

TSG-RAN Meeting #20
Hämeenlinna, Finland, 03-06 June 2003

RP-030371

Title: 'Out of Service behaviour' CRs (CRs to TS 25.331)
Source: TSG-RAN WG2
Agenda item: 7.2.2

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Doc-2nd-Level	Workitem
25.331	1988	-	R99	Setting of T317 to infinity and out of service behaviour	F	3.14.0	3.15.0	R2-031490	TEI
25.331	1989	-	Rel-4	Setting of T317 to infinity and out of service behaviour	A	4.9.0	4.10.0	R2-031491	TEI
25.331	1990	-	Rel-5	Setting of T317 to infinity and out of service behaviour	F	5.4.0	5.5.0	R2-031492	TEI5

TSG-RAN Meeting #20
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Tdoc # RP-030371

CR-Form-v7
<h2 style="margin: 0;">CHANGE REQUEST</h2>
25.331 CR 1988 # rev - # Current version: 3.14.0

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

Title:	# Setting of T317 to infinity and out of service behaviour		
Source:	# Qualcomm		
Work item code:	# TEI Date: # 05/06/03		
Category:	# F Release: # R99		
	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900. </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: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .	Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)
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Reason for change:	# 1 - Setting T317 to infinity can help to avoid the release of the RRC connection in situations where all radio coverage is lost (e.g. elevator, underground car park, etc). In such cases, when T317 expires, the UE would go to idle mode while UTRAN would still believe that it is still in RRC connected state. 2 - The RRC specification states that when out of service the UE shall perform cell selection. However, it does not state the behaviour when the cell selection process fails to find a suitable cell of the RPLMN. The behaviour should be clarified to ensure that users can access other PLMNs for normal service or for emergency calls.
Summary of change:	# Functionality corrected: UE behaviour when out of service Changes: 1 - All the values of T317 should be interpreted as "infinity" 2a - It is clarified that when out of service the UE searches for the RPLMN for one complete scan of the supported bands and frequencies for a timer with default value of 30s. After this time the UE can select another PLMN or camp on an acceptable cell for limited service. 2b - It is stated that when the UE camps on a cell of another PLMN for limited service the RRC connection is either released or maintained. Isolated Impact Change Analysis. This change clarifies the out of service procedure. If the UE does not implement the CR and UTRAN does implement it, the UE may go to idle mode at the T317 expiry, potentially resulting in the loss of UTRAN

	<p>originated pages. If the UE implements the CR and UTRAN does not implement it, there would be no problems, since UTRAN may not be aware that the UE is out of service.</p> <p>It would not affect implementations behaving like indicated in the CR, it would affect implementations supporting the corrected functionality otherwise.</p>
Consequences if not approved:	<p>⌘ 1 - UEs may go to idle mode without UTRAN being aware of it. After a UE goes to idle mode at the T317 expiry, it could lose UTRAN originated pages.</p> <p>2 - A UE not aligned to this CR would be prevented from accessing emergency calls and from selecting a new PLMN for normal service while out of service of the RPLMN. In addition, if the UE camps on an acceptable cell for limited service while in RRC connected mode and then it returns to the RPLMN could be de-synchronised from the UTRAN. This would mean that the UE could not be paged by the network until the equivalent of T305+T307 expires in the network or a periodic LAU/RAU occurs (unless the network implements a network based solution such as paging with URNTI and CN identities)</p>

Clauses affected:	⌘	7.2.2.1, 7.2.2.2, 8.5.5.4, 8.5.X, 10.3.3.43, 11.3								
Other specs affected:	<table border="1"> <tr> <td>Y</td> <td>N</td> </tr> <tr> <td>Y</td> <td></td> </tr> <tr> <td></td> <td>N</td> </tr> <tr> <td></td> <td>N</td> </tr> </table>	Y	N	Y			N		N	Other core specifications ⌘ 24.008 Test specifications O&M Specifications
Y	N									
Y										
	N									
	N									
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.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

