

Source: TSG CN WG1
Title: CR on Rel-6 WI TEI6 towards TS 24.008 and TS 23.122
Agenda item: 9.21
Document for: APPROVAL

This document contains **4 CRs on Rel-6 Work Item "TEI6"**, that have been agreed by TSG CN WG1 CN#35 meeting and forwarded to TSG CN Plenary meeting #25 for approval.

TDoc #	Tdoc Title	Spec	CR #	Rev	CAT	Current version	WI	Rel
N1-041511	Introduction of Extended RLC/MAC Control Message segmentation capability	24.008	904		B	6.5.0	TEI6	Rel-6
N1-041601	Mapping of QoS Traffic Class to RRC Establishment Cause	24.008	883	1	F	6.5.0	TEI6	Rel-6
N1-041602	Network Search for recovering from Faulty Networks	24.008	852	3	F	6.5.0	TEI6	Rel-6
N1-041531	Correction of definitions of PLMNs in the same country HPLMN	23.122	77	1	F	6.1.0	TEI6	Rel-6

3GPP TSG-CN1 Meeting #35
Sophia Antipolis, France, 16-20 August 2004

Tdoc N1-041511

3GPP TSG-GERAN #20
Bilbao, Spain, 21-25 June, 2004

Tdoc GP-041710

CR-Form-v7
CHANGE REQUEST
⌘ 24.008 CR 904 ⌘ rev - ⌘ Current version: 6.5.0 ⌘

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

Title:	⌘	Introduction of Extended RLC/MAC Control Message segmentation capability
Source:	⌘	NOKIA
Work item code:	⌘	TEI6
		Date: ⌘ 24/06/2004
Category:	⌘	B
		<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><i>Use <u>one</u> of the following categories:</i></p> <p>F (correction)</p> <p>A (corresponds to a correction in an earlier release)</p> <p>B (addition of feature),</p> <p>C (functional modification of feature)</p> <p>D (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p> </div> <div style="width: 45%;"> <p><i>Use <u>one</u> of the following releases:</i></p> <p>2 (GSM Phase 2)</p> <p>R96 (Release 1996)</p> <p>R97 (Release 1997)</p> <p>R98 (Release 1998)</p> <p>R99 (Release 1999)</p> <p>Rel-4 (Release 4)</p> <p>Rel-5 (Release 5)</p> <p>Rel-6 (Release 6)</p> </div> </div>

Reason for change:	⌘	-	Introduction of Extended RLC/MAC Control Message segmentation capability
Summary of change:	⌘	-	Extended RLC/MAC Control Message segmentation capability bit is added in MS RAC
Consequences if not approved:	⌘	-	It is not possible to indicate the support of Extended RLC/MAC Control Message segmentation for GERAN MSs, preventing the use of this segmentation

Clauses affected:	⌘	10.5.5.12a									
Other specs affected:	⌘	<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 style="width: 20px;"> </td> <td style="width: 20px;">X</td> </tr> <tr> <td style="width: 20px;"> </td> <td style="width: 20px;">X</td> </tr> <tr> <td style="width: 20px;"> </td> <td style="width: 20px;">X</td> </tr> </table>	Y	N		X		X		X	Other core specifications
		Y	N								
			X								
			X								
	X										
	Test specifications										
	O&M Specifications										
Other comments:	⌘										

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.

10.5.5.12a MS Radio Access capability

The purpose of the *MS RA capability* information element is to provide the radio part of the network with information concerning radio aspects of the mobile station. The contents might affect the manner in which the network handles the operation of the mobile station.

The *MS RA capability* is a type 4 information element, with a maximum length of 52 octets.

The value part of a *MS RA capability* information element is coded as shown in table 10.5.146/3GPP TS 24.008.

For the indication of the radio access capabilities the following conditions shall apply:

- Among the three Access Type Technologies GSM 900-P, GSM 900-E and GSM 900-R only one shall be present.
- Due to shared radio frequency channel numbers between GSM 1800 and GSM 1900, the mobile station should provide the relevant radio access capability for either GSM 1800 band OR GSM 1900 band, not both.
- The MS shall indicate its supported Access Technology Types during a single MM procedure.
- If the alternative coding by using the Additional access technologies struct is chosen by the mobile station, the mobile station shall indicate its radio access capability for the serving BCCH frequency band in the first included Access capabilities struct, if this information element is not sent in response to an Access Technologies Request from the network or if none of the requested Access Technology Types is supported by the MS. Otherwise, the mobile station shall include the radio access capabilities for the frequency bands it supports in the order of priority requested by the network (see 3GPP TS 44.060).
- The first Access Technology Type shall not be set to "1111".

For error handling the following shall apply:

- If a received Access Technology Type is unknown to the receiver, it shall ignore all the corresponding fields.
- If within a known Access Technology Type a receiver recognizes an unknown field it shall ignore it.
- For more details about error handling of MS radio access capability see 3GPP TS 48.018 [86].

Table 10.5.146/3GPP TS 24.008: Mobile Station Radio Access Capability Information Element

```

<MS RA capability value part : < MS RA capability value part struct >>
<spare bits>**; -- may be used for future enhancements

<MS RA capability value part struct>::= --recursive structure allows any number of Access technologies
{ { < Access Technology Type: bit (4) > exclude 1111
  < Access capabilities : <Access capabilities struct> > }

  | { < Access Technology Type: bit (4) == 1111 > -- structure adding Access technologies with same
capabilities
  < Length : bit (7) > -- length in bits of list of Additional access technologies and spare bits
  { 1 < Additional access technologies: < Additional access technologies struct > > } ** 0
  <spare bits>** } }

{ 0 | 1 <MS RA capability value part struct> } ;

< Additional access technologies struct > ::=
  < Access Technology Type : bit (4) >
  < GMSK Power Class : bit (3) >
  < 8PSK Power Class : bit (2) > ;

< Access capabilities struct > ::=
  < Length : bit (7) > -- length in bits of Content and spare bits
  <Access capabilities : <Content>>
  <spare bits>** ; -- expands to the indicated length
  -- may be used for future enhancements

< Content > ::=
  < RF Power Capability : bit (3) >
  { 0 | 1 <A5 bits : <A5 bits>> } -- zero means that the same values apply for parameters as in the immediately
preceding Access capabilities field within this IE
  < ES IND : bit >
  < PS : bit >
  < VGCS : bit >
  < VBS : bit >
  { 0 | 1 < Multislot capability : Multislot capability struct > } -- zero means that the same values for multislot
parameters as given in an earlier Access capabilities field within this IE apply also here
-- Additions in release 99
  { 0 | 1 < 8PSK Power Capability : bit(2)> } -- '1' also means 8PSK modulation capability in uplink.
  < COMPACT Interference Measurement Capability : bit >
  < Revision Level Indicator : bit >
  < UMTS FDD Radio Access Technology Capability : bit > -- 3G RAT
  < UMTS 3.84 Mcps TDD Radio Access Technology Capability : bit > -- 3G RAT
  < CDMA 2000 Radio Access Technology Capability : bit > -- 3G RAT
-- Additions in release 4
  < UMTS 1.28 Mcps TDD Radio Access Technology Capability: bit > -- 3G RAT
  < GERAN Feature Package 1 : bit >
  { 0 | 1 < Extended DTM GPRS Multi Slot Class : bit(2) >
    < Extended DTM EGPRS Multi Slot Class : bit(2) > }
  < Modulation based multislot class support : bit >
-- Additions in release 5
  { 0 | 1 < High Multislot Capability : bit(2) > }
  { 0 | 1 < GERAN Iu Mode Capabilities > } -- '1' also means support of GERAN Iu mode
  < GMSK Multislot Power Profile : bit (2) >
  < 8-PSK Multislot Power Profile : bit (2) >
-- Additions in release 6
  < Multiple TBF Capability : bit >;
  < Extended RLC/MAC Control Message Segmentation Capability : bit >;
  -- error: struct too short, assume features do not exist
  -- error: struct too long, ignore data and jump to next Access technology

