses affected:</b>	# 10.3.6.33				
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications #	Y	N	#	X
Y	N				
#	X				
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">X</td> </tr> </table> Test specifications #	#	X		
#	X				
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">X</td> </tr> </table> O&M Specifications #	#	X		
#	X				
<b>Other comments:</b>	#				

### How to create CRs using this form:

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- 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.

## 10.3.6.33 DPCH compressed mode info

NOTE: Only for FDD.

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

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Transmission gap pattern sequence	MP	1 to <maxTGPS>		
>TGPSI	MP		TGPSI 10.3.6.82	
>TGPS Status Flag	MP		Enumerated(activate, deactivate)	This flag indicates whether the Transmission Gap Pattern Sequence shall be activated or deactivated.
>TGCFN	CV-Active		Integer (0..255)	Connection Frame Number of the first frame of the first pattern within the Transmission Gap Pattern Sequence.
>Transmission gap pattern sequence configuration parameters	OP			
>>TGMP	MP		Enumerated(TDD measurement, FDD measurement, GSM carrier RSSI measurement, GSM Initial BSIC identification, GSM BSIC re-confirmation, Multi-carrier measurement)	Transmission Gap pattern sequence Measurement Purpose.
>>TGPRC	MP		Integer (1..511, Infinity)	The number of transmission gap patterns within the Transmission Gap Pattern Sequence.
>>TGSN	MP		Integer (0..14)	Transmission Gap Starting Slot Number The slot number of the first transmission gap slot within the TGCFN.
>>TGL1	MP		Integer(1..14)	The length of the first Transmission Gap within the transmission gap pattern expressed in number of slots
>>TGL2	MD		Integer (1..14)	The length of the second Transmission Gap within the transmission gap pattern. If omitted, then TGL2=TGL1. <u>The value of TGL2 shall be ignored if TGD is set to "undefined"</u>

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>TGD	MP		Integer(15..269, undefined)	Transmission gap distance indicates the number of slots between starting slots of two consecutive transmission gaps within a transmission gap pattern. If there is only one transmission gap in the transmission gap pattern, this parameter shall be set to zeroundefined.
>>TGPL1	MP		Integer (1..144)	The duration of transmission gap pattern 1.
>>TGPL2	MD		Integer (1..144)	The duration of transmission gap pattern 2. If omitted, then TGPL2=TGPL1.
>>RPP	MP		Enumerated (mode 0, mode 1).	Recovery Period Power control mode during the frame after the transmission gap within the compressed frame. Indicates whether normal PC mode or compressed PC mode is applied
>>ITP	MP		Enumerated (mode 0, mode 1).	Initial Transmit Power is the uplink power control method to be used to compute the initial transmit power after the compressed mode gap.
>>CHOICE <i>UL/DL mode</i>	MP			
>>>DL only				Compressed mode used in DL only
>>>>Downlink compressed mode method	MP		Enumerated (puncturing, SF/2, higher layer scheduling)	Method for generating downlink compressed mode gap
>>>UL only				Compressed mode used in UL only
>>>>Uplink compressed mode method	MP		Enumerated (SF/2, higher layer scheduling)	Method for generating uplink compressed mode gap
>>>UL and DL				Compressed mode used in UL and DL
>>>>Downlink compressed mode method	MP		Enumerated (puncturing, SF/2, higher layer scheduling)	Method for generating downlink compressed mode gap
>>>>Uplink compressed mode method	MP		Enumerated (SF/2, higher layer scheduling)	Method for generating uplink compressed mode gap
>>Downlink frame type	MP		Enumerated (A, B)	
>>DeltaSIR1	MP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE during the frame containing the start of the first transmission gap in the transmission gap pattern (without including the effect of the bit-rate increase)
>>DeltaSIRafter1	MP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE one frame after the frame containing the start of the first transmission

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>DeltaSIR2	OP		Real(0..3 by step of 0.1)	gap in the transmission gap pattern. Delta in DL SIR target value to be set in the UE during the frame containing the start of the second transmission gap in the transmission gap pattern (without including the effect of the bit-rate increase) When omitted, DeltaSIR2 = DeltaSIR1.
>>DeltaSIRafter2	OP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE one frame after the frame containing the start of the second transmission gap in the transmission gap pattern. When omitted, DeltaSIRafter2 = DeltaSIRafter1.
>>N Identify abort	<i>CV-Initial BSIC</i>		Integer(1..12 8)	Indicates the maximum number of repeats of patterns that the UE shall use to attempt to decode the unknown BSIC of the GSM cell in the initial BSIC identification procedure
>>T Reconfirm abort	<i>CV-Re-confirm BSIC</i>		Real(0.5..10.0 by step of 0.5)	Indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure. The time is given in steps of 0.5 seconds.

Condition	Explanation
<i>Active</i>	This IE is mandatory present when the value of the IE "TGPS Status Flag" is "Activate" and not needed otherwise.
<i>Initial BSIC</i>	This IE is mandatory present when the value of the IE "TGMP" is set to "GSM Initial BSIC identification" and not needed otherwise.
<i>Re-confirm BSIC</i>	This IE is mandatory present when the value of the IE "TGMP" is set to "GSM BSIC re-confirmation" and not needed otherwise.

CR-Form-v7

## CHANGE REQUEST

# 25.331 CR 1626 # rev - # Current version: 5.1.0 #

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	# Correction of Transmission Gap Distance semantics description		
<b>Source:</b>	# TSG-RAN WG2		
<b>Work item code:</b>	# TEI	<b>Date:</b>	# 13/08/2002
<b>Category:</b>	# <b>A</b>	<b>Release:</b>	# 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)
		Rel-6	(Release 6)

<b>Reason for change:</b>	# The current semantics description states that under certain conditions TGD should be set to zero, but this is not a possible value for this parameter. The link between presence of TGD and TGL2 has also been omitted.
<b>Summary of change:</b>	# Semantics description updated to say that TGD should be set to "undefined", and link to TGL2 in this case clarified.
<b>Consequences if not approved:</b>	# Possible confusion over what value should be set, leading to misinterpretation of the parameters.

<b>Clauses affected:</b>	# 10.3.6.33								
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 20px;">Y</td> <td style="width: 20px;">N</td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications # <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">X</td> </tr> </table> Test specifications # <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">X</td> </tr> </table> O&M Specifications #	Y	N	#	X	#	X	#	X
Y	N								
#	X								
#	X								
#	X								
<b>Other comments:</b>	#								

### How to create CRs using this form:

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- 1) Fill out the above form. The symbols above marked # contain pop-up help information about the field that they are closest to.
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- 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.

## 10.3.6.33 DPCH compressed mode info

NOTE: Only for FDD.

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

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Transmission gap pattern sequence	MP	1 to <maxTGPS>		
>TGPSI	MP		TGPSI 10.3.6.82	
>TGPS Status Flag	MP		Enumerated(activate, deactivate)	This flag indicates whether the Transmission Gap Pattern Sequence shall be activated or deactivated.
>TGCFN	CV-Active		Integer (0..255)	Connection Frame Number of the first frame of the first pattern within the Transmission Gap Pattern Sequence.
>Transmission gap pattern sequence configuration parameters	OP			
>>TGMP	MP		Enumerated(TDD measurement, FDD measurement, GSM carrier RSSI measurement, GSM Initial BSIC identification, GSM BSIC re-confirmation, Multi-carrier measurement)	Transmission Gap pattern sequence Measurement Purpose.
>>TGPRC	MP		Integer (1..511, Infinity)	The number of transmission gap patterns within the Transmission Gap Pattern Sequence.
>>TGSN	MP		Integer (0..14)	Transmission Gap Starting Slot Number The slot number of the first transmission gap slot within the TGCFN.
>>TGL1	MP		Integer(1..14)	The length of the first Transmission Gap within the transmission gap pattern expressed in number of slots
>>TGL2	MD		Integer (1..14)	The length of the second Transmission Gap within the transmission gap pattern. If omitted, then TGL2=TGL1. <u>The value of TGL2 shall be ignored if TGD is set to "undefined"</u>



Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>TGD	MP		Integer(15..269, undefined)	Transmission gap distance indicates the number of slots between starting slots of two consecutive transmission gaps within a transmission gap pattern. If there is only one transmission gap in the transmission gap pattern, this parameter shall be set to zeroundefined.
>>TGPL1	MP		Integer (1..144)	The duration of transmission gap pattern 1.
>>TGPL2	MD		Integer (1..144)	The duration of transmission gap pattern 2. If omitted, then TGPL2=TGPL1.
>>RPP	MP		Enumerated (mode 0, mode 1).	Recovery Period Power control mode during the frame after the transmission gap within the compressed frame. Indicates whether normal PC mode or compressed PC mode is applied
>>ITP	MP		Enumerated (mode 0, mode 1).	Initial Transmit Power is the uplink power control method to be used to compute the initial transmit power after the compressed mode gap.
>>CHOICE <i>UL/DL mode</i>	MP			
>>>DL only				Compressed mode used in DL only
>>>>Downlink compressed mode method	MP		Enumerated (puncturing, SF/2, higher layer scheduling)	Method for generating downlink compressed mode gap
>>>UL only				Compressed mode used in UL only
>>>>Uplink compressed mode method	MP		Enumerated (SF/2, higher layer scheduling)	Method for generating uplink compressed mode gap
>>>UL and DL				Compressed mode used in UL and DL
>>>>Downlink compressed mode method	MP		Enumerated (puncturing, SF/2, higher layer scheduling)	Method for generating downlink compressed mode gap
>>>>Uplink compressed mode method	MP		Enumerated (SF/2, higher layer scheduling)	Method for generating uplink compressed mode gap
>>Downlink frame type	MP		Enumerated (A, B)	
>>DeltaSIR1	MP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE during the frame containing the start of the first transmission gap in the transmission gap pattern (without including the effect of the bit-rate increase)
>>DeltaSIRafter1	MP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE one frame after the frame containing the start of the first transmission

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>DeltaSIR2	OP		Real(0..3 by step of 0.1)	gap in the transmission gap pattern. Delta in DL SIR target value to be set in the UE during the frame containing the start of the second transmission gap in the transmission gap pattern (without including the effect of the bit-rate increase) When omitted, DeltaSIR2 = DeltaSIR1.
>>DeltaSIRafter2	OP		Real(0..3 by step of 0.1)	Delta in DL SIR target value to be set in the UE one frame after the frame containing the start of the second transmission gap in the transmission gap pattern. When omitted, DeltaSIRafter2 = DeltaSIRafter1.
>>N Identify abort	<i>CV-Initial BSIC</i>		Integer(1..12 8)	Indicates the maximum number of repeats of patterns that the UE shall use to attempt to decode the unknown BSIC of the GSM cell in the initial BSIC identification procedure
>>T Reconfirm abort	<i>CV-Re-confirm BSIC</i>		Real(0.5..10.0 by step of 0.5)	Indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure. The time is given in steps of 0.5 seconds.

Condition	Explanation
<i>Active</i>	This IE is mandatory present when the value of the IE "TGPS Status Flag" is "Activate" and not needed otherwise.
<i>Initial BSIC</i>	This IE is mandatory present when the value of the IE "TGMP" is set to "GSM Initial BSIC identification" and not needed otherwise.
<i>Re-confirm BSIC</i>	This IE is mandatory present when the value of the IE "TGMP" is set to "GSM BSIC re-confirmation" and not needed otherwise.

CR-Form-v7

## CHANGE REQUEST

# 25.331 CR 1627 # rev - # Current version: 3.11.0 #

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	# Corrections to Active Set Update and simultaneous reconfiguration		
<b>Source:</b>	# TSG-RAN WG2		
<b>Work item code:</b>	# TEI	<b>Date:</b>	# 09/08/2002
<b>Category:</b>	# <b>F</b>	<b>Release:</b>	# R99
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)	2	(GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)	R96	(Release 1996)
	<b>B</b> (addition of feature),	R97	(Release 1997)
	<b>C</b> (functional modification of feature)	R98	(Release 1998)
	<b>D</b> (editorial modification)	R99	(Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

<b>Reason for change:</b>	# The case where the Active Set Update message is received during an ongoing reconfiguration procedure was inadvertently deleted in RRC V3.11.0.
<b>Summary of change:</b>	# The UE may send an Active Set Update Failure message in case the activation times for the two procdures are within a 5 frame time window (text added is identical to that accidently deleted in v3.11.0)
<b>Consequences if not approved:</b>	# Inappropriate network implementation could result due to lack of required UE specification.

<b>Clauses affected:</b>	# 8.3.4.5a										
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">#</td> </tr> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">#</td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">#</td> </tr> </table>	Y	N	#	#	X	#	#	#	Other core specifications	# TS34.123-1
Y	N										
#	#										
X	#										
#	#										
		Test specifications									
		O&M Specifications									
<b>Other comments:</b>	#										

**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.

### 8.3.4 Active set update

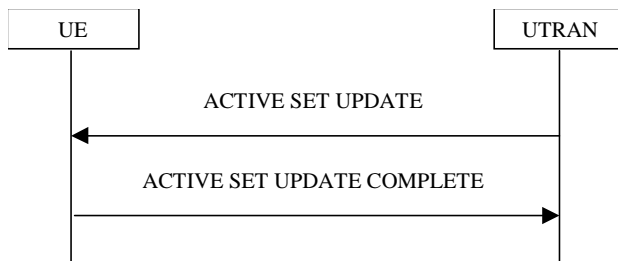


Figure 8.3.4-1: Active Set Update procedure, successful case

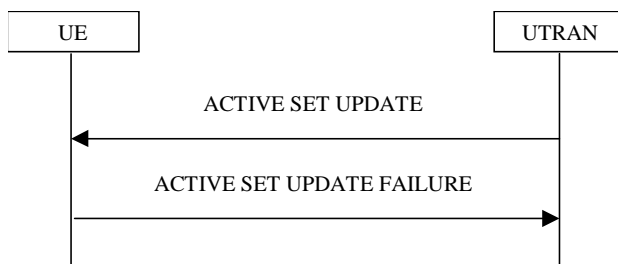


Figure 8.3.4-2: Active Set Update procedure, failure case

#### 8.3.4.1 General

The purpose of the active set update procedure is to update the active set of the connection between the UE and UTRAN. This procedure shall be used in CELL\_DCH state. The UE should keep on using the old RLs while configuring the new RLs. Also the UE should keep the transmitter turned on during the procedure. This procedure is only used in FDD mode.

#### 8.3.4.2 Initiation

The procedure is initiated when UTRAN orders a UE in CELL\_DCH state, to make the following modifications of the active set of the connection:

- a) Radio link addition;
- b) Radio link removal;
- c) Combined radio link addition and removal.

In case a) and c), UTRAN should:

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

In all cases, UTRAN should:

- 1> send an ACTIVE SET UPDATE message on downlink DCCH using AM or UM RLC;
- 1> create active sets that contain at least one common radio link across a DPCH frame boundary as the result of one or multiple (parallel) active set update procedures.

UTRAN should include the following information:

- 1> IE "Radio Link Addition Information": Downlink DPCH information and other optional parameters relevant for the radio links to be added along with the IE "Primary CPICH info" used for the reference ID to indicate which radio link to add. This IE is needed in cases a) and c) listed above;
- 1> IE "Radio Link Removal Information": IE "Primary CPICH info" used for the reference ID to indicate which radio link to remove. This IE is needed in cases b) and c) listed above.