7.2.2.1 URA_PCH or CELL_PCH state

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

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

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

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

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

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

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

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

2> if the cell selection process fails to find a suitable cell after a complete scan of all RATs and all frequency bands supported by the UE, the UE should after a minimum of TimerOutOfService time (default value 30 s) of being "out of service area":

3> indicate all available PLMNs to NAS to enable the selection of a new PLMN. If the NAS indicates the selection of a new PLMN the UE shall store information for the new PLMN within the variable SELECTED_PLMN and perform actions according to subclause 8.5.X;

3> if an acceptable cell is found then the UE shall camp on that cell to obtain limited service as defined in [4] and perform actions according to subclause 8.5.X. If the RRC connection is released due to camping on an acceptable cell, indicate this to upper layers.

3> else if no acceptable cell is found, the UE shall continue looking for an acceptable cell as defined in [4].

7.2.2.2 CELL_FACH state

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

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

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

- 2> maintain up-to-date system information as broadcast by the serving cell as specified in subclause 8.1.1;
- 2> perform cell reselection process as specified in [4];

- 2> perform measurements process according to measurement control information as specified in subclause 8.4 and in subclause 14.4;
 - 2> run timer T305 (periodical cell update);
 - 2> select and configure the RB multiplexing options applicable for the transport channels to be used in this RRC state;
 - 2> listen to all FACH transport channels mapped on the S-CCPCH selected by the UE according to the procedure in subclause 8.5.19;
 - 2> act on RRC messages received on BCCH, CCCH and DCCH;
 - 2> act on RRC messages received on, if available, SHCCH (TDD only).
- 1> if the UE is "out of service area":
- 2> perform cell selection process as specified in [4];
 - 2> run timers T305 (periodical cell update), and T317 (cell update when re-entering "in service") or T307 (transition to Idle mode);
 - 2> if the cell selection process fails to find a suitable cell after a complete scan of all RATs and all frequency bands supported by the UE, the UE should after a minimum of **TimerOutOfService time (default value 30 seconds)** of being "out of service area":
 - 3> indicate all available PLMNs to NAS to enable the selection of a new PLMN. If the NAS indicates the selection of a new PLMN the UE shall store information for the new PLMN within the variable **SELECTED_PLMN** and perform actions according to subclause 8.5.X;
 - 3> if an acceptable cell is found then the UE shall camp on that cell to obtain limited service as defined in [4] and perform actions according to subclause 8.5.X. If the RRC connection is released due to camping on an acceptable cell, indicate this to upper layers.
 - 3> else if no acceptable cell is found, the UE shall continue looking for an acceptable cell as defined in [4].

[...]

8.5.5.4 T317 expiry

T317 should never expire, i.e. all its values should be assumed to be "infinity".

If the UE is using the value of "infinity" for T317, and T317 is running:

1> UE behaviour shall be as specified in 7.2.2.2:

When the T317 expires, the UE shall:

- 1> move to idle mode;
- 1> release all dedicated resources;
- 1> 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;
- 1> clear the variable ESTABLISHED_SIGNALLING_CONNECTIONS;
- 1> clear the variable ESTABLISHED_RABS;
- 1> perform actions specified in subclause 8.5.2 when entering idle mode from connected mode.

[...]

8.5.X Change of PLMN while in RRC connected mode

If the UE camps on an acceptable cell to obtain limited service while in RRC connected mode the UE shall either:

- 1> move to idle mode;
- 1> release all dedicated resources;
- 1> 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;
- 1> clear the variable ESTABLISHED_SIGNALLING_CONNECTIONS;
- 1> clear the variable ESTABLISHED_RABS;
- 1> perform actions specified in subclause 8.5.2 when entering idle mode from connected mode.

or:

- 1> keep the RRC connection of the selected PLMN and its behaviour while camping on the cell of the other PLMN shall be as if in Idle mode in that PLMN.
- 1> if the UE re-enters “in service area” on the selected PLMN or cannot maintain limited service (i.e. cannot find any acceptable cell of any PLMN), the UE shall resume its RRC Connected mode behaviour as if it had not camped on any cell whilst being in “out of service area”.