```

Table 10.5.146/3GPP TS 24.008 (continued): Mobile Station Radio Access Capability IE

```

< Multislot capability struct > ::=
  { 0 | 1 < HSCSD multislot class : bit (5) > }
  { 0 | 1 < GPRS multislot class : bit (5) > < GPRS Extended Dynamic Allocation Capability : bit > }
  { 0 | 1 < SMS_VALUE : bit (4) > < SM_VALUE : bit (4) > }
-- Additions in release 99
  { 0 | 1 < ECSD multislot class : bit (5) > }
  { 0 | 1 < EGPRS multislot class : bit (5) > < EGPRS Extended Dynamic Allocation Capability : bit > }
  { 0 | 1 < DTM GPRS Multi Slot Class: bit(2)>
    <Single Slot DTM : bit>
    { 0 | 1 <DTM EGPRS Multi Slot Class : bit(2)> } } ;
-- error: struct too short, assume features do not exist

< GERAN Iu Mode Capabilities > ::=
  < Length : bit (4) > -- length in bits of Iu mode-only capabilities and spare bits
-- Additions in release 6
  < FLO Iu Capability : bit >
  < spare bits > ** ; -- expands to the indicated length
                    -- may be used for future enhancements

< A5 bits > ::= < A5/1 : bit > < A5/2 : bit > < A5/3 : bit > < A5/4 : bit > < A5/5 : bit > < A5/6 : bit > < A5/7 : bit >; -- bits for circuit
mode ciphering algorithms. These fields are not used by the network and may be excluded by the MS.

Access Technology Type
This field indicates the access technology type to be associated with the following access capabilities.

Bits
4 3 2 1
0 0 0 0 GSM P
0 0 0 1 GSM E --note that GSM E covers GSM P
0 0 1 0 GSM R --note that GSM R covers GSM E and GSM P
0 0 1 1 GSM 1800
0 1 0 0 GSM 1900
0 1 0 1 GSM 450
0 1 1 0 GSM 480
0 1 1 1 GSM 850
1 0 0 0 GSM 700
1 0 0 1 GSM T 380
1 0 1 0 GSM T 410
1 0 1 1 GSM T 900
1 1 1 1 Indicates the presence of a list of Additional access technologies
All other values are treated as unknown by the receiver.

A MS which does not support any GSM access technology type shall set this field to '0000'.

RF Power Capability, GMSK Power Class (3 bit field)
This field contains the binary coding of the power class used for GMSK associated with the indicated Access
Technology Type (see 3GPP TS 45.005).

A MS which does not support any GSM access technology type shall set this field to '000'.

8PSK Power Capability (2 bit field)
If 8-PSK modulation is supported for uplink, this field indicates the radio capability for 8-PSK modulation. The
following coding is used (see 3GPP TS 45.005 [33]):
Bits 2 1
0 0 Reserved
0 1 Power class E1
1 0 Power class E2
1 1 Power class E3

8PSK Power Class (2 bit field)
This field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 45.005):
Bits 2 1
0 0 8PSK modulation not supported for uplink
0 1 Power class E1
1 0 Power class E2

```

Additional access technologies struct

This structure contains the GMSK Power Class and 8PSK Power Class for an additional Access Technology. All other capabilities for this indicated Access Technology are the same as the capabilities indicated by the preceding Access capabilities struct.

A5/1

0 encryption algorithm A5/1 not available
1 encryption algorithm A5/1 available

A5/2

0 encryption algorithm A5/2 not available
1 encryption algorithm A5/2 available

A5/3

0 encryption algorithm A5/3 not available
1 encryption algorithm A5/3 available

A5/4

0 encryption algorithm A5/4 not available
1 encryption algorithm A5/4 available

A5/5

0 encryption algorithm A5/5 not available
1 encryption algorithm A5/5 available

A5/6

0 encryption algorithm A5/6 not available
1 encryption algorithm A5/6 available

A5/7

0 encryption algorithm A5/7 not available
1 encryption algorithm A5/7 available

ES IND – (Controlled early Classmark Sending)

0 "controlled early Classmark Sending" option is not implemented
1 "controlled early Classmark Sending" option is implemented

Table 10.5.146/3GPP TS 24.008 (concluded): Mobile Station Radio Access Capability IE

PS – (Pseudo Synchronisation)

- 0 PS capability not present
- 1 PS capability present

VGCS – (Voice Group Call Service)

- 0 no VGCS capability or no notifications wanted
- 1 VGCS capability and notifications wanted.

VBS – (Voice Broadcast Service)

- 0 no VBS capability or no notifications wanted
- 1 VBS capability and notifications wanted

HSCSD Multi Slot Class

The Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32]. This field is not used by the network and may be excluded by the MS. Range 1 to 18, all other values are reserved.

GPRS Multi Slot Class

The GPRS Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32].

ECSD Multi Slot Class

The presence of this field indicates ECSD capability. Whether the MS is capable of 8-PSK modulation in uplink is indicated by the presence of 8-PSK Power Capability field. The Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32]. This field is not used by the network and may be excluded by the MS. Range 1 to 18, all other values are reserved.