### 8.3.4.3 Reception of an ACTIVE SET UPDATE message by the UE

Upon reception of an ACTIVE SET UPDATE message the UE shall act upon all received information elements as specified in 8.6, unless specified otherwise in the following. The UE shall:

- 1> first add the RLS indicated in the IE "Radio Link Addition Information";
- 1> remove the RLS indicated in the IE "Radio Link Removal Information". If the UE active set is full or becomes full, an RL, which is included in the IE "Radio Link Removal Information" for removal, shall be removed before adding RL, which is included in the IE "Radio Link Addition Information" for addition;
- 1> perform the physical layer synchronisation procedure as specified in [29];
- 1> if the IE "TFCI combining indicator" associated with a radio link to be added is set to TRUE:
  - 2> if a DSCH transport channel is assigned and there is a 'hard' split in the TFCI field:
    - 3> configure Layer 1 to soft-combine TFCI (field 2) of this new link with those links already in the TFCI (field 2) combining set.
- 1> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE COMPLETE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- 1> clear that entry;
- 1> transmit an ACTIVE SET UPDATE COMPLETE message on the uplink DCCH using AM RLC without waiting for the Physical Layer synchronisation;
- 1> the procedure ends on the UE side.

### 8.3.4.4 Unsupported configuration in the UE

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

- 1> keep the active set as it was before the ACTIVE SET UPDATE message was received;
- 1> transmit an ACTIVE SET UPDATE FAILURE message on the DCCH using AM RLC;
- 1> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE FAILURE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- 1> clear that entry;
- 1> set the IE "failure cause" to "configuration unsupported";
- 1> when the ACTIVE SET UPDATE FAILURE message has been submitted to lower layers for transmission:
  - 2> the procedure ends on the UE side.

### 8.3.4.5 Invalid configuration

If any of the following conditions are valid:

- a radio link indicated by the IE "Downlink DPCH info for each RL" in the IE "Radio link addition information" has a different spreading factor than the spreading factor for the radio links in the active set that will be established at the time indicated by the IE "Activation time"; and/or
- a radio link in the IE "Radio link addition information" is also present in the IE "Radio Link Removal Information"; and/or
- the IE "Radio Link Removal Information" contains all the radio links which are part of or will be part of the active set at the time indicated by the IE "Activation time"; and/or

- the IE "TX Diversity Mode" is not set to "none" and it indicates a diversity mode that is different from the one currently used in all or part of the active set; and/or
- a radio link indicated by the IE "Radio Link Removal Information" does not exist in the active set; and/or
- after the removal of all radio links indicated by the IE "Radio Link Removal Information" and the addition of all radio links indicated by the IE "Radio Link Addition Information" the active set would contain more than the maximum allowed number of radio links; and/or
- the variable INVALID\_CONFIGURATION is set to TRUE:

the UE shall:

- 1> keep the active set as it was before the ACTIVE SET UPDATE message was received;
- 1> transmit an ACTIVE SET UPDATE FAILURE message on the DCCH using AM RLC;
- 1> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE FAILURE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- 1> clear that entry;
- 1> set the IE "failure cause" to "Invalid configuration";
- 1> When the ACTIVE SET UPDATE FAILURE message has been submitted to lower layers for transmission:
  - 2> the procedure ends on the UE side.

If the following condition is valid:

- the active set update procedure results in active sets that do not contain at least one common radio link before and after a DPCH frame boundary:

the UE behaviour is not specified.

#### 8.3.4.5a Incompatible simultaneous reconfiguration~~Void~~

If the variable ORDERED\_RECONFIGURATION is set to TRUE; and

- 1> if the activation time for the procedure that has set variable ORDERED\_RECONFIGURATION and the activation time for the Active Set Update procedure are within a time window of 5 frames, the UE may:
  - 2> transmit a ACTIVE SET UPDATE FAILURE message on the uplink DCCH using AM RLC;
  - 2> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE FAILURE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Accepted transactions" in the variable TRANSACTIONS; and
  - 2> clear that entry;
  - 2> set the IE "failure cause" to the cause value "incompatible simultaneous reconfiguration";
  - 2> when the ACTIVE SET UPDATE FAILURE message has been delivered to lower layers for transmission:
    - 3> continue with any ongoing processes and procedures as if the ACTIVE SET UPDATE message has not been received;
    - 3> and the procedure ends.

#### 8.3.4.6 Reception of the ACTIVE SET UPDATE COMPLETE message by the UTRAN

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

- 1> the UTRAN may remove radio link(s) that are indicated to remove to the UE in case b) and c); and

1> the procedure ends on the UTRAN side.

#### 8.3.4.7 Reception of the ACTIVE SET UPDATE FAILURE message by the UTRAN

When the UTRAN has received the ACTIVE SET UPDATE FAILURE message, the UTRAN may delete radio links that were included in the IE "Radio Link Addition Information" for addition. The procedure ends on the UTRAN side.

#### 8.3.4.8 Invalid ACTIVE SET UPDATE message

If the ACTIVE SET UPDATE message contains a protocol error causing the variable `PROTOCOL_ERROR_REJECT` to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling as follows. The UE shall:

- 1> transmit a ACTIVE SET UPDATE FAILURE message on the uplink DCCH using AM RLC;
- 1> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE FAILURE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Rejected transactions" in the variable `TRANSACTIONS`; and
- 1> clear that entry;
- 1> set the IE "failure cause" to the cause value "protocol error";
- 1> include the IE "Protocol error information" with contents set to the value of the variable `PROTOCOL_ERROR_INFORMATION`;
- 1> when the ACTIVE SET UPDATE FAILURE message has been delivered to lower layers for transmission:
  - 2> continue with any ongoing processes and procedures as if the invalid ACTIVE SET UPDATE message has not been received;
  - 2> and the procedure ends.

#### 8.3.4.9 Reception of an ACTIVE SET UPDATE message in wrong state

If the UE is in another state than `CELL_DCH` state upon reception of the ACTIVE SET UPDATE message, the UE shall perform procedure specific error handling as follows. The UE shall:

- 1> transmit a ACTIVE SET UPDATE FAILURE message on the uplink DCCH using AM RLC;
- 1> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE FAILURE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Accepted transactions" in the variable `TRANSACTIONS`; and
- 1> clear that entry;
- 1> set the IE "failure cause" to the cause value "protocol error";
- 1> include the IE "Protocol error information" with the IE "Protocol error cause" set to "Message not compatible with receiver state";
- 1> when the ACTIVE SET UPDATE FAILURE message has been delivered to lower layers for transmission:
  - 2> continue with any ongoing processes and procedures as if the ACTIVE SET UPDATE message has not been received;
  - 2> and the procedure ends.



CR-Form-v7	
<b>CHANGE REQUEST</b>	
# <b>25.331 CR 1628</b> # rev <b>-</b> #	Current version: <b>4.5.0</b> #

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	# Corrections to Active Set Update and simultaneous reconfiguration		
<b>Source:</b>	# TSG-RAN WG2		
<b>Work item code:</b>	# TEI	<b>Date:</b>	# 09/08/2002
<b>Category:</b>	# <b>A</b>	<b>Release:</b>	# Rel-4
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

<b>Reason for change:</b>	# The case where the Active Set Update message is received during an ongoing reconfiguration procedure was inadvertently deleted in RRC V4.5.0.
<b>Summary of change:</b>	# The UE may send an Active Set Update Failure message in case the activation times for the two procedures are within a 5 frame time window (text added is identical to that accidentally deleted in v4.5.0)
<b>Consequences if not approved:</b>	#

<b>Clauses affected:</b>	# 8.3.4.5a		
<b>Other specs affected:</b>	#	#	Other core specifications #
	#	#	
	#	#	
<b>Other comments:</b>	#		

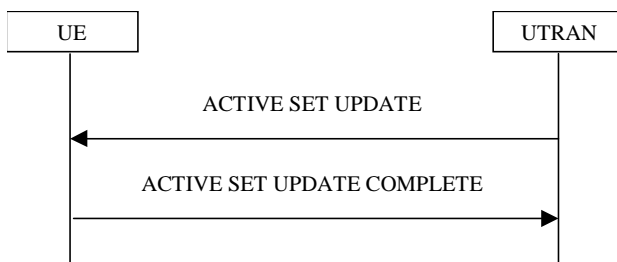
**How to create CRs using this form:**

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:

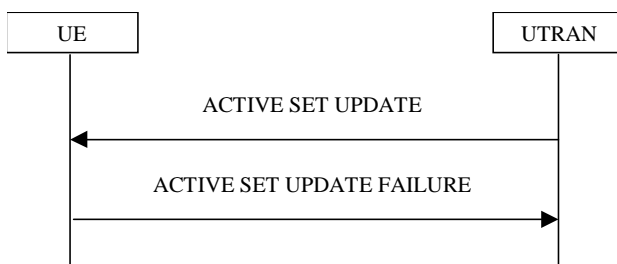
- 1) Fill out the above form. The symbols above marked # contain pop-up help information about the field that they are closest to.

- 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.

### 8.3.4 Active set update



**Figure 8.3.4-1: Active Set Update procedure, successful case**



**Figure 8.3.4-2: Active Set Update procedure, failure case**

#### 8.3.4.1 General

The purpose of the active set update procedure is to update the active set of the connection between the UE and UTRAN. This procedure shall be used in CELL\_DCH state. The UE should keep on using the old RLs while configuring the new RLs. Also the UE should keep the transmitter turned on during the procedure. This procedure is only used in FDD mode.

#### 8.3.4.2 Initiation

The procedure is initiated when UTRAN orders a UE in CELL\_DCH state, to make the following modifications of the active set of the connection:

- a) Radio link addition;
- b) Radio link removal;
- c) Combined radio link addition and removal.

In case a) and c), UTRAN should:

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

In all cases, UTRAN should:

- 1> send an ACTIVE SET UPDATE message on downlink DCCH using AM or UM RLC;
- 1> create active sets that contain at least one common radio link across a DPCH frame boundary as the result of one or multiple (parallel) active set update procedures.

UTRAN should include the following information:

- 1> IE "Radio Link Addition Information": Downlink DPCH information and other optional parameters relevant for the radio links to be added along with the IE "Primary CPICH info" used for the reference ID to indicate which radio link to add. This IE is needed in cases a) and c) listed above;

- 1> IE "Radio Link Removal Information": IE "Primary CPICH info" used for the reference ID to indicate which radio link to remove. This IE is needed in cases b) and c) listed above.

#### 8.3.4.3 Reception of an ACTIVE SET UPDATE message by the UE

Upon reception of an ACTIVE SET UPDATE message the UE shall act upon all received information elements as specified in 8.6, unless specified otherwise in the following.

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> first add the RLs indicated in the IE "Radio Link Addition Information";
- 1> remove the RLs indicated in the IE "Radio Link Removal Information". If the UE active set is full or becomes full, an RL, which is included in the IE "Radio Link Removal Information" for removal, shall be removed before adding RL, which is included in the IE "Radio Link Addition Information" for addition;
- 1> perform the physical layer synchronisation procedure as specified in [29];
- 1> if the IE "TFCI combining indicator" associated with a radio link to be added is set to TRUE:
  - 2> if a DSCH transport channel is assigned and there is a 'hard' split in the TFCI field:
    - 3> configure Layer 1 to soft-combine TFCI (field 2) of this new link with those links already in the TFCI (field 2) combining set.
- 1> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE COMPLETE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- 1> clear that entry;
- 1> transmit an ACTIVE SET UPDATE COMPLETE message on the uplink DCCH using AM RLC without waiting for the Physical Layer synchronisation;
- 1> the procedure ends on the UE side.

#### 8.3.4.4 Unsupported configuration in the UE

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

- 1> keep the active set as it was before the ACTIVE SET UPDATE message was received;
- 1> transmit an ACTIVE SET UPDATE FAILURE message on the DCCH using AM RLC;
- 1> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE FAILURE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- 1> clear that entry;
- 1> set the IE "failure cause" to "configuration unsupported";
- 1> when the ACTIVE SET UPDATE FAILURE message has been submitted to lower layers for transmission:
  - 2> the procedure ends on the UE side.

#### 8.3.4.5 Invalid configuration

If any of the following conditions are valid:

- a radio link indicated by the IE "Downlink DPCH info for each RL" in the IE "Radio link addition information" has a different spreading factor than the spreading factor for the radio links in the active set that will be established at the time indicated by the IE "Activation time"; and/or
- a radio link in the IE "Radio link addition information" is also present in the IE "Radio Link Removal Information"; and/or
- the IE "Radio Link Removal Information" contains all the radio links which are part of or will be part of the active set at the time indicated by the IE "Activation time"; and/or
- the IE "TX Diversity Mode" is not set to "none" and it indicates a diversity mode that is different from the one currently used in all or part of the active set; and/or
- a radio link indicated by the IE "Radio Link Removal Information" does not exist in the active set; and/or
- after the removal of all radio links indicated by the IE "Radio Link Removal Information" and the addition of all radio links indicated by the IE "Radio Link Addition Information" the active set would contain more than the maximum allowed number of radio links; and/or
- the variable INVALID\_CONFIGURATION is set to TRUE:

the UE shall:

- 1> keep the active set as it was before the ACTIVE SET UPDATE message was received;
- 1> transmit an ACTIVE SET UPDATE FAILURE message on the DCCH using AM RLC;
- 1> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE FAILURE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- 1> clear that entry;
- 1> set the IE "failure cause" to "Invalid configuration";
- 1> When the ACTIVE SET UPDATE FAILURE message has been submitted to lower layers for transmission:
  - 2> the procedure ends on the UE side.

If the following condition is valid:

- the active set update procedure results in active sets that do not contain at least one common radio link before and after a DPCH frame boundary:

the UE behaviour is not specified.

#### 8.3.4.5a Incompatible simultaneous reconfiguration~~Void~~

If the variable ORDERED\_RECONFIGURATION is set to TRUE; and

- 1> if the activation time for the procedure that has set variable ORDERED\_RECONFIGURATION and the activation time for the Active Set Update procedure are within a time window of 5 frames, the UE may:
  - 2> transmit a ACTIVE SET UPDATE FAILURE message on the uplink DCCH using AM RLC;
  - 2> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE FAILURE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Accepted transactions" in the variable TRANSACTIONS; and
  - 2> clear that entry;
  - 2> set the IE "failure cause" to the cause value "incompatible simultaneous reconfiguration";
  - 2> when the ACTIVE SET UPDATE FAILURE message has been delivered to lower layers for transmission:
    - 3> continue with any ongoing processes and procedures as if the ACTIVE SET UPDATE message has not been received;

[3> and the procedure ends.](#)

#### 8.3.4.6 Reception of the ACTIVE SET UPDATE COMPLETE message by the UTRAN

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

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

#### 8.3.4.7 Reception of the ACTIVE SET UPDATE FAILURE message by the UTRAN

When the UTRAN has received the ACTIVE SET UPDATE FAILURE message, the UTRAN may delete radio links that were included in the IE "Radio Link Addition Information" for addition. The procedure ends on the UTRAN side.

#### 8.3.4.8 Invalid ACTIVE SET UPDATE message

If the ACTIVE SET UPDATE message contains a protocol error causing the variable `PROTOCOL_ERROR_REJECT` to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling as follows. The UE shall:

- 1> transmit a ACTIVE SET UPDATE FAILURE message on the uplink DCCH using AM RLC;
- 1> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE FAILURE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Rejected transactions" in the variable `TRANSACTIONS`; and
- 1> clear that entry;
- 1> set the IE "failure cause" to the cause value "protocol error";
- 1> include the IE "Protocol error information" with contents set to the value of the variable `PROTOCOL_ERROR_INFORMATION`;
- 1> when the ACTIVE SET UPDATE FAILURE message has been delivered to lower layers for transmission:
  - 2> continue with any ongoing processes and procedures as if the invalid ACTIVE SET UPDATE message has not been received;
  - 2> and the procedure ends.