If the NAS indicates the selection of a new PLMN while the UE is in RRC connected mode in the selected PLMN or if the UE attempts transmission on a cell of another PLMN (i.e. to initiate emergency call), the UE shall for the selected PLMN:

- 1> move to idle mode;
- 1> release all dedicated resources;
- 1> 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;
- 1> clear the variable ESTABLISHED_SIGNALLING_CONNECTIONS;
- 1> clear the variable ESTABLISHED_RABS;
- 1> perform actions specified in subclause 8.5.2 when entering idle mode from connected mode.

[...]

10.3.3.43 UE Timers and Constants in connected mode

This information element specifies timer- and constants values used by the UE in connected mode.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
T301	MD		Integer(100, 200 .. 2000 by step of 200, 3000, 4000, 6000, 8000)	Value in milliseconds. Default value is 2000. This IE should not be used by the UE in this release of the protocol. One spare value is needed.
N301	MD		Integer(0..7)	Default value is 2. This IE should not be used by the UE in this release of the protocol.
T302	MD		Integer(100, 200... 2000 by step of 200, 3000,	Value in milliseconds. Default value is 4000. One spare value is needed.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
			4000, 6000, 8000)	
N302	MD		Integer(0..7)	Default value is 3.
T304	MD		Integer(100, 200, 400, 1000, 2000)	Value in milliseconds. Default value is 2000. Three spare values are needed.
N304	MD		Integer(0..7)	Default value is 2..
T305	MD		Integer(5, 10, 30, 60, 120, 360, 720, infinity)	Value in minutes. Default value is 30. Infinity means no update
T307	MD		Integer(5, 10, 15, 20, 30, 40, 50)	Value in seconds. Default value is 30. One spare value is needed.
T308	MD		Integer(40, 80, 160, 320)	Value in milliseconds. Default value is 160.
T309	MD		Integer(1..8)	Value in seconds. Default value is 5.
T310	MD		Integer(40 .. 320 by step of 40)	Value in milliseconds. Default value is 160.
N310	MD		Integer(0 .. 7)	Default value is 4.
T311	MD		Integer(250 .. 2000 by step of 250)	Value in milliseconds. Default value is 2000.
T312	MD		Integer (0..15)	Value in seconds. Default value is 1. The value 0 is not used in this version of the specification.
N312	MD		Integer (1, 2, 4, 10, 20, 50, 100, 200, 400, 600, 800, 1000)	Default value is 1.
T313	MD		Integer (0..15)	Value in seconds. Default value is 3.
N313	MD		Integer (1, 2, 4, 10, 20, 50, 100, 200)	Default value is 20.
T314	MD		Integer(0, 2, 4, 6, 8, 12, 16, 20)	Value in seconds. Default value is 12.
T315	MD		Integer (0,10, 30, 60, 180, 600, 1200, 1800)	Value in seconds. Default value is 180.
N315	MD		Integer (1, 2, 4, 10, 20, 50, 100, 200, 400, 600, 800, 1000)	Default value is 1.
T316	MD		Integer(0, 10, 20, 30, 40, 50, infinity)	Value in seconds. Default value is 30. One spare value is needed.
T317	MD		Integer (0,10, 30, 60, 180, 600, 1200, 1800)	Value in seconds Default value is 180. In this version of the protocol all the values should be interpreted as "infinity".

[...]

11.3 Information element definitions

[...]

| -- All the values should be interpreted as "infinity"

```
T-317 ::= ENUMERATED {  
           s0, s10, s30, s60, s180,  
           s600, s1200, s1800 }
```

[...]