EGPRS Multi Slot Class

The presence of this field indicates EGPRS capability. Whether the MS is capable of 8-PSK modulation in uplink is indicated by the presence of 8-PSK Power Capability field. The EGPRS Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32].

GPRS Extended Dynamic Allocation Capability

- 0 Extended Dynamic Allocation Capability for GPRS is not implemented
- 1 Extended Dynamic Allocation Capability for GPRS is implemented

EGPRS Extended Dynamic Allocation Capability

- 0 Extended Dynamic Allocation Capability for EGPRS is not implemented
- 1 Extended Dynamic Allocation Capability for EGPRS is implemented

SMS_VALUE (Switch-Measure-Switch) (4 bit field)

The SMS field indicates the time needed for the mobile station to switch from one radio channel to another, perform a neighbor cell power measurement, and the switch from that radio channel to another radio channel. This field is not used by the network and may be excluded by the MS.

Bits

- | | | | | |
|---|---|---|---|------------------------------------|
| 4 | 3 | 2 | 1 | |
| 0 | 0 | 0 | 0 | 1/4 timeslot (~144 microseconds) |
| 0 | 0 | 0 | 1 | 2/4 timeslot (~288 microseconds) |
| 0 | 0 | 1 | 0 | 3/4 timeslot (~433 microseconds) |
| | | | | ... |
| 1 | 1 | 1 | 1 | 16/4 timeslot (~2307 microseconds) |

(SM_VALUE) Switch-Measure (4 bit field)

The SM field indicates the time needed for the mobile station to switch from one radio channel to another and perform a neighbour cell power measurement. This field is not used by the network and may be excluded by the MS.

Bits

- | | | | | |
|---|---|---|---|------------------------------------|
| 4 | 3 | 2 | 1 | |
| 0 | 0 | 0 | 0 | 1/4 timeslot (~144 microseconds) |
| 0 | 0 | 0 | 1 | 2/4 timeslot (~288 microseconds) |
| 0 | 0 | 1 | 0 | 3/4 timeslot (~433 microseconds) |
| | | | | ... |
| 1 | 1 | 1 | 1 | 16/4 timeslot (~2307 microseconds) |

DTM GPRS Multi Slot Class (2 bit field)

This field indicates the DTM GPRS multislot capabilities of the MS. It is coded as follows:

Bits

2 1

- 0 0 Unused. If received, the network shall interpret this as '01'
- 0 1 Multislot class 5 supported
- 1 0 Multislot class 9 supported
- 1 1 Multislot class 11 supported

Single Slot DTM (1 bit field)

This field indicates whether the MS supports single slot DTM operation (see 3GPP TS 43.055 [87]).

Bit

- 0 Single Slot DTM not supported
- 1 Single Slot DTM supported

An MS indicating support for Extended DTM GPRS multislot class or Extended DTM EGPRS multislot class shall set this bit to '1'. The network may ignore the bit in this case.

DTM EGPRS Multi Slot Class (2 bit field)

This field indicates the DTM EGPRS multislot capabilities of the MS. This field shall be included only if the mobile station supports EGPRS DTM. This field is coded as the DTM GPRS multislot Class field.

COMPACT Interference Measurement Capability (1 bit field)

- 0 COMPACT Interference Measurement Capability is not implemented
- 1 COMPACT Interference Measurement Capability is implemented

Revision Level Indicator (1 bit field)

Bit

- 0 The ME is Release '98 or older
- 1 The ME is Release '99 onwards

UMTS FDD Radio Access Technology Capability (1 bit field)

Bit

- 0 UMTS FDD not supported
- 1 UMTS FDD supported

UMTS 3.84 Mcps TDD Radio Access Technology Capability (1 bit field)

Bit

- 0 UMTS 3.84 Mcps TDD not supported
- 1 UMTS 3.84 Mcps TDD supported

CDMA 2000 Radio Access Technology Capability (1 bit field)

Bit

- 0 CDMA 2000 not supported
- 1 CDMA 2000 supported

UMTS 1.28 Mcps TDD Radio Access Technology Capability (1 bit field)

Bit

- 0 UMTS 1.28 Mcps TDD not supported
- 1 UMTS 1.28 Mcps TDD supported

GERAN Feature Package 1 (1 bit field)

This field indicates whether the MS supports the GERAN Feature Package 1 (see 3GPP TS 44.060). It is coded as follows:

- 0 GERAN feature package 1 not supported.
- 1 GERAN feature package 1 supported.

Extended DTM GPRS Multi Slot Class (2 bit field)

This field indicates the extended DTM GPRS capabilities of the MS and shall be interpreted in conjunction with the DTM GPRS Multi Slot Class field. It is coded as follows, where 'DGMSC' denotes the DTM GPRS multislot class field:

DGMSC Bit	2 1	Bit 2 1	
	0 0	0 0	Unused. If received, it shall be interpreted as '01 00'
	0 0	0 1	Unused. If received, it shall be interpreted as '01 00'
	0 0	1 0	Unused. If received, it shall be interpreted as '01 00'
	0 0	1 1	Unused. If received, it shall be interpreted as '01 00'
	0 1	0 0	Multislot class 5 supported

0 1	0 1	Multislot class 6 supported
0 1	1 0	Unused. If received, it shall be interpreted as '01 00'
0 1	1 1	Unused. If received, it shall be interpreted as '01 00'
1 0	0 0	Multislot class 9 supported
1 0	0 1	Multislot class 10 supported
1 0	1 0	Unused. If received, it shall be interpreted as '10 00'
1 0	1 1	Unused. If received, it shall be interpreted as '10 00'
1 1	0 0	Multislot class 11 supported
1 1	0 1	Unused. If received, it shall be interpreted as '11 00'
1 1	1 0	Unused. If received, it shall be interpreted as '11 00'
1 1	1 1	Unused. If received, it shall be interpreted as '11 00'

The presence of this field indicates that the MS supports combined fullrate and halfrate GPRS channels in the downlink. When this field is not present, the MS supports the multislot class indicated by the *DTM GPRS Multi Slot Class* field.

Extended DTM EGPRS Multislot Class (2 bit field)

This field is not considered when the DTM EGPRS Multislot Class field is not included. This field indicates the extended DTM EGPRS multislot capabilities of the MS and shall be interpreted in conjunction with the DTM EGPRS Multislot Class field. This field is coded as the Extended DTM GPRS Multislot Class field. The presence of this field indicates that the MS supports combined fullrate and halfrate GPRS channels in the downlink. When this field is not present, the MS supports the multislot class indicated by the DTM EGPRS Multi Slot Class field.