#### 8.3.4.9 Reception of an ACTIVE SET UPDATE message in wrong state

If the UE is in another state than `CELL_DCH` state upon reception of the ACTIVE SET UPDATE message, the UE shall perform procedure specific error handling as follows. The UE shall:

- 1> transmit a ACTIVE SET UPDATE FAILURE message on the uplink DCCH using AM RLC;
- 1> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE FAILURE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Accepted transactions" in the variable `TRANSACTIONS`; and
- 1> clear that entry;
- 1> set the IE "failure cause" to the cause value "protocol error";
- 1> include the IE "Protocol error information" with the IE "Protocol error cause" set to "Message not compatible with receiver state";
- 1> when the ACTIVE SET UPDATE FAILURE message has been delivered to lower layers for transmission:
  - 2> continue with any ongoing processes and procedures as if the ACTIVE SET UPDATE message has not been received;

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**7**

Error! No text of specified style in document.

2> and the procedure ends.

CR-Form-v7

## CHANGE REQUEST

# **25.331 CR 1629** # rev **-** # Current version: **5.1.0** #

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	# Corrections to Active Set Update and simultaneous reconfiguration		
<b>Source:</b>	# TSG-RAN WG2		
<b>Work item code:</b>	# TEI	<b>Date:</b>	# 09/08/2002
<b>Category:</b>	# <b>A</b>	<b>Release:</b>	# Rel-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)	<b>2</b>	(GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)	<b>R96</b>	(Release 1996)
	<b>B</b> (addition of feature),	<b>R97</b>	(Release 1997)
	<b>C</b> (functional modification of feature)	<b>R98</b>	(Release 1998)
	<b>D</b> (editorial modification)	<b>R99</b>	(Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		<b>Rel-4</b> (Release 4)
			<b>Rel-5</b> (Release 5)
			<b>Rel-6</b> (Release 6)

<b>Reason for change:</b>	# The case where the Active Set Update message is received during an ongoing reconfiguration procedure was inadvertently deleted in RRC V5.1.0.
<b>Summary of change:</b>	# The UE may send an Active Set Update Failure message in case the activation times for the two procdures are within a 5 frame time window (text added is identical to that accidently deleted in v5.1.0)
<b>Consequences if not approved:</b>	#

<b>Clauses affected:</b>	# 8.3.4.5a										
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20px;">Y</td> <td style="width: 20px;">N</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other core specifications	#
Y	N										
<input type="checkbox"/>	<input type="checkbox"/>										
<input type="checkbox"/>	<input type="checkbox"/>										
<input type="checkbox"/>	<input type="checkbox"/>										
		Test specifications	#								
		O&M Specifications	TS34.123-1								
<b>Other comments:</b>	#										

**How to create CRs using this form:**

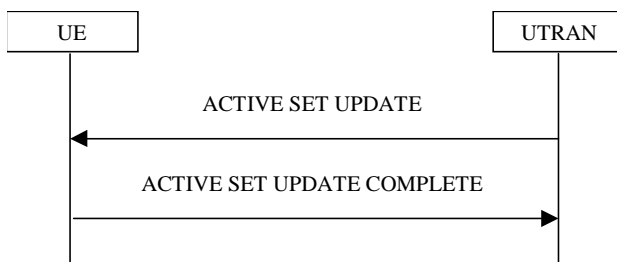
Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

- 1) Fill out the above form. The symbols above marked # contain pop-up help information about the field that they are closest to.

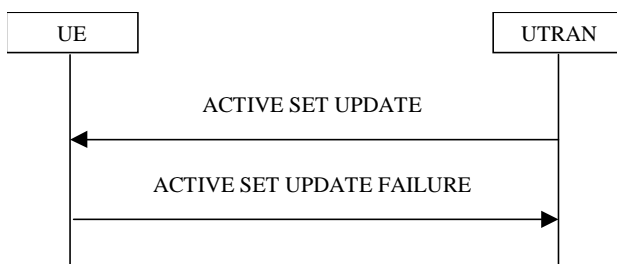


- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the 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.

### 8.3.4 Active set update



**Figure 8.3.4-1: Active Set Update procedure, successful case**



**Figure 8.3.4-2: Active Set Update procedure, failure case**

#### 8.3.4.1 General

The purpose of the active set update procedure is to update the active set of the connection between the UE and UTRAN. This procedure shall be used in CELL\_DCH state. The UE should keep on using the old RLs while configuring the new RLs. Also the UE should keep the transmitter turned on during the procedure. This procedure is only used in FDD mode.

#### 8.3.4.2 Initiation

The procedure is initiated when UTRAN orders a UE in CELL\_DCH state, to make the following modifications of the active set of the connection:

- a) Radio link addition;
- b) Radio link removal;
- c) Combined radio link addition and removal.

In case a) and c), UTRAN should:

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

In all cases, UTRAN should:

- 1> send an ACTIVE SET UPDATE message on downlink DCCH using AM or UM RLC;
- 1> create active sets that contain at least one common radio link across a DPCH frame boundary as the result of one or multiple (parallel) active set update procedures.

UTRAN should include the following information:

- 1> IE "Radio Link Addition Information": Downlink DPCH information and other optional parameters relevant for the radio links to be added along with the IE "Primary CPICH info" used for the reference ID to indicate which radio link to add. This IE is needed in cases a) and c) listed above;

- 1> IE "Radio Link Removal Information": IE "Primary CPICH info" used for the reference ID to indicate which radio link to remove. This IE is needed in cases b) and c) listed above.

#### 8.3.4.3 Reception of an ACTIVE SET UPDATE message by the UE

Upon reception of an ACTIVE SET UPDATE message the UE shall act upon all received information elements as specified in 8.6, unless specified otherwise in the following.

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> first add the RLs indicated in the IE "Radio Link Addition Information";
- 1> remove the RLs indicated in the IE "Radio Link Removal Information". If the UE active set is full or becomes full, an RL, which is included in the IE "Radio Link Removal Information" for removal, shall be removed before adding RL, which is included in the IE "Radio Link Addition Information" for addition;
- 1> perform the physical layer synchronisation procedure as specified in [29];
- 1> if the IE "TFCI combining indicator" associated with a radio link to be added is set to TRUE:
  - 2> if a DSCH transport channel is assigned and there is a 'hard' split in the TFCI field:
    - 3> configure Layer 1 to soft-combine TFCI (field 2) of this new link with those links already in the TFCI (field 2) combining set.
- 1> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE COMPLETE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- 1> clear that entry;
- 1> transmit an ACTIVE SET UPDATE COMPLETE message on the uplink DCCH using AM RLC without waiting for the Physical Layer synchronisation;
- 1> the procedure ends on the UE side.

#### 8.3.4.4 Unsupported configuration in the UE

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

- 1> keep the active set as it was before the ACTIVE SET UPDATE message was received;
- 1> transmit an ACTIVE SET UPDATE FAILURE message on the DCCH using AM RLC;
- 1> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE FAILURE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- 1> clear that entry;
- 1> set the IE "failure cause" to "configuration unsupported";
- 1> when the ACTIVE SET UPDATE FAILURE message has been submitted to lower layers for transmission:
  - 2> the procedure ends on the UE side.

#### 8.3.4.5 Invalid configuration

If any of the following conditions are valid:

- a radio link indicated by the IE "Downlink DPCH info for each RL" in the IE "Radio link addition information" has a different spreading factor than the spreading factor for the radio links in the active set that will be established at the time indicated by the IE "Activation time"; and/or
- a radio link in the IE "Radio link addition information" is also present in the IE "Radio Link Removal Information"; and/or
- the IE "Radio Link Removal Information" contains all the radio links which are part of or will be part of the active set at the time indicated by the IE "Activation time"; and/or
- the IE "TX Diversity Mode" is not set to "none" and it indicates a diversity mode that is different from the one currently used in all or part of the active set; and/or
- a radio link indicated by the IE "Radio Link Removal Information" does not exist in the active set; and/or
- after the removal of all radio links indicated by the IE "Radio Link Removal Information" and the addition of all radio links indicated by the IE "Radio Link Addition Information" the active set would contain more than the maximum allowed number of radio links; and/or
- the variable INVALID\_CONFIGURATION is set to TRUE:

the UE shall:

- 1> keep the active set as it was before the ACTIVE SET UPDATE message was received;
- 1> transmit an ACTIVE SET UPDATE FAILURE message on the DCCH using AM RLC;
- 1> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE FAILURE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Accepted transactions" in the variable TRANSACTIONS; and
- 1> clear that entry;
- 1> set the IE "failure cause" to "Invalid configuration";
- 1> When the ACTIVE SET UPDATE FAILURE message has been submitted to lower layers for transmission:
  - 2> the procedure ends on the UE side.

If the following condition is valid:

- the active set update procedure results in active sets that do not contain at least one common radio link before and after a DPCH frame boundary:

the UE behaviour is not specified.

#### 8.3.4.5a ~~Void~~ Incompatible simultaneous reconfiguration

If the variable ORDERED\_RECONFIGURATION is set to TRUE; and

- 1> if the activation time for the procedure that has set variable ORDERED\_RECONFIGURATION and the activation time for the Active Set Update procedure are within a time window of 5 frames, the UE may:
  - 2> transmit a ACTIVE SET UPDATE FAILURE message on the uplink DCCH using AM RLC;
  - 2> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE FAILURE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Accepted transactions" in the variable TRANSACTIONS; and
  - 2> clear that entry;
  - 2> set the IE "failure cause" to the cause value "incompatible simultaneous reconfiguration";
  - 2> when the ACTIVE SET UPDATE FAILURE message has been delivered to lower layers for transmission:
    - 3> continue with any ongoing processes and procedures as if the ACTIVE SET UPDATE message has not been received;

[3> and the procedure ends.](#)

#### 8.3.4.6 Reception of the ACTIVE SET UPDATE COMPLETE message by the UTRAN

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

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

#### 8.3.4.7 Reception of the ACTIVE SET UPDATE FAILURE message by the UTRAN

When the UTRAN has received the ACTIVE SET UPDATE FAILURE message, the UTRAN may delete radio links that were included in the IE "Radio Link Addition Information" for addition. The procedure ends on the UTRAN side.

#### 8.3.4.8 Invalid ACTIVE SET UPDATE message

If the ACTIVE SET UPDATE message contains a protocol error causing the variable `PROTOCOL_ERROR_REJECT` to be set to TRUE according to clause 9, the UE shall perform procedure specific error handling as follows. The UE shall:

- 1> transmit a ACTIVE SET UPDATE FAILURE message on the uplink DCCH using AM RLC;
- 1> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE FAILURE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Rejected transactions" in the variable `TRANSACTIONS`; and
- 1> clear that entry;
- 1> set the IE "failure cause" to the cause value "protocol error";
- 1> include the IE "Protocol error information" with contents set to the value of the variable `PROTOCOL_ERROR_INFORMATION`;
- 1> when the ACTIVE SET UPDATE FAILURE message has been delivered to lower layers for transmission:
  - 2> continue with any ongoing processes and procedures as if the invalid ACTIVE SET UPDATE message has not been received;
  - 2> and the procedure ends.

#### 8.3.4.9 Reception of an ACTIVE SET UPDATE message in wrong state

If the UE is in another state than `CELL_DCH` state upon reception of the ACTIVE SET UPDATE message, the UE shall perform procedure specific error handling as follows. The UE shall:

- 1> transmit a ACTIVE SET UPDATE FAILURE message on the uplink DCCH using AM RLC;
- 1> set the IE "RRC transaction identifier" in the ACTIVE SET UPDATE FAILURE message to the value of "RRC transaction identifier" in the entry for the ACTIVE SET UPDATE message in the table "Accepted transactions" in the variable `TRANSACTIONS`; and
- 1> clear that entry;
- 1> set the IE "failure cause" to the cause value "protocol error";
- 1> include the IE "Protocol error information" with the IE "Protocol error cause" set to "Message not compatible with receiver state";
- 1> when the ACTIVE SET UPDATE FAILURE message has been delivered to lower layers for transmission:

- 2> continue with any ongoing processes and procedures as if the ACTIVE SET UPDATE message has not been received;
- 2> and the procedure ends.

**3GPP TSG-RAN WG2 Meeting #31  
Stockholm, Sweden, 19th - 23rd August 2002**

**Tdoc # R2-022310**

CR-Form-v7	<b>CHANGE REQUEST</b>
# <b>25.331 CR 1630</b> # rev <b>-</b> # Current version: <b>3.11.0</b> #	

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	# UE behaviour following RLC size change		
<b>Source:</b>	# TSG-RAN WG2		
<b>Work item code:</b>	# TEI	<b>Date:</b>	# 12/08/2002
<b>Category:</b>	# <b>F</b>	<b>Release:</b>	# R99
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

<b>Reason for change:</b>	#	The current specification requires the UE to set, in case of a RLC size change for a signalling radio bearer indicated through system information, the HFN values of the corresponding RLC entity to the value of "START" that will be included in next CELL UPDATE message to be transmitted in the future. However the UE cannot predict the value of START that will result at that time. Requiring all Ues to perform a CELL UPDATE immediately after the occurrence of this RLC size change could cause undue amount of CELL UPDATE processing at the UTRAN if a significant number of them attempt this simultaneously.  There is an incorrect behavior specified for the UE in case of RLC size change of an SRB RLC entity being caused by ACTIVE SET UPDATE message.
<b>Summary of change:</b>	#	It is proposed to resolve this problem by adding a note indicating the perils of having RLC size changes for a SRB indicated through system information.  Text referring to the ACTIVE SET UPDATE message changing the RLC size for a SRB is deleted since this message cannot change the RLC size.
<b>Consequences if not approved:</b>	#	<b>Isolated Impact Analysis</b> Functionality corrected: SRB configuration  Isolated impact statement: Correction to a function where specification was unimplementable. Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.

The behaviour if UTRAN or both did not implement the CR: the HFN values for the re-established RLC entity for the SRB in question would not be synchronized causing eventual failure of connection.

<b>Clauses affected:</b>	⌘	8.6.5.1									
<b>Other specs affected:</b>	⌘	<table border="1"> <tr> <td><b>Y</b></td> <td><b>N</b></td> </tr> <tr> <td></td> <td><b>X</b></td> </tr> <tr> <td></td> <td><b>X</b></td> </tr> <tr> <td></td> <td><b>X</b></td> </tr> </table>	<b>Y</b>	<b>N</b>		<b>X</b>		<b>X</b>		<b>X</b>	Other core specifications ⌘ Test specifications O&M Specifications
		<b>Y</b>	<b>N</b>								
			<b>X</b>								
	<b>X</b>										
	<b>X</b>										
<b>Other comments:</b>	⌘										

**How to create CRs using this form:**

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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.



### 8.6.4.8 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> 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.
- NOTE:** The IE "RB mapping info" is only included in IE "Predefined RB configurations" in system information when used for Inter-RAT handover to UTRAN and there is no AM RLC size change involved in this case.
- 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 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

#### 8.6.4.9 RLC Info

If the IE "RLC Info" is included, the UE shall:

- 1> configure the transmitting and receiving RLC entities in the UE for that radio bearer accordingly;
- 1> if IE "Polling Info" is absent:
  - 2> remove any previously stored configuration for the IE "Polling Info".

If the IE "Transmission RLC discard" is not included for UM RLC or TM RLC, RLC discard procedure shall not be used for that radio bearer.