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Tdoc # RP-030371

CR-Form-v7	<h2 style="margin: 0;">CHANGE REQUEST</h2>
<p style="text-align: center;"> # 25.331 CR 1989 # rev - # Current version: 4.9.0 # </p>	

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

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Reason for change:	<p># 1 - Setting T317 to infinity can help to avoid the release of the RRC connection in situations where all radio coverage is lost (e.g. elevator, underground car park, etc). In such cases, when T317 expires, the UE would go to idle mode while UTRAN would still believe that it is still in RRC connected state.</p> <p>2 - The RRC specification states that when out of service the UE shall perform cell selection. However, it does not state the behaviour when the cell selection process fails to find a suitable cell of the RPLMN. The behaviour should be clarified to ensure that users can access other PLMNs for normal service or for emergency calls.</p>
Summary of change:	<p># Functionality corrected: UE behaviour when out of service</p> <p>Changes:</p> <p>1 - All the values of T317 should be interpreted as "infinity"</p> <p>2a - It is clarified that when out of service the UE searches for the RPLMN for one complete scan of the supported bands and frequencies for a timer with default value of 30s. After this time the UE can select another PLMN or camp on an acceptable cell for limited service.</p> <p>2b - It is stated that when the UE camps on a cell of another PLMN for limited service the RRC connection is either released or maintained.</p> <p>Isolated Impact Change Analysis.</p> <p>This change clarifies the out of service procedure. If the UE does not implement the CR and UTRAN does implement it, the UE may go to idle mode at the T317 expiry, potentially resulting in the loss of UTRAN</p>

	<p>originated pages. If the UE implements the CR and UTRAN does not implement it, there would be no problems, since UTRAN may not be aware that the UE is out of service.</p> <p>It would not affect implementations behaving like indicated in the CR, it would affect implementations supporting the corrected functionality otherwise.</p>
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In the URA_PCH or CELL_PCH state the UE shall perform the following actions:

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

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

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

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

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

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

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

2> if the cell selection process fails to find a suitable cell after a complete scan of all RATs and all frequency bands supported by the UE, the UE should after a minimum of TimerOutOfService time (default value 30 s) of being "out of service area":

3> indicate all available PLMNs to NAS to enable the selection of a new PLMN. If the NAS indicates the selection of a new PLMN the UE shall store information for the new PLMN within the variable SELECTED_PLMN and perform actions according to subclause 8.5.X;

3> if an acceptable cell is found then the UE shall camp on that cell to obtain limited service as defined in [4] and; perform actions according to subclause 8.5.X. If the RRC connection is released due to camping on an acceptable cell, indicate this to upper layers.

3> else if no acceptable cell is found, the UE shall continue looking for an acceptable cell as defined in [4].

7.2.2.2 CELL_FACH state

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

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

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

- 2> maintain up-to-date system information as broadcast by the serving cell as specified in subclause 8.1.1;
- 2> perform cell reselection process as specified in [4];

- 2> perform measurements process according to measurement control information as specified in subclause 8.4 and in subclause 14.4;
 - 2> run timer T305 (periodical cell update);
 - 2> select and configure the RB multiplexing options applicable for the transport channels to be used in this RRC state;
 - 2> listen to all FACH transport channels mapped on the S-CCPCH selected by the UE according to the procedure in subclause 8.5.19;
 - 2> act on RRC messages received on BCCH, CCCH and DCCH;
 - 2> act on RRC messages received on, if available, SHCCH (TDD only).
- 1> if the UE is "out of service area":
- 2> perform cell selection process as specified in [4];
 - 2> run timers T305 (periodical cell update), and T317 (cell update when re-entering "in service") or T307 (transition to Idle mode);
 - 2> if the cell selection process fails to find a suitable cell after a complete scan of all RATs and all frequency bands supported by the UE, the UE should after a minimum of **TimerOutOfService time (default value 30 seconds)** of being "out of service area":
 - 3> indicate all available PLMNs to NAS to enable the selection of a new PLMN. If the NAS indicates the selection of a new PLMN the UE shall store information for the new PLMN within the variable **SELECTED_PLMN** and perform actions according to subclause 8.5.X;
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 - 3> else if no acceptable cell is found, the UE shall continue looking for an acceptable cell as defined in [4].

[...]

8.5.5.4 T317 expiry

T317 should never expire, i.e. all its values should be assumed to be "infinity".