Modulation based multislot class support (1 bit field)

Bit	
0	"Modulation based multislot class" not supported
1	"Modulation based multislot class" supported

High Multislot Capability (2 bit field)

The High Multislot Capability is individually combined with each multislot class field sent by the MS (the possible multislot class fields are: HSCSD multislot class, ECSD multislot class, GPRS multislot class, EGPRS multislot class, DTM GPRS multislot class, DTM EGPRS multislot class, extended DTM GPRS multislot class and extended DTM EGPRS multislot class) to extend the related multislot class to multislot classes 30 to 45, see 3GPP TS 45.002.

For each multislot class, the following mapping is done:

Bits	coded multislot class field	actual multislot class
2 1		
0 0	8	30
0 0	10, 23, 28, 29	39
0 0	11, 20, 25	32
0 0	12, 21, 22, 26, 27	33
0 0	Any other	Multislot Class field value
0 1	8	35
0 1	10, 19, 24	36
0 1	11, 23, 28, 29	45
0 1	12, 21, 22, 26, 27	38
0 1	Any other	Multislot Class field value
1 0	8	40
1 0	10, 19, 24	41
1 0	11, 20, 25	42
1 0	12, 23, 28, 29	44
1 0	Any other	Multislot Class field value
1 1	12, 21, 22, 26, 27	43
1 1	11, 20, 25	37
1 1	10, 19, 24	31
1 1	9, 23, 28, 29	34
1 1	Any other	Multislot Class field value

GERAN Iu Mode Capabilities

This field indicates if the mobile station supports GERAN Iu mode. Furthermore, it indicates the GERAN Iu mode capabilities of the mobile station. The field shall be included if the mobile station supports GERAN Iu mode. If the field is not present, the mobile station does not support GERAN Iu mode.

GMSK Multislot Power Profile (2 bit field)

For detailed definitions, see the Mobile Station Classmark 3 information element.

CR-Form-v7.1

CHANGE REQUEST

⌘ **23.122 CR 77** ⌘ rev **1** ⌘ Current version: **6.1.0** ⌘

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

Title:	⌘ Correction of definitions of PLMNs in the same country		
Source:	⌘ Vodafone		
Work item code:	⌘ TEI6	Date:	⌘ 16/08/2004
Category:	⌘ F	Release:	⌘ Rel-6
	<i>Use <u>one</u> of the following categories:</i> F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		<i>Use <u>one</u> of the following releases:</i> Ph2 (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) Rel-7 (Release 7)

Reason for change:	⌘ The term "Visited PLMN of home country" is defined in section 1.2 but is not used in the body of the specification and also conflicts with the extra information about MCC values in the USA in normative Annex B. The term is therefore misleading and redundant and should be deleted. Annex B is not referred to from the body of the specification and might be overlooked.
Summary of change:	⌘ The definition of "Visited PLMN of home country" is deleted. Two references are added to from section 4.4.3.3 to the normative Annex B.
Consequences if not approved:	⌘ The changes made do not alter the intended behaviour of implementations of 23.122. However, the changes guard against an implementation overlooking normative text and thereby interpreting that networks in the USA are in different countries when they are in the same country. Such a misinterpretation might cause incorrect network selection by the mobile equipment.

Clauses affected:	⌘ 1.2, 4.4.3.3										
Other specs affected:	<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> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications Test specifications O&M Specifications	Y	N	⌘	X	⌘	X	⌘	X	⌘	
Y	N										
⌘	X										
⌘	X										
⌘	X										
Other comments:	⌘										

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***First Proposed Change

1.2 Definitions and abbreviations

For the purposes of the present document, the abbreviations defined in 3GPP TR 21.905 [36] apply.

(A/Gb mode only): Indicates this clause applies only to GSM system. For multi system case this is determined by the current serving radio access network.

(Iu mode only): Indicates this clause applies only to UMTS system. For multi system case this is determined by the current serving radio access network.

Acceptable Cell: This is a cell that the MS may camp on to make emergency calls. It must satisfy criteria which is defined for A/Gb mode in 3GPP TS 43.022 and for Iu mode in 3GPP TS 25.304.

Access Technology: The access technology associated with a PLMN. The MS uses this information to determine what type of radio carrier to search for when attempting to select a specific PLMN (e.g., GSM, UMTS or GSM COMPACT). A PLMN may support more than one access technology.

Allowable PLMN: In the case of a MS operating in MS operation mode A or B, this is a PLMN which is not in the list of "forbidden PLMNs" in the MS. In the case of a MS operating in MS operation mode C, this is a PLMN which is not in the list of "forbidden PLMNs" or in the list of "forbidden PLMNs for GPRS service" in the MS

Available PLMN: For A/Gb mode this is a PLMN where the MS has found a cell that satisfies certain conditions specified in 3GPP TS 43.022. For Iu mode this is a PLMN where the MS has found a cell that satisfies certain conditions specified in 3GPP TS 25.304.

Camped on a cell: The MS (ME if there is no SIM) has completed the cell selection/reselection process and has chosen a cell from which it plans to receive all available services. Note that the services may be limited, and that the PLMN may not be aware of the existence of the MS (ME) within the chosen cell.

Current serving cell: This is the cell on which the MS is camped.

CTS MS: An MS capable of CTS services is a CTS MS.

GPRS MS: An MS capable of GPRS services is a GPRS MS.

MS operation mode: See 3GPP TS 23.060 [27].

High quality signal: The high quality signal limit is used in the PLMN selection procedure. It is defined in the appropriate AS specification: 3GPP TS 43.022 for the GSM radio access technology, 3GPP TS 25.304 for the UMTS radio access technology (FDD or TDD mode).

Home PLMN: This is a PLMN where the MCC and MNC of the PLMN identity match the MCC and MNC of the IMSI. Matching criteria are defined in Annex A.

In A/Gb mode,...: Indicates this clause applies only to GSM System. For multi system case this is determined by the current serving radio access network.

In Iu mode,...: Indicates this clause applies only to UMTS System. For multi system case this is determined by the current serving radio access network.

Localised Service Area (LSA): A localised service area consists of a cell or a number of cells. The cells constituting a LSA may not necessarily provide contiguous coverage.