#### 8.6.4.10 PDCP Info

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

- 1> if the radio bearer is connected to a CS domain radio access bearer:
  - 2> set the variable INVALID\_CONFIGURATION to TRUE.
- 1> if the IE "PDCP PDU header" is set to the value "absent":
  - 2> if the IE "Support for lossless SRNS relocation" is true:
    - 3> set the variable INVALID\_CONFIGURATION to TRUE.
- 1> if the IE "PDCP PDU header" is set to the value "present":
  - 2> if the IE "Support for lossless SRNS relocation" is false:
    - 3> if the IE "Header compression information" is absent:
      - 4> set the variable INVALID\_CONFIGURATION to TRUE.
- 1> if the IE "Header compression information" is absent:
  - 2> not use Header compression after the successful completion of this procedure;
  - 2> remove any stored configuration for the IE "Header compression information".
- 1> configure the PDCP entity for that radio bearer accordingly;
- 1> configure the RLC entity for that radio bearer according to the value of the IE "Support for lossless SRNS relocation".

#### 8.6.4.11 PDCP SN Info

If the IE "PDCP SN Info" is included, the UE shall:

- 1> transfer the sequence number to the PDCP entity for the radio bearer;
- 1> configure the RLC entity for the radio bearer to stop;
- 1> include the current PDCP receive sequence number and the radio bearer identity for the radio bearer in the variable PDCP\_SN\_INFO.

#### 8.6.4.12 NAS Synchronisation Indicator

If the IE "NAS Synchronisation Indicator" is present in a message, the UE shall:

- 1> forward the content to upper layers along with the IE "CN domain identity" of the associated RAB stored in the variable ESTABLISHED\_RABS at the CFN indicated in the IE "Activation time" in order to synchronise actions in NAS and AS.

### 8.6.5 Transport channel information elements

#### 8.6.5.1 Transport Format Set

If the IE "Transport format set" is included, the UE shall:

- 1> if the transport format set is a RACH TFS received in System Information Block type 5 or 6, and CHOICE "Logical Channel List" has the value "Explicit List":

- 2> ignore that System Information Block.
- 1> if the transport format set for a downlink transport channel is received in a System Information Block, and CHOICE "Logical Channel List" has a value different from 'ALL':
  - 2> ignore that System Information Block.
- 1> if the transport format set for a downlink transport channel is received in a message on a DCCH, and CHOICE "Logical Channel List" has a value different from 'ALL':
  - 2> keep the transport format set if this exists for that transport channel;
  - 2> set the variable INVALID\_CONFIGURATION to TRUE.
- 1> if the value of any IE "RB identity" (and "Logical Channel" for RBs using two UL logical channels) in the IE "Logical channel list" does not correspond to a logical channel indicated to be mapped onto this transport channel in any RB multiplexing option (either included in the same message or previously stored and not changed by this message); or
- 1> if the "Logical Channel List" for any of the RLC sizes defined for that transport channel is set to "Configured" while it is set to "All" or given as an "Explicit List" for any other RLC size; or
- 1> if the "Logical Channel List" for any of the RLC sizes defined for that transport channel is set to "All" and for any logical channel mapped to this transport channel, the value of the "RLC size list" (either provided in the IE "RB mapping info" if included in the same message, or stored) is not set to "Configured"; or
- 1> if the "Logical Channel List" for any of the RLC sizes defined for that transport channel is given as an "Explicit List" that contains a logical channel for which the value of the "RLC size list" (either provided in the IE "RB mapping info" if included in the same message, or stored) is not set to "Configured"; or
- 1> if the "Logical Channel List" for all the RLC sizes defined for that transport channel are given as "Explicit List" and if one of the logical channels mapped onto this transport channel is not included in any of those lists; or
- 1> if the "Logical Channel List" for the RLC sizes defined for that transport channel is set to "Configured" and for any logical channel mapped onto that transport channel, the value of the "RLC size list" (either provided in the IE "RB mapping info" if included in the same message, or stored) is also set to "Configured"; or
- 1> if the IE "Transport Format Set" was not received within the IE "PRACH system information list" and if the "Logical Channel List" for the RLC sizes defined for that transport channel is set to "Configured" and for any logical channel mapped onto that transport channel, the "RLC size list" (either provided in the IE "RB mapping info" if included in the same message, or stored) is given as an "Explicit List" that includes an "RLC size index" that does not correspond to any RLC size in this "Transport Format Set":
  - 2> keep the transport format set if this exists for that transport channel;
  - 2> set the variable INVALID\_CONFIGURATION to TRUE.
- 1> if the total number of configured transport formats for the transport channel exceeds maxTF:
  - 2> keep the transport format set if this exists for that transport channel;
  - 2> set the variable INVALID\_CONFIGURATION to TRUE.
- 1> if the IE "Transport format set" is considered as valid according to the rules above:
  - 2> remove a previously stored transport format set if this exists for that transport channel;
  - 2> store the transport format set for that transport channel;
  - 2> consider the first instance of the parameter *Number of TBs and TTI List* within the *Dynamic transport format information* to correspond to transport format 0 for this transport channel, the second to transport format 1 and so on;
  - 2> if the IE "Transport format Set" has the choice "Transport channel type" set to "Dedicated transport channel":
    - 3> calculate the transport block size for all transport formats in the TFS using the following

$$\text{TB size} = \text{RLC size} + \text{MAC header size},$$

where:

- MAC header size is calculated according to [15] if MAC multiplexing is used. Otherwise it is 0 bits;
- 'RLC size' reflects the RLC PDU size.

- 2> if the IE "Transport format Set" has the choice "Transport channel type" set to "Common transport channel":
  - 3> calculate the transport block size for all transport formats in the TFS using the following:

$$\text{TB size} = \text{RLC size}.$$

- 2> if the IE "Number of Transport blocks"  $\neq 0$  and IE "RLC size" = 0, no RLC PDU data exists but only parity bits exist for that transport format;
- 2> if the IE "Number of Transport blocks" = 0, neither RLC PDU neither data nor parity bits exist for that transport format;
- 2> configure the MAC with the new transport format set (with computed transport block sizes) for that transport channel;
- 2> if the RB multiplexing option for a RB mapped onto that transport channel (based on the stored RB multiplexing option) is not modified by this message:
  - 3> determine the sets of RLC sizes that apply to the logical channels used by that RB, based on the IE "Logical Channel List" and/or the IE "RLC Size List" from the previously stored RB multiplexing option.
  - 3> if the IE "Transport Format Set" was received within the IE "PRACH system information list":
    - 4> ignore the RLC size indexes in the stored RB multiplexing option that do not correspond to any RLC size in the received Transport Format Set.
  - 3> if the IE "Transport Format Set" was received within the IE "PRACH system information list", if that RB is using AM and if RACH is the transport channel to be used on the uplink:
    - 4> 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.
  - 3> if the IE "Transport Format Set" was not received within the IE "PRACH system information list", 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:
    - 4> set the variable INVALID\_CONFIGURATION to true.
- 3> 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:
  - 4> re-establish the corresponding RLC entity;
  - 4> configure the corresponding RLC entity with the new RLC size;
  - 4> 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
  - 4> 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:
    - 5> if this IE was included in system information and if the IE "Status" in variable CIPHERING\_STATUS of this CN domain is set to "Started":
      - 6> 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~~ following cell reselection.

NOTE: Since the UE cannot predict the START value at the time of the next CELL UPDATE transmission in the future, UTRAN should desist from changing the RLC size for a signalling radio bearer within a cell, or configuring different RLC sizes for a signalling radio bearer across UTRAN boundaries. Other than this aforementioned case the change in RLC size for a signalling radio bearer is known to the UE when reading system information following cell reselection.

5> if this IE was included in CELL UPDATE CONFIRM and if the IE "Status" in the variable CIPHERING\_STATUS of this CN domain is set to "Started":

6> 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.

5> if this IE was included in a reconfiguration message and if the IE "Status" in the variable CIPHERING\_STATUS of this CN domain is set to "Started":

6> 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.

~~5> if this IE was included in ACTIVE SET UPDATE and if the IE "Status" in the variable CIPHERING\_STATUS of this CN domain is set to "Started":~~

~~6> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" that will be included in the ACTIVE SET UPDATE COMPLETE message for this CN domain.~~

3> if that RB is using UM:

4> indicate the largest applicable RLC size to the corresponding RLC entity.

3> configure MAC with the set of applicable RLC Sizes for each of the logical channels used for that RB.

For configuration restrictions on Blind Transport Format Detection, see [27].

**3GPP TSG-RAN WG2 Meeting #31  
Stockholm, Sweden, 19th - 23rd August 2002**

**Tdoc # R2-022311**

CR-Form-v7
<h2 style="margin: 0;">CHANGE REQUEST</h2>
# <b>25.331 CR 1631</b> # rev <b>-</b> # Current version: <b>4.5.0</b> #

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	#	UE behaviour following RLC size change	
<b>Source:</b>	#	TSG-RAN WG2	
<b>Work item code:</b>	#	TEI	<b>Date:</b> # 12/08/2002
<b>Category:</b>	#	<b>A</b>	<b>Release:</b> # Rel-4
		Use <u>one</u> of the following categories:	Use <u>one</u> of the following releases:
		<b>F</b> (correction)	2 (GSM Phase 2)
		<b>A</b> (corresponds to a correction in an earlier release)	R96 (Release 1996)
		<b>B</b> (addition of feature),	R97 (Release 1997)
		<b>C</b> (functional modification of feature)	R98 (Release 1998)
		<b>D</b> (editorial modification)	R99 (Release 1999)
		Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .	Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

<b>Reason for change:</b>	#	The current specification requires the UE to set, in case of a RLC size change for a signalling radio bearer indicated through system information, the HFN values of the corresponding RLC entity to the value of "START" that will be included in next CELL UPDATE message to be transmitted in the future. However the UE cannot predict the value of START that will result at that time. Requiring all Ues to perform a CELL UPDATE immediately after the occurrence of this RLC size change could cause undue amount of CELL UPDATE processing at the UTRAN if a significant number of them attempt this simultaneously.  There is an incorrect behavior specified for the UE in case of RLC size change of an SRB RLC entity being caused by ACTIVE SET UPDATE message.
<b>Summary of change:</b>	#	It is proposed to resolve this problem by adding a note indicating the perils of having RLC size changes for a SRB indicated through system information.  Text referring to the ACTIVE SET UPDATE message changing the RLC size for a SRB is deleted since this message cannot change the RLC size.
<b>Consequences if not approved:</b>	#	

<b>Clauses affected:</b>	#	8.6.5.1				
<b>Other specs affected:</b>		<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications	Y	N	#	X
	Y	N				
#	X					
		<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 20px; text-align: center;">#</td> <td style="width: 20px; text-align: center;">X</td> </tr> </table> Test specifications	#	X		
#	X					



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/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.

### 8.6.5.1 Transport Format Set

If the IE "Transport format set" is included, the UE shall:

- 1> if the transport format set is a RACH TFS received in System Information Block type 5 or 6, and CHOICE "Logical Channel List" has the value "Explicit List":
  - 2> ignore that System Information Block.
- 1> if the transport format set for a downlink transport channel is received in a System Information Block, and CHOICE "Logical Channel List" has a value different from 'ALL':
  - 2> ignore that System Information Block.
- 1> if the transport format set for a downlink transport channel is received in a message on a DCCH, and CHOICE "Logical Channel List" has a value different from 'ALL':
  - 2> keep the transport format set if this exists for that transport channel;
  - 2> set the variable INVALID\_CONFIGURATION to TRUE.
- 1> if the value of any IE "RB identity" (and "Logical Channel" for RBs using two UL logical channels) in the IE "Logical channel list" does not correspond to a logical channel indicated to be mapped onto this transport channel in any RB multiplexing option (either included in the same message or previously stored and not changed by this message); or
- 1> if the "Logical Channel List" for any of the RLC sizes defined for that transport channel is set to "Configured" while it is set to "All" or given as an "Explicit List" for any other RLC size; or
- 1> if the "Logical Channel List" for any of the RLC sizes defined for that transport channel is set to "All" and for any logical channel mapped to this transport channel, the value of the "RLC size list" (either provided in the IE "RB mapping info" if included in the same message, or stored) is not set to "Configured"; or
- 1> if the "Logical Channel List" for any of the RLC sizes defined for that transport channel is given as an "Explicit List" that contains a logical channel for which the value of the "RLC size list" (either provided in the IE "RB mapping info" if included in the same message, or stored) is not set to "Configured"; or
- 1> if the "Logical Channel List" for all the RLC sizes defined for that transport channel are given as "Explicit List" and if one of the logical channels mapped onto this transport channel is not included in any of those lists; or
- 1> if the "Logical Channel List" for the RLC sizes defined for that transport channel is set to "Configured" and for any logical channel mapped onto that transport channel, the value of the "RLC size list" (either provided in the IE "RB mapping info" if included in the same message, or stored) is also set to "Configured"; or
- 1> if the IE "Transport Format Set" was not received within the IE "PRACH system information list" and if the "Logical Channel List" for the RLC sizes defined for that transport channel is set to "Configured" and for any logical channel mapped onto that transport channel, the "RLC size list" (either provided in the IE "RB mapping info" if included in the same message, or stored) is given as an "Explicit List" that includes an "RLC size index" that does not correspond to any RLC size in this "Transport Format Set":
  - 2> keep the transport format set if this exists for that transport channel;
  - 2> set the variable INVALID\_CONFIGURATION to TRUE.
- 1> if the total number of configured transport formats for the transport channel exceeds maxTF:
  - 2> keep the transport format set if this exists for that transport channel;
  - 2> set the variable INVALID\_CONFIGURATION to TRUE.
- 1> if the IE "Transport format set" is considered as valid according to the rules above:
  - 2> remove a previously stored transport format set if this exists for that transport channel;

- 2> store the transport format set for that transport channel;
- 2> consider the first instance of the parameter *Number of TBs and TTI List* within the *Dynamic transport format information* to correspond to transport format 0 for this transport channel, the second to transport format 1 and so on;
- 2> if the IE "Transport format Set" has the choice "Transport channel type" set to "Dedicated transport channel":
  - 3> calculate the transport block size for all transport formats in the TFS using the following

$$\text{TB size} = \text{RLC size} + \text{MAC header size},$$

where:

- MAC header size is calculated according to [15] if MAC multiplexing is used. Otherwise it is 0 bits;
  - 'RLC size' reflects the RLC PDU size.
- 2> if the IE "Transport format Set" has the choice "Transport channel type" set to "Common transport channel":
    - 3> calculate the transport block size for all transport formats in the TFS using the following:
$$\text{TB size} = \text{RLC size}.$$
  - 2> if the IE "Number of Transport blocks"  $\neq 0$  and IE "RLC size" = 0, no RLC PDU data exists but only parity bits exist for that transport format;
  - 2> if the IE "Number of Transport blocks" = 0, neither RLC PDU neither data nor parity bits exist for that transport format;
  - 2> configure the MAC with the new transport format set (with computed transport block sizes) for that transport channel;
  - 2> if the RB multiplexing option for a RB mapped onto that transport channel (based on the stored RB multiplexing option) is not modified by this message:
    - 3> determine the sets of RLC sizes that apply to the logical channels used by that RB, based on the IE "Logical Channel List" and/or the IE "RLC Size List" from the previously stored RB multiplexing option.
    - 3> if the IE "Transport Format Set" was received within the IE "PRACH system information list":
      - 4> ignore the RLC size indexes in the stored RB multiplexing option that do not correspond to any RLC size in the received Transport Format Set.
    - 3> if the IE "Transport Format Set" was received within the IE "PRACH system information list", if that RB is using AM and if RACH is the transport channel to be used on the uplink:
      - 4> 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.
    - 3> if the IE "Transport Format Set" was not received within the IE "PRACH system information list", 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:
      - 4> set the variable INVALID\_CONFIGURATION to true.
    - 3> 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:
      - 4> re-establish the corresponding RLC entity;
      - 4> configure the corresponding RLC entity with the new RLC size;
      - 4> 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

- 4> 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:
  - 5> if this IE was included in system information and if the IE "Status" in variable CIPHERING\_STATUS of this CN domain is set to "Started":
    - 6> 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~~following cell reselection.