If the UE is using the value of "infinity" for T317, and T317 is running:

1> UE behaviour shall be as specified in 7.2.2.2:

When the T317 expires, the UE shall:

- 1> move to idle mode;
- 1> release all dedicated resources;
- 1> 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;
- 1> clear the variable ESTABLISHED_SIGNALLING_CONNECTIONS;
- 1> clear the variable ESTABLISHED_RABS;
- 1> perform actions specified in subclause 8.5.2 when entering idle mode from connected mode.

[...]

8.5.X Change of PLMN while in RRC connected mode

If the UE camps on an acceptable cell to obtain limited service while in RRC connected mode the UE shall either:

- 1> move to idle mode;
- 1> release all dedicated resources;
- 1> 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;
- 1> clear the variable ESTABLISHED_SIGNALLING_CONNECTIONS;
- 1> clear the variable ESTABLISHED_RABS;
- 1> perform actions specified in subclause 8.5.2 when entering idle mode from connected mode.

or:

- 1> keep the RRC connection of the selected PLMN and its behaviour while camping on the cell of the other PLMN shall be as if in Idle mode in that PLMN.
- 1> if the UE re-enters “in service area” on the selected PLMN or cannot maintain limited service (i.e. cannot find any acceptable cell of any PLMN), the UE shall resume its RRC Connected mode behaviour as if it had not camped on any cell whilst being in “out of service area”.

If the NAS indicates the selection of a new PLMN while the UE is in RRC connected mode in the selected PLMN or if the UE attempts transmission on a cell of another PLMN (i.e. to initiate emergency call), the UE shall for the selected PLMN:

- 1> move to idle mode;
- 1> release all dedicated resources;
- 1> 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;
- 1> clear the variable ESTABLISHED_SIGNALLING_CONNECTIONS;
- 1> clear the variable ESTABLISHED_RABS;
- 1> perform actions specified in subclause 8.5.2 when entering idle mode from connected mode.

[...]

10.3.3.43 UE Timers and Constants in connected mode

This information element specifies timer- and constants values used by the UE in connected mode.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
T301	MD		Integer(100, 200 .. 2000 by step of 200, 3000, 4000, 6000, 8000)	Value in milliseconds. Default value is 2000. This IE should not be used by the UE in this release of the protocol. One spare value is needed.
N301	MD		Integer(0..7)	Default value is 2. This IE should not be used by the UE in this release of the protocol.
T302	MD		Integer(100, 200... 2000 by step of 200, 3000,	Value in milliseconds. Default value is 4000. One spare value is needed.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
			4000, 6000, 8000)	
N302	MD		Integer(0..7)	Default value is 3.
T304	MD		Integer(100, 200, 400, 1000, 2000)	Value in milliseconds. Default value is 2000. Three spare values are needed.
N304	MD		Integer(0..7)	Default value is 2..
T305	MD		Integer(5, 10, 30, 60, 120, 360, 720, infinity)	Value in minutes. Default value is 30. Infinity means no update
T307	MD		Integer(5, 10, 15, 20, 30, 40, 50)	Value in seconds. Default value is 30. One spare value is needed.
T308	MD		Integer(40, 80, 160, 320)	Value in milliseconds. Default value is 160.
T309	MD		Integer(1..8)	Value in seconds. Default value is 5.
T310	MD		Integer(40 .. 320 by step of 40)	Value in milliseconds. Default value is 160.
N310	MD		Integer(0 .. 7)	Default value is 4.
T311	MD		Integer(250 .. 2000 by step of 250)	Value in milliseconds. Default value is 2000.
T312	MD		Integer (0..15)	Value in seconds. Default value is 1. The value 0 is not used in this version of the specification.
N312	MD		Integer (1, 2, 4, 10, 20, 50, 100, 200, 400, 600, 800, 1000)	Default value is 1.
T313	MD		Integer (0..15)	Value in seconds. Default value is 3.
N313	MD		Integer (1, 2, 4, 10, 20, 50, 100, 200)	Default value is 20.
T314	MD		Integer(0, 2, 4, 6, 8, 12, 16, 20)	Value in seconds. Default value is 12.
T315	MD		Integer (0,10, 30, 60, 180, 600, 1200, 1800)	Value in seconds. Default value is 180.
N315	MD		Integer (1, 2, 4, 10, 20, 50, 100, 200, 400, 600, 800, 1000)	Default value is 1.
T316	MD		Integer(0, 10, 20, 30, 40, 50, infinity)	Value in seconds. Default value is 30. One spare value is needed.
T317	MD		Integer (0,10, 30, 60, 180, 600, 1200, 1800)	Value in seconds Default value is 180. In this version of the protocol all the values should be interpreted as "infinity".