Location Registration (LR): An MS which is IMSI attached to non-GPRS services only performs location registration by the Location Updating procedure. A GPRS MS which is IMSI attached to GPRS services or to GPRS and non-GPRS services performs location registration by the Routing Area Update procedure only when in a network of network operation mode I. Both procedures are performed independently by the GPRS MS when it is IMSI attached to GPRS and non-GPRS services in a network of network operation mode II or III (see 3GPP TS 23.060).

MS: Mobile Station. The present document makes no distinction between MS and UE.

Network Type: The network type associated with HPLMN or a PLMN on the PLMN selector (see 3GPP TS 31.102). The MS uses this information to determine what type of radio carrier to search for when attempting to select a specific PLMN. A PLMN may support more than one network type.

Registered PLMN (RPLMN): This is the PLMN on which certain LR outcomes have occurred (see table 1).

Registration: This is the process of camping on a cell of the PLMN and doing any necessary LRs.

Registration Area: A registration area is an area in which mobile stations may roam without a need to perform location registration. The registration area corresponds to location area (LA) for performing location updating procedure and it corresponds to routing area for performing the routing area update procedure.

The PLMN to which a cell belongs (PLMN identity) is given in the system information transmitted on the BCCH (MCC + MNC part of LAI).

Selected PLMN: This is the PLMN that has been selected according to clause 3.1, either manually or automatically.

SIM: Subscriber Identity Module (see 3GPP TS 21.111). The present document makes no distinction between SIM and USIM.

SoLSA exclusive access: Cells on which normal camping is allowed only for MS with Localised Service Area (LSA) subscription.

Suitable Cell: This is a cell on which an MS may camp. It must satisfy criteria which is defined for A/Gb mode in 3GPP TS 43.022 and for Iu mode in 3GPP TS 25.304.

~~**Visited PLMN of home country:** This is a PLMN, different from the home PLMN, where the MCC part of the PLMN identity is the same as the MCC of the IMSI.~~

Visited PLMN: This is a PLMN, different from the home PLMN.

*** Second Proposed Change ***

4.4.3.3 In VPLMN

If the MS is in a VPLMN, the MS shall periodically attempt to obtain service on its HPLMN or higher priority PLMN listed in "user controlled PLMN selector" or "operator controlled PLMN selector" by scanning in accordance with the requirements that are applicable to i), ii) and iii) as defined in the Automatic Network Selection Mode in clause 4.4.3.1.1. In the case that the mobile has a stored "Equivalent PLMNs" list the mobile shall only select a PLMN if it is of a higher priority than those of the same country as the current serving PLMN which are stored in the "Equivalent PLMNs" list. For this purpose, a value T minutes may be stored in the SIM, T is either in the range 6 minutes to 8 hours in 6 minute steps or it indicates that no periodic attempts shall be made. If no value is stored in the SIM, a default value of 60 minutes is used.

The attempts to access the HPLMN or higher priority PLMN shall be as specified below:

- a) The periodic attempts shall only be performed in automatic mode when the MS is roaming;
- b) After switch on, a period of at least 2 minutes and at most T minutes shall elapse before the first attempt is made;
- c) The MS shall make an attempt if the MS is on the VPLMN at time T after the last attempt;
- d) Periodic attempts shall only be performed by the MS while in idle mode;
- e) If the HPLMN or higher priority PLMN is not found, the MS shall remain on the VPLMN.
- f) In steps i), ii) and iii) the MS shall limit its attempts to access higher priority PLMNs to PLMNs of the same country as the current serving VPLMN, as defined in Annex B.
- g) Only the priority levels of Equivalent PLMNs of the same country as the current serving VPLMN, as defined in Annex B, shall be taken into account to compare with the priority level of a selected PLMN.

CR-Form-v7.1

CHANGE REQUEST

⌘ **TS 24.008** **CR** **883** ⌘ rev **1** ⌘ Current version: **6.5.0** ⌘

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

Title:	⌘ Mapping of QoS Traffic Class to RRC Establishment Cause		
Source:	⌘ Vodafone D2 GmbH		
Work item code:	⌘ TEI6	Date:	⌘ 02/08/2004
Category:	⌘ F	Release:	⌘ Rel-6
	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)
		Rel-7	(Release 7)

Reason for change:	⌘ According to Table L.1.2/3GPP TS 24.008 Annex L, when the PDP context activation is initiated by the MS to establish a PDP context between the MS and the network for the Traffic class in QoS given by 'Subscribed Traffic Class', the RRC establishment cause is mapped to 'Originating High Priority Signaling'. Because the reversal mapping of the RRC establishment cause 'Originating High Priority Signaling' to the corresponding NAS procedure is ambiguous, as shown in Table L.1.1/3GPP TS 24.008 and Table L.1.2/3GPP TS 24.008, respectively, it is impossible for the network to identify to what kind of the NAS procedure this RRC establishment attempt is related.
Summary of change:	⌘ To map the Traffic Class 'Subscribed Traffic Class' to the RRC establishment cause 'Originating Subscribed traffic call' as specified in 3GPP TS 25.331 Section 10.3.3.11 instead of 'Originating High priority signalling'.
Consequences if not approved:	⌘ Network can't correctly record the attempts of the NAS procedure 'Activate PDP Context' initiated by the MS.

Clauses affected:	⌘ Annex L										
Other specs affected:	<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> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> </table>	Y	N		X		X		X	Other core specifications	⌘
Y	N										
	X										
	X										
	X										
		Test specifications									
		O&M Specifications									
Other comments:	⌘										

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/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.

Annex L (normative): Establishment cause (lu mode only)

L.1 Mapping of NAS procedure to RRC establishment cause(lu mode only)

When MM requests the establishment of a RR connection, the RRC establishment cause used by the MS shall be selected according to the CS NAS procedure as specified in table L.1.1.

Table L.1.1/3GPP TS 24.008: Mapping of CS NAS procedure to establishment cause

CS NAS procedure	RRC Establishment cause (according 3GPP TS 25.331)
Originating CS speech call	Originating Conversational Call
Originating CS data call	Originating Conversational Call
CS Emergency call	Emergency call
Call re-establishment	Call re-establishment
Location update	Registration
IMSI Detach	Detach
MO SMS via CS domain	Originating Low Priority Signalling
Supplementary Services	Originating High Priority Signalling
Answer to circuit switched paging	Set equal to the value of the paging cause used in the reception of paging in the RRC layer
SS part of Location services	Originating High Priority Signalling

When GMM requests the establishment of a PS signalling connection, the RRC establishment cause used by the MS shall be selected according to the PS NAS procedure as specified in Table L.1.2.