NOTE: Since the UE cannot predict the START value at the time of the next CELL UPDATE transmission in the future, UTRAN should desist from changing the RLC size for a signalling radio bearer or configuring different RLC sizes for a signalling radio bearer within a cell. Other than this aforementioned case the change in RLC size for a signalling radio bearer is known to the UE when reading system information following cell reselection. across UTRAN boundaries.

- 5> if this IE was included in CELL UPDATE CONFIRM and if the IE "Status" in the variable CIPHERING\_STATUS of this CN domain is set to "Started":
  - 6> 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.
- 5> if this IE was included in a reconfiguration message and if the IE "Status" in the variable CIPHERING\_STATUS of this CN domain is set to "Started":
  - 6> 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.
- ~~5> if this IE was included in ACTIVE SET UPDATE and if the IE "Status" in the variable CIPHERING\_STATUS of this CN domain is set to "Started":
  - 6> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" that will be included in the ACTIVE SET UPDATE COMPLETE message for this CN domain.~~
- 3> if that RB is using UM:
  - 4> indicate the largest applicable RLC size to the corresponding RLC entity.
- 3> configure MAC with the set of applicable RLC Sizes for each of the logical channels used for that RB.

For configuration restrictions on Blind Transport Format Detection, see [27].

**3GPP TSG-RAN WG2 Meeting #31**  
**Stockholm, Sweden, 19th - 23rd August 2002**

**Tdoc # R2-022312**

CR-Form-v7
<b>CHANGE REQUEST</b>
# <b>25.331 CR 1632</b> # rev <b>-</b> # Current version: <b>5.1.0</b> #

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	# UE behaviour following RLC size change		
<b>Source:</b>	# TSG-RAN WG2		
<b>Work item code:</b>	# TEI <span style="float: right;"><b>Date:</b> # 12/08/2002</span>		
<b>Category:</b>	# <b>A</b> <span style="float: right;"><b>Release:</b> # Rel-5</span>		
	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;">                     Use <u>one</u> of the following categories:  <b>F</b> (correction)  <b>A</b> (corresponds to a correction in an earlier release)  <b>B</b> (addition of feature),  <b>C</b> (functional modification of feature)  <b>D</b> (editorial modification)                      Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a>.                 </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)                      Rel-6 (Release 6)                 </td> </tr> </table>	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .	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) Rel-6 (Release 6)
Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .	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) Rel-6 (Release 6)		

<b>Reason for change:</b>	# The current specification requires the UE to set, in case of a RLC size change for a signalling radio bearer indicated through system information, the HFN values of the corresponding RLC entity to the value of "START" that will be included in next CELL UPDATE message to be transmitted in the future. However the UE cannot predict the value of START that will result at that time. Requiring all Ues to perform a CELL UPDATE immediately after the occurrence of this RLC size change could cause undue amount of CELL UPDATE processing at the UTRAN if a significant number of them attempt this simultaneously.  There is an incorrect behavior specified for the UE in case of RLC size change of an SRB RLC entity being caused by ACTIVE SET UPDATE message.
<b>Summary of change:</b>	# It is proposed to resolve this problem by adding a note indicating the perils of having RLC size changes for a SRB indicated through system information.  Text referring to the ACTIVE SET UPDATE message changing the RLC size for a SRB is deleted since this message cannot change the RLC size.
<b>Consequences if not approved:</b>	#

<b>Clauses affected:</b>	# 8.6.5.1										
<b>Other specs affected:</b>	<table style="border: none;"> <tr> <td style="border: 1px solid black; padding: 2px; text-align: center;">Y</td> <td style="border: 1px solid black; padding: 2px; text-align: center;">N</td> <td rowspan="2" style="padding-left: 10px;">Other core specifications</td> <td rowspan="2" style="padding-left: 10px;">#</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px; text-align: center;">#</td> <td style="border: 1px solid black; padding: 2px; text-align: center;">X</td> </tr> <tr> <td></td> <td style="border: 1px solid black; padding: 2px; text-align: center;">#</td> <td style="padding-left: 10px;">Test specifications</td> <td style="padding-left: 10px;">#</td> </tr> </table>	Y	N	Other core specifications	#	#	X		#	Test specifications	#
Y	N	Other core specifications	#								
#	X										
	#	Test specifications	#								

O&M Specifications

**Other comments:** ☞

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- 1) Fill out the above form. The symbols above marked ☞ contain pop-up help information about the field that they are closest to.
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- 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.

### 8.6.5.1 Transport Format Set

If the IE "Transport format set" is included, the UE shall:

- 1> if the transport format set is a RACH TFS received in System Information Block type 5 or 6, and CHOICE "Logical Channel List" has the value "Explicit List":
  - 2> ignore that System Information Block.
- 1> if the transport format set for a downlink transport channel is received in a System Information Block, and CHOICE "Logical Channel List" has a value different from 'ALL':
  - 2> ignore that System Information Block.
- 1> if the transport format set for a downlink transport channel is received in a message on a DCCH, and CHOICE "Logical Channel List" has a value different from 'ALL':
  - 2> keep the transport format set if this exists for that transport channel;
  - 2> set the variable INVALID\_CONFIGURATION to TRUE.
- 1> if the value of any IE "RB identity" (and "Logical Channel" for RBs using two UL logical channels) in the IE "Logical channel list" does not correspond to a logical channel indicated to be mapped onto this transport channel in any RB multiplexing option (either included in the same message or previously stored and not changed by this message); or
- 1> if the "Logical Channel List" for any of the RLC sizes defined for that transport channel is set to "Configured" while it is set to "All" or given as an "Explicit List" for any other RLC size; or
- 1> if the "Logical Channel List" for any of the RLC sizes defined for that transport channel is set to "All" and for any logical channel mapped to this transport channel, the value of the "RLC size list" (either provided in the IE "RB mapping info" if included in the same message, or stored) is not set to "Configured"; or
- 1> if the "Logical Channel List" for any of the RLC sizes defined for that transport channel is given as an "Explicit List" that contains a logical channel for which the value of the "RLC size list" (either provided in the IE "RB mapping info" if included in the same message, or stored) is not set to "Configured"; or
- 1> if the "Logical Channel List" for all the RLC sizes defined for that transport channel are given as "Explicit List" and if one of the logical channels mapped onto this transport channel is not included in any of those lists; or
- 1> if the "Logical Channel List" for the RLC sizes defined for that transport channel is set to "Configured" and for any logical channel mapped onto that transport channel, the value of the "RLC size list" (either provided in the IE "RB mapping info" if included in the same message, or stored) is also set to "Configured"; or
- 1> if the IE "Transport Format Set" was not received within the IE "PRACH system information list" and if the "Logical Channel List" for the RLC sizes defined for that transport channel is set to "Configured" and for any logical channel mapped onto that transport channel, the "RLC size list" (either provided in the IE "RB mapping info" if included in the same message, or stored) is given as an "Explicit List" that includes an "RLC size index" that does not correspond to any RLC size in this "Transport Format Set":
  - 2> keep the transport format set if this exists for that transport channel;
  - 2> set the variable INVALID\_CONFIGURATION to TRUE.
- 1> if the total number of configured transport formats for the transport channel exceeds maxTF:
  - 2> keep the transport format set if this exists for that transport channel;
  - 2> set the variable INVALID\_CONFIGURATION to TRUE.
- 1> if the IE "Transport format set" is considered as valid according to the rules above:
  - 2> remove a previously stored transport format set if this exists for that transport channel;

- 2> store the transport format set for that transport channel;
- 2> consider the first instance of the parameter *Number of TBs and TTI List* within the *Dynamic transport format information* to correspond to transport format 0 for this transport channel, the second to transport format 1 and so on;
- 2> if the IE "Transport format Set" has the choice "Transport channel type" set to "Dedicated transport channel":
  - 3> calculate the transport block size for all transport formats in the TFS using the following

$$\text{TB size} = \text{RLC size} + \text{MAC header size},$$

where:

- MAC header size is calculated according to [15] if MAC multiplexing is used. Otherwise it is 0 bits;
  - 'RLC size' reflects the RLC PDU size.
- 2> if the IE "Transport format Set" has the choice "Transport channel type" set to "Common transport channel":
    - 3> calculate the transport block size for all transport formats in the TFS using the following:
 
$$\text{TB size} = \text{RLC size}.$$
  - 2> if the IE "Number of Transport blocks"  $\neq 0$  and IE "RLC size" = 0, no RLC PDU data exists but only parity bits exist for that transport format;
  - 2> if the IE "Number of Transport blocks" = 0, neither RLC PDU neither data nor parity bits exist for that transport format;
  - 2> configure the MAC with the new transport format set (with computed transport block sizes) for that transport channel;
  - 2> if the RB multiplexing option for a RB mapped onto that transport channel (based on the stored RB multiplexing option) is not modified by this message:
    - 3> determine the sets of RLC sizes that apply to the logical channels used by that RB, based on the IE "Logical Channel List" and/or the IE "RLC Size List" from the previously stored RB multiplexing option.
    - 3> if the IE "Transport Format Set" was received within the IE "PRACH system information list":
      - 4> ignore the RLC size indexes in the stored RB multiplexing option that do not correspond to any RLC size in the received Transport Format Set.
    - 3> if the IE "Transport Format Set" was received within the IE "PRACH system information list", if that RB is using AM and if RACH is the transport channel to be used on the uplink:
      - 4> 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.
    - 3> if the IE "Transport Format Set" was not received within the IE "PRACH system information list", 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:
      - 4> set the variable INVALID\_CONFIGURATION to true.
  - 3> 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:
    - 4> re-establish the corresponding RLC entity;
    - 4> configure the corresponding RLC entity with the new RLC size;
    - 4> 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



- 4> 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:
  - 5> if this IE was included in system information and if the IE "Status" in variable CIPHERING\_STATUS of this CN domain is set to "Started":
    - 6> 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 [following cell reselection](#). ~~that will be sent before the next transmission.~~

NOTE: Since the UE cannot predict the START value at the time of the next CELL UPDATE transmission in the future, UTRAN should desist from changing the RLC size for a signalling radio bearer or configuring different RLC sizes for a signalling radio bearer within a cell. Other than this aforementioned case the change in RLC size for a signalling radio bearer is known to the UE when reading system information following cell reselection across UTRAN boundaries.

- 5> if this IE was included in CELL UPDATE CONFIRM and if the IE "Status" in the variable CIPHERING\_STATUS of this CN domain is set to "Started":
  - 6> 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.
- 5> if this IE was included in a reconfiguration message and if the IE "Status" in the variable CIPHERING\_STATUS of this CN domain is set to "Started":
  - 6> 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.
- ~~5> if this IE was included in ACTIVE SET UPDATE and if the IE "Status" in the variable CIPHERING\_STATUS of this CN domain is set to "Started":
  - 6> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" that will be included in the ACTIVE SET UPDATE COMPLETE message for this CN domain.~~
- 3> if that RB is using UM:
  - 4> indicate the largest applicable RLC size to the corresponding RLC entity.
- 3> configure MAC with the set of applicable RLC Sizes for each of the logical channels used for that RB.

For configuration restrictions on Blind Transport Format Detection, see [27].

## CHANGE REQUEST

# **25.331 CR 1633** # rev - # Current version: **3.11.0** #

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	# RRC SN in uplink				
<b>Source:</b>	# TSG-RAN WG2				
<b>Work item code:</b>	# TEI	<b>Date:</b>	# 19 August 2002		
<b>Category:</b>	# <b>F</b>	<b>Release:</b>	# R99		
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:		
	<b>F</b> (correction)		2 (GSM Phase 2)		
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)		
	<b>B</b> (addition of feature),		R97 (Release 1997)		
	<b>C</b> (functional modification of feature)		R98 (Release 1998)		
	<b>D</b> (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)		
			Rel-6 (Release 6)		

<b>Reason for change:</b>	# It is not clear if the RRC SN of repeated uplink meassages has to be incremented or not (or incremented twice!). The increment is explicitly stated for the RRC CONNECTION RELEASE COMPLETE message, for the UE CAPABILITY INFORMATION message, but nothing is said for the CELL UPDATE message. Moreover, in section 8.5.10.2 there is a general statement about incrementing the RRC SN for each UL message. A literal interpretation may lead to increment the RRC SN twice (for the RRC CONNECTION RELEASE COMPLETE message and for the UE CAPABILITY INFORMATION message).
<b>Summary of change:</b>	# The statement about incrementing the RRC SN is removed for the RRC CONNECTION RELEASE COMPLETE message and for the UE CAPABILITY INFORMATION message. A general statement is added to section 8.5.10.2 that applies to all retransmitted messages.  <b>Isolated Impact Change Analysis.</b>  This change clarifies the integrity protection procedure. It is a clarification that captures the common understanding in the industry. It would not affect implementations behaving like indicated in the CR, it would affect implementations supporting the corrected functionality otherwise.  <b>Impact on test specifications</b> No impact
<b>Consequences if not approved:</b>	# The UE could increment the RRC SN twice for each repetition of an RRC CONNECTION RELEASE COMPLETE message and for the UE CAPABILITY

INFORMATION message.

**Clauses affected:** ⌘ 8.1.4.6, 8.1.6.6, 8.3.1.12, 8.5.10, 8.5.10.2

	Y	N		
<b>Other specs affected:</b>	⌘	X	Other core specifications	⌘
		X	Test specifications	
		X	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/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.

[...]

#### 8.1.4.6 Expiry of timer T308, unacknowledged mode transmission

When in state CELL\_DCH and the timer T308 expires, the UE shall:

- 1> increment V308 by one;
- 1> if V308 is equal to or smaller than N308:
  - 2> prior to retransmitting the RRC CONNECTION RELEASE COMPLETE message:
    - 3> if the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started":
      - 4> include the same IEs as in the last unsuccessful attempt of this message, except for the IE "Integrity check info", which is ~~modified as follows~~set as specified in 8.5.10.
        - 5> ~~increment the "Uplink RRC Message sequence number" for signalling radio bearer RB1 in the variable INTEGRITY\_PROTECTION\_INFO by one;~~
        - 5> ~~set the IE "RRC Message sequence number" in the IE "Integrity check info" by the value of the "Uplink RRC Message sequence number" for signalling radio bearer RB1 in the variable INTEGRITY\_PROTECTION\_INFO in this message;~~
        - 5> ~~recalculate the IE "Message authentication code" in the IE "Integrity check info" in this message, in accordance with subclause 8.5.10.3.~~
    - 3> else:
      - 4> include the same IEs as in the last unsuccessful attempt of this message.
  - 2> set the IE "RRC transaction identifier" in the RRC CONNECTION RELEASE COMPLETE message retransmitted below to the value of "RRC transaction identifier" in the entry for the RRC CONNECTION RELEASE message in the table "Accepted transactions" in the variable TRANSACTIONS;
  - 2> send the RRC CONNECTION RELEASE COMPLETE message on signalling radio bearer RB1;
  - 2> start timer T308 when the RRC CONNECTION RELEASE COMPLETE message is sent on the radio interface.
- 1> if V308 is greater than N308:
  - 2> release all its radio resources;
  - 2> indicate the release 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 any entry for the RRC CONNECTION RELEASE message in the tables "Accepted transactions" and "Rejected transactions" in the variable TRANSACTIONS;
  - 2> clear the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS;
  - 2> clear the variable ESTABLISHED\_RABS;
  - 2> enter idle mode;
  - 2> perform the actions specified in subclause 8.5.2 when entering idle mode;
  - 2> and the procedure ends.