[...]

11.3 Information element definitions

[...]

| -- All the values should be interpreted as "infinity"

```
T-317 ::= ENUMERATED {  
    s0, s10, s30, s60, s180,  
    s600, s1200, s1800 }
```

[...]

TSG-RAN Meeting #20
Hämeenlinna, Finland, 03-06 June 2003

Tdoc # RP-030371

CR-Form-v7
<h2 style="margin: 0;">CHANGE REQUEST</h2>
25.331 CR 1990 # rev - # Current version: 5.4.0

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

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

Title:	# Setting of T317 to infinity and out of service behaviour		
Source:	# Qualcomm		
Work item code:	# TEI Date: # 05/06/03		
Category:	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> # F Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900. </td> <td style="width: 50%; vertical-align: top;"> Release: # Rel-5 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>	# F Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .	Release: # Rel-5 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)
# F Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .	Release: # Rel-5 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)		

Reason for change:	# 1 - Setting T317 to infinity can help to avoid the release of the RRC connection in situations where all radio coverage is lost (e.g. elevator, underground car park, etc). In such cases, when T317 expires, the UE would go to idle mode while UTRAN would still believe that it is still in RRC connected state. 2 - The RRC specification states that when out of service the UE shall perform cell selection. However, it does not state the behaviour when the cell selection process fails to find a suitable cell of the RPLMN. The behaviour should be clarified to ensure that users can access other PLMNs for normal service or for emergency calls.
Summary of change:	# Functionality corrected: UE behaviour when out of service Changes: 1 - All the values of T317 shall be interpreted as "infinity" 2a - It is clarified that when out of service the UE searches for the RPLMN for one complete scan of the supported bands and frequencies or a timer with default value of 30s. After this time the UE can select another PLMN or camp on an acceptable cell for limited service. 2b - It is stated that when the UE camps on a cell of another PLMN for limited service the RRC connection is either released or maintained. Isolated Impact Change Analysis. This change clarifies the out of service procedure. If the UE does not implement the CR and UTRAN does implement it, the UE may go to idle mode at the T317 expiry, potentially resulting in the loss of UTRAN

	<p>originated pages. If the UE implements the CR and UTRAN does not implement it, there would be no problems, since UTRAN may not be aware that the UE is out of service.</p> <p>It would not affect implementations behaving like indicated in the CR, it would affect implementations supporting the corrected functionality otherwise.</p>
Consequences if not approved:	<p>⌘ 1 - UEs may go to idle mode without UTRAN being aware of it. After a UE goes to idle mode at the T317 expiry, it could lose UTRAN originated pages.</p> <p>2 - A UE not aligned to this CR would be prevented from accessing emergency calls and from selecting a new PLMN for normal service while out of service of the RPLMN. In addition, if the UE camps on an acceptable cell for limited service while in RRC connected mode and then it returns to the RPLMN could be de-synchronised from the UTRAN. This would mean that the UE could not be paged by the network until the equivalent of T305+T307 expires in the network or a periodic LAU/RAU occurs (unless the network implements a network based solution such as paging with URNTI and CN identities)</p>

Clauses affected:	⌘ 7.2.2.1, 7.2.2.2, 8.5.5.4, 8.5.X, 10.3.3.43, 11.3												
Other specs affected:	<table border="1"> <tr> <td>Y</td> <td>N</td> <td></td> </tr> <tr> <td>Y</td> <td></td> <td>Other core specifications</td> </tr> <tr> <td></td> <td>N</td> <td>Test specifications</td> </tr> <tr> <td></td> <td>N</td> <td>O&M Specifications</td> </tr> </table> <p>⌘ 24.008</p>	Y	N		Y		Other core specifications		N	Test specifications		N	O&M Specifications
Y	N												
Y		Other core specifications											
	N	Test specifications											
	N	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.