Table L.1.2/3GPP TS 24.008: Mapping of PS NAS procedure to establishment cause

PS NAS procedure	RRC Establishment cause (according 3GPP TS 25.331)
GPRS Attach	Registration
Routing Area Update – for the case of 'Directed Signalling Connection Re-Establishment (see chapter 4.7.2.5.)	Call Re-Establishment
Routing area Update – all cases other than 'Directed Signalling Connection Re-Establishment	Registration
GPRS Detach	Detach
Request to re-establish RABs	Either 'Originating Conversational Call' or 'Originating Streaming Call' or 'Originating Interactive Call' or 'Originating Background Call' – depending on the Traffic Class in QoS of the "most demanding" RAB. (see Note 1)
Activate PDP Context	Either 'Originating Conversational Call' or 'Originating Streaming Call' or 'Originating Interactive Call' or 'Originating Background Call' – depending on the Traffic Class in QoS of the "most demanding" RAB. (see Note 1) – If Traffic Class in QoS is not 'Conversational Class' or 'Streaming Class' or 'Interactive Class' or 'Background Class' but is 'Subscribed Traffic Class', then ' Originating High Priority Signalling Originating Subscribed traffic Call ' shall be used.
Modify PDP Context	Originating High Priority Signalling
Deactivate PDP Context	Originating High Priority Signalling
MO SMS via PS domain	Originating Low Priority Signalling
SS part of Location services	Originating High Priority Signalling
Answer to packet paging	Set equal to the value of the paging cause used in the reception of paging in the RRC layer
NOTE 1: For classification of "most demanding" Traffic Class the following ranking order applies: "Conversational" followed by "Streaming" followed by "Interactive" followed by "Background", where "Conversational" is the most demanding Traffic class in terms of being delay sensitive. In choosing the "most demanding" Traffic Class all already active PDP Context together with the PDP Context to be activated shall be considered	

NOTE: The RRC establishment cause may be used by the network to prioritise the connection establishment request from the MS at high load situations in the network.

CR-Form-v7.1

CHANGE REQUEST

⌘ **24.008 CR 852** ⌘ rev **3** ⌘ Current version: **6.5.0** ⌘

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

Title:	⌘ Network Search for recovering from Faulty Networks		
Source:	⌘ Siemens AG, Infineon AG		
Work item code:	⌘ TEI6	Date:	⌘ 10/08/2004
Category:	⌘ 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-6 Use <u>one</u> of the following releases: Ph2 (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) Rel-7 (Release 7)

Reason for change:	⌘ With the current definitions in 24.008 and 23.122, it is allowed to perform a PLMN reselection in order to obtain service on another PLMN if the attempt counter for the registration reaches its limits. However this possibility is not very obvious in 24.008. If a registration request is rejected with one of the causes "Semantically incorrect message", "Invalid Mandatory information message", "message type not existent", "Information element not existent", or "protocol error unspecified", further registration attempts are useless, as the reason for the rejection is probably an implementation problem rather than a temporary network problem (like congestion).
Summary of change:	⌘ It is recommended to immediately stop the registration attempts once the network responds with one of the causes "Semantically incorrect message", "Invalid Mandatory information message", "message type not existent", "Information element not existent", or "protocol error unspecified", by setting the attempt counter to 4 or 5, respectively, and optionally to trigger a PLMN reselection. This would avoid unnecessary registration reattempts which are currently required. It is clarified, that once the attempt counter for the registration attempts reaches its limit, the MS may optionally perform a PLMN reselection in order to find an alternative PLMN to obtain service. This option is already part of the 3GPP specifications at least from Phase2 for CS services and from R97 for PS services. For CS service this is stated in TS 24.008 sec. 4.2.1.2 and TS 23.122 sec. 4.4.4. For PS service this is stated in TS 24.008 sec. 4.7.3.1.5, sec. 4.2.4.1.2 for the Attach and sec.4.7.5.1.5, 4.2.5.1.8 for the RAU and in general in TS 23.122 sec.

4.4.4.

Consequences if not approved:

⌘ Risk of misinterpretation of the specification in such a manner that it is assumed that the MS may not perform a PLMN reselection once the attempt counter for registration procedures reaches its limit.

Clauses affected:

⌘ 4.4.4.9; 4.7.3.1.5; 4.7.3.2.5; 4.7.5.1.5; 4.7.5.2.5

Other specs affected:

Y	N
	X
	X
	X

⌘ Other core specifications ⌘
⌘ Test specifications
⌘ O&M Specifications

Other comments:

⌘

4.4.4.9 Abnormal cases on the mobile station side

The different abnormal cases that can be identified are the following:

- a) Access barred because of access class control

___ The location updating procedure is not started. The mobile station stays in the current serving cell and applies normal cell reselection process. The procedure is started as soon as possible and if still necessary (when the barred state is ended or because of a cell change). [\[editors note: style changed to B1\]](#)

- b) The answer to random access is an IMMEDIATE ASSIGNMENT REJECT message (A/Gb mode only)

___ The location updating is not started. The mobile station stays in the chosen cell and applies normal cell selection process. The waiting timer T3122 is reset when a cell change occurs. The procedure is started as soon as possible after T3122 timeout if still necessary. [\[editors note: style changed to B1\]](#)

- c) Random access failure (A/Gb mode only)

___ Timer T3213 is started. When it expires the procedure is attempted again if still necessary. [\[editors note: style changed to B1\]](#)

NOTE: As specified in 3GPP TS 45.008 [34], a cell reselection then takes place, with return to the cell inhibited for 5 seconds if there is at least one other suitable cell. Typically the selection process will take the mobile station back to the cell where the random access failed after 5 seconds.

___ If at the expiry of timer T3213 a new cell has not been selected due to the lack of valid information (see 3GPP TS 45.008 [34]), the mobile station may as an option delay the repeated attempt for up to 8 seconds to allow cell re-selection to take place. In this case the procedure is attempted as soon as a new cell has been selected or the mobile station has concluded that no other cell can be selected. [\[editors note: style changed to B1\]](#)

___ If random access failure occurs for two successive random access attempts for location updating the mobile station proceeds as specified below. [\[editors note: style changed to B1\]](#)

- d) RR connection failure

___ The procedure is aborted and the mobile station proceeds as specified below. [\[editors note: style changed to B1\]](#)

- e) T3210 timeout

___ The procedure is aborted, the RR connection is aborted and the MS proceeds as specified below. [\[editors note: style changed to B1\]](#)

- f) RR release before the normal end of procedure

___ The procedure is aborted and the mobile station proceeds as specified below. [\[editors note: style changed to B1\]](#)

- g) Location updating reject, other causes than those treated in subclause 4.4.4.7

___ [Upon reception of the cause codes # 95, # 96, # 97, # 99 and # 111 the MS should set the attempt counter to 4.](#) The MS waits for release of the RR connection as specified in subclause 4.4.4.8, and then proceeds as specified below. [\[editors note: style changed to B1\]](#)

- h) RR connection establishment failure (Iu mode only)

___ The procedure is aborted and the mobile station proceeds as specified below. [\[editors note: style changed to B1\]](#)

NOTE: Case h) covers all cases when the signalling connection cannot be established, including random access failure and access reject. As the RRC protocol has error specific retransmission mechanisms (see 3GPP TS 25.331 [23c]), there is no need to distinguish between the different error cases within MM.