[...]

#### 8.1.6.6 T304 timeout

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

- 1> if V304 is smaller than or equal to N304:
  - 2> prior to retransmitting the UE CAPABILITY INFORMATION message:
    - 3> if the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started":
      - 4> include the same IEs as in the last unsuccessful attempt of this message, except for the IE "Integrity check info", which is set as specified in 8.5.10~~modified as follows~~:
        - ~~5> increment the "Uplink RRC Message sequence number" for signalling radio bearer RB2 in the variable INTEGRITY\_PROTECTION\_INFO by one;~~
        - ~~5> set the IE "RRC Message sequence number" in the IE "Integrity check info" by the value of the "Uplink RRC Message sequence number" for signalling radio bearer RB2 in the variable INTEGRITY\_PROTECTION\_INFO in this message;~~
        - ~~5> recalculate the IE "Message authentication code" in the IE "Integrity check info" in this message, in accordance with subclause 8.5.10.3.~~
    - 3> else:
      - 4> include the same IEs as in the last unsuccessful attempt of this message.
  - 2> send the UE CAPABILITY INFORMATION message on signalling radio bearer RB2;
  - 2> restart timer T304;
  - 2> increment counter V304.
- 1> if V304 is greater than N304:
  - 2> initiate the Cell update procedure as specified in subclause 8.3.1, using the cause "Radio link failure".

[...]

### 8.3.1.12 T302 expiry or cell reselection

If any or several of the following conditions are true:

- expiry of timer T302;
- reselection to another UTRA cell (including the previously serving cell) before completion of the cell update or URA update procedure;

the UE shall:

- 1> stop T302 if it is running;
- 1> if the UE was in CELL\_DCH state prior to the initiation of the procedure; and
  - 2> if timers T314 and T315 have elapsed while T302 was running:
    - 3> enter idle mode.
    - 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. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2.
    - 3> and the procedure ends.
  - 2> if timer T314 has elapsed while T302 was running and,
    - 3> if "T314 expired" in the variable RB\_TIMER\_INDICATOR is set to FALSE and
    - 3> if T315 is still running:

- 4> release locally all radio bearers which are 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> indicate release of those radio access bearers to upper layers;
  - 4> delete all information about those radio access bearers from the variable ESTABLISHED\_RABS;
  - 4> set "T314 expired" in the variable RB\_TIMER\_INDICATOR to TRUE.
- 2> if timer T315 has elapsed while T302 was running and,
- 3> if "T315 expired" in the variable RB\_TIMER\_INDICATOR is set to FALSE and,
  - 3> if T314 is still running:
    - 4> release locally all radio bearers which are 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> indicate release of those radio access bearers to upper layers;
    - 4> delete all information about those radio access bearers from the variable ESTABLISHED\_RABS;
    - 4> set "T315 expired" in the variable RB\_TIMER\_INDICATOR to TRUE.
- 1> check whether it is still in "in service area" (see subclause 8.5.5.2);
- 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> in case of a cell update procedure:
- 2> clear any entry for the CELL UPDATE CONFIRM message in the table "Accepted transactions" in the variable TRANSACTIONS.
- 1> in case of a URA update procedure:
- 2> clear any entry for the URA UPDATE CONFIRM message in the table "Accepted transactions" in the variable TRANSACTIONS.

If the UE detects "in service area" if it has not entered idle mode, and:

- 1> if V302 is equal to or smaller than N302, the UE shall:
  - 2> if the UE performed cell re-selection:
    - 3> delete its C-RNTI.
  - 2> in case of a cell update procedure:
    - 3> set the contents of the CELL UPDATE message according to subclause 8.3.1.3 and 8.5.10;
    - 3> if a CELL UPDATE CONFIRM message was received and caused the IE "Reconfiguration" in the variable CIPHERING\_STATUS to be set to TRUE and/or the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to be set to TRUE:
      - 4> if the IE "Downlink counter synchronisation info" was included in the received CELL UPDATE CONFIRM message:
        - 5> apply the new security (integrity protection) configuration received in the CELL UPDATE CONFIRM on the CELL UPDATE message.
    - 3> submit the CELL UPDATE message for transmission on the uplink CCCH.
  - 2> in case of a URA update procedure:
    - 3> set the contents of the URA UPDATE message according to subclause 8.3.1.3 and 8.5.10;

- 3> if a URA UPDATE CONFIRM message was received and caused the IE "Reconfiguration" in the variable CIPHERING\_STATUS to be set to TRUE and/or the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO is set to TRUE:
  - 4> if the IE "Downlink counter synchronisation info" was included in the received URA UPDATE CONFIRM message:
    - 5> apply the new security (integrity protection) configuration received in the URA UPDATE CONFIRM on the URA UPDATE message.
  - 3> submit the URA 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, the UE shall:
  - 2> clear the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO;
  - 2> clear the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
  - 2> clear the variable PDCP\_SN\_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> set the variable CELL\_UPDATE\_STARTED to FALSE;
  - 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 does not detect "in service area", it shall:

- 1> continue searching for "in service area".

[...]

## 8.5.10 Integrity protection

If the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started" then the UE shall:

- 1> perform integrity protection (and integrity checking) on all RRC messages, with the following exceptions:
  - HANDOVER TO UTRAN COMPLETE

PAGING TYPE 1

PUSCH CAPACITY REQUEST

PHYSICAL SHARED CHANNEL ALLOCATION

RRC CONNECTION REQUEST

RRC CONNECTION SETUP

RRC CONNECTION SETUP COMPLETE

RRC CONNECTION REJECT

RRC CONNECTION RELEASE (CCCH only)

SYSTEM INFORMATION

SYSTEM INFORMATION CHANGE INDICATION

If the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Not started" then integrity protection (and integrity checking) shall not be performed on any RRC message.

For each signalling radio bearer, the UE shall use two RRC hyper frame numbers:

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

and two message sequence numbers:

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

The above information is stored in the variable INTEGRITY\_PROTECTION\_INFO per signalling radio bearer (RB0-RB4).

Upon the first activation of integrity protection for an RRC connection, UE and UTRAN initialise the "Uplink RRC Message sequence number" and "Downlink RRC Message sequence number" for all signalling radio bearers as specified in subclauses 8.6.3.5 and 8.5.10.1.

The RRC message sequence number (RRC SN) is incremented for every integrity protected RRC message.

If the IE "Integrity Protection Mode Info" is present in a received message, the UE shall:

- 1> perform the actions in subclause 8.6.3.5 before proceeding with the integrity check of the received message.

### 8.5.10.1 Integrity protection in downlink

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

- 1> check the value of the IE "RRC message sequence number" included in the IE "Integrity check info";
- 2> if the "Downlink RRC Message sequence number" is not present in the variable INTEGRITY\_PROTECTION\_INFO:
  - 3> initialise the "Downlink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO with the value of the IE "RRC message sequence number" included in the IE "Integrity check info" of the received message.
- 2> if the "Downlink RRC Message sequence number" is present in the variable INTEGRITY\_PROTECTION\_INFO:
  - 3> if the RRC message sequence number is lower than the "Downlink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO:



- 4> increment "Downlink RRC HFN" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO with one.
- 3> if the RRC message sequence number is equal to the "Downlink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO:
  - 4> discard the message.
- 1> calculate an expected message authentication code in accordance with subclause 8.5.10.3;
- 1> compare the expected message authentication code with the value of the received IE "message authentication code" contained in the IE "Integrity check info";
  - 2> if the expected message authentication code and the received message authentication code are the same, the integrity check is successful:
    - 3> update the "Downlink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO with the value of the IE "RRC message sequence number" included in the IE "Integrity check info" of the received RRC message.
  - 2> if the calculated expected message authentication code and the received message authentication code differ:
    - 3> if the IE "RRC message sequence number" included in the IE "Integrity check info" is lower than the "Downlink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO (in this case the "Downlink RRC HFN" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO was incremented by one, as stated above):
      - 4> decrement "Downlink RRC HFN" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO by one.
    - 3> discard the message.

If the UE receives an RRC message on signalling radio bearer with identity n, the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started" and the IE 'Integrity check info' is not present the UE shall:

- 1> discard the message.

UTRAN may transmit several copies of the same message in the downlink to increase the probability of proper reception of the message by the UE. In such a case, the RRC SN for these repeated messages should be the same.

### 8.5.10.2 Integrity protection in uplink

Prior to sending an RRC message using the signalling radio bearer with radio bearer identity n, and the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started" the UE shall:

- 1> increment "Uplink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO with 1, even if the message is a retransmission of a previously transmitted message. When "Uplink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO becomes 0, the UE shall increment "Uplink RRC HFN" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO with 1;
- 1> calculate the message authentication code in accordance with subclause 8.5.10.3;
- 1> replace the "Message authentication code" in the IE "Integrity check info" in the message with the calculated message authentication code;
- 1> replace the "RRC Message sequence number" in the IE "Integrity check info" in the message with contents set to the new value of the "Uplink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO.

In the response message for the procedure ordering the security reconfiguration, the UE indicates the activation time, for each signalling radio bearer except for the signalling radio bearer that was used for this security reconfiguration procedure. When the new integrity configuration is to be applied in uplink, UTRAN should start to apply the new integrity protection configuration according to the activation time for each signalling radio bearer (except for the

signalling radio bearer which is used to send the message that is reconfiguring the security configuration) where the new configuration is to be applied starting from and including reception of the response message).

[...]

## CHANGE REQUEST

# **25.331 CR 1634** # rev **-** # Current version: **4.5.0** #

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	# RRC SN in uplink				
<b>Source:</b>	# TSG-RAN WG2				
<b>Work item code:</b>	# TEI	<b>Date:</b>	# 19 August 2002		
<b>Category:</b>	# <b>A</b>	<b>Release:</b>	# Rel-4		
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:		
	<b>F</b> (correction)		2 (GSM Phase 2)		
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)		
	<b>B</b> (addition of feature),		R97 (Release 1997)		
	<b>C</b> (functional modification of feature)		R98 (Release 1998)		
	<b>D</b> (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)		
			Rel-6 (Release 6)		

<b>Reason for change:</b>	# It is not clear if the RRC SN of repeated uplink meassages has to be incremented or not (or incremented twice!). The increment is explicitly stated for the RRC CONNECTION RELEASE COMPLETE message, for the UE CAPABILITY INFORMATION message, but nothing is said for the CELL UPDATE message. Moreover, in section 8.5.10.2 there is a general statement about incrementing the RRC SN for each UL message. A literal interpretation may lead to increment the RRC SN twice (for the RRC CONNECTION RELEASE COMPLETE message and for the UE CAPABILITY INFORMATION message).
<b>Summary of change:</b>	# The statement about incrementing the RRC SN is removed for the RRC CONNECTION RELEASE COMPLETE message and for the UE CAPABILITY INFORMATION message. A general statement is added to section 8.5.10.2 that applies to all retransmitted messages.  <b>Isolated Impact Change Analysis.</b>  This change clarifies the integrity protection procedure. It is a clarification that captures the common understanding in the industry. It would not affect implementations behaving like indicated in the CR, it would affect implementations supporting the corrected functionality otherwise.  <b>Impact on test specifications</b> No impact
<b>Consequences if not approved:</b>	# The UE could increment the RRC SN twice for each repetition of an RRC CONNECTION RELEASE COMPLETE message and for the UE CAPABILITY

INFORMATION message.

<b>Clauses affected:</b>	⌘	8.1.4.6, 8.1.6.6, 8.3.1.12, 8.5.10.2										
<b>Other specs affected:</b>	⌘	<table border="1"><tr><td>Y</td><td>N</td></tr><tr><td></td><td>X</td></tr><tr><td></td><td>X</td></tr><tr><td></td><td>X</td></tr></table>	Y	N		X		X		X	Other core specifications	⌘
		Y	N									
			X									
	X											
	X											
	X	Test specifications										
	X	O&M Specifications										
<b>Other comments:</b>	⌘											

### 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.

[...]

#### 8.1.4.6 Expiry of timer T308, unacknowledged mode transmission

When in state CELL\_DCH and the timer T308 expires, the UE shall:

- 1> increment V308 by one;
- 1> if V308 is equal to or smaller than N308:
  - 2> prior to retransmitting the RRC CONNECTION RELEASE COMPLETE message:
    - 3> if the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started":
      - 4> include the same IEs as in the last unsuccessful attempt of this message, except for the IE "Integrity check info", which is ~~modified as follows~~set as specified in 8.5.10.
        - ~~5> increment the "Uplink RRC Message sequence number" for signalling radio bearer RB1 in the variable INTEGRITY\_PROTECTION\_INFO by one;~~
        - ~~5> set the IE "RRC Message sequence number" in the IE "Integrity check info" by the value of the "Uplink RRC Message sequence number" for signalling radio bearer RB1 in the variable INTEGRITY\_PROTECTION\_INFO in this message;~~
        - ~~5> recalculate the IE "Message authentication code" in the IE "Integrity check info" in this message, in accordance with subclause 8.5.10.3.~~
    - 3> else:
      - 4> include the same IEs as in the last unsuccessful attempt of this message.
  - 2> set the IE "RRC transaction identifier" in the RRC CONNECTION RELEASE COMPLETE message retransmitted below to the value of "RRC transaction identifier" in the entry for the RRC CONNECTION RELEASE message in the table "Accepted transactions" in the variable TRANSACTIONS;
  - 2> send the RRC CONNECTION RELEASE COMPLETE message on signalling radio bearer RB1;
  - 2> start timer T308 when the RRC CONNECTION RELEASE COMPLETE message is sent on the radio interface.
- 1> if V308 is greater than N308:
  - 2> release all its radio resources;
  - 2> indicate the release 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 any entry for the RRC CONNECTION RELEASE message in the tables "Accepted transactions" and "Rejected transactions" in the variable TRANSACTIONS;
  - 2> clear the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS;
  - 2> clear the variable ESTABLISHED\_RABS;
  - 2> enter idle mode;
  - 2> perform the actions specified in subclause 8.5.2 when entering idle mode;
  - 2> and the procedure ends.

[...]

#### 8.1.6.6 T304 timeout

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

- 1> if V304 is smaller than or equal to N304:
  - 2> prior to retransmitting the UE CAPABILITY INFORMATION message:
    - 3> if the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started":
      - 4> include the same IEs as in the last unsuccessful attempt of this message, except for the IE "Integrity check info", which is set as specified in 8.5.10, modified as follows:
        - ~~5> increment the "Uplink RRC Message sequence number" for signalling radio bearer RB2 in the variable INTEGRITY\_PROTECTION\_INFO by one;~~
        - ~~5> set the IE "RRC Message sequence number" in the IE "Integrity check info" by the value of the "Uplink RRC Message sequence number" for signalling radio bearer RB2 in the variable INTEGRITY\_PROTECTION\_INFO in this message;~~
        - ~~5> recalculate the IE "Message authentication code" in the IE "Integrity check info" in this message, in accordance with subclause 8.5.10.3.~~
    - 3> else:
      - 4> include the same IEs as in the last unsuccessful attempt of this message.
  - 2> send the UE CAPABILITY INFORMATION message on signalling radio bearer RB2;
  - 2> restart timer T304;
  - 2> increment counter V304.
- 1> if V304 is greater than N304:
  - 2> initiate the Cell update procedure as specified in subclause 8.3.1, using the cause "Radio link failure".