7.2.2.1 URA_PCH or CELL_PCH state

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

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

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

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

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

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

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

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

2> if the cell selection process fails to find a suitable cell after a complete scan of all RATs and all frequency bands supported by the UE, the UE shall after a minimum of TimerOutOfService time (default value 30 s) of being "out of service area":

3> indicate all available PLMNs to NAS to enable the selection of a new PLMN. If the NAS indicates the selection of a new PLMN the UE shall store information for the new PLMN within the variable SELECTED_PLMN and perform actions according to subclause 8.5.X;

3> if an acceptable cell is found then the UE shall camp on that cell to obtain limited service as defined in [4] and perform actions according to subclause 8.5.X. If the RRC connection is released due to camping on an acceptable cell, indicate this to upper layers.

3> else if no acceptable cell is found, the UE shall continue looking for an acceptable cell as defined in [4].

7.2.2.2 CELL_FACH state

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

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

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

- 2> maintain up-to-date system information as broadcast by the serving cell as specified in subclause 8.1.1;
- 2> perform cell reselection process as specified in [4];

- 2> perform measurements process according to measurement control information as specified in subclause 8.4 and in subclause 14.4;
 - 2> run timer T305 (periodical cell update);
 - 2> select and configure the RB multiplexing options applicable for the transport channels to be used in this RRC state;
 - 2> listen to all FACH transport channels mapped on the S-CCPCH selected by the UE according to the procedure in subclause 8.5.19;
 - 2> act on RRC messages received on BCCH, CCCH and DCCH;
 - 2> act on RRC messages received on, if available, SHCCH (TDD only).
- 1> if the UE is "out of service area":
- 2> perform cell selection process as specified in [4];
 - 2> run timers T305 (periodical cell update), and T317 (cell update when re-entering "in service") or T307 (transition to Idle mode);
 - 2> if the cell selection process fails to find a suitable cell after a complete scan of all RATs and all frequency bands supported by the UE, the UE shall after a minimum of **TimerOutOfService time (default value 30 seconds)** of being "out of service area":
 - 3> indicate all available PLMNs to NAS to enable the selection of a new PLMN. If the NAS indicates the selection of a new PLMN the UE shall store information for the new PLMN within the variable **SELECTED_PLMN** and perform actions according to subclause 8.5.X;
 - 3> if an acceptable cell is found then the UE shall camp on that cell to obtain limited service as defined in [4] and perform actions according to subclause 8.5.X. If the RRC connection is released due to camping on an acceptable cell, indicate this to upper layers.
 - 3> else if no acceptable cell is found, the UE shall continue looking for an acceptable cell as defined in [4].

[...]

8.5.5.4 T317 expiry

T317 shall never expire, i.e. all its value shall be assumed to be "infinity".

If T317 is running:

1> the UE behaviour shall be as specified in 7.2.2.2:

~~When the T317 expires, the UE shall:~~

~~1> move to idle mode;~~

~~1> release all dedicated resources;~~

~~1> 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;~~

~~1> clear the variable ESTABLISHED_SIGNALLING_CONNECTIONS;~~

~~1> clear the variable ESTABLISHED_RABS;~~

~~1> perform actions specified in subclause 8.5.2 when entering idle mode from connected mode.~~

[...]

8.5.X Change of PLMN while in RRC connected mode

If the UE camps on an acceptable cell to obtain limited service while in RRC connected mode the UE shall either:

1> move to idle mode;

1> release all dedicated resources;

1> 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;

1> clear the variable ESTABLISHED_SIGNALLING_CONNECTIONS;

1> clear the variable ESTABLISHED_RABS;

1> perform actions specified in subclause 8.5.2 when entering idle mode from connected mode.

or:

1> keep the RRC connection of the selected PLMN and its behaviour while camping on the cell of the other PLMN shall be as if in Idle mode in that PLMN.