In cases d) to h) above and for repeated failures as defined in c) above the mobile station proceeds as follows. Timer T3210 is stopped if still running. The RR Connection is aborted in case of timer T3210 timeout. The attempt counter is incremented. The next actions depend on the Location Area Identities (stored and received from the BCCH of the current serving cell) and the value of the attempt counter.

- the update status is UPDATED, and the stored LAI is equal to the one received on the BCCH from the current serving cell and the attempt counter is smaller than 4:
 - The mobile station shall keep the update status to UPDATED, the MM IDLE sub-state after the RR connection release is NORMAL SERVICE. The mobile station shall memorize the location updating type used in the location updating procedure. It shall start timer T3211 when the RR connection is released. When timer T3211 expires the location updating procedure is triggered again with the memorized location updating type; *[editors note: style changed to BI]*
 - either the update status is different from UPDATED, or the stored LAI is different from the one received on the BCCH from the current serving cell, or the attempt counter is greater or equal to 4:
 - When the RR connection is released ~~the~~ the mobile station shall delete any LAI, TMSI, ciphering key sequence number stored in the SIM/USIM, and list of equivalent PLMNs, set the update status to NOT UPDATED and enter the MM IDLE sub-state ATTEMPTING TO UPDATE (see subclause 4.2.2.2 for the subsequent actions) or optionally the MM IDLE sub-state PLMN SEARCH (see subclause 4.2.1.2) in order to perform a PLMN selection according to 3GPP TS 23.122 [14] ~~when the RR connection is released (See subclause 4.2.2.2 for the subsequent actions)~~. If the attempt counter is smaller than 4, the mobile station shall memorize that timer T3211 is to be started when the RR connection is released, otherwise it shall memorize that timer T3212 is to be started when the RR connection is released. *[editors note: style changed to BI]*

4.7.3.1.5 Abnormal cases in the MS

The following abnormal cases can be identified:

- a) Access barred because of access class control

The GPRS attach procedure shall not be started. The MS stays in the current serving cell and applies normal cell reselection process. The GPRS attach procedure is started as soon as possible, i.e. when access is granted or because of a cell change.

- b) Lower layer failure before the ATTACH ACCEPT or ATTACH REJECT message is received

The procedure shall be aborted. The MS shall proceed as described below.

- c) T3310 time-out

On the first expiry of the timer, the MS shall reset and restart timer T3310 and shall retransmit the ATTACH REQUEST message. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3310, the MS shall abort the GPRS attach procedure and, in UMTS, release the PS signalling connection (see 3GPP TS 25.331 [23c]). The MS shall proceed as described below.

- d) ATTACH REJECT, other causes than those treated in subclause 4.7.3.1.4

Upon reception of the cause codes # 95, # 96, # 97, # 99 and # 111 the MS should set the GPRS attach attempt counter to 5. The MS shall proceed as described below.

- e) Change of cell within the same RA (GSM only)

If a cell change occurs within the same RA when the MS is in state GMM-REGISTERED-INITIATED, then the cell update procedure shall be performed before completion of the attach procedure.

- f) Change of cell into a new routing area

If a cell change into a new routing area occurs before an ATTACH ACCEPT or ATTACH REJECT message has been received, the GPRS attach procedure shall be aborted and re-initiated immediately. If a routing area border is crossed when the ATTACH ACCEPT message is received but before an ATTACH COMPLETE message is sent, the GPRS attach procedure shall be aborted and the routing area updating procedure shall be initiated. If a P-TMSI was allocated during the GPRS attach procedure, this P-TMSI shall be used in the routing area updating procedure. If a P-TMSI signature was allocated together with the P-TMSI during the GPRS attach procedure, this P-TMSI signature shall be used in the routing area updating procedure.

- g) Mobile originated detach required

If the MS is in state GMM-REGISTERED-INITIATED, the GPRS attach procedure shall be aborted and the GPRS detach procedure shall be performed (see subclause 4.7.4.1).

- h) Procedure collision

If the MS receives a DETACH REQUEST message from the network in state GMM-REGISTERED-INITIATED with type of detach 're-attach not required', the GPRS detach procedure shall be progressed and the GPRS attach procedure shall be aborted. Otherwise the GPRS attach procedure shall be progressed and the DETACH REQUEST message shall be ignored.

In cases b, c and d the MS shall proceed as follows. Timer T3310 shall be stopped if still running. The GPRS attach attempt counter shall be incremented.

If the GPRS attach attempt counter is less than 5:

- timer T3311 is started and the state is changed to GMM-DEREGISTERED.ATTEMPTING-TO-ATTACH.

If the GPRS attach attempt counter is greater than or equal to 5:

- the MS shall delete any RAI, P-TMSI, P-TMSI signature, list of equivalent PLMNs, and GPRS ciphering key sequence number, shall set the GPRS update status to GU2 NOT UPDATED, shall start timer T3302. The state

is changed to GMM-DEREGISTERED. ATTEMPTING-TO-ATTACH or optionally to GMM-DEREGISTERED.PLMN-SEARCH (see subclause 4.2.4.1.2) [in order to perform a PLMN selection according to 3GPP TS 23.122 \[14\]](#).