[...]

### 8.3.1.12 T302 expiry or cell reselection

If any or several of the following conditions are true:

- expiry of timer T302;
- reselection to another UTRA cell (including the previously serving cell) before completion of the cell update or URA update procedure;

the UE shall:

- 1> stop T302 if it is running;
- 1> if the UE was in CELL\_DCH state prior to the initiation of the procedure; and
  - 2> if timers T314 and T315 have elapsed while T302 was running:
    - 3> enter idle mode.
    - 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. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2.
    - 3> and the procedure ends.
  - 2> if timer T314 has elapsed while T302 was running and,
    - 3> if "T314 expired" in the variable RB\_TIMER\_INDICATOR is set to FALSE and
    - 3> if T315 is still running:

- 4> release locally all radio bearers which are 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> indicate release of those radio access bearers to upper layers;
  - 4> delete all information about those radio access bearers from the variable ESTABLISHED\_RABS;
  - 4> set "T314 expired" in the variable RB\_TIMER\_INDICATOR to TRUE.
- 2> if timer T315 has elapsed while T302 was running and,
- 3> if "T315 expired" in the variable RB\_TIMER\_INDICATOR is set to FALSE and,
  - 3> if T314 is still running:
    - 4> release locally all radio bearers which are 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> indicate release of those radio access bearers to upper layers;
    - 4> delete all information about those radio access bearers from the variable ESTABLISHED\_RABS;
    - 4> set "T315 expired" in the variable RB\_TIMER\_INDICATOR to TRUE.
- 1> check whether it is still in "in service area" (see subclause 8.5.5.2);
- 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> in case of a cell update procedure:
- 2> clear any entry for the CELL UPDATE CONFIRM message in the table "Accepted transactions" in the variable TRANSACTIONS.
- 1> in case of a URA update procedure:
- 2> clear any entry for the URA UPDATE CONFIRM message in the table "Accepted transactions" in the variable TRANSACTIONS.

If the UE detects "in service area" if it has not entered idle mode, and:

- 1> if V302 is equal to or smaller than N302, the UE shall:
  - 2> if the UE performed cell re-selection:
    - 3> delete its C-RNTI.
  - 2> in case of a cell update procedure:
    - 3> set the contents of the CELL UPDATE message according to subclause 8.3.1.3 and 8.5.10;
    - 3> if a CELL UPDATE CONFIRM message was received and caused the IE "Reconfiguration" in the variable CIPHERING\_STATUS to be set to TRUE and/or the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to be set to TRUE:
      - 4> if the IE "Downlink counter synchronisation info" was included in the received CELL UPDATE CONFIRM message:
        - 5> apply the new security (integrity protection) configuration received in the CELL UPDATE CONFIRM on the CELL UPDATE message.
    - 3> submit the CELL UPDATE message for transmission on the uplink CCCH.
  - 2> in case of a URA update procedure:
    - 3> set the contents of the URA UPDATE message according to subclause 8.3.1.3 and 8.5.10;

- 3> if a URA UPDATE CONFIRM message was received and caused the IE "Reconfiguration" in the variable CIPHERING\_STATUS to be set to TRUE and/or the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO is set to TRUE:
  - 4> if the IE "Downlink counter synchronisation info" was included in the received URA UPDATE CONFIRM message:
    - 5> apply the new security (integrity protection) configuration received in the URA UPDATE CONFIRM on the URA UPDATE message.
  - 3> submit the URA 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, the UE shall:
  - 2> clear the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO;
  - 2> clear the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
  - 2> clear the variable PDCP\_SN\_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> set the variable CELL\_UPDATE\_STARTED to FALSE;
  - 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 does not detect "in service area", it shall:

- 1> continue searching for "in service area".

[...]

## 8.5.10 Integrity protection

If the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started" then the UE shall:

- 1> perform integrity protection (and integrity checking) on all RRC messages, with the following exceptions:
  - HANDOVER TO UTRAN COMPLETE



PAGING TYPE 1

PUSCH CAPACITY REQUEST

PHYSICAL SHARED CHANNEL ALLOCATION

RRC CONNECTION REQUEST

RRC CONNECTION SETUP

RRC CONNECTION SETUP COMPLETE

RRC CONNECTION REJECT

RRC CONNECTION RELEASE (CCCH only)

SYSTEM INFORMATION

SYSTEM INFORMATION CHANGE INDICATION

If the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Not started" then integrity protection (and integrity checking) shall not be performed on any RRC message.

For each signalling radio bearer, the UE shall use two RRC hyper frame numbers:

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

and two message sequence numbers:

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

The above information is stored in the variable INTEGRITY\_PROTECTION\_INFO per signalling radio bearer (RB0-RB4).

Upon the first activation of integrity protection for an RRC connection, UE and UTRAN initialise the "Uplink RRC Message sequence number" and "Downlink RRC Message sequence number" for all signalling radio bearers as specified in subclauses 8.6.3.5 and 8.5.10.1.

The RRC message sequence number (RRC SN) is incremented for every integrity protected RRC message.

If the IE "Integrity Protection Mode Info" is present in a received message, the UE shall:

- 1> perform the actions in subclause 8.6.3.5 before proceeding with the integrity check of the received message.

### 8.5.10.1 Integrity protection in downlink

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

- 1> check the value of the IE "RRC message sequence number" included in the IE "Integrity check info";
- 2> if the "Downlink RRC Message sequence number" is not present in the variable INTEGRITY\_PROTECTION\_INFO:
  - 3> initialise the "Downlink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO with the value of the IE "RRC message sequence number" included in the IE "Integrity check info" of the received message.
- 2> if the "Downlink RRC Message sequence number" is present in the variable INTEGRITY\_PROTECTION\_INFO:
  - 3> if the RRC message sequence number is lower than the "Downlink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO:

- 4> increment "Downlink RRC HFN" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO with one.
- 3> if the RRC message sequence number is equal to the "Downlink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO:
  - 4> discard the message.
- 1> calculate an expected message authentication code in accordance with subclause 8.5.10.3;
- 1> compare the expected message authentication code with the value of the received IE "message authentication code" contained in the IE "Integrity check info";
  - 2> if the expected message authentication code and the received message authentication code are the same, the integrity check is successful:
    - 3> update the "Downlink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO with the value of the IE "RRC message sequence number" included in the IE "Integrity check info" of the received RRC message.
  - 2> if the calculated expected message authentication code and the received message authentication code differ:
    - 3> if the IE "RRC message sequence number" included in the IE "Integrity check info" is lower than the "Downlink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO (in this case the "Downlink RRC HFN" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO was incremented by one, as stated above):
      - 4> decrement "Downlink RRC HFN" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO by one.
    - 3> discard the message.

If the UE receives an RRC message on signalling radio bearer with identity n, the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started" and the IE 'Integrity check info' is not present the UE shall:

- 1> discard the message.

UTRAN may transmit several copies of the same message in the downlink to increase the probability of proper reception of the message by the UE. In such a case, the RRC SN for these repeated messages should be the same.

### 8.5.10.2 Integrity protection in uplink

Prior to sending an RRC message using the signalling radio bearer with radio bearer identity n, and the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started" the UE shall:

- 1> increment "Uplink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO with 1, even if the message is a retransmission of a previously transmitted message. When "Uplink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO becomes 0, the UE shall increment "Uplink RRC HFN" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO with 1;
- 1> calculate the message authentication code in accordance with subclause 8.5.10.3;
- 1> replace the "Message authentication code" in the IE "Integrity check info" in the message with the calculated message authentication code;
- 1> replace the "RRC Message sequence number" in the IE "Integrity check info" in the message with contents set to the new value of the "Uplink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO.

In the response message for the procedure ordering the security reconfiguration, the UE indicates the activation time, for each signalling radio bearer except for the signalling radio bearer that was used for this security reconfiguration procedure. When the new integrity configuration is to be applied in uplink, UTRAN should start to apply the new integrity protection configuration according to the activation time for each signalling radio bearer (except for the

signalling radio bearer which is used to send the message that is reconfiguring the security configuration) where the new configuration is to be applied starting from and including reception of the response message).

[...]

## CHANGE REQUEST

# **25.331 CR 1635** # rev **-** # Current version: **5.1.0** #

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	# RRC SN in uplink				
<b>Source:</b>	# TSG-RAN WG2				
<b>Work item code:</b>	# TEI	<b>Date:</b>	# 19 August 2002		
<b>Category:</b>	# <b>A</b>	<b>Release:</b>	# Rel-5		
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:		
	<b>F</b> (correction)		2 (GSM Phase 2)		
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)		
	<b>B</b> (addition of feature),		R97 (Release 1997)		
	<b>C</b> (functional modification of feature)		R98 (Release 1998)		
	<b>D</b> (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)		
			Rel-6 (Release 6)		

<b>Reason for change:</b>	# It is not clear if the RRC SN of repeated uplink meessages has to be incremented or not (or incremented twice!). The increment is explicitly stated for the RRC CONNECTION RELEASE COMPLETE message, for the UE CAPABILITY INFORMATION message, but nothing is said for the CELL UPDATE message. Moreover, in section 8.5.10.2 there is a general statement about incrementing the RRC SN for each UL message. A literal interpretation may lead to increment the RRC SN twice (for the RRC CONNECTION RELEASE COMPLETE message and for the UE CAPABILITY INFORMATION message).
<b>Summary of change:</b>	# The statement about incrementing the RRC SN is removed for the RRC CONNECTION RELEASE COMPLETE message and for the UE CAPABILITY INFORMATION message. A general statement is added to section 8.5.10.2 that applies to all retransmitted messages.  <b>Isolated Impact Change Analysis.</b>  This change clarifies the integrity protection procedure. It is a clarification that captures the common understanding in the industry. It would not affect implementations behaving like indicated in the CR, it would affect implementations supporting the corrected functionality otherwise.  <b>Impact on test specifications</b> No impact
<b>Consequences if not approved:</b>	# The UE could increment the RRC SN twice for each repetition of an RRC CONNECTION RELEASE COMPLETE message and for the UE CAPABILITY

INFORMATION message.

<b>Clauses affected:</b>	⌘	8.1.4.6, 8.1.6.6, 8.3.1.12, 8.5.10.2										
<b>Other specs affected:</b>	⌘	<table border="1"><tr><td>Y</td><td>N</td></tr><tr><td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td></tr><tr><td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td></tr><tr><td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td></tr></table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	⌘
		Y	N									
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<input type="checkbox"/>	<input checked="" type="checkbox"/>											
<input type="checkbox"/>	<input checked="" type="checkbox"/>											
		Test specifications										
		O&M Specifications										
<b>Other comments:</b>	⌘											

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- 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.

[...]

#### 8.1.4.6 Expiry of timer T308, unacknowledged mode transmission

When in state CELL\_DCH and the timer T308 expires, the UE shall:

- 1> increment V308 by one;
- 1> if V308 is equal to or smaller than N308:
  - 2> prior to retransmitting the RRC CONNECTION RELEASE COMPLETE message:
    - 3> if the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started":
      - 4> include the same IEs as in the last unsuccessful attempt of this message, except for the IE "Integrity check info", which is ~~modified as follows~~set as specified in 8.5.10.
        - 5> ~~increment the "Uplink RRC Message sequence number" for signalling radio bearer RB1 in the variable INTEGRITY\_PROTECTION\_INFO by one;~~
        - 5> ~~set the IE "RRC Message sequence number" in the IE "Integrity check info" by the value of the "Uplink RRC Message sequence number" for signalling radio bearer RB1 in the variable INTEGRITY\_PROTECTION\_INFO in this message;~~
        - 5> ~~recalculate the IE "Message authentication code" in the IE "Integrity check info" in this message, in accordance with subclause 8.5.10.3.~~
    - 3> else:
      - 4> include the same IEs as in the last unsuccessful attempt of this message.
  - 2> set the IE "RRC transaction identifier" in the RRC CONNECTION RELEASE COMPLETE message retransmitted below to the value of "RRC transaction identifier" in the entry for the RRC CONNECTION RELEASE message in the table "Accepted transactions" in the variable TRANSACTIONS;
  - 2> send the RRC CONNECTION RELEASE COMPLETE message on signalling radio bearer RB1;
  - 2> start timer T308 when the RRC CONNECTION RELEASE COMPLETE message is sent on the radio interface.
- 1> if V308 is greater than N308:
  - 2> release all its radio resources;
  - 2> indicate the release 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 any entry for the RRC CONNECTION RELEASE message in the tables "Accepted transactions" and "Rejected transactions" in the variable TRANSACTIONS;
  - 2> clear the variable ESTABLISHED\_SIGNALLING\_CONNECTIONS;
  - 2> clear the variable ESTABLISHED\_RABS;
  - 2> enter idle mode;
  - 2> perform the actions specified in subclause 8.5.2 when entering idle mode;
  - 2> and the procedure ends.

[...]

#### 8.1.6.6 T304 timeout

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

- 1> if V304 is smaller than or equal to N304:
  - 2> prior to retransmitting the UE CAPABILITY INFORMATION message:
    - 3> if the IE "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started":
      - 4> include the same IEs as in the last unsuccessful attempt of this message, except for the IE "Integrity check info", which is set as specified in 8.5.10, modified as follows:
        - ~~5> increment the "Uplink RRC Message sequence number" for signalling radio bearer RB2 in the variable INTEGRITY\_PROTECTION\_INFO by one;~~
        - ~~5> set the IE "RRC Message sequence number" in the IE "Integrity check info" by the value of the "Uplink RRC Message sequence number" for signalling radio bearer RB2 in the variable INTEGRITY\_PROTECTION\_INFO in this message;~~
        - ~~5> recalculate the IE "Message authentication code" in the IE "Integrity check info" in this message, in accordance with subclause 8.5.10.3.~~
    - 3> else:
      - 4> include the same IEs as in the last unsuccessful attempt of this message.
  - 2> send the UE CAPABILITY INFORMATION message on signalling radio bearer RB2;
  - 2> restart timer T304;
  - 2> increment counter V304.
- 1> if V304 is greater than N304:
  - 2> initiate the Cell update procedure as specified in subclause 8.3.1, using the cause "Radio link failure".

[...]

### 8.3.1.12 T302 expiry or cell reselection

If any or several of the following conditions are true:

- expiry of timer T302;
- reselection to another UTRA cell (including the previously serving cell) before completion of the cell update or URA update procedure;

the UE shall:

- 1> stop T302 if it is running;
- 1> if the UE was in CELL\_DCH state prior to the initiation of the procedure; and
  - 2> if timers T314 and T315 have elapsed while T302 was running:
    - 3> enter idle mode.
    - 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. Other actions the UE shall perform when entering idle mode from connected mode are specified in subclause 8.5.2.
    - 3> and the procedure ends.
  - 2> if timer T314 has elapsed while T302 was running and,
    - 3> if "T314 expired" in the variable RB\_TIMER\_INDICATOR is set to FALSE and
    - 3> if T315 is still running:

- 4> release locally all radio bearers which are 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> indicate release of those radio access bearers to upper layers;
  - 4> delete all information about those radio access bearers from the variable ESTABLISHED\_RABS;
  - 4> set "T314 expired" in the variable RB\_TIMER\_INDICATOR to TRUE.
- 2> if timer T315 has elapsed while T302 was running and,
- 3> if "T315 expired" in the variable RB\_TIMER\_INDICATOR is set to FALSE and,
  - 3> if T314 is still running:
    - 4> release locally all radio bearers which are 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> indicate release of those radio access bearers to upper layers;
    - 4> delete all information about those radio access bearers from the variable ESTABLISHED\_RABS;
    - 4> set "T315 expired" in the variable RB\_TIMER\_INDICATOR to TRUE.
- 1> check whether it is still in "in service area" (see subclause 8.5.5.2);
- 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> in case of a cell update procedure:
- 2> clear any entry for the CELL UPDATE CONFIRM message in the table "Accepted transactions" in the variable TRANSACTIONS.
- 1> in case of a URA update procedure:
- 2> clear any entry for the URA UPDATE CONFIRM message in the table "Accepted transactions" in the variable TRANSACTIONS.