1> if the UE re-enters “in service area” on the selected PLMN or cannot maintain limited service (i.e. cannot find any acceptable cell of any PLMN), the UE shall resume its RRC Connected mode behaviour as if it had not camped on any cell whilst being in “out of service area”.

If the NAS indicates the selection of a new PLMN while the UE is in RRC connected mode in the selected PLMN or if the UE attempts transmission on a cell of another PLMN (i.e. to initiate emergency call), the UE shall for the selected PLMN:

1> move to idle mode;

1> release all dedicated resources;

1> 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;

1> clear the variable ESTABLISHED_SIGNALLING_CONNECTIONS;

1> clear the variable ESTABLISHED_RABS;

1> perform actions specified in subclause 8.5.2 when entering idle mode from connected mode.

[...]

10.3.3.43 UE Timers and Constants in connected mode

This information element specifies timer- and constants values used by the UE in connected mode.

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
T301	MD		Integer(100, 200 .. 2000 by step of 200, 3000, 4000, 6000, 8000)	Value in milliseconds. Default value is 2000. This IE should not be used by the UE in this release of the protocol. One spare value is needed.	
N301	MD		Integer(0..7)	Default value is 2. This IE should not be used by the UE in this release of the protocol.	
T302	MD		Integer(100, 200... 2000)	Value in milliseconds. Default value is 4000.	

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
			by step of 200, 3000, 4000, 6000, 8000)	One spare value is needed.	
N302	MD		Integer(0..7)	Default value is 3.	
T304	MD		Integer(100, 200, 400, 1000, 2000)	Value in milliseconds. Default value is 2000. Three spare values are needed.	
N304	MD		Integer(0..7)	Default value is 2..	
T305	MD		Integer(5, 10, 30, 60, 120, 360, 720, infinity)	Value in minutes. Default value is 30. Infinity means no update	
T307	MD		Integer(5, 10, 15, 20, 30, 40, 50)	Value in seconds. Default value is 30. One spare value is needed.	
T308	MD		Integer(40, 80, 160, 320)	Value in milliseconds. Default value is 160.	
T309	MD		Integer(1...8)	Value in seconds. Default value is 5.	
T310	MD		Integer(40 .. 320 by step of 40)	Value in milliseconds. Default value is 160.	
N310	MD		Integer(0 .. 7)	Default value is 4.	
T311	MD		Integer(250 .. 2000 by step of 250)	Value in milliseconds. Default value is 2000.	
T312	MD		Integer (0..15)	Value in seconds. Default value is 1. The value 0 is not used in this version of the specification.	
N312	MD		Integer (1, 2, 4, 10, 20, 50, 100, 200, 400, 600, 800, 1000)	Default value is 1.	
T313	MD		Integer (0..15)	Value in seconds. Default value is 3.	
N313	MD		Integer (1, 2, 4, 10, 20, 50, 100, 200)	Default value is 20.	
T314	MD		Integer(0, 2, 4, 6, 8, 12, 16, 20)	Value in seconds. Default value is 12.	
T315	MD		Integer (0,10, 30, 60, 180, 600, 1200, 1800)	Value in seconds. Default value is 180.	
N315	MD		Integer (1, 2, 4, 10, 20, 50, 100, 200, 400, 600, 800, 1000)	Default value is 1.	
T316	MD		Integer(0, 10, 20, 30, 40, 50, infinity)	Value in seconds. Default value is 30. One spare value is needed.	

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
T317	MD		Integer (0,10,30,60,180,600,1200,1800)	Value in seconds Default value is 180 <u>infinity</u> .	
			<u>Enumerated (infinity, infinity, infinity, infinity, infinity, infinity, infinity)</u>	<u>All the values are changed to "infinity" in Rel-5</u>	<u>REL-5</u>

[...]

11.3 Information element definitions

[...]

```

-- All the values are changed to "infinity" in Rel-5
T-317 ::= ENUMERATED {
    s0infinity0, s10_infinity1, s30_infinity2, infinity3s60,
    infinity4s180,
    infinity5s600, infinity6s1200, s1800_infinity7}

```

[...]