4.7.3.2.5 Abnormal cases in the MS

The abnormal cases specified in subclause 4.7.3.1.5 apply with the following modification:

If the GPRS attach attempt counter is incremented according to subclause 4.7.3.1.5 the next actions depend on the Location Area Identities (stored on SIM/USIM and the one of the current serving cell) and the value of the attach attempt counter:

- if the update status is U1 UPDATED, and the stored LAI is equal to the one of the current serving cell and the attach attempt counter is smaller than 5, then the mobile station shall keep the update status to U1 UPDATED, the new MM state is MM IDLE substate NORMAL SERVICE;
- if the attach attempt counter is smaller than 5 and, additionally, the update status is different from U1 UPDATED or the stored LAI is different from the one of the current serving cell, then the mobile station shall delete any LAI, TMSI, ciphering key sequence number stored in the SIM/USIM and list of equivalent PLMNs and set the update status to U2 NOT UPDATED. The MM state remains MM LOCATION UPDATING PENDING; or
- if the attach attempt counter is greater or equal to 5, then the mobile station shall delete any LAI, TMSI, ciphering key sequence number stored in the SIM/USIM and list of equivalent PLMNs and set the update status to U2 NOT UPDATED.

A GPRS MS operating in MS operation mode A shall then proceed with appropriate MM specific procedure; a GPRS MS operating in MS operation mode B may then proceed with appropriate MM specific procedures. The MM sublayer shall act as in network operation mode II or III (depending whether a PCCCH is present) as long as the combined GMM procedures are not successful and no new RA is entered. The new MM state is MM IDLE substate ATTEMPTING TO UPDATE [or optionally MM IDLE substate PLMN SEARCH in order to perform a PLMN selection according to 3GPP TS 23.122 \[14\]](#).

4.7.5.1.5 Abnormal cases in the MS

The following abnormal cases can be identified:

- a) Access barred because of access class control

The routing area updating procedure shall not be started. The MS stays in the current serving cell and applies the normal cell reselection process. The procedure is started as soon as possible and if still necessary, i.e. when the barred state is removed or because of a cell change.

- b) Lower layer failure before the ROUTING AREA UPDATE ACCEPT or ROUTING AREA UPDATE REJECT message is received

The procedure shall be aborted. The MS shall proceed as described below.

- c) T3330 time-out

The procedure is restarted four times, i.e. on the fifth expiry of timer T3330, the MS shall abort the procedure and, in UMTS, release the PS signalling connection (see 3GPP TS 25.331 [23c]). The MS shall proceed as described below.

- d) ROUTING AREA UPDATE REJECT, other causes than those treated in subclause 4.7.5.1.4

Upon reception of the cause codes # 95, # 96, # 97, # 99 and # 111 the MS should set the routing area updating attempt counter to 5. The MS shall proceed as described below.

- e) If a routing area border is crossed, when the MS is in state GMM-ROUTING-AREA-UPDATE-INITIATED, the routing area updating procedure shall be aborted and re-initiated immediately. The MS shall set the GPRS update status to GU2 NOT UPDATED.

- f) In GSM, if a cell change occurs within the same RA, when the MS is in state GMM-ROUTING-AREA-UPDATE-INITIATED, the cell update procedure is performed, before completion of the routing area updating procedure.

- g) Routing area updating and detach procedure collision

GPRS detach containing detach type "re-attach required" or "re-attach not required":

If the MS receives a DETACH REQUEST message before the routing area updating procedure has been completed, the routing area updating procedure shall be aborted and the GPRS detach procedure shall be progressed.

GPRS detach containing detach type "IMSI detach":

If the MS receives a DETACH REQUEST message before the routing area updating procedure has been completed, the routing area updating procedure shall be progressed, i.e. the DETACH REQUEST message shall be ignored.

- h) Routing area updating and P-TMSI reallocation procedure collision

If the MS receives a P-TMSI REALLOCATION REQUEST message before the routing area updating procedure has been completed, the P-TMSI reallocation procedure shall be aborted and the routing area updating procedure shall be progressed.

In cases b, c and d the MS shall proceed as follows:

Timer T3330 shall be stopped if still running. The routing area updating attempt counter shall be incremented.

If the routing area updating attempt counter is less than 5, and the stored RAI is equal to the RAI of the current serving cell and the GMM update status is equal to GU1 UPDATED:

- the MS shall keep the GMM update status to GU1 UPDATED and changes state to GMM-REGISTERED.NORMAL-SERVICE. The MS shall start timer T3311. When timer T3311 expires the routing area updating procedure is triggered again.

If the routing area updating attempt counter is less than 5, and the stored RAI is different to the RAI of the current serving cell or the GMM update status is different to GU1 UPDATED:

- the MS shall start timer T3311, shall set the GPRS update status to GU2 NOT UPDATED and changes state to GMM-REGISTERED.ATTEMPTING-TO-UPDATE.

If the routing area updating attempt counter is greater than or equal to 5:

- the MS shall start timer T3302, shall delete the list of equivalent PLMNs, shall set the GPRS update status to GU2 NOT UPDATED and shall change to state GMM-REGISTERED.ATTEMPTING-TO-UPDATE or optionally to GMM-REGISTERED.PLMN-SEARCH(see subclause 4.2.5.1.8) [in order to perform a PLMN selection according to 3GPP TS 23.122 \[14\]](#).

4.7.5.2.5 Abnormal cases in the MS

The abnormal cases specified in subclause 4.7.5.1.5 apply with the following modification:

If the GPRS routing area updating attempt counter is incremented according to subclause 4.7.5.1.5 the next actions depend on the Location Area Identities (stored on SIM/USIM and the one of the current serving cell) and the value of the routing area updating attempt counter.

- if the update status is U1 UPDATED, and the stored LAI is equal to the one of the current serving cell and the routing area updating attempt counter is smaller than 5, then the mobile station shall keep the update status to U1 UPDATED, the new MM state is MM IDLE substate NORMAL SERVICE;
- if the routing area updating attempt counter is smaller than 5 and, additionally, the update status is different from U1 UPDATED or the stored LAI is different from the one of the current serving cell, the mobile station shall delete any LAI, TMSI, ciphering key sequence number stored in the SIM/USIM and list of equivalent PLMNs and set the update status to U2 NOT UPDATED. The MM state remains MM LOCATION UPDATING PENDING; or
- if the routing area updating attempt counter is greater or equal to 5, the mobile station shall delete any LAI, TMSI, ciphering key sequence number stored in the SIM/USIM and list of equivalent PLMNs and set the update status to U2 NOT UPDATED.

A GPRS MS operating in MS operation mode A shall then proceed with appropriate MM specific procedure; a GPRS MS operating in MS operation mode B may then proceed with appropriate MM specific procedures. The MM sublayer shall act as in network operation mode II or III (depending whether a PCCCH is present) as long as the combined GMM procedures are not successful and no new RA is entered. The new MM state is MM IDLE substate ATTEMPTING TO UPDATE [or optionally MM IDLE substate PLMN SEARCH in order to perform a PLMN selection according to 3GPP TS 23.122 \[14\]](#).