If the UE detects "in service area" if it has not entered idle mode, and:

- 1> if V302 is equal to or smaller than N302, the UE shall:
  - 2> if the UE performed cell re-selection:
    - 3> delete its C-RNTI.
  - 2> in case of a cell update procedure:
    - 3> set the contents of the CELL UPDATE message according to subclause 8.3.1.3 and 8.5.10;
    - 3> if a CELL UPDATE CONFIRM message was received and caused the IE "Reconfiguration" in the variable CIPHERING\_STATUS to be set to TRUE and/or the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO to be set to TRUE:
      - 4> if the IE "Downlink counter synchronisation info" was included in the received CELL UPDATE CONFIRM message:
        - 5> apply the new security (integrity protection) configuration received in the CELL UPDATE CONFIRM on the CELL UPDATE message.
    - 3> submit the CELL UPDATE message for transmission on the uplink CCCH.
  - 2> in case of a URA update procedure:
    - 3> set the contents of the URA UPDATE message according to subclause 8.3.1.3 and 8.5.10;



- 3> if a URA UPDATE CONFIRM message was received and caused the IE "Reconfiguration" in the variable CIPHERING\_STATUS to be set to TRUE and/or the IE "Reconfiguration" in the variable INTEGRITY\_PROTECTION\_INFO is set to TRUE:
  - 4> if the IE "Downlink counter synchronisation info" was included in the received URA UPDATE CONFIRM message:
    - 5> apply the new security (integrity protection) configuration received in the URA UPDATE CONFIRM on the URA UPDATE message.
  - 3> submit the URA 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, the UE shall:
  - 2> clear the variable RB\_UPLINK\_CIPHERING\_ACTIVATION\_TIME\_INFO;
  - 2> clear the variable INTEGRITY\_PROTECTION\_ACTIVATION\_INFO;
  - 2> clear the variable PDCP\_SN\_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> set the variable CELL\_UPDATE\_STARTED to FALSE;
  - 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 does not detect "in service area", it shall:

- 1> continue searching for "in service area".

[...]

## 8.5.10 Integrity protection

If the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started" then the UE shall:

- 1> perform integrity protection (and integrity checking) on all RRC messages, with the following exceptions:
  - HANDOVER TO UTRAN COMPLETE

PAGING TYPE 1

PUSCH CAPACITY REQUEST

PHYSICAL SHARED CHANNEL ALLOCATION

RRC CONNECTION REQUEST

RRC CONNECTION SETUP

RRC CONNECTION SETUP COMPLETE

RRC CONNECTION REJECT

RRC CONNECTION RELEASE (CCCH only)

SYSTEM INFORMATION

SYSTEM INFORMATION CHANGE INDICATION

If the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Not started" then integrity protection (and integrity checking) shall not be performed on any RRC message.

For each signalling radio bearer, the UE shall use two RRC hyper frame numbers:

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

and two message sequence numbers:

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

The above information is stored in the variable INTEGRITY\_PROTECTION\_INFO per signalling radio bearer (RB0-RB4).

Upon the first activation of integrity protection for an RRC connection, UE and UTRAN initialise the "Uplink RRC Message sequence number" and "Downlink RRC Message sequence number" for all signalling radio bearers as specified in subclauses 8.6.3.5 and 8.5.10.1.

The RRC message sequence number (RRC SN) is incremented for every integrity protected RRC message.

If the IE "Integrity Protection Mode Info" is present in a received message, the UE shall:

- 1> perform the actions in subclause 8.6.3.5 before proceeding with the integrity check of the received message.

### 8.5.10.1 Integrity protection in downlink

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

- 1> check the value of the IE "RRC message sequence number" included in the IE "Integrity check info";
- 2> if the "Downlink RRC Message sequence number" is not present in the variable INTEGRITY\_PROTECTION\_INFO:
  - 3> initialise the "Downlink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO with the value of the IE "RRC message sequence number" included in the IE "Integrity check info" of the received message.
- 2> if the "Downlink RRC Message sequence number" is present in the variable INTEGRITY\_PROTECTION\_INFO:
  - 3> if the RRC message sequence number is lower than the "Downlink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO:

- 4> increment "Downlink RRC HFN" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO with one.
- 3> if the RRC message sequence number is equal to the "Downlink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO:
  - 4> discard the message.
- 1> calculate an expected message authentication code in accordance with subclause 8.5.10.3;
- 1> compare the expected message authentication code with the value of the received IE "message authentication code" contained in the IE "Integrity check info";
  - 2> if the expected message authentication code and the received message authentication code are the same, the integrity check is successful:
    - 3> update the "Downlink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO with the value of the IE "RRC message sequence number" included in the IE "Integrity check info" of the received RRC message.
  - 2> if the calculated expected message authentication code and the received message authentication code differ:
    - 3> if the IE "RRC message sequence number" included in the IE "Integrity check info" is lower than the "Downlink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO (in this case the "Downlink RRC HFN" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO was incremented by one, as stated above):
      - 4> decrement "Downlink RRC HFN" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO by one.
    - 3> discard the message.

If the UE receives an RRC message on signalling radio bearer with identity n, the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started" and the IE 'Integrity check info' is not present the UE shall:

- 1> discard the message.

UTRAN may transmit several copies of the same message in the downlink to increase the probability of proper reception of the message by the UE. In such a case, the RRC SN for these repeated messages should be the same.

### 8.5.10.2 Integrity protection in uplink

Prior to sending an RRC message using the signalling radio bearer with radio bearer identity n, and the "Status" in the variable INTEGRITY\_PROTECTION\_INFO has the value "Started" the UE shall:

- 1> increment "Uplink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO with 1, even if the message is a retransmission of a previously transmitted message. When "Uplink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO becomes 0, the UE shall increment "Uplink RRC HFN" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO with 1;
- 1> calculate the message authentication code in accordance with subclause 8.5.10.3;
- 1> replace the "Message authentication code" in the IE "Integrity check info" in the message with the calculated message authentication code;
- 1> replace the "RRC Message sequence number" in the IE "Integrity check info" in the message with contents set to the new value of the "Uplink RRC Message sequence number" for signalling radio bearer RBn in the variable INTEGRITY\_PROTECTION\_INFO.

In the response message for the procedure ordering the security reconfiguration, the UE indicates the activation time, for each signalling radio bearer except for the signalling radio bearer that was used for this security reconfiguration procedure. When the new integrity configuration is to be applied in uplink, UTRAN should start to apply the new integrity protection configuration according to the activation time for each signalling radio bearer (except for the

signalling radio bearer which is used to send the message that is reconfiguring the security configuration) where the new configuration is to be applied starting from and including reception of the response message).

[...]

## CHANGE REQUEST

# **25.331 CR 1636** # rev **-** # Current version: **3.11.0** #

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	# Multiplexing of Tr mode RBs of different CN domains on the same transport channel		
<b>Source:</b>	# TSG-RAN WG2		
<b>Work item code:</b>	# TEI	<b>Date:</b>	# 19 August 2002
<b>Category:</b>	# <b>F</b>	<b>Release:</b>	# R99
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

<b>Reason for change:</b>	# Cipherng for Tr mode RBs is performed in MAC. If two Transparent mode RBs belonging to different CN domains are mapped onto the same transport channel, MAC is forced to apply different cipherng keys within the same transport channel. Moreover, such a configuration is not likely to ever be implemented by operators. Allowing it in the specifications would simply cause unnecessary development and testing.
	Similar considerations are applicable to the mapping of a transparent mode SRB and a transparent mode RB onto the same transport channel [This applies only to Rel-4 and Rel-5]
<b>Summary of change:</b>	# It is clarified that, if cipherng is applied, UTRAN should not map Transparent mode RBs of different CN domains on the same transport channel. [For Rel-4 and Rel-5, UTRAN should not map transparent mode SRBs and RBs onto the same transport channel].
	<b>Isolated Impact Change Analysis.</b>
	This change clarifies the cipherng procedure. If UTRAN does not implement this CR and the UE does, cipherng on Tr mode RLC entities may not be executed correctly by the UE, or the UE may fail the security mode procedure. If the UE does not implement this CR and UTRAN does, the problematic configuration would never be used and there would be no compatibility problems. It would not affect implementations behaving like indicated in the CR, it would affect implementations supporting the corrected functionality otherwise.
	<b>Impact on the test specifications</b>

		No impact, since all the reference configurations map Transparent mode RBs belonging to different CN domains onto distinct transport channels.									
<b>Consequences if not approved:</b>	⌘	Unnecessary UE complexity and testing									
<b>Clauses affected:</b>	⌘	8.6.4.8									
<b>Other specs affected:</b>	⌘	<table border="1"> <thead> <tr> <th>Y</th> <th>N</th> </tr> </thead> <tbody> <tr> <td></td> <td>X</td> </tr> <tr> <td></td> <td>X</td> </tr> <tr> <td></td> <td>X</td> </tr> </tbody> </table>	Y	N		X		X		X	Other core specifications ⌘ Test specifications O&M Specifications
Y	N										
	X										
	X										
	X										
<b>Other comments:</b>	⌘										

**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.

[...]

#### 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> 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.
- NOTE: The IE "RB mapping info" is only included in IE "Predefined RB configurations" in system information when used for Inter-RAT handover to UTRAN and there is no AM RLC size change involved in this case.
- 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 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

If ciphering is applied, UTRAN should not map Transparent Mode RBs of different CN domains on the same transport channel. In such case the UE behaviour is not specified.

[...]

## CHANGE REQUEST

# **25.331 CR 1637** # rev **-** # Current version: **4.5.0** #

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	# Multiplexing of Tr mode RBs of different CN domains on the same transport channel		
<b>Source:</b>	# TSG-RAN WG2		
<b>Work item code:</b>	# TEI	<b>Date:</b>	# 19 August 2002
<b>Category:</b>	# <b>A</b>	<b>Release:</b>	# Rel-4
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

<b>Reason for change:</b>	# Cipherng for Tr mode RBs is performed in MAC. If two Transparent mode RBs belonging to different CN domains are mapped onto the same transport channel, MAC is forced to apply different cipherng keys within the same transport channel. Moreover, such a configuration is not likely to ever be implemented by operators. Allowing it in the specifications would simply cause unnecessary development and testing.
	Similar considerations are applicable to the mapping of a transparent mode SRB and a transparent mode RB onto the same transport channel [This applies only to Rel-4 and Rel-5]
<b>Summary of change:</b>	# It is clarified that, if cipherng is applied, UTRAN should not map Transparent mode RBs of different CN domains on the same transport channel. [For Rel-4 and Rel-5, UTRAN should not map transparent mode SRBs and RBs onto the same transport channel].
	<b>Isolated Impact Change Analysis.</b>
	This change clarifies the cipherng procedure. If UTRAN does not implement this CR and the UE does, cipherng on Tr mode RLC entities may not be executed correctly by the UE, or the UE may fail the security mode procedure. If the UE does not implement this CR and UTRAN does, the problematic configuration would never be used and there would be no compatibility problems. It would not affect implementations behaving like indicated in the CR, it would affect implementations supporting the corrected functionality otherwise.
	<b>Impact on the test specifications</b>

		No impact, since all the reference configurations map Transparent mode RBs belonging to different CN domains onto distinct transport channels.									
<b>Consequences if not approved:</b>	⌘	Unnecessary UE complexity and testing									
<b>Clauses affected:</b>	⌘	8.6.4.8									
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Y	N										
	X										
	X										
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<b>Other comments:</b>	⌘										

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[...]

#### 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> 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.
- NOTE: The IE "RB mapping info" is only included in IE "Predefined RB configurations" in system information when used for Inter-RAT handover to UTRAN and there is no AM RLC size change involved in this case.
- 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 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

If ciphering is applied, UTRAN should not map Transparent Mode RBs of different CN domains on the same transport channel and it should not map transparent mode SRBs and RBs onto the same transport channel. In such cases the UE behaviour is not specified.

[...]

CR-Form-v7

## CHANGE REQUEST

# **25.331 CR 1638** # rev **-** # Current version: **5.1.0** #

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

**Proposed change affects:** UICC apps#  ME  Radio Access Network  Core Network

<b>Title:</b>	# Multiplexing of Tr mode RBs of different CN domains on the same transport channel		
<b>Source:</b>	# TSG-RAN WG2		
<b>Work item code:</b>	# TEI	<b>Date:</b>	# 19 August 2002
<b>Category:</b>	# <b>A</b>	<b>Release:</b>	# Rel-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)	2	(GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)	R96	(Release 1996)
	<b>B</b> (addition of feature),	R97	(Release 1997)
	<b>C</b> (functional modification of feature)	R98	(Release 1998)
	<b>D</b> (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)
		Rel-6	(Release 6)

<b>Reason for change:</b>	# Cipherng for Tr mode RBs is performed in MAC. If two Transparent mode RBs belonging to different CN domains are mapped onto the same transport channel, MAC is forced to apply different cipherng keys within the same transport channel. Moreover, such a configuration is not likely to ever be implemented by operators. Allowing it in the specifications would simply cause unnecessary development and testing.
	Similar considerations are applicable to the mapping of a transparent mode SRB and a transparent mode RB onto the same transport channel [This applies only to Rel-4 and Rel-5]
<b>Summary of change:</b>	# It is clarified that, if cipherng is applied, UTRAN should not map Transparent mode RBs of different CN domains on the same transport channel. [For Rel-4 and Rel-5, UTRAN should not map transparent mode SRBs and RBs onto the same transport channel].
	<b>Isolated Impact Change Analysis.</b>
	This change clarifies the cipherng procedure. If UTRAN does not implement this CR and the UE does, cipherng on Tr mode RLC entities may not be executed correctly by the UE, or the UE may fail the security mode procedure. If the UE does not implement this CR and UTRAN does, the problematic configuration would never be used and there would be no compatibility problems. It would not affect implementations behaving like indicated in the CR, it would affect implementations supporting the corrected functionality otherwise.
	<b>Impact on the test specifications</b>

		No impact, since all the reference configurations map Transparent mode RBs belonging to different CN domains onto distinct transport channels.									
<b>Consequences if not approved:</b>	⌘	Unnecessary UE complexity and testing									
<b>Clauses affected:</b>	⌘	8.6.4.8									
<b>Other specs affected:</b>	⌘	<table border="1"> <thead> <tr> <th>Y</th> <th>N</th> </tr> </thead> <tbody> <tr> <td></td> <td>X</td> </tr> <tr> <td></td> <td>X</td> </tr> <tr> <td></td> <td>X</td> </tr> </tbody> </table>	Y	N		X		X		X	Other core specifications ⌘ Test specifications O&M Specifications
Y	N										
	X										
	X										
	X										
<b>Other comments:</b>	⌘										

**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.



[...]

#### 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:
  - 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:
  - 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

If ciphering is applied, UTRAN should not map Transparent Mode RBs of different CN domains on the same transport channel and it should not map transparent mode SRBs and RBs onto the same transport channel. In such cases the UE behaviour is not specified.

[